Catalog of
The University of Iowa

1976-78

Copies of this Catalog are available for examination in all Iowa high schools, offices of the county superintendents of schools, public libraries and justice-and-community colleges; at the major state government offices in Des Moines; and in each office of the University. Copies may be requested from the Office of Admissions without charge. Reprints of individual sections of the Catalog are also available without charge.

Tuition, fees, residence hall rates, course offerings and personnel are shown as they existed at the time of preparation of the Catalog, and are subject to subsequent change by action of the Iowa Board of Regents, governing body of the University. Current information about costs and course offerings for particular sessions may be requested from the Office of Admissions.

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# University Calendar

## FIRST SEMESTER

<table>
<thead>
<tr>
<th>Event</th>
<th>1976-77</th>
<th>1977-78</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advising and Counseling</td>
<td>August 23</td>
<td>August 22</td>
</tr>
<tr>
<td>Registration begins</td>
<td>August 24</td>
<td>August 23</td>
</tr>
<tr>
<td>Classes begin</td>
<td>August 26</td>
<td>August 25</td>
</tr>
<tr>
<td>Holiday</td>
<td>September 6</td>
<td>September 5</td>
</tr>
<tr>
<td>Thanksgiving recess begins</td>
<td>November 24</td>
<td>November 23</td>
</tr>
<tr>
<td>Holiday</td>
<td>November 25</td>
<td>November 24</td>
</tr>
<tr>
<td>University holiday</td>
<td>November 26</td>
<td>November 25</td>
</tr>
<tr>
<td>Classes resume</td>
<td>November 29</td>
<td>November 28</td>
</tr>
<tr>
<td>First-semester classes end</td>
<td>December 9</td>
<td>December 9</td>
</tr>
<tr>
<td>Examination week begins</td>
<td>December 11</td>
<td>December 12</td>
</tr>
<tr>
<td>Examination week ends</td>
<td>December 17</td>
<td>December 16</td>
</tr>
<tr>
<td>University holiday</td>
<td>December 23</td>
<td>December 26</td>
</tr>
<tr>
<td>Holiday</td>
<td>December 24</td>
<td>December 27</td>
</tr>
<tr>
<td>University Holiday</td>
<td>December 31</td>
<td>January 2</td>
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## SECOND SEMESTER

<table>
<thead>
<tr>
<th>Event</th>
<th>1976-77</th>
<th>1977-78</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration begins</td>
<td>January 10</td>
<td>January 12</td>
</tr>
<tr>
<td>Classes begin</td>
<td>January 12</td>
<td>January 16</td>
</tr>
<tr>
<td>Spring vacation begins</td>
<td>March 18</td>
<td>March 17</td>
</tr>
<tr>
<td>Saturday-only classes meet</td>
<td>March 19</td>
<td>March 18</td>
</tr>
<tr>
<td>Classes resume</td>
<td>March 28</td>
<td>March 27</td>
</tr>
<tr>
<td>Second-semester classes end</td>
<td>May 3</td>
<td>May 5</td>
</tr>
<tr>
<td>Examination week begins</td>
<td>May 5</td>
<td>May 8</td>
</tr>
<tr>
<td>Examination week ends</td>
<td>May 13</td>
<td>May 12</td>
</tr>
<tr>
<td>Commencement</td>
<td>May 14</td>
<td>May 13</td>
</tr>
<tr>
<td>Holiday</td>
<td>May 30</td>
<td>May 29</td>
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## SUMMER SESSION

<table>
<thead>
<tr>
<th>Event</th>
<th>1977</th>
<th>1978</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration</td>
<td>June 6</td>
<td>June 5</td>
</tr>
<tr>
<td>Classes begin</td>
<td>June 7</td>
<td>June 6</td>
</tr>
<tr>
<td>Holiday</td>
<td>July 4</td>
<td>July 4</td>
</tr>
<tr>
<td>Session closes</td>
<td>July 29</td>
<td>July 28</td>
</tr>
<tr>
<td>Opening of Independent Study Unit for law and graduate students</td>
<td>August 1</td>
<td>July 31</td>
</tr>
<tr>
<td>Holiday</td>
<td>September 5</td>
<td>September 4</td>
</tr>
</tbody>
</table>
Contents

General Information 4
Housing 9
Libraries 11
Services for Students 12
College of Liberal Arts 15
College of Business Administration 223
College of Dentistry 241
College of Education 257
College of Engineering 290
Graduate College 321
College of Law 333
College of Medicine 340
College of Nursing 377
College of Pharmacy 382
Continuing Education 387
Health Center 390
General Services 393
Research Activities 395
Financial Aids 398
Administrative Personnel 399
Iowa Board of Regents Administrative Code 401
Index 407
Campus Map 409
The University of Iowa received its charter from the first Iowa General Assembly on February 23, 1847, just two months after Iowa's admission to statehood. The University has been in continuous operation since March, 1855.

The University now consists of ten colleges: Business Administration, Dentistry, Education, Engineering, Graduate, Law, Liberal Arts, Medicine, Nursing and Pharmacy. Within the College of Liberal Arts there are seven schools: Art and Art History, Journalism, Letters, Library Science, Music, Religion and Social Work.

The University's enrollment was 22,500 students in the fall of 1975. In 900-acre main campus spans the Iowa River valley and merges with the business center of Iowa City, a community of 50,000 inhabitants near Cedar Rapids, Iowa's second-largest city.

Approximately 83.5 percent (Fall, 1975) of the University's undergraduate students are enrolled in the College of Liberal Arts. Slightly less than one-fourth of its total enrollment is in the Graduate College. Enrollment in the professional colleges—Dentistry, Law and Medicine—is approximately ten percent of the University total.

Four-fifths of the University's undergraduate students are Iowa residents. All Iowa counties, all other states and more than 70 foreign countries are represented in the University's student body.

The male-female ratio among undergraduate students is 7:6. Over 60 percent of the University's entering freshmen have B averages or above in high school; approximately 80 percent ranked in the upper half of their high school classes, 25 percent in the upper tenth.

Half of the University's students have part-time jobs. One-fourth have education loans. One of ten undergraduates and one of four freshmen have scholarships.

The Faculty

The University faculty numbers 1,200 full-time members. Many are nationally and internationally recognized. Most are engaged to some extent in research which contributes to the effectiveness as teachers. The University seeks to maintain a healthy balance between teaching and research, and between undergraduate and graduate-professional teaching.

A substantial number to the University's 1,400 part-time instructors—including graduate assistants—have had full-time college-level teaching experience. They are appointed on the basis of their competence in the areas in which they teach. Most intend to pursue careers in higher education and therefore have a primary interest in augmenting the University's teaching and research potential. All are trained with and supervised by regular faculty members.

Accreditation and Associations

The University of Iowa has been accredited by the North Central Association of Colleges and Secondary Schools since the Association's organization in 1913. The University is a member of the Association of American Universities. It is associated with Northwestern, Indiana, Purdue, Ohio State and Michigan State Universities, and the Universities of Minnesota, Wisconsin and Michigan in the Western Universities Association. It is associated with these "Big Ten" universities and The University of Chicago in the Committee for Institutional Cooperation (CIC). Various colleges and schools of the University are members of accrediting associations in their respective fields, as follows:

Colleges

Business Administration—American Association of Collegiate Schools of Business

Dentistry—American Dental Association

Education, Teacher Education—National Council for Accreditation of Teacher Education

Engineering—Engineers Council for Professional Development

Law—American Bar Association and Association of American Law Schools

Medicine—Liaison Committee on Medical Education (representing the American Medical Association and the Association of American Medical Colleges)

Nursing—National League for Nursing

Pharmacy—American Council on Pharmaceutical Education

Schools

Library Science—American Library Association

Music—National Association of Schools of Music

Social Work—Council on Social Work Education

Departments

Chemistry—American Chemical Society

Dental Hygiene—American Dental Association, Council on Dental Education

Hospital Administration—Accrediting Commission on Graduate Education for Hospital Administration

Medical Technology—Council on Medical Education of the American Medical Association in collaboration with the American Society of Clinical Pathologists and the American Society for Medical Technology

Physical Therapy—American Medical Association in collaboration with the American Physical Therapy Association

Psychology—American Psychological Association

Speech Pathology and Audiology—American Speech and Hearing Association

Sessions

The University's academic year consists of two sessions of approximately 17 weeks each. The University also conducts an eight-week summer session and, following that, an Independent Study Unit of from one to four additional weeks for students in the Graduate College and the College of Law.
Code of Student Life
University of Iowa students have a large measure of freedom and self-determination, because liberal policies affecting student life have been served the University's liberal approach to education. Standards for the conduct of student life are set forth in a code carefully written and regularly reviewed by a committee of students and faculty members. This Code of Student Life reflects the principles expressed in the 1967 Joint Statement on Rights and Freedoms of Students, drafted and endorsed by the National Student Association and the American Association of University Professors. Accordingly, the Code relates only to student misconduct which adversely affects some University process or function, or some other interest of the University as an academic community. Students are expected to acquaint themselves with the Code and to conduct themselves in accord with the standards it sets forth.

Human Rights
The University is guided by the precept that in no aspect of its programs shall there be a difference in the treatment of persons because of race, creed, color, national origin, age, sex or any other classifications that deprive the person of consideration as an individual, and that equal opportunity and access to facilities shall be available to all. This principle is expected to be observed in the admission, housing and education of students; in policies governing programs of extracurricular life and activities; and in the employment of faculty and staff personnel. The University works cooperatively with the community in furthering this principle.

Admission
Correspondence regarding admission to any college of The University of Iowa should be addressed to the Admissions Office, 108 Calvin Hall, The University of Iowa, Iowa City, Iowa 52242. The first letter should request an application for admission, briefly describe the prospective applicant's high school or college background and outline his or her plans for further study, including the department or general field in which he or she expects to major. All applicants for admission to all colleges of the University must submit formal applications to the Admissions Office and must furnish official transcripts and other supporting material as specified.

Determining Residence
For admission, tuition and fee purposes, the University Registrar classifies all students enrolling in the University as residents or nonresidents of Iowa, according to criteria established by the Iowa Board of Regents and on the basis of information provided by the student and all other relevant information.

Application Deadlines
Applicants for admission must submit the required application documents to the Office of Admissions by the deadline dates listed below. Different deadline dates apply to foreign students.

College of Dental Care
January 15—Fall Semester only

College of Engineering
Ten days before Registration begins—all sessions

Graduate College
May 1—Summer Session July 15—Fall Semester December 1—Spring Semester

College of Law
April 1—Summer Session March 1—Fall Semester only

College of Medicine
December 1—Fall Semester only

College of Nursing
March 1—Fall Semester June 15—Spring Semester January 15—Summer Session

College of Pharmacy
March 1—Fall Semester only

Dental Hygiene Program
April 1—Fall Semester only

Teacher Education Program
May 15 Preceding the academic year in which student plans to enroll in professional education courses

Foreign Students
Self-financed students located overseas: January 1—Summer Session March 1—Fall Semester August 1—Spring Semester

Students in the U.S. or Canada, or those who will be sponsored by their government or by a private educational agency or foundation:

May 15—Summer Session
July 1—Fall Semester
December 1—Spring Semester

(Note: Prospective foreign students should initiate application procedures one year in advance, to ensure their completion by the deadline date and prior to initiating application procedures should obtain a copy of the University pamphlet, Information for Prospective Foreign Students. The pamphlet may be requested from either the Office of International Education and Services or Office of Admissions, Calvin Hall, The University of Iowa, Iowa City, IA 52242 U.S.A.)

American College Tests
The University of Iowa requires all entering freshmen and underclassmen as usual to complete the American College Tests
(ACT) and have their test scores reported to the University before the regular deadline.

The University of Iowa uses ACT scores for:

- **Admission**: As a criterion for admitting some students uncondi-
tionally or on probation; for requiring some students to attend a
prophylactic summer session; and for denying admission to ap-
plicants who do not meet minimal standards.

- **Placement**: As a basis for excusing some students from certain
basic core requirements; for placing others in sections designed
to meet individual needs; and for advising students concerning
their programs of study and future educational plans.

- **Scholarship**: As a criterion for awarding University-adminis-
tered scholarships and loans.

Scholastic Aptitude Test (SAT) scores may be submitted with
freshmen or undergraduate transfer admission applications and
will be used for admission evaluation. However, ACT scores 
must be submitted prior to registration.

It is advisable that anyone interested in applying for undergrad-
uate admission at Iowa complete the American College Test during
the fall prior to his or her anticipated registration.

Applicants who have completed the tests but did not have their
scores reported to the University should request these reports from
the Records Section, American College Testing Program, Box
451, Iowa City, Iowa 52240. Further information, including
testing dates and location, may be obtained from high school or
college counselors, or from the ACT Program.

Graduate and Professional College Examinations
Prospective Graduate College applicants should take the Graduate
Record Examination (GRE) Aptitude Test or, if applying for
admission to a department of the College of Business Administra-
tion other than Economics, the prospective applicants to the
colleges of Dentistry, Law or Medicine are required to take
admission tests of the respective colleges.

**Application Fee**
A $10 application fee must accompany applications submitted by
prospective students not previously enrolled for full-time study at
the University during the regular academic year. A Graduate
College applicant must pay the fee, unless he or she has earned a
degree from The University of Iowa. Application fees are not
refundable, except to Iowa residents who are denied admission.

**Medical Information**
In the interest of providing optimum health care, Student Health
Service strongly recommends that following their admission in-
coming students submit physical examination reports and personal
health histories on the forms provided for that purpose. This
information does not affect the student’s admission and is exclu-
sively for the use of Student Health Service as necessary back-
ground for attending to the student’s health needs.

**Tuition and Fees**
The following is the University’s schedule of tuition and fees, per
semester, for the academic year:

<table>
<thead>
<tr>
<th>Undergraduate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program</strong></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
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<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
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<tr>
<td>5</td>
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<td>6</td>
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<tr>
<td>7</td>
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<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
</tbody>
</table>

**Medicine**

| **Program**  | **Graduate** | **Denialty** |
|--------------|
| **Hours**    | **Res. nonres.** | **Res. nonres.** |
| 0-5          | $218 | $218 | $148 | $148 |
| 5-8          | $245 | $245 | $277 |
| 9-10         | $600 | $1350 | 390 | 860 |

*Nine hours and over
**Twelve hours and over*

Extension courses $30 per semester hour. Correspondence Courses $30 per semester hour.

General fees provide for the student’s use of Iowa Memorial Union
facilities, and of libraries, laboratories and gymnasium; free admis-
sion to minor sports events and to student-faculty concerts and
plays; admission to major sports events and to performances by
visiting stage and concert artists, at reduced rates; subscriptions to
the student newspaper, The Daily Iowan, on a housing unit basis;
certain student hospital services; and other activities and services
as announced.

**Registration**
All persons who attend University classes are required to register
and pay the established tuition and fees. Students in the Graduate
College and the colleges of Engineering, Liberal Arts and Nursing
may audit courses with proper approval. Students who audit
courses will be assessed fees based on the lowest credits for which
the course is available that semester.

**Procedure for Payment of Student Accounts**
Tuition and fees, board, room and other University residence hall
or fraternity-security housing expenses, and such incidental Uni-
versity expenses as library and parking fees, are payable on an
installment basis, with billing the first of September, October and
November for the fall semester, and the first of February, March
and April for the spring semester. Students with accounts overdue
on the 15th of the month are reported to the Registrar for
cancellation of registration. There is a $10 fee for reinstatement.
Refund Schedule
Students who cancel their registration during a regular semester receive a reduction of fees assessed as follows: during the first week of classes—20%; during the second week—50%; during the third week—50%. There is no reduction of fees for cancellations after the third week of classes.

University Marking System
Mark Definition Grade Points/Semester Hour
A above average 4
B average 3
C average 2
D below average but passing 1
F failing 0
R* audit 0
W withdrawn 0
S* satisfactory -
U* unsatisfactory (Graduate College only) -
O* no grade submitted -

(*not used in computing grade-point averages)

Recognition of High Scholastic Achievement
The University recognizes high scholastic achievement by awarding degrees "with distinction," "with high distinction," and "with highest distinction," based on these criteria:

Pharmacy
Highest distinction 3.75 + GPA highest 2%
High distinction 3.50-3.74 next highest 3%
Distinction 3.25-3.49 next highest 5%

Other Colleges
Highest distinction 3.75 + GPA highest 2%
High distinction 3.50-3.74 next highest 3%
Distinction 3.25-3.49 next highest 5%

Records
All academic records are maintained by the Office of the Registrar and will not be released without written permission of the student.

Numbering of Courses
Each course in the regular University curriculum has an identifying number, preceded by the number of the college, department or program by which the course is administered. For example "4-11" is the code for the course numbered 11 in the Department of Chemistry (4), entitled "Elementary Quantitative Analysis." Course numbers below 100 designate courses "Primarily for Undergraduates," numbers 100 to 199 designate courses "For Undergraduates and Graduates," and numbers 200 and above designate courses "Primarily for Graduates."

College of Business Administration
6A Accounting
6B Business Administration
6E Economics
65 Business Education

College of Dentistry
81 Fixed Prosthodontics
82 Operative Dentistry and Parodontics
84 Removable Prosthodontics
86 Oral Pathology and Diagnosis
87 Oral Surgery
88 Dental Hygiene
89 Orthodontics
90 Pedodontics
92 Periodontics
111 Preventive and Community Dentistry
112 Dentistry Non-Departmental
114 Comprehensive Care

College of Education
7A Post-Secondary and Continuing Education
7C Counseling and Guidance
7D Educational Administration
7E Early Childhood and Elementary Education
7F Social Foundations and Comparative Education
7H Post-Secondary and Continuing Education
7P Educational Psychology, Measurement and Statistics
7S Secondary Education
7U Special Education
7V Instructional Design and Technology
7X Education Interdivisional

College of Engineering
All courses are offered by the Divisions for the academic programs. Division course offerings are distinguished by the first two digits of the course prefix.

Prefix Division
01x Division
50x Division
54x Information Engineering
56x Materials Engineering
58x Systems Engineering

The third digit of the course prefix denotes the academic program for which the course is offered.

Third Digit x Program
00x Undergraduate Engineering Core
01 Biomedical Engineering
02 Chemical Engineering
03 Civil Engineering
04 Environmental Engineering
05 Electrical Engineering
06 Industrial and Management Engineering
08 Mechanical Engineering
09 Mechanics and Hydraulics

91 College of Law

College of Liberal Arts
0 Nondepartmental Courses
00L Lakeside Laboratory
1A Basic Studio
1B Elements of Art
1C Ceramics
1D Design
1E Art Education
<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1F</td>
<td>Drawing</td>
<td>38</td>
<td>Portuguese</td>
</tr>
<tr>
<td>1G</td>
<td>Woodworking</td>
<td>39</td>
<td>East Asian Languages and Literature</td>
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<tr>
<td>1H</td>
<td>Art History</td>
<td>391</td>
<td>Japanese</td>
</tr>
<tr>
<td>1I</td>
<td>Multimedia</td>
<td>41</td>
<td>Russian</td>
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<tr>
<td>1K</td>
<td>Painting</td>
<td>42</td>
<td>Social Work</td>
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<tr>
<td>1L</td>
<td>Photography</td>
<td>44</td>
<td>Geography</td>
</tr>
<tr>
<td>1M</td>
<td>Print Making</td>
<td>45</td>
<td>American Civilization</td>
</tr>
<tr>
<td>1N</td>
<td>Sculptures</td>
<td>48</td>
<td>Comparative Literature</td>
</tr>
<tr>
<td>1P</td>
<td>Cross reference with courses which originated in other departments</td>
<td>80</td>
<td>Hospital and Health Administration</td>
</tr>
<tr>
<td>2</td>
<td>Biology</td>
<td>97</td>
<td>Science Education</td>
</tr>
<tr>
<td>3</td>
<td>Speech Pathology and Audiology</td>
<td>98</td>
<td>Social Studies</td>
</tr>
<tr>
<td>4</td>
<td>Chemistry</td>
<td>102</td>
<td>Urban and Regional Planning</td>
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<td>5</td>
<td>English</td>
<td>103</td>
<td>Linguistics</td>
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<tr>
<td>5L</td>
<td>English Language and Linguistics</td>
<td>104</td>
<td>Recreation Education</td>
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<td>English Professional</td>
<td>108</td>
<td>School of Letters</td>
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<tr>
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<td>English Writing</td>
<td>113</td>
<td>Anthropology</td>
</tr>
<tr>
<td>9</td>
<td>French</td>
<td>122</td>
<td>Communication Studies</td>
</tr>
<tr>
<td>10</td>
<td>Basic Skills Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Core Courses</td>
<td></td>
<td></td>
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<td>12</td>
<td>Geology</td>
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<td>German</td>
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<td>14</td>
<td>Greek</td>
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<td></td>
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<td>16</td>
<td>History</td>
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<td>17</td>
<td>Home Economics</td>
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<tr>
<td>18</td>
<td>Italian</td>
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<tr>
<td>19</td>
<td>Journalism</td>
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<tr>
<td>20</td>
<td>Latin</td>
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<tr>
<td>21</td>
<td>Library Science</td>
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<tr>
<td>22C</td>
<td>Computer Science</td>
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<td>22M</td>
<td>Mathematics</td>
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<tr>
<td>22S</td>
<td>Statistics</td>
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<tr>
<td>23</td>
<td>Military Science</td>
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<tr>
<td>23A</td>
<td>Aeronautic Military Studies</td>
<td></td>
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<tr>
<td>24</td>
<td>Museum Training</td>
<td></td>
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</tr>
<tr>
<td>25</td>
<td>Music</td>
<td></td>
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<tr>
<td>26</td>
<td>Philosophy</td>
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<tr>
<td>27</td>
<td>Physical Education for Men</td>
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<td>Physical Education for Women</td>
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<td>Physics and Astronomy</td>
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<tr>
<td>30</td>
<td>Political Science</td>
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<td>Public Affairs</td>
<td></td>
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<tr>
<td>31</td>
<td>Psychology</td>
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<tr>
<td>32</td>
<td>Religion</td>
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<td>33</td>
<td>European Literature and Though</td>
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<td>34</td>
<td>Sociology</td>
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<tr>
<td>35</td>
<td>Spanish</td>
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<tr>
<td>36</td>
<td>Speech and Dramatic Art</td>
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<tr>
<td>36B</td>
<td>Broadcasting and Film</td>
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<td>36R</td>
<td>Rhetorical Studies</td>
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<td>36T</td>
<td>Theatre</td>
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<td>37</td>
<td>Zoology</td>
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<td>96</td>
<td>College of Nursing</td>
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<tr>
<td>38</td>
<td>Peruvian</td>
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<td></td>
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<td>39</td>
<td>East Asian Languages and Literature</td>
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<tr>
<td>391</td>
<td>Japanese</td>
<td></td>
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<td>41</td>
<td>Russian</td>
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<td>42</td>
<td>Social Work</td>
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<td>44</td>
<td>Geography</td>
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<td>45</td>
<td>American Civilization</td>
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<td>48</td>
<td>Comparative Literature</td>
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<td>Hospital and Health Administration</td>
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<td>97</td>
<td>Science Education</td>
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<td>98</td>
<td>Social Studies</td>
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<td>102</td>
<td>Urban and Regional Planning</td>
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<td>103</td>
<td>Linguistics</td>
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<td>104</td>
<td>Recreation Education</td>
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<td>108</td>
<td>School of Letters</td>
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<td>113</td>
<td>Anthropology</td>
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<tr>
<td>122</td>
<td>Communication Studies</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

College of Medicine

50 Medicine, Nondepartmental
50 Anatomy
51 Microbiology
62 Dermatology and Syphilology
63 Preventive Medicine and Environmental Health
64 Neurology
65 Human Nutrition
66 Otorhinolaryngology and Gynecology
67 Ophthalmology
68 Otolaryngology and Maxillofacial Surgery
69 Pathology
70 Pediatrics
71 Pharmacology
72 Physiology and Biophysics
73 Psychiatry
74 Radiology
75 Surgery
76 Orthopedic Surgery
77 Radiation Biology
78 Internal Medicine
79 Urology
99 Biochemistry
101 Physical Therapy
115 Family Practice
116 Anesthesiology
117 Physician's Assistant Program
96 College of Nursing

College of Pharmacy

46 College of Pharmacy
Unmarried students with less than 56 semester hours of college credit are required, as a condition of University registration, to live in University residence halls, excepting students who normally would have completed three years at the college level, or who qualify for specific exemptions. Exemption criteria are outlined in the parietal rule brochure available from the University Housing Office, 330 North Capitol Street, Iowa City, Iowa 52242. Exemption requests must be received by the University Housing Office at least 30 days before the session for which the exemption is requested. Exemption request forms are available from the University Housing Office.

Fair Housing Policy
The following is the University's statement on fair housing practices:

"It is and shall be the firm policy of the University that householders shall rent to all students on the basis of their individual merits as persons, without exclusion or discrimination on the basis of race, creed, color or national origin."

Iowa City has a fair-housing ordinance providing for equal opportunity to secure housing without distinction due to race, religion or ancestry, except in certain instances involving owner-occupied dwellings units. A Human Relations Commission is responsible for the observance of this ordinance and for the initiation of redress for violations of it.

University Residence Halls
University residence hall furnishings, facilities and services are designed to provide a pleasant atmosphere conducive to effective study.

Single, double, triple and quadruple rooms with full or partial board are available in the Grand Avenue Residence Halls (west campus), which include Hillcrest, Quadrangle, South Quadrangle, Rosewood and Sizer halls, and in the Clinton Street Residence Halls (east campus), which include Bierce Hall, Carver Hall, Daum House and Stanley Hall. Students not living in residence halls may contract for full or partial board.

There are lounges, study rooms, borrowing libraries and recreation rooms available to each residence hall.

Each residence hall is divided into small living units. Each hall has a full-time head resident, and there is a student resident advisor in each living unit. Each unit has its own student governing body and is represented in the government of its residence hall. Student-initiated residence hall programs and activities provide a wide range of opportunity to pursue social, cultural, recreational and athletic interests.

Upperclass Students
Juniors, seniors and graduate students may request residence hall accommodations in areas reserved for them.

Applications and Assignments
Prospective undergraduate students receive with their application for admission a separate application for residence hall accommodations. Prospective students applying for residence hall accommodations should read the terms and conditions of the contract, complete all information requested on the application form, sign the contract portion, complete the advance payment form and return the completed application with their check in the amount of $50 to the University Housing Office.

Applications for residence hall housing are not considered until the applicant has been admitted to the University.

Students are encouraged to choose their own roommate. Prospective roommates must request assignment together when they apply, preferably with both applications submitted at the same time. The assignment of roommates will not be made until all of the prospective roommates' application materials have been received and both have been admitted to the University. The application last received or the student last admitted determines the date order of assignment. Roommate assignment is made without regard to race, color, nationality or religion.

Students already living in University residence halls are given priority in the assignment of accommodations. The residence hall application and $50 advance payment constitute a contract offer. An application may be withdrawn by notifying the University Housing Office in writing before the application becomes a binding contract. It becomes binding after June 1, if for the academic year; after December 1, if for the second semester only; after May 15, if for the summer session; or ten days after the University Housing Office receives notice of the acceptance of the contract and assignment of accommodations. If the notice is made within nine days before the beginning of registration, the contract becomes binding two days before the beginning of registration.

Upon written request, the $50 advance payment will be refunded to applicants who are not admitted to the University, and to those who cancel their residence hall contracts in accordance with the terms and conditions set forth in the contract.

Rates
Basic rates for University residence hall accommodations for the 1976-77 academic year are $1,204 for a double room and $1,190 for a triple, with full board. Rates for the several available room and board options vary according to the accommodations, and all rates are subject to change annually.

Married Student Housing
There are 749 University-operated apartments available to married students in the Hawkeye Drive, Hawkeye Court and Parkview complexes.

Rates for 1976-77 range from $99 to $107 per month for one-bedroom units (there are only 4) at the lower rate to $130.00 for two-bedroom units, not including gas, electricity and tele-
phases. All units are unfurnished. Rates are subject to change annually.

Married student housing is assigned in the order applications are received. Assignments are contingent on the applicant's meeting all University admission requirements. However, applications may be filed before completion of admission.

A $25 advance payment is required for all apartments at the time they are offered for leasing.

Off-Campus Housing

The Protective Association of Tenants is a student organization which provides a listing service of off-campus housing, works with tenants' rights problems and provides a tenants' handbook to help inform individuals of the law and the rights of tenants.

Fraternities

Nineteen undergraduate and six professional fraternities operate chapter houses at Iowa. Houses accommodate 35 to 45 men.

Undergraduate fraternities are Acacia, Alpha Epsilon Pi, Beta Theta Pi, Delta Chi, Delta Tau Delta, Delta Upsilon, Kappa Sigma, Lambda Chi Alpha, Phi Delta Theta, Phi Gamma Delta, Phi Kappa Psi, Phi Kappa Sigma, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Sigma Pi and Tau Kappa Epsilon.

Professional fraternities operating chapter houses include Alpha Phi Sigma (dentistry), Alpha Kappa Kappa (medicine), Delta Sigma Delta (dentistry), Phi Delta Pi (medicine), Phi Rho Sigma (medicine) and Phi Omega (dentistry).

Sororities

The 14 national sororities active at Iowa are Alpha Chi Omega, Alpha Delta Pi, Alpha Gamma Delta, Alpha Phi, Alpha Xi Delta, Chi Omega, Delta Delta Delta, Delta Gamma, Delta Zeta, Gamma Phi Beta, Kappa Alpha Theta, Kappa Alpha Gamma, Pi Beta Phi and Zeta Tau Alpha.
The Leigh Hunt Collection, brought together by Luther A. Brewer of Cedar Rapids, Iowa, is considered one of the most complete in existence. It contains nearly 2,000 manuscript and manuscript letters written by Hunt or to him by his many famous literary friends, 100 association volumes, and 600 editions of Hunt's writings.

The Mark Ryken Memorial Collection of approximately 3,700 volumes is particularly rich in deluxe editions, including many proof bindings made especially for Mrs. Ryken.

The Finch River Collection includes more than 8,000 political pamphlets, chiefly from the years 1788-1799, supplemented by numerous French newspapers and government publications of the time.

The Johns Hopkins Collection on typescript, given to the Library by a long-time Iowa City printer, includes 7,800 volumes of type specimens, books important in printing history and volumes illustrating the art and progress of printing through the centuries.

The "Ding! Darling" Collection comprises originals of nearly 6,000 caricatures which for more than 40 years Dink recorded and commented on the economic, political and diplomatic affairs of the United States. His caricatures are virtually a pictorial history of this country during the first half of the 20th century. A subject index to the collection enhances its usefulness for a reference and research.

The Bollinger-Lincoln Collection, gathered by Judge James W. Bollinger of Davenport is one of the best libraries of Lincolniana in the United States. A number of items in it concerns John Wilkes Booth and the trial of his fellow conspirators. Another large group contains reminiscences of people who knew Lincoln. Lastly, broadside relating to the Civil War Period have been added.

The "K" Collection is a gathering of early, rare or special works on diverse subjects, including books of the 15th and 16th centuries, early printed books, first editions, Club publications, private press books and selected modern first editions.

The Manuscript Collection includes more than 6,600 individually cataloged letters or manuscript items of English and American authors or historical figures, principally of the 19th and 20th centuries, including letters of statesmen, diplomats, diaries and correspondence files relating to midwestern economic, political and agricultural history.

Other special collections include the Harvey Ingram Collection of books dealing with the American Indians; the Levi G. Leonard Collection of manuscripts and documents dealing with railroad building in the Midwest; the History of Hydraulics Collection; the Edwin Ford Piper Collection of ballads and balladsongs; the Chauncey Collection, which contains several thousand letters and business documents descriptive of the Chauncey movement; the Blunden Collection of poetry, biography and criticism, manuscripts and letters relating to the contemporary English poet, Edmund Blunden; the Iowa Authors Collection; the Map Collection, containing more than 120,000 maps and indexed aerial photographs and nearly 2,000 atlases, gazetteers and related reference items; and the University Archives.
Academic Advisory Offices

Each student is assigned a faculty adviser to assist with registration, educational planning, and academic counseling. Students planning to complete preprofessional courses are assigned to academic advisers from the areas of their choice. Students in the professional colleges are advised by the college dean or their designated representatives. Graduate students are advised by their department heads and the Graduate College Dean. In addition to academic advising, advisers also serve as general consultants to students, and refer those with special problems to the appropriate areas.

The Action Studies Program

Pattersoned after the "free university" concept, the Action Studies Program provides a vehicle for immediate response to student demand for courses too current or too experimental for initiation as part of the regular University curriculum. Anyone with an interest in a particular topic may set up a course with the help of Action Studies. The courses are generally open to anyone who is interested in the course. Courses taken for no credit are free. Regular tuition is charged for credit courses. Most of the courses in the Action Studies Program run concurrently with the regular University schedule. A catalog with course descriptions, times, and meeting places is printed every semester. A catalog of individuals engaged in a resource and skills exchange is printed once a month. For more information, contact the Action Studies Office, 303 Jefferson Building.

Admissions

All inquiries, transcripts, evaluations of transfer credit and applications for admission into any college of the University should be directed to the Office of Admissions.

Career Services and Placement Center

Placement

Job placement assistance is provided for all seniors and graduate students seeking employment in business, industry, government, and non-profit agencies. Activities include individual consultations with professional placement advisers, seminars for developing job-hunting interviewing skills, on-campus interviews with prospective employers, information on employment trends for college graduates, background data on thousands of employers, and data on current job opportunities. (Also see "College of Engineering" and "College of Education" for placement services these Colleges offer.)

Career Planning

Activities include help in developing realistic career plans, locating career alternatives related to major fields of study or interests, finding meaningful entry-level employment, developing effective job search skills and tools, and preparing women and minorities for the work world. Assistance provided through individual career advising, workshops, career days, groups and seminars, and two-credit course, "Making a Vocational-Educational Choice."

Career Resource Center

Whether in search of information on career opportunities or how to best prepare to enter the job market, the Career Resource Center offers assistance from its professional advising staff, the computerized vocational information system, and its collection of career pamphlets, job search aids, college catalogs, education directories, and employer files and directories.

Cooperative Education

Coordinated by the Career Services and Placement Center, the Cooperative Education Program offers students the opportunity to alternate academic studies with related work experiences. Students who meet the prerequisites of their respective colleges or academic departments generally enter the Program following their sophomore year. Cooperative education positions are filled on a competitive basis with participating employers making the final selections from among the student candidates.

Counseling Service

The professionally trained counselors and psychologists of the University Counseling Service staff offer vocational, educational and personal counseling to University students, staff and faculty. Interviews are confidential and information is released only upon the client's written request. All counseling and testing services are available without cost to any University student or staff member.

Dental Service

The dental clinics at the University of Iowa College of Dentistry are primarily for educational purposes. All employees of the University and all students who are registered in the University may receive dental treatment at the College and will be accorded the same opportunity for treatment as any other patient. However, the College of Dentistry is not affiliated with the University. Student Health Service is not involved, and does not render service under the Student Health Hospitalization fund. Fees are established for all treatments rendered, and patients are to pay cash or use their Master Charge card.

Educational Opportunity Program

This program identifies students from economically disadvantaged backgrounds and arranges financial and academic assistance according to individual need for those admitted to the University. All information should be sent to the EOP Admissions Coordinator in the Office of Admissions.

Evaluation and Examination Service

Evaluation and Examination Service duplicates, scores and analyzes many course examinations. It helps faculty members de-
velop and improve their classroom tests by providing thorough analyses of the results of examinations. It also helps faculty or student groups with particular project requests, such as teacher or course evaluation and development. Additionally, it conducts research projects and provides consulting services on questionnaire and survey design.

It administers many of the University's required and optional tests for entering students, and is also a center for many national testing programs, including the American College Test (ACT), Medical College Admission Test (MCAT), Graduate Record Examination (GRE), Graduate Management Admissions Test (GMAT), Gradu-

**Health Service**

The Student Health Service, including the clinic and inpatient service, is located in the Children's Hospital in the University medical complex. All registered students at the University are eligible for care in the Student Health Service, which provides comprehensive primary medical services. Student Inpatient (inpatient) care is provided to students requiring medical supervision and nursing care. There is a daily charge for inpatient nursing care, and there are charges for laboratory tests, X-rays, etc. All students are advised to be covered by health and accident insurance. If such coverage is not available under existing family or group plan policies, University-approved group plan insurance is available for individual students or as a family plan covering students and dependents.

**High School-College Relations**

Admission is a part of the Office of Admissions, the High School-College Relations Office coordinates and implements all scheduled relations with secondary schools and institutions of higher education.

**Intercollegiate Athletics**

The University is a member of the Western Intercollegiate Conference (Big Ten), and has athletic programs in football, basketball, track, baseball, swimming, golf, wrestling, tennis, cross-country, and gymnastics. Membership is determined by the Board of Control of Athletics, which is composed of 13 members from the University's teaching and administrative staff, two University alumni, one representative of the University Student Staff, and two students.

**Intramural Sports and Recreational Activities**

Through the University's Division of Recreational Services, all interested students have opportunities to participate in more than 20 different intramural sports and recreational activities. (See "Recreational Services" in "General Services and Facilities."

**Iowa Memorial Union**

The Union is the center of University convivial activities. It houses the Student Activities Center, University Counseling Service, Career Services and Placement Center and Campus Information Center. Its facilities include a variety of food services, a bowling and billiards area, a barber shop, a creative crafts center, a bookstore, a sundries shop, a television room, lounges, meeting rooms, auditorium for lectures and concerts, art and sculpture display areas, and, in the adjoining Iowa House, 105 guest rooms for families, alumni, conference and workshop participants, and other visitors to the campus.

**Office of International Education and Services (OIES)**

The OIES assists U.S. students who wish to study, travel or work abroad, and counsels foreign students who attend the University. The OIES houses an Overseas Opportunities Center staffed by a professional adviser. The Center has extensive information about hundreds of study abroad programs (including several jointly sponsored by The University of Iowa), foreign universities, travel opportunities, housing, camping, trekking, etc. The OIES serves as the Fulbright Program Advisor for UI students and faculty, and has information about many scholarships and fellowship programs for people with international interests. The International Student ID card may be obtained at the OIES. The Foreign Student Advisers in the OIES promote and facilitate interaction among Americans and foreign students and professionals. They also provide information, advice and counselling for the over 500 foreign students and professionals in such areas as immigration, personal and social adjustment, and financial planning.

The OIES operates the International Center, which students, faculty and Iowa City community members use for meetings, meals and activities which have an international focus.

**Orientation Office**

With the aid of representative student, faculty and staff personnel, the Orientation Office designs and conducts a wide variety of programs to help new students—freshmen, transfer and graduate—with as many of their how-to-and-where-to questions as possible. In the academic area, regarding services and facilities available to them, and in all other aspects of student life in the University community.

**Reading Lab**

The Reading Lab of the Rhysor Program provides individualized instruction for any University student who wishes to improve their college-level reading performances. Students are asked to specify what reading problems they have met; teachers adapt practical materials and methods to help tackle those problems. Students may work on improving study skills, including SQ3R and mapping techniques, technical skills, test-taking abilities, command of vocabulary, comprehension, critical reading and increased rate of reading.

The Reading Lab offers two service courses:

1. A Voluntary Reading Lab meets twice a week at scheduled hours for 12 weeks. Students may attend more or less often if they wish, and may enroll at any point during that time if they feel they need reading help. This is not required for credit and assigns no grade; ordinarily no outside assignments are given; work is restricted to the Lab hours, and makes extensive use of Lab materials and the students' own texts in other courses.

2. Speeded Reading is taught twice during the semester, four times a week for six weeks. It is also a volunteer course without credit or grades. Students are expected to attend regularly, and work on eye-span and skimming exercises; reading films and timed reading exercises, both with comprehension tests; pace practice, and rapid reading practice outside class. Pre- and post-tests are given. Students learn to vary their rate according to the difficulty of material and purpose for reading, and retain effective comprehension.
The Lab also offers two for-credit courses, 10-8 Rhetoric, for students who need exceptional help preparing for college-level reading, and SP-370 Teaching in a College-Level Reading Lab.

Registrar
The Office of the Registrar determines the residence status of each student, issues University Identification cards, supervises registration procedures, assesses fees, and maintains all students' academic records and official transcripts. It also assists students in determining graduation requirements, processing applications for degrees, and interpreting college and University academic regulations, and it provides assistance to students concerning Selective Service and military service matters and helps student veterans with University application and enrollment procedures, and receipt of Veteran Administration benefits.

Religious Opportunities
Recognizing the religious interests of University students, various faiths and denominations have established campus centers and ministries. The Association of Campus Ministries coordinates inter-religious activities and promotes religious consciousness, understanding and commitment.

Special Support Services
Established especially for members of minority groups, low-income undergraduate students and special-admission students, this office provides assistance with special needs, including request for tuition, career advising, study sessions and financial aid.

Speech and Hearing Clinic
The University of Iowa Speech and Hearing Clinic provides services for speech, language, and hearing problems. Any University student may receive needed services without charge. Services include diagnostic examinations, consultations, individual clinic sessions, small group sessions and referrals to other clinics as needed.

Veterans' Services
Veterans, dependents of veterans, and servicemen are served as a part of the Office of the Registrar. The Veteran Affairs Office provides assistance, information and tutorial programs for veterans students. People with questions or problems related to Veterans Administration benefits or registration and study at the University should contact this office.

Writing Lab
The Individual Instruction in Writing offered by the Lab (twice a week at scheduled hours) is open to any University student—from entering freshmen and women to doctoral candidates. Each person's own writing is the content of the course for that person, and the teacher responds to what each person writes and helps him or her identify and overcome particular writing problems in personal conferences. Papers required in other courses may be written and discussed in the Lab, but the primary aim is to help people gain the competence they need to respond to any writing situation with confidence.

Any student who fears he or she cannot do the writing expected in the required Rhetoric course, may confer with the Director of the Lab about seeking Individual Instruction in Writing for credit (10/5) before registering for the required course. Noncredit students may enroll throughout the semester.
College of Liberal Arts


The central objective of the College of Liberal Arts is to provide an environment which will encourage the student in the fullest possible development of his or her capabilities. Through its curriculum and related activities, the College seeks to ensure that its students acquire basic competencies in communication skills and quantitative thinking; guides its students toward familiarity with the principal ideas, facts and work methods in the various fields of natural and social science, language and literature, fine art, history and philosophy; and seeks to provide its students with experiences conducive to their development of resourceful and independent minds, strength of character and sense of personal responsibility.

The College of Liberal Arts has its beginnings in the chartering of the University in 1847. It now enrolls more than three-fourths of all the University's undergraduate students, provides facilities and facilities for a majority of the University's advanced degree programs and, in addition to supportive and major coursework for Liberal Arts programs, provides preparatory coursework for undergraduate programs offered by other colleges of the University.

Degrees Offered

- Afro-American Studies, B.A. (in American Civilization)
- American Civilization, B.A.
- Anthropology, B.A.
- Art and Art History, B.A., B.F.A.
- Asian Studies, B.A.
- Astronomy, B.A.
- Biochemistry, B.A., B.S.
- Botany, B.A.
- Chemistry, B.A., B.S.
- Classics, B.A.
- Communication Studies, B.A.
- Computer Science, B.A., B.S.
- Dance, B.A., B.S.
- Dental Hygiene, B.S.
- Early Childhood Education, B.A., B.S.
- Economics, B.A., B.S.
- Elementary Education, B.A., B.S.
- English, B.A.
- French, B.A.
- General Science, B.A., B.S.
- General Studies, B.G.S.
- Geography, B.A., B.S.
- Geology, B.A., B.S.
- German, B.A.
- Greek, B.A.
- Health Occupations Education, B.A., B.S.
- History, B.A.
- Home Economics, B.A., B.S.
- Italian, B.A.
- Journalism, B.A., B.S.
- Latin, B.A.
- Letters, B.A.
- Liberal Studies, B.L.S.
- Linguistics, B.A.
- Literature, Science and the Arts, B.A.
- Mathematical Sciences (includes Statistics), B.A., B.S.
- Medical Technology, B.S. (in General Science)
- Microbiology, B.S.
- Music, B.A., B.M.
- Nuclear Medicine Technology, B.S. (in General Science)
- Physical Education, B.A., B.S.
- Physical Therapy, B.S. (in General Science)
- Physics, B.A.
- Political Science, B.A.
- Portuguese, B.A.
- Psychology, B.A., B.S.
- Recreation Education, B.S.
- Religion, B.A.
- Russian, B.A.
- Social Studies, B.A.
- Social Work, B.A.
- Sociology, B.A., B.S.
- Spanish, B.A.
- Special Education, B.A., B.S.
- Speech and Dramatic Art, B.A.
- Speech Pathology and Audiology, B.A., B.S.
- Zoology, B.A.

No degree is awarded in secondary education. Prospective teachers must state requirements and minimum course requirements in education and complete a departmental major, and are certified by the University to teach subjects at the secondary level. (For a listing of advanced degrees offered in Liberal Arts subject areas, see the "Graduate College" section of the Catalog.)

Schools and Divisions

There are seven schools and two divisions in the College of Liberal Arts. The Division of Fine Arts includes the School of Art and Art History, the School of Music, and the Department of Speech and Dramatic Art. The division of Mathematical Sciences includes the departments of Computer Science, Mathematics and Statistics. The School of Letters is a federation of the departments of Classics, East Asian Languages and Literature, English, French and Italian. German, Linguistics, Russian, Spanish and Portuguese, and Speech and Dramatic Art; the programs in Afro-American Studies, American Civilization, Comparative Literature and Modern Languages, the International Writing, Translation and Writers Workshop, and the Windflower Press. There are also schools of Journalism, Library Science, Religion and Social Work.

Basic Program

Exempt for the degree Bachelor of General Studies and Bachelor of Liberal Studies, the basic program for baccalaureate graduation from the College of Liberal Arts consists of:
General Requirements
Core areas
- Historical-cultural
- Literature
- Natural science
- Social science
- Foreign language
- Mathematics
- Physical education skills
- Rhetoric skills

Area of Concentration (major)
Electives
Typically, the student takes about one-third of his or her coursework in each of these three groups, focusing on the general requirements the first two years and on the area of concentration during the junior and senior years. The general requirements, and the methods of meeting them, are explained in detail at the end of this section.

Bachelor of General Studies
The program leading to the Bachelor of General Studies degree provides for broad flexibility, rather than the traditional single major. Of the general requirements listed above, only the rhetoric skills requirement (one semester) applies to the General Studies program. For the General Studies degree, the student must earn at least 45 semester hours of credit in University courses numbered above 99, and must achieve at least a 2.0 grade-point average in all such courses. No more than 20 100-level credits earned in one department can be applied toward the 45-credit requirement, and no more than 40 credits total earned in one department can be applied toward graduation.

Bachelor of Liberal Studies
This program is designed to serve adults who cannot attend the College as full-time, on-campus students. Credits toward the B.L.S. degree may be earned through on-campus coursework, independent study, proficiency examinations, and/or radio, television or other audiovisual instruction.

To be admitted to the program, the student must have earned at least 62 semester hours of transferable degree credit.

The student must satisfy the College’s basic skills and core course requirements, unless he or she has been awarded the Associate in Arts (A.A.) or Associate in Science (A.S.) degree by an accredited two-year institution of higher education. Of the 124 semester hours of credit required for the degree, at least 45 must be earned in a four-year college, in courses which have college defined as upper-level (in the College of Liberal Arts, for example, courses numbered 100 and above); 45 must be completed in courses offered by the Iowa Regents Universities: and, for graduation from The University of Iowa, 30 must be earned in courses offered by The University of Iowa.

Grading requires a minimum grade point average of 2.0 in all coursework applied toward the degree, in all coursework comprised after admission to the program, and in the 45 semester hours of upper-level coursework.

The student may develop an approved area of emphasis in his or her program, but is not required to do so.

Students admitted to the B.L.S. program are designated as "unclassified."

While the B.L.S. is awarded by the College of Liberal Arts, the program is administered by the Division of Extension and University Services, and application should be made to the Division.

Two or More Bachelor’s Degrees
Students who have received a bachelor’s degree and who wish to qualify for an additional bachelor’s degree must complete at least 30 additional hours of study in residence beyond the first degree.

Double Majors
Students may meet the major requirements in more than one department and if both departments award the same degree the student may earn a bachelor’s degree with two majors, e.g., B.A. in History and English; B.S. in Psychology and Sociology. No double majors can be earned between colleges of the University.

Credit Requirements
Graduation from any College of Liberal Arts baccalaureate program requires a minimum of 124 semester hours of college credit, of which at least 90, or the last 30, or 45 of the last 60, must be earned in residence in the College.

Maximum Credit in One Department
No more than 50 semester hours of credit earned in one department may be applied toward College requirements for the Bachelor of Arts or Bachelor of Science degrees.

Transfer Credit Limit
No more than 62 semester hours of junior college transfer credit may be applied toward College requirements for baccalaureate graduation.

Credit for Graduate Courses
Undergraduate students in the College must obtain the specific approval of the appropriate departmental executive officer and the dean of the College to register for courses numbered above 399 and to include such courses in an undergraduate program.

Correspondence and Extension Credits
No more than 30 semester hours of credit earned in correspondence courses may be applied toward College requirements for baccalaureate graduation.

Classification
Freshman: less than 28 semester hours earned Sophomore: 28 through 55 semester hours earned Junior: 56 through 89 semester hours earned Senior: more than 89 semester hours earned

Semester Load Limit
The normal schedule is 15-16 semester hours for a semester, eight for a summer session. No student may register for more than 20 semester hours in one semester, or 10 in a summer session, without the permission of the 1st Liberal Arts Advisory Officer.

Academic Standards
Marking System
The College uses the 4-point marking system, in which grade points are awarded on a scale descending from A = 4. For a full description, see the General Information Section of the Catalog.
Grade-Point Requirements for Graduation

Baccalaureate graduation from the College generally requires at least a 2.0 average on all college-level work attempted, all work attempted at the University, all work attempted in the major field and all work in the major field at the University.

Good Standing

Minimum University of Iowa and overall cumulative grade-point averages required for good standing in the College are 1.5 for freshmen, 1.6 for sophomores, 1.75 for juniors and 1.9 for seniors.

Pass-Fail Option

All students in the College have the option of taking courses on a pass-fail basis, under these conditions:

The student must have the consent of his or her faculty advisor and the course instructor, and must file a completed pass-fail card either during Registration or at the Registrar's Office before the end of the third week of classes (second week in a summer session).

Students who enroll at Iowa for the first time after May, 1974, or not graduated by July, 1977, may apply no more than 16 semester hours of "pass" credit towards the bachelor's degree, and may earn this credit only in academic, physical education, art or music courses, technical education courses, or certain executive courses.

For transfer students enrolled at Iowa for the first time after May, 1974, with less than 36 semester hours of transfer credit, the "pass" credit limit is also 16; for those with more than 35 semester hours of transfer credit, the "pass" credit limit is eight.

Students enrolled as beginning freshmen before May, 1974, who graduated by July, 1977, may apply up to 32 semester hours of "pass" credit or S-F credit toward the graduation requirement.

Transfer students enrolled before May, 1974, with less than 28 semester hours of transfer credit may apply a maximum of 32 semester hours of "pass" credit toward graduation; with 28 to 35 semester hours of transfer credit, a maximum of 24 semester hours of "pass" credit; with 36 to 89 semester hours of transfer credit, a maximum of 16 semester hours of "pass" credit; and with 90 or more semester hours of transfer credit, a maximum of eight "pass" credits. Credits earned in satisfactory-fail courses also count toward these limits.

A student may not take courses in his or her major department on a pass-fail basis.

"Fail" grades in pass-fail courses are included in the computation of grade-point average.

Satisfactory-Fail Courses

Certain courses are offered only on a satisfactory-fail basis. No more than 16 semester hours of credit earned in such courses may be applied toward graduation. A student may take satisfactory-fail courses in his or her major department. No special form is required for satisfactory-fail registration. "Fail" grades in satisfactory-fail courses are included in the computation of grade-point average.

Auditing Courses

Students in the College of Liberal Arts may register for zero credit (audit) with the permission of the instructor and the advisor. The mark of "R" (registered) is assigned to those registered for zero credit if attendance and performance are satisfactory; if unsatisfactory, the mark of "W" (withdrawn) is assigned. Courses completed with a mark of "R" do not meet any graduation requirements. The listed semester hours credit for the course will be used in assessing tuition fees.

Second-Grade-Only Option

If a student repeats a university course, unless regression occurs, only the second grade and credit are included in computation of the student's grade-point average. This option requires permission of the dean, and the filling of a completed approval form.

Incomplete and No Report

A mark of "I" (incomplete) or "D" (no report) which is not replaced by a final grade prior to the announced deadline within the student's next regular semester of registration will be replaced by a Final grade of "F".

Readmission After Academic Dismissal

A student dropped from the College for the first time for failure to meet academic requirements may apply for readmission after one year. A student dropped for a second time may not apply for readmission until five years later.

Recognition for Academic Achievement

The College awards degrees "with highest distinction" to students in the highest 2 percent of the graduating class, "with high distinction" to students in the next highest 5 percent, and "with distinction" to students in the next highest 5 percent. Ranking is based on students' grade-point averages for all college-level study undertaken prior to their final registration.

The College also awards degrees "with Honors" to students who have satisfied the requirements for an Honors major, receive departmental recommendation and are approved by the College's Honors Council and dean.

To be eligible for either form of recognition, the student must take his or her final 60 semester hours of study in residence in the College, and must have completed at least 45 semester hours of study in the College before his or her final registration.

Dean's List

Liberal Arts students achieving grade-point averages of 3.5 or above during a given semester on 12 or more semester hours of coursework graded A, B, C or D are recognized by inclusion on the Dean's List for that semester.

Special Programs

Advanced Placement

Under the Advanced Placement Program of the College Entrance Examination Board, a high school senior may take comprehensive achievement examinations in a number of subjects. The College of Liberal Arts grants college credit and, where appropriate, advanced placement of students who achieve satisfactory standards in these examinations. For information, write to the College Entrance Examination Board, 475 Riverside Drive, New York City 10027.
Advanced Standing in English
An entering student who has had the type of high school prepara-
tion sponsored by the Advanced Standing Program in English qualifies to attempt to meet the College of Liberal Arts rhetoric require-
ment with credit by taking the rhetoric proficiency exami-
nations offered before the course begins. At least two weeks
before he or she registers at the University, he or her
Advanced Standing English teacher should send a statement to the
Director of Admissions that the student has satisfactorily com-
pleted such preparation. For information about the Advanced
Standing Program in English, write to the Rhetoric Program
Coordinator, The University of Iowa.

Credit by Examination
A student may earn up to 32 semester hours of credit, and/or
course exemption, in the general education program of the Col-
lege, or in certain introductory departmental courses, through tests
offered in the College-Level Examination Program (CLEP) of the
College Entrance Examination Board. Information about the tests
and permission to take them may be obtained from the Liberal Arts
Advisory Office.

Foreign Studies Certificate
The College’s Foreign Studies Certificate program is designed for
undergraduate students who seek to broaden their knowledge of
societies other than their own. The program is a supplement to and
not a substitute for a major. The chairmen of the various language
departments serve as advisers to students in preparing for the
certificate. After selecting an area or country of interest, students
wishing to earn the certificate will be guided by the appropriate
chairmen in choosing a group of courses designed to provide a
basic understanding of the area or country. Courses may include
work in geography, history, anthropology, art, literature, political
science or other fields offering international studies.

Program leading to the certificate will include at least 18
semester hours of courses in the chosen country or
area. In addition, students fulfill the foreign language requirement
for the B.A. in a language appropriate to the chosen country or
area. A student who successfully completes a Foreign Studies
Course program designed by the appropriate departmental chair-
man receives the Foreign Studies Certificate with his or her
degree.

Interested students should consult the chairman of the appro-
priate department:
Classic (Ancient Greece or Rome)
East Asian Languages and Literatures (India, China or Japan)
French and Italian (France or Italy)
German
Russian (Russia or Eastern Europe)
Spanish and Portuguese (Spain, Portugal or Latin America)

Honors
The Honors Program is a College-wide plan for exceptionally
promising students. Honors students are assigned to special
sections in general studies courses. Those whose major depart-
ments offer honors curricula have opportunities to enhance their
studies in Honors seminars, independent research and other special
activities, and to earn the baccalaureate degree “with Honors.”
Entering freshmen whose records indicate they would benefit
from the Honors Program are invited to participate. However, the
Program is open to all interested and qualified students.

Preprofessional (Joint Programs)
Up to 30 semester hours of credit earned in another college of the
University will be accepted toward the bachelor’s degree by the
College of Liberal Arts, provided all specific requirements for the
degree have been met, including the requirements for a major in
some department or area of concentration. This makes it possible
for the student who enters the colleges of Medicine or Dentistry, or
the medical technology, physical therapy or dental hygiene pro-
grams, for which a bachelor’s degree is not an admission require-
ment, to obtain a bachelor’s from the College of Liberal Arts upon
successful completion of one academic year in the professional
college or program.

Liberal Arts Advisory Office
The Liberal Arts Advisory Office functions as an integral part of
the Office of the Dean of Liberal Arts.
Every undergraduate student enrolled in the College has an
academic adviser, selected from the faculty, to help the student
with registration and the progressive development of the educa-
tional program which will best prepare the student to pursue his or
her life goals. Faculty advisers are assigned by the Advisory Office.
Students who have declared majors are assigned advisers from
their major departments; those who have not declared majors are
assigned advisers from the Liberal Arts Faculty at large; those in
preprofessional programs are assigned special advisers from the
appropriate professional areas.

Students should go to the Advisory Office to change faculty
advisers, declare or change majors, determine the advisability of
their taking tests in the College-Level Examination Program (the
Advisory Office administers CLEP for the College and assigns
credit for satisfactory CLEP scores) and determine their eligibility
to use the Second Grade Only option; for information and/or
advice about College requirements for graduation, pass-fail and
satisfactory-fail; concerning deadlines for various administrative
actions (such as dropping courses, adding courses, canceling
registration) within the College; for information about the Bache-
lor of General Studies degree program; and concerning probation,
dismissal, re-enrollment, academic discipline and any other aca-
emic matter.

Requirements
(See: Graduates from an accredited junior college with an A.A.
or A.S. degree satisfies all College graduation requirements out-
lined below, except the foreign language requirement.) Beginning
with the Fall semester 1974-75, a minimum of 60 semester hours of
credit accepted for transfer will be required for A.A. or A.S.
degree registration.

Core Requirements
There are four core areas: historical-cultural studies, literature,
natural science and social science. All students may satisfy the
core requirements by earning in each core area eight semester
hours of credit in core courses offered in that area, or in depart-
mental courses approved for core purposes.

With the approval of his or her major department, a student may be
excused from the core requirement in the area of his major.
Exemption may also be granted on the basis of a comprehensive
examination or a College-Level Examination Program test on the
core subject.

Except for literature, core courses may be taken as electives.
Core courses and approved departmental options in the four core
areas are as follows:
## College of Liberal Arts

### Course Descriptions

#### Earthquake, Mountain-building, or Natural Drift for Non-Science Students
- **Lecture, Laboratory:** Not open to students who have had Geology 2/3, 133 or 123.
- **Units:** 4.0
- **Course:** Attracts air pollution and natural disaster, etc. Focus on principles of environmental science. Open to students who have had Geology 123 or 124.

#### Physical Sciences

**Chemistry and Physics of the Environment**
- **Units:** 4.0
- **Lecture:** Chemistry and physics of environmental problems, environmental geology. Laboratory for non-science students. Not open to students who have had Geology 123 or 124.

**Technology and Man**
- **Units:** 4.0
- **Lecture:** Focuses on the impact of technology on society. Non-science majors. Open to students who have had Geology 123 or 124.

#### Departmental Options

- Any of the courses listed below may be used in any combination (except as indicated) with any other courses on this or the above core list to satisfy the natural science core requirement.
- For descriptions of the departmental courses, see the appropriate department section of the Catalog.

### Botany

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:1</td>
<td>Introduction to Botany</td>
<td>4.0</td>
</tr>
<tr>
<td>2:1'</td>
<td>Evolution of Land Plants</td>
<td>4.0</td>
</tr>
<tr>
<td>2:3</td>
<td>Biology of the Local Flora</td>
<td>4.0</td>
</tr>
</tbody>
</table>

### Chemistry

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:1</td>
<td>Principles of Chemistry I</td>
<td>3.0</td>
</tr>
<tr>
<td>4:7</td>
<td>General Chemistry I</td>
<td>3.0</td>
</tr>
<tr>
<td>4:4</td>
<td>Principles of Chemistry II</td>
<td>3.0</td>
</tr>
<tr>
<td>4:6</td>
<td>Elementary Chemistry Laboratory</td>
<td>2.0</td>
</tr>
<tr>
<td>4:8</td>
<td>General Chemistry II</td>
<td>3.0</td>
</tr>
<tr>
<td>4:9</td>
<td>General Chemistry Laboratory</td>
<td>2.0</td>
</tr>
</tbody>
</table>

### General Science (Open Only to Elementary and Special Education Majors)

- **Units:** 3
- **Courses:**
  - 97:55 Science Foundation I
  - 97:56 Science Foundation II
  - 97:112 Advanced Science Foundations

### Geology

- **Units:** 12.0
- **Course:** Introduction to Geology (may not be taken in combination with 11.23) 4.0

### Mathematics

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>22M:10</td>
<td>Fundamentals of College Mathematics I</td>
<td>4.0</td>
</tr>
<tr>
<td>or</td>
<td>Fundamentals of College Mathematics II</td>
<td>4.0</td>
</tr>
</tbody>
</table>

### Physics and Astronomy

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>29:1</td>
<td>College Physics</td>
<td>4.0</td>
</tr>
<tr>
<td>or</td>
<td>Introductory Physics I</td>
<td>4.0</td>
</tr>
<tr>
<td>29:2</td>
<td>College Physics</td>
<td>4.0</td>
</tr>
<tr>
<td>or</td>
<td>Introductory Physics II</td>
<td>4.0</td>
</tr>
</tbody>
</table>

### Anthropology

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>113:3</td>
<td>Introduction to the Study of Culture and Society</td>
<td>4.0</td>
</tr>
<tr>
<td>113:10</td>
<td>The World’s Peoples</td>
<td>4.0</td>
</tr>
</tbody>
</table>

### Economics

- **Units:** 6
  - 68:1 Principles of Economics | 4.0
  - 68:2 Principles of Economics | 4.0

### Geography

- **Units:** 4
  - 44:1 Introduction to Human Geography | 4.0
  - 44:2 Natural Environment and Man | 4.0
  - 44:11 Introduction to Social Geography | 4.0
  - 44:19 Natural Environmental Issues | 2.0
  - 44:30 Introduction to Economic Geography | 3.0
  - 44:35 Introduction to Urban Geography | 3.0

### Linguistics

- **Units:** 10
  - 103:11 Language and Society | 4.0

### Political Science

- **Units:** 3
  - 30:1 Introduction to American Politics | 4.0
  - 30:2 Introduction to Politics | 4.0
  - 30:10 Introduction to Political Behavior | 4.0
  - 30:11 Introduction to Political Theory | 4.0
  - 30:12 Introduction to Comparative Politics | 4.0
  - 30:13 Introduction to World Politics | 4.0
  - 30:130 The American Political System | 4.0
  - 31:1 Elementary Psychology | 4.0
  - 31:3 General Psychology | 4.0

### Sociology

- **Units:** 3
  - 34:1 Introduction to Sociology: Principles | 4.0
  - 34:2 Introduction to Sociology: Problems | 4.0

### Zooology

- **Units:** 3
  - 37:3 Principles of Animal Biology | 5.0

### Social Science Core

- **Units:** 8
  - **Note:** This core requirement may be met with any combination of the departmental courses listed below. For course descriptions, including prerequisites, see the appropriate departmental section of the Catalog.
  - 30:10 Introduction to American Politics | 4.0
  - 30:10 Introduction to Politics | 4.0
  - 30:10 Introduction to Political Behavior | 4.0
  - 30:10 Introduction to Political Theory | 4.0
  - 30:10 Introduction to Comparative Politics | 4.0
  - 30:10 Introduction to World Politics | 4.0
  - 30:130 The American Political System | 4.0
  - 31:1 Elementary Psychology | 4.0
  - 31:3 General Psychology | 4.0
  - 34:1 Introduction to Sociology: Principles | 4.0
  - 34:2 Introduction to Sociology: Problems | 4.0
Foreign Language Requirements

The Bachelor of Arts degree requires at least two years of college-level study, or four years of high school study, or an equivalent combination of college-level and high school study or equivalent proficiency evidenced by examination, in one foreign language.

Mathematics Requirement

The general requirement in mathematics can be met by at least two and one-half years of high school mathematics, or a minimum score of 22 on the mathematics section of the American College Tests, or completion of the University course 22M.1 Basic Mathematical Techniques or a college-level course in Mathematics.

Physical Education Skills Requirement

This requirement may be met with four semester hours of credit in the physical education skills courses, or by satisfactory performance in one of the comprehensive physical education skills tests given at announced times each semester. The student may receive up to four semester hours of "pass" credit for successful completion of the test.

Physical Education Skills Requirement

The instructional program in physical education skills provides for a wide variety of activities; archery, badminton, ballet, bowling, canoeing, canoeing and angling, conditioning, diving, fencing, field hockey, figure skating, flag football, folk and square dance, golf, gymnastics, handball, judo, jujitsu, jiu-jitsu, life saving, modern dance, paddlball, recreational games, relaxation, riding, rhythmic gymnastics, rifle, rugby, self defense, soccer, skiing, softball, squash, swimming, table tennis, tennis, track and field, tennis, track and field, uct, volleyball, water polo, water safety instructions, weight control, weight training, wrestling. The program also gives the student an opportunity to correct physical defects which respond to therapeutic exercises.

Rhetoric Skills Requirement

The College of Liberal Arts requires all entering undergraduate students to enroll in rhetoric coursework each semester until they achieve a satisfactory level of competence in oral and written communication, proficiency in investigating, analyzing, expressing, and responding to the ideas, beliefs and attitudes of other writers and speakers, and proficiency in the responsible use of various sources of information and ideas.

Students are originally assigned to Rhetoric courses on the basis of American College Test scores. Most incoming freshmen are assigned either to the two-semester, eight-credit sequence, 101.1, 101.2 Rhetoric, or to the accelerated one-semester, four-credit course, 103.3, Rhetoric. Students initially assigned to and registered for 103.3, 104.3, 360.25 may attempt to satisfy all or part of the Rhetoric requirement, and earn two or four semester hours of credit, by taking the writing and/or speech tests offered during the first week of the semester. Rhetoric classes begin with student performance which serve as placement indication. Students in 101.1 who demonstrate above average reading speed and comprehension and above average writing skill may be advised to switch to 103.3, for example.

Students whose early work indicates a need for individualized instruction beyond their classroom may enroll for non-credit work in the Rhetoric and/or Writing Labs offered by the Rhetoric Program. Some students may be advised to switch to 103.3, a one-semester, two-credit course of individualized instruction in reading, and/or to 103.9, a one-semester, two-credit course of individualized instruction in writing. No more than eight semester hours of rhetoric credit may be counted toward baccalaureate requirements.

Transfer students may meet the rhetoric requirement with eight semester hours of transfer credit in comparable coursework, or with six semester hours of graduate credit in composition and two in speech. Students who partially satisfy the requirement with transfer credit may be assigned to 102.2, 103.3, 104.3 or 360.25. Students admitted to the University with 40 or more transfer credits are excused from the rhetoric requirement.

Admission Requirements

To qualify for admission to the College of Liberal Arts, the applicant must meet the College requirements outlined below, and any special requirements for the program of his or her choice.

Entering Freshmen

An applicant seeking admission as an entering freshman must have the high school from which he or she graduated provide a certificate of high school credits, including a complete statement of high school record, class rank, access to standardized tests and certification of graduation.

A graduate of an approved Iowa high school who has the proper subject-matter background, is in the upper one-half of his or her graduating class and meets specific curricular requirements, will generally be admitted upon certification of graduation. An applicant who is not in the upper one-half of his or her graduating class may be required to take special examinations, and, after a review of the entire record and at the discretion of the admissions officer, may be admitted unconditionally, admitted on probation, required to enroll for a trial period during a preceding summer session or denied admission.
A graduate of an accredited high school in another state must meet at least the same standards as a graduate of an Iowa high school. The options for admissions by probation or trial enrollment may not be open to these students.

Undergraduate Students Transferring from Other Colleges

Students from Accredited Colleges and Universities

Transcripts of records are given full value if they come from colleges or universities accredited by the North Central Association of Colleges and Secondary Schools or similar regional associations. The recommendations contained in the current issue of the Report of Cereb given by Educational Institutions published by the American Association of Collegians Registrars and Admissions Officers will be followed for schools not regionally accredited.

Each applicant must submit an official transcript bearing the original seal and signature of the official in charge of records from each college or university the student has previously attended. The applicant must also submit any other records or letters the college may require to support his or her application for admission.

A transfer applicant is expected to have maintained a C average in a 4-point system for all college work attempted and must not be under suspension from the last college attended. Transfer applicants who are not residents of Iowa are expected to have maintained a 2.5 average. An applicant who does not meet this standard may be permitted to take entrance examinations. An applicant who successfully completes the examinations may be admitted on probation.

In general, a graduate of an accredited college or university who is not a resident of Iowa is not eligible for admission to the University of Iowa unless the highest grades recorded have been completed at the University of Iowa.

A student from a nonaccredited college or university who is not a resident of Iowa is not eligible for admission to the University of Iowa unless the highest grades recorded have been completed at the University of Iowa.

Students from Nonaccredited Colleges

The college may refuse to recognize credit from a nonaccredited college or may admit the applicant on a non-degree basis and provide a means for the validation of some or all of the credit. The validation period begins as of the beginning of the semester and will ordinarily be a full academic year. The College will specify in the student the terms of the validation process at the time of provisional admission. Each student from a nonaccredited college is considered on his or her merits, and admission or rejection is at the discretion of the admissions officer.

Afro-American Studies

Program chairman: Dennis T. Turner. Undergraduate Afro-American Studies Program is interdisciplinary; it draws courses from various fields, including for core course, American Culture, African-American History, and English, Geography, History, and Sociology.

Graduate Program offered: M.A., M.F.A., Ph.D., in Afro-American Studies, with concentrations in literature, history, and philosophy.

The Afro-American Studies Program focuses on the study of people of African ancestry in the North American colonies and the United States of America from the 17th century to the present. Although the program primarily emphasizes history, literature, it is recognized that knowledge and understanding of black Americans will be incomplete if the study is restricted to the perspective of any single discipline. For that reason, the Afro-American Studies Committee engages in a continuous effort to expand the perspectives by developing courses which will fuse the knowledge drawn from many disciplines in the humanities and social sciences. In addition, because of the concern for a comprehensive rather than narrow study of Afro-Americans, the program also examines their African heritage and their present relationships to Africans in other lands.

The Program originated in 1969 in courses intended to foster awareness of the role Afro-Americans have taken in the development of the United States and to promote understanding of the present conditions and concerns of black Americans. Subsequently, these courses have been organized into undergraduate and graduate curricula which permit a concentration of Afro-American studies programs leading to B.A., B.S., M.A. or Ph.D. in American Civilization. While the original purposes of the Afro-American courses are not being neglected, the new curricula prepare students to teach Afro-American studies, to train other teachers, to undertake the scholarly research needed in the field, and to organize and administer educational programs in Afro-American Studies. Although most of the students in the Ph.D. program are preparing to work as professional teachers and administrators, the B.A. and M.A. programs provide valuable backgrounds for many other students seeking careers in community work, public school teaching, religion, government, and political science. In short, the Afro-American Studies Program offers training important to any individual whose future career will require understanding and knowledge of black Americans.

Undergraduate Study

A student majoring in American Civilization must complete 16 semester-long courses. Courses generally taken by students concentrating in Afro-American Culture: An Historical Approach and Introduction to Afro-American Culture: An Analytical Approach. 45-116-117 Afro-American Literature I-II, 45-165-166 African and African-American Civilization of the 20th Century, and an elective.

Graduate Programs

The Master of Arts Program

The Master of Arts program is designed both for the individual who does not expect to earn any additional degrees and for the individual who plans to study for a doctorate. General requirements for the master's degree are listed in the Afro-American Civilization section of this catalog. The concentration in Afro-American Studies in the M.A. program is designed in consultation with the
student's advising committee and approved by the American Civilization executive committee. A thesis is not required in the program.

The Doctoral Program
The doctoral program in American Civilization with concentration in Afro-American Studies is designed primarily for individuals who expect to assume roles in which they direct programs of Afro-American Studies and as directors of Black Studies projects. Such individuals are also prepared as research scholars. The program blends formal coursework and independent study.

Curriculum Requirements
The minimum requirements for a Ph.D. in American Civilization with concentration in Afro-American Studies are 72 semester hours of coursework, including a thesis. Of the 72 hours, at least 30 must be in Afro-American Studies. In addition, the student must complete a minimum of 9 semester hours in each of five cognate fields, including American Civilization. One of these cognate fields may be a branch of Afro-American Studies. American Literature and Intellectual History of America are frequently selected as cognate fields.

In addition to the required coursework specified above, the student completes his or her program with a thesis and with electives, generally selected from Afro-American Studies or from the cognate fields.

Language/Tool Requirements
Each student in the program must demonstrate, by examination or coursework, competence in one foreign language. In addition, each student must demonstrate competence in a skill subject by taking 45:191 Introduction to American Civilization and 45:211 Introduction to Research in Afro-American Culture, both of which offer instruction in methodology.

Comprehensive Examinations
By the end of the second semester of graduate study at the University, a doctoral candidate should have passed a comprehensive examination. This examination, which is both written and oral, consists of four areas: Afro-American Studies, American Civilization, and two cognate fields, one of which may be a branch of Afro-American Studies.

Thesis
Each doctoral candidate must complete a thesis requiring original research in some aspect of Afro-American culture, and must successfully defend the thesis before a faculty committee.

Admission
In addition to satisfying the requirements of the Graduate College for admission to graduate study, a student must have an appropriate educational background in literature and the social sciences. A student may be asked to take, without credit toward his or her graduate degree, courses needed to remedy any deficiencies in his or her undergraduate preparation.

Co-Curricular Activities Related to Afro-American Studies

Black Kaleidoscope
Each year the Afro-American Studies Program attempts to promote knowledge and consciousness within the on-campus and off-campus community by sponsoring Black Kaleidoscope, a series of lectures and demonstrations by scholars and artists distinguished in Afro-American culture.

Institute in Afro-American Culture
Since 1968 The University of Iowa each summer has served as host for an Institute in Afro-American Studies for college and university teachers. The institutes, which bring renowned scholars and lecturers to the campus, have focused on such topics as the Harlem Renaissance, Richard Wright, W.E.B. DuBois, black Americans in theater and slave narratives. Although students in residence at the University are not eligible to be official members of the Institute, they are permitted to enroll in a three-credit-hour course which is offered at the same time as the Institute and on the current year's topic.

Black Action Theater
A co-curricular activity which is academically sponsored through the Afro-American Studies Program, Black Action Theater allows participants an opportunity for instruction and experience in theatrical productions of plays by black authors.

Afro-American Cultural Center
The Afro-American Studies Program encourages participation in the activities of the Afro-American Cultural Center. The Center serves as a museum and library for educational and cultural events and exhibits of black culture. Thus, it provides cultural enrichment for black people of the Iowa City community and a cultural meeting place for black students. It also attempts to promote a knowledge of black culture which will improve inter-racial understanding among all members of the University community.

Black Genesis Theatre
The Afro-American Studies Program also encourages participation in Black Genesis Theatre, a student organization which blends dance, music, poetry and visual arts in representation of black culture and history.

Courses

Afro-American Studies and Related Areas

45:10 Black Poetry Workshop
3 s.h.
A survey of black American poetry, focusing on folk and spirituals in the Black Arts Movement of the 1960's. Discussions and criticisms of poems selected by students in the class. Open to undergraduates only.

45:11 Contemporary Black Experience
3 s.h.
Review and discussion of seminal works or images of the contemporary black experience. The framework of the course will be the literature and discussions, with bibliography materials provided as support. Open to undergraduates only.

45:20 Introduction to Afro-American History
3 s.h.
A coverage of African history, including the history of Africa south of the Sahara, from ancient times to the present day, and the history of blacks in the New World. Readings will be selected from out of United States history. Open to undergraduate only. Same as History 1460.

45:21 Afro-American Culture
An Aesthetic Approach
3 s.h.
An introduction to the culture of blacks in the United States with emphasis on significant characteristics of their music, art, literature and philosophy. Open to undergraduates only.

45:25 African Drama
3 s.h.
An examination of drama by contemporary Africans. The reading list includes

Afro-American Studies
plays for singing, recit-ah plays, melody plays. These were advanced in undergraduate and graduate students.

4.1.12 Afro-American History in the New World
A survey of the social, cultural, and political development of African Americans in the New World. This course will emphasize the impact of slavery on African American life and society. Students are encouraged to participate in community-based projects and to engage in critical thinking about the legacy of slavery. Open to undergraduate and graduate students. Same as Sociology 10.234.

4.1.13 Race and Ethnic Relations
A study of the dynamics of race and ethnic groups in American society. Special emphasis is given to the historical, social, and political factors that have shaped the experiences of different ethnic groups. Open to undergraduate and graduate students. Same as Sociology 10.235.

4.1.14 Afro-American Literature I
A study of the literature of African Americans from the 18th century to the present. The works of major African American writers are studied in the context of their cultural, political, and social environment. Open to undergraduate and graduate students. Same as English 11.146.

4.1.15 Afro-American Literature II
A survey of African American literature from the 19th century to the present. The works of major African American writers are studied in the context of their cultural, political, and social environment. Open to undergraduate and graduate students. Same as English 11.147.

4.1.16 Afro-American Literature III
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.148.

4.1.17 Afro-American Literature IV
A study of the literature of African Americans from the 20th century to the present. The works of major African American writers are studied in the context of their cultural, political, and social environment. Open to undergraduate and graduate students. Same as English 11.149.

4.1.18 Afro-American Literature V
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.150.

4.1.19 Afro-American Literature VI
A survey of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.151.

4.1.20 Afro-American Literature VII
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.152.

4.1.21 Afro-American Literature VIII

4.1.22 Afro-American Literature IX
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.154.

4.1.23 Afro-American Literature X
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.155.

4.1.24 Afro-American Literature XI
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.156.

4.1.25 Afro-American Literature XII
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.157.

4.1.26 Afro-American Literature XIII
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.158.

4.1.27 Afro-American Literature XIV
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.159.

4.1.28 Afro-American Literature XV
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.160.

4.1.29 Afro-American Literature XVI
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.161.

4.1.30 Afro-American Literature XVII
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.162.

4.1.31 Afro-American Literature XVIII
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.163.

4.1.32 Afro-American Literature XIX
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.164.

4.1.33 Afro-American Literature XX
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.165.

4.1.34 Afro-American Literature XXI
A study of the role of African American literature in the development of American literature. Open to undergraduate and graduate students. Same as English 11.166.
American Civilization

45:408 Seminar in Afro-American Literature
3 s.h.

Emphasizes in-depth criticism of significant authors in Afro-American culture and experience. Primarily for graduate students concentrating in Afro-American Studies.

Significant Courses Related to Afro-American Studies

For course descriptions, see appropriate sections of this catalog.

Anthropology
113:118 Social Anthropology of the Caribbean
3 s.h.
113:119 Urban Anthropology
3 s.h.
117:120 Peoples of West Africa
3 s.h.

Art

Business Administration
68:205 Business and Society
3 s.h.
68:225 Employment Relations and Public Policy
3 s.h.

Economics
66:137 Problems in Urban Economics
3 s.h.

Education
7F:104 Education in Newly-Developing Countries
2-3 s.h.
7F:130 Educational Sociology
2-3 s.h.
7F:380 Seminar: Value Problems in the Administration of American Education
3 s.h.
7P:109 Socialization of the School-Age Child
2-3 s.h.
7U:133 The Culturally Different in Educational Settings
3 s.h.

French
9:183 Introduction to the French-Speaking World
3 s.h.

History
16:61 American History, 1852-1877
3 s.h.
16:62 American History, 1877-Present
3 s.h.

Sociology

Urban and Regional Planning
102:102 Urban Politics
3 s.h.

American Civilization

Program chairman (acting): John Beardsley

Fellows: professors David Johnson (Philosophy), Robert Alexander (Art), Paul Buzer (English), Samuel Hecht (Speech and Drama Art), Lane Davis (Political Science), Robert Dwyer (History), Bill Harvey (History), Jere Hume (Anthropology), Sydney James (History), Irving Kovarsky (Business Administration), Richard MacCrate (Speech and Drama Art), Larry Oker (English), Bernard Paul (English), Paul Pless (History), Malcolm Robb (History), Robert Sayer (English), Darrel T. Sitter (History), Ronald Van Dyke (Political Science), Edwin Verem (Art), J. Richard Wilson (Sociology); associate professors Douglas Andrew (Speech and Drama Art), William G. DeLay (Education), Linda Elkin (History), Joseph Felton (Sociology), Edward S. Lewis (Sociology), Charles Lutcher (English), Mildred Pope (Sociology), Mary Johnson (English), Charles Martin (Speech and Drama Art), Lyman Persons (Speech and Drama Art), Carol Whiting (Speech and Drama Art), Theodore Steiner (Sociology); instructors Douglas Kilgore (Anthropology), Lynn Willey (History).

Degrees offered: B.A., M.A., Ph.D.

At both the undergraduate and graduate levels, the program in American Civilization provides a broad multi-disciplinary knowledge of American culture. Course offerings include information on the distinctive features of American culture, literature and art, and developments of the United States, contributions of minority groups to American civilization, social and governmental organizations of America and the manifestations of mass and popular culture.

While the undergraduate program offers a useful general education, it also enables the student to identify problems in U.S. culture and to define them in ways specific enough to make solutions possible. The major can also serve as partial preparation for graduate study in American literature, American history, and the social studies; it can serve as a solid basis for graduate study in American civilization, literature, history, social science, law, or journalism.

Undergraduate Study

The student has the opportunity to develop a highly individualized program within the framework of the four general subject areas in which coursework is required for undergraduate majors in American Civilization. These subject areas are:

Four seminars of coursework in American literature;

Four seminars of coursework in American history;

Two seminars of coursework in two other areas of American culture; and

45-2 American Civilization II, Senior Colloquium (45-90), and another two additional seminars of coursework in American civilization.

Lists of courses that fulfill the requirements are available at the American Civilization office. A considerable variety of undergraduate programs can be formulated within the required groups.

For instance, students have concentrated in areas as diverse as problems of poverty today, the impact of modern art on America in 1913, and the significance of contemporary sports hero.

The Master of Arts Program

On the master's level the program requires the study of the varied materials, methods, and bibliography of American civilization (45:191 Introduces to American Civilization and 45:197 Interpretations of American Civilization). Students concentrate in two major fields. They select either American literature or history, and one other field in American culture.

Requirements for the degree:

Thirty-six semester hours of graduate work beyond the B.A.

Study of selected works important for an understanding of American civilization; and

An examination on coursework.

The Doctoral Program

In consultation with an adviser and the comprehensive committee selected by the student, the doctoral candidates pursue through a balanced and integrated program of courses and readings a knowledge of significant portions of American civilization. Doc-
Anthropology

45216 Politics and the Black Writer 3 cr.
Prerequisite: Consent of instructor. An examination of the role of intellectuals and the study of political ideologies among African blacks.

45220 Religion and Black Culture 3 cr.
A study of the interaction of black culture, religion, and philosophy in various contexts of the world. Prerequisite: Consent of instructor. Same as Religion 33:155.

45236 Seminar: Problems in American Art 2-6 cr.
Same as Art 110:160.

45246 Seminar in the History of American Women 2 cr.
Same as History 123:64.

45256 Seminar in Afro-American History 2 cr.
Advanced study to African American history, with emphasis on select topics. Same as History 16:225.

45266 Readings in Afro-American History 2 cr.
Introduction to bibliography and sources for the study of Afro-American history. Same as History 16:236.

45276 Readings in the History of American Women 2 cr.
Same as History 16:237.

45286 Seminar for Study of Afro-American Literature 2 cr.
Exposure to the early, fable, folklore, mass culture, and minstrel music of America, and other American cultural sources.

45296 Advanced Seminar in Afro-American Literature 2 cr.
Independent study for graduate students concentrating in Afro-American Studies. Prerequisite: 3 cr. of 45286. Same as History 16:238.

45300 Special Project Graduate 1-6 cr.

45300 M.A. Thesis 1-6 cr.

45320 American Film and American Culture 2 cr.
An investigation of a selected group of American films as they reflect, shape, or illustrate the various aspects of American culture. Same as Speech and Dramatic Art 308:400.

Costume offered through Division of Dramatics.

45356 Readings in the Future of Man 2 cr.
45371 Seminar in Search of the American Dream 2 cr.
45392 American Sociology in the 20th Century 2 cr.
45397 The Sociology of American Values 2 cr.
45410 The Ascent of Man 2 cr.

Undergraduate Program

An undergraduate major in anthropology provides a foundation for professional training not only of anthropologists but of doctors, nurses, lawyers, economists, political scientists, social workers, sociologists—anyone whose work will involve cultures other than his or her own.

Mayors must take at least 30 semester hours of coursework in anthropology, including 11:3:4 Introductions to the Study of Culture and Society, 11:3:10 The World’s Peoples and 11:3:11 Introduction to Archaeology and Physical Anthropology. In addition each student must take one course in archaeology, one course in ethnology and one course in social anthropology. The remaining hours are to be selected in consultation with the advisor.

Anthropology electives offer a wide range of choices, including courses dealing with language and culture, social problems of underdeveloped areas, religious activity in folk and regional settings, primitive art, biological anthropology and urban anthropology. Specialization is discouraged in the undergraduate program, which is designed to give the student the broadest possible cross-cultural background. Coursework is encouraged in such related areas as sociology, linguistics, psychology, geography, ethnology and statistics. Students are also encouraged to participate in archaeological field research.

Special Programs

HONORS

Honors Designed for maximum development of superior abilities and interests, the Honors Program in anthropology is open to students with a minimum cumulative grade point average of 3.5 overall and 3.2 in anthropology. In addition to the regular requirements for a major in anthropology, honors students must complete the Department's Honors Seminar and Honors Research course.

Field Research

Opportunities are available for students to participate in archaeo-


Graduate Programs

Although dedicated to the holistic view of anthropology, the Department's emphasis lies in archaeology and social-cultural anthropology. The Department offers the Master of Arts degree in anthropology. The M.A. Program


The M.A. program is general in nature, designed to prepare the student to deal with any aspect of anthropology at an introductory level.

The Department offers the M.A. degree with or without thesis. The latter program is considered terminal, and ordinarily precludes consideration for admission to the Ph.D. program.

The number of semester hours of credit required for the M.A. with thesis may vary from 30 to 36, depending upon the student's previous academic preparation. The non-thesis program re-
quires at least 38 semester hours of graduate work. A 36-hour M.A. degree without thesis is available in conjunction with a minor concentration in museology.

The first-year graduate student entering the program with a B.A. degree in any discipline, or with a master's degree in a discipline other than anthropology, must satisfactorily complete the core course sequence, which includes 113:146 Social Anthropology, 113:158 Archaeology Theory and Method, 113:171 Anthropological Linguistics and 113:355 Biological Anthropology and their related graduate seminars, and must complete one additional course in social anthropology, archaeology, linguistics, research methods or statistics, and two ethnographic area courses. Students with an interest in archaeology are required to be trained in field techniques.

Students with previous training in anthropology may petition for permission to waive part of this distribution requirement.

Ph.D. in Anthropology

The Ph.D. degree represents a balance between general competence in all the subfields of anthropology covered at the M.A. level, and a professional level of specialization in one.

These are the requirements for the Ph.D. degree in anthropology:

At least 72 semester hours of graduate coursework;

Demonstration of a reading knowledge of at least two foreign languages;

Mastery of a relevant research skill (e.g., fluency in a foreign language or proficiency in a branch of mathematics, logic, computer programming, geology, or palaeoecology);

Ethnographic or technological specialization in a major geographic area approved by the student's Ph.D. advisory committee, e.g., North America, Mesoamerica, Oceania, Southeast Asia or the circumocean region;

Specialization in a minor and major topic area (e.g., kinship or social organization, ethnobiology, settlement pattern archaeology, language and culture, religion, cultural ecology, urban anthropology);

A written comprehensive examination in the student's area of specialization, and

Preparation and oral defense of a dissertation.

The comprehensive examination will take place when the student's coursework is completed or nearly completed, after the research requirements have been satisfied, and before he or she begins field work.

All doctoral candidates are required to carry out original anthropological research. Ordinarily, students conduct field work as the basis for their dissertations; however, occasionally a research proposal may be carried out using only documents, collections or other source material.

All doctoral candidates are required to be adequately trained in techniques of gathering primary data in an archaeological or ethnographic field research.
Courses

For Undergraduates Only

112:19 Introduction to the Study of Cultures and Society 4.0
Comprehensive study of culture and social organization, may be taken in partial fulfillment of major science core requirement.

112:20 The Anthropologist 3.0
Anthropological studies of human and animal life among the American Indian, Africa, and Asia. May be taken in partial fulfillment of major science core requirement.

112:21 Introduction to Anthropology and Physical Anthropology

Study and development of man and society from the viewpoint of physical anthropology and archaeology. Introduction to man's physical evolution and culture history.

112:25 Introduction to Midwestern Puebloan: Emphasis Iowa 2.0
Practical cultural evolution of Iowa viewed against the background of North American prehistory. Discussion of current and highly research. No prerequisites. Not open to anthropology majors.

112:25 Individual Study

112:26 Human Anatomy

May be taken to fulfill core course.

112:27 Individual Study

112:28 Human Anatomy

May be taken to fulfill core course.

112:30 Rapid Research Project: Special research project, under Honors chair-man, chosen after consultation with the Honors advisor; may be repeated.

Advanced Courses

General Anthropology

112:45 General Anthropology

2.0
Human evolution, prehistory and history, the major institutions and arts of modern man, and man's place in the animal kingdom. (Primarily for majors with advanced reading, open to students who have taken 112:5).

112:46 History of Anthropology

2.5
Development of anthropology as a discipline, comprehensive persons, concepts, and problems in the study of man and modern cultural anthropology. Prerequisite: 112:4/112:5 or consent of instructor.

112:50 Research Project

2.0
Problems and studies involved in continuing and comparing the behavior and ideas of different peoples. Anthropological research is done in special interest, of importance; may be taken a maximum of 3 times with consent of instructor.

112:52 Seminar in Anthropology

2.0
Same description as for 112:53.

112:53 Field Research

3.0
Same description as for 112:50.

112:54 Cultural Personality

3.0
Cultural Personality

112:55 Cultural Personality

3.0
Relationships of cultural and psychological variables in understanding behavior, sex differences and differences in personality and socialization; same as Sociology 316.2. Prerequisites: 112:1, 112:3 or 54:1.

112:56 Primate Art

3.0
Primate Art: Theories and observations of primate behavior in the wild of the New World monkeys; travel to observe primates in various regions of the world and be involved in the effort to understand the issues. Same as 45:2.

112:57 Insect Predatory

3.0
An extensive review of the various connections between insects and other species of animals to the beneficial behavior of insects. Prerequisite: 112:9 or 112:20. Does not satisfy anthropology core requirement for anthropology majors.

112:62 Independent Study

3.0
Prerequisite: consent of instructor.

113:19 Modern Asian Studies

3.0
Same as Asian Languages and Literatures 31:19 and School of Law 125:19.

113:20 Modern Asian Studies

3.0
Same as Asian Languages and Literatures 31:19 and School of Law 125:19.

113:21 Seminar: Anthropological Theory

3.0
An overview of the development of major cultural anthropology texts, the development of an oral study of the history of the field of major figures in 30th century anthropology.

113:22 Seminar: History of Anthropology

3.0
Discussion of the development of major cultural anthropology texts, the development of an oral study of the history of the field of major figures in 30th century anthropology.

113:23 Seminar: History of Anthropology

3.0
Development of period in anthropology, concepts, problems, and techniques of anthropology, sociological and cultural anthropology, research, graduate training or consent of instructor.

113:24 Advanced Research in Anthropology

3.0
Selected aspects of anthropological theory: problems, concepts, and techniques in the context of various cultural history and sociology of anthropology as a social organization of practitioners, open to seniors and graduate students.

113:25 Methods and Procedures in Anthropological Data Analysis

3.0
Procedures for analyzing field data and library materials including IRIA Plan.

Ethnology

112:35 The Ancient Indian

3.0
History and culture; contacts with North America. Prerequisite: 112:5 or 112:7.

113:15 Africa in the Indo World

3.0
Social and cultural history of African peoples in the Near East, a part of the colonial period. Open to seniors and graduate students.

113:22 Native Peoples of South America

3.0
Indigenous peoples of South America and Cuba/Indians; cultural and economic, political and social aspects of Indian life in pre-contact and present-day conditions. Prerequisite: 112:5 or 113:1.

113:23 Native Peoples of South America

3.0
Analysis of the social and cultural history of indigenous peoples in South America and Cuba/Indians; cultural and economic, political and social aspects of Indian life in pre-contact and present-day conditions. Prerequisite: 112:5 or 113:1.

113:26 Ethnology of Southeast Asia

3.0
Analysis of indigenous cultural patterns within Southeast Asian cultures, excluding Viet Nam; ethnic, religious, social, political organization and the relation of these to other cultural factors. Prerequisite: 112:3 or 125:5 or consent of instructor.

113:27 Ethnology of Southeast Asia

3.0
Analysis of indigenous cultural patterns within Southeast Asian cultures, excluding Viet Nam; ethnic, religious, social, political organization and the relation of these to other cultural factors. Prerequisite: 112:3 or 125:5 or consent of instructor.

113:28 Ethnology of Southeast Asia

3.0
Ethnology and anthropology of native cultures in the areas of Southeast Asia, Indonesia, the Philippines, Taiwan, and China.

113:29 Field Research in Ethnology

3.0
Ethnological and archaeological techniques; combining theory and practice in the development of research methods, with current research topics.

113:30 Ethnology of the Caribbean

3.0
Ethnological and archaeological techniques; combining theory and practice in the development of research methods, with current research topics.

Social Institutions

113:10 Anthropology of the Caribbean

3.0
Historical background and other factors influencing contemporary social and cultural phenomena in the Caribbean region. Students on Alm-Antropage
The student must earn a total of at least 74 semester hours of credit in non-art courses. For art history majors only, these must include two or more semesters of a second foreign language and at least 15 semester hours in at least three of these related areas: anthropology, classics, drama, history, language, literature, music, philosophy, religion, or sociology.

**Studio Emphasis**

The Bachelor of Arts degree with an emphasis in studio requires the following courses and credits in art:

**History of Art**
- 11:27 History and Appreciation of Art 4 s.h.
- 11:38 Art in the Western World or 4 s.h.
- 11:42 Art in East and West 4 s.h.
- Two intermediate-level courses 6 s.h.

**Studio**
- 1A:001 Colloquium 1 s.h.
- 1A:002 Colloquium 1 s.h.
- 1A:003 Basic Drawing 2 s.h.
- 1A:004 Basic Design 2 s.h.
- 1A:005 Inter-dimensional Concepts 3 s.h.
- At least one fundamental course from six of the following areas: 9 s.h.
  - Ceramics
  - Design
  - Drawing
  - Metalworking and Jewelry
  - Multimedia
  - Painting
  - Photography
  - Printmaking
  - Sculpture

**Electives**

Courses in history of art, studio, or art education combined to bring the total semester hours of courses listed in the School of Art and Art History to 160 less than 38, but no more than 50 s.h. Credits earned in the art beyond 50 s.h. do not count toward the B.A. degree.

Transfer studio majors, regardless of the number of hours being transferred to art, must complete at The University of Iowa a minimum of:
- 3 semester hours in art history and 12 semester hours in studio, including at least two different studio areas.

In addition, all course distribution requirements must be satisfied.

**Art History Emphasis**

The Bachelor of Arts degree with an emphasis in art history requires the following courses and credits in art:

**Studio**

as advised 8 s.h.
Art History

11:37  History and Appreciation of Art  4 s.h.
11:38  Art in the Western World  4 s.h.
11:42  Art in East and West  4 s.h.

Intermediate and advanced  at least 10 s.h.

Art Electives

Must raise the total of art courses to a minimum of 38 s.h. and may raise the total to a maximum of 50 s.h. Art courses may be taken beyond this level, but do not count toward the B.A. degree.

Art Education

Art education majors may elect to emphasize either studio or art history and must complete 1E:196 Concepts in Art Education and 1E:198 Art Education Studio.

The undergraduate degree program in art education is administered by the School of Art and Art History in cooperation with the College of Education. Certification requirements for teaching art in the elementary and secondary schools are administered through the College of Education. Certification requirements specifically for art education majors are:

7E:143  Methods: Art  3 s.h.
7S:105  Advanced Methods: Art  3 s.h.
7S:187  Seminar: Curriculum & Student Teaching (Art Section)  1-3 s.h.
7E:197  Aesthetic Education (elective)  arr.

For the general certification requirements, see the College of Education section of the Catalog.

Bachelor of Fine Arts

A student seeking the Bachelor of Fine Arts degree must meet the general education requirements of the College of Liberal Arts (see "College of Liberal Arts"), earn a total of 62 semester hours of credit in non-art courses, and earn at least 62 semester hours of credit in art and art history courses, which must include the following:

History of Art

11:37  History and Appreciation of Art  4 s.h.
11:38  Art in the Western World  4 s.h.
11:42  Art in East and West  4 s.h.

Two intermediate-level courses  6 s.h.

Studio

1A:001  Colloquium  1 s.h.
1A:002  Colloquium  1 s.h.
1A:003  Basic Drawing  2 s.h.
1A:004  Basic Design  2 s.h.
1A:005  Inter-dimensional Concepts  3 s.h.

At least one fundamental course from six of the following areas:

- Ceramics  2 s.h.
- Design  2 s.h.
- Drawing  2 s.h.
- Metalworking and Jewelry  2 s.h.
- Multimedia  2 s.h.
- Painting  2 s.h.
- Photography  2 s.h.
- Printmaking  2 s.h.
- Sculpture  2 s.h.

At least four semesters of course work in the major studio area for a minimum of 9 s.h.

Complete at least the second semester of course work in each of two minor studio areas (if selected from among one of the six required areas), 6 s.h.

Electives

Combined courses in history of art, studio or art education to bring the total semester hours of courses listed in the School of Art and Art History to 62 semester hours.

Transfer studio majors, regardless of the number of hours being transferred to art, must complete at least the University of Iowa's minimum of 3 semester hours in art history and a minimum of 12 semester hours in studio, including at least two different studio areas.

In addition, all course distribution requirements must be satisfied, including the studio major and minors.

The B.F.A. is not offered with a major in the history of art. Studio majors must apply to enter the B.F.A. program. Application is made following completion of the basic courses. Students obtain the review form from an adviser and make an appointment with the faculty in the proposed major area of concentration for the day of the B.F.A. review. Admission to the B.F.A. program is by permission of area faculty.

Art Education

Art education majors in the B.F.A. program must include 1E:196 Concepts in Art Education and 1E:198 Art Education Studio in their 62 semester hours of art. See the Bachelor of Arts section of the Catalog for general requirements in art education.

Graduate Programs

Note: A student who wishes to prepare for undergraduate teaching by combining the art history and studio areas may do so at the Master of Arts level as indicated in the following program descriptions for those two areas. Such a combination generally requires one or two additional semesters.

Art History

Master of Arts in Art History

The student is expected to acquire a broad general knowledge of art history as an academic and humanistic discipline, become familiar with major periods and movements of world art, and gain proficiency in techniques of research within selected areas. Spe-
Art and Art History

cific requirements include the B.A. or B.F.A. degree, with at least 18 semester hours of undergraduate work in art history, and a minimum of 30 semester hours of graduate-level coursework, with a grade-point average of 3.0 or higher, and including the follow-
ing:

Methodology of Art History and Criticism 3 s.h.
Two other art history seminars (with different instructors) 4-6 s.h.
Additional art history courses 14-21 s.h.
Studio 0-6 s.h.
Courses outside the school 0-9 s.h.

Students with little or no undergraduate studio training are re-
quied to take two courses in different studio fields. Art history graduate students with substantial undergraduate studio training will be exempted from the graduate studio requirement. Con-
sideration will be given by the studio faculty to the lesser prepa-
ration and/or aptitude of the art history major, who will be per-
mitted to take studio courses under individual instruction and/ or on an S/U basis. M.A. degree candidates with undergraduate majors in art history are encouraged to take courses outside the School.
A student preparing to teach in both the art history and studio areas will take 12 to 18 semester hours of studio coursework, with a minimum of 9 semester hours in one subject, in addition to the University’s undergraduate requirement for a studio major, and will also satisfy the drawing requirement.

Foreign Language
Within the first 20 hours of graduate work, the M.A. candidate will be expected to demonstrate the ability to read art historical writings in an appropriate foreign language, normally German or French, but other languages, including oriental languages, may be acceptable. This requirement may be satisfied by the Graduate School Foreign Language Test (GSFLT), the examination of an appropriate University of Iowa language department, satisfactory completion of the final semester of a Ph.D. language reading course, or satisfactory completion (at least a B grade) of the fourth semester of a college or university language course.

Comprehensive Examination
Qualification for the M.A. degree requires a comprehensive writ-
en and oral examination, approximately four hours in length, broadly covering the entire field of art history. The examination normally is given at the beginning of each semester and summer session. The student must take this examination within the two regularly-scheduled examination dates following the semester in which he or she completes 30 s.h. of graduate work.

Thesis
The student must also prepare either a written thesis, for which three semester hours of credit may be allowed, or a substantial research paper (approximately 20-40 pages in length), which will be filed in the Art Library. The research paper may emerge from either seminar or regular coursework. It must be acceptable to the instructor of the course in which it is submitted. A full draft of the thesis must be submitted by the end of the semester preceding the semester in which the degree is to be taken. The research paper must be submitted no later than the midpoint of the semester in which the degree is to be taken.

Area Requirements
To be awarded the M.A. degree, the student must have done at least 8 hours in courses in these five areas of art history:

- Ancient (up to Early Christian, ca. 300 A.D.)
- Medieval (ca. 300-1300 A.D.)
- Renaissance or Baroque (to ca. 1750)
- 19th Century or Modern (from ca. 1750)
- Oriental (India, China, Japan, Islamic)

The student may have taken these courses as an undergraduate or a graduate student, but the courses should be equivalent to one-
semester one-credit-hour level course at the University of Iowa—that is, above the intermediate survey level covering the entire area. Examples from each area would be Roman Art: Early Chris-

Deiciencies
At the time of admission to the M.A. program, the transcript of each entering student will be assessed to ascertain in which areas course distribution deficiencies exist. To remedy the deficiencies, the student will normally register in 100-level courses in the appropriate areas, either for credit or audit.

Doctor of Philosophy (art history only)
In the Ph.D. program, the student is expected to have a broad general knowledge of art history and to acquire detailed know-

Foreign Languages
Within the first 15 semester hours of graduate work beyond the M.A., the doctoral student must demonstrate ability to read art historical writings in two appropriate foreign languages. For majors in European art, one language normally will be German; for majors in non-art, Latin, Chinese or Japanese may be acceptable. The language examination procedure is explained in the M.A. program description.

Comprehensive Examination
The student must take a comprehensive examination in one major field (six hours) and two minor fields (three hours each) selected by the student in consultation with his or her advisor and approved by the art history faculty. At least one minor must be concerned
with an art historical period or area remote from the major field. A one-semester field may be related to the major; this field may be in a discipline or disciplines outside the School, e.g., in religion, history, or philosophy. The oral portion of the comprehensive examination is given by a committee of not less than five members of the graduate faculty, including those who prepared written examinations in the major and minor fields. Full details of the Ph.D. committee requirements are presented in the University Manual of the Graduate College.

**Dissertation**

The student must prepare a written dissertation constituting an original scholarly contribution to the field. Up to six semester hours of credit toward the art history course requirements may be allowed for dissertation preparation. The dissertation topic must be formally presented for faculty approval.

**Final Examination**

The student is given a final oral examination on the dissertation, by a committee of not less than five members of the graduate faculty, one of whom must be from outside the School. For full details, consult the Manual of the Graduate College.

**Admission**

Applicants for admission to the Graduate College to major in art history should send the application form, application fee and transcripts to the Director of Admissions, Calvin Hall. A term paper, or other example of ability to write in the field, and letters of recommendation from three references should be sent to the Art History Admissions Committee, Art Building.

Deadline for receipt of completed applications is June 15 for the fall semester, November 15 for the spring semester, or April 15 for summer registration.

**Art Education**

**Master of Arts in Art Education**

Requirements for the M.A. in art education are:

The B.A. or B.F.A. in art equivalent to that offered at The University of Iowa and teaching certification in art; and

- Completion of 36 semester hours of graduate credit, including 18 semester hours of studio and art history in a ratio of two to one, eight semester hours in art education and 12 semester hours to be specified after the student commences his program;

- An oral and/or written examination in art education and a related field;

- A written thesis based on research in art education or art history or a studio thesis (a studio thesis must be accompanied by a brief statement of the student's technical, aesthetic and/or psychological approach) and, as for the M.A. degree in studio, clearance for M.A. candidacy by faculty review.

**Admission**

Applicants for admission to the Graduate College to major in art education should send the application form, application fee, and transcripts to the Director of Admissions, Calvin Hall. A term paper or other example of ability to write in the field plus a selection of slides or photographs of creative work in the applicant's major studio area should be sent to the Art Education Admissions Committee, Art Building.

Deadline for receipt of completed applications is June 15 for the fall semester, November 15 for the spring semester, or April 15 for summer registration.

**Studio**

**Master of Arts in Studio Art**

The M.A. in studio may be taken with a major in painting, drawing, sculpture, prints, design, photography, ceramics, metalworking, and jewelry, or multimedia. The degree requires:

- The B.A. or B.F.A. in art equivalent to that offered at The University of Iowa (undergraduate deficiencies, if any, may be made up concurrently with, but are in addition to, graduate requirements);

- A minimum of 36 semester hours of graduate work, including at least 12 semester hours in a major studio subject, a total of from 21 to 29 semester hours in studio courses, nine semester hours in the history and theory of art and up to eight semester hours of courses outside art and art history; and

- Studio and written theses.

Graduate students who have not had drawing at The University of Iowa are required to take at least one drawing course during the first year.

A student preparing to teach in both the studio and art history areas must offer an art history minor of 15 semester hours, including 1H1-294 Methodology of Art History and Criticism and one other seminar. These hours are in addition to the university's undergraduate requirement for an art history major, and in combination with the undergraduate hours must satisfy the distribution requirement for art history.

**The Thesis**

Majors in studio must submit a thesis of selected studio work. An additional written thesis is required, and may be a brief statement of the student's technical, aesthetic and/or psychological approach, unless the advisor assigns an art history or technical subject. If technical, content will be supervised by the studio advisor; if historical, it will be supervised by an art historian. In the latter case the student should register for thesis credit of 1 s.h. in 1H1-302 M.A. Written Thesis. Such credits are applicable to the total number required for graduation but are in addition to other requirements for the M.A. degree.

**Master of Fine Arts (studio only)**

The M.F.A. may be taken with a studio major in painting, drawing, sculpture, prints, design, photography, ceramics, metalworking and jewelry, or multimedia. The degree requires:

- A minimum of 60 semester hours of graduate work, including 12 to 24 semester hours in a major studio subject, at least six
Art and Art History

Semester hours in a minor studio field, at least 43 semester hours of studio courses, nine semester hours in art history and theory of art, and eight semester hours in courses outside the school;

Acceptance of studio thesis supervision and advisory responsibility by a member of the staff qualified in the student’s chosen field of specialization;

Acceptance of responsibility for supervising the writing thesis, when such is assigned, by a member of the art history staff; and

Formation of a faculty committee for review of the candidate’s progress and final review and acceptance of the thesis.

All hours accumulated toward an M.A. degree earned at Iowa are applicable to the M.F.A. degree, with the exception of thesis credits. Approved M.A. credits from another accredited college or university are applicable within the limits of the 24-42 resid-
dence requirement.

Clearance for Degree Candidacy

Students entering the graduate program with an M.A. are only provisional candidates for the higher degree until cleared for M.F.A. candidacy by a faculty review. A student may be invited by his adviser to apply for clearance for the M.F.A. degree following acceptance of the M.A. thesis. As in the case of the M.A. degree, two full semesters, or a semester and a summer session, must elapse between the clearance and the awarding of the M.F.A.

Admission

The admission procedure for graduate studio programs includes a screening and a final review of applications. First screenings are

conducted at the screening committee’s first regular meeting following receipt of all of the applicant’s supporting material. Contact the school for meeting dates.

Painting, ceramics, design, metalworking or jewelry, or multimedia majors must submit slides and/or photographs of their work in their major field. Only applicants who are in residence at the University may submit original work in these areas.

Dra...
194/60

Colloquium in Art History
For senior art history majors.

For Undergraduates and Graduates
Notes: courses numbered above 195-100 have as prerequisite an introductory course in the appropriate art history area or permission of instructor.

195/60

Primitive Art Amer.
3 a.h.
Indigenous art in the Americas in the 19th Century. Prerequisites: 11:17, 11:18 or 11:42 or equivalent.

195/10

Egyptian and Mesopotamian Art
3 a.h.
Sculpture, painting, architecture and stone art from c. 3000 B.C. to classical times in Egypt and Near East. Same as Religion 20:159.

195/15

Art of Islam
3 a.h.
Islamic architecture, painting and minor arts in Spain North Africa, Egypt, Turkey, Syria/Palestine, Iraq, Iran, Afghanistan and India, in 600-1200 A.D. Same as Religion 22:192.

195/17

Buddhist and Hindu Iconography
2-4 a.h.
Historical development of religious imagery in Buddhism and Hinduism in India, Central Asia and China, and Japan. Same as Religion 22:175.

195/19

Art of India
3 a.h.
Art and architecture of India from earliest period to 1200 A.D., in relation to historical development of Buddhism and Hinduism. Same as Religion 22:192 and East Asian Languages and Literature 20:191.

195/19

Art of India II
3 a.h.
Art and architecture of India from 1200 A.D. to the modern era, in relation to historical development of Buddhism and Islam. Same as Religion 22:192 and East Asian Languages and Literature 20:191.

195/17

Art of Southeast Asia
3 a.h.
Art and architecture of Greater India, including Burma, Thailand, Cambodia, Vietnam, and Indonesia. Same as East Asian Languages and Literature 20:191.

195/19

Painting of India
3 a.h.
Well-painting and miniature painting of India in relation to historical development of Buddhist Hinduism, Invasion and art. Same as Religion 22:192 and East Asian Languages and Literature 20:191.

195/19

Art of China
3 a.h.
Art and archaeology of China in relation to philosophies and religions (Confucianism, Taoism and Buddhism). Same as East Asian Languages and Literature 20:192.

195/20

Chinese Painting I
3 a.h.
Early Chinese painting from the 4th century B.C. through 13th A.D., treating major styles but also considering emergence of landscape. Same as East Asian Languages and Literature 20:192.

195/21

Chinese Painting II
3 a.h.
Later Chinese painting, spanning landscape of 15th through the 19th centuries, but concentrating on earlier periods. Same as East Asian Languages and Literature 20:192.

195/22

Art of Japan
3 a.h.
Art and archaeology of Japan in relation to philosophies and religions (Shintoism, Buddhism, and Zen). Same as Japanese 20:192.

195/23

Japanese Painting
3 a.h.
Painting in Japan, concentrating on both Chinese influence and indigenous styles from 7th through early 16th centuries. Same as Japanese 20:192.

195/23

Chinese Painting III
3 a.h.
The art of the Sung, Yuan and Ming from 220-1644 A.D. and Chinese art from 1644 to present (13th-18th B.C.) from the Song period (1069-1279). Same as Greek 14:120.

195/24

Greek vase painting
3 a.h.
Art and architecture in the Greek world from Early Classical period (c. 480 B.C.) through Hellenistic times. Same as Greek 20:194.

195/28

Greek Vase Painting II
3 a.h.
The development of Greek ceramic techniques, styles and subjects from Protogeometric period through Hellenistic times. Same as Greek 14:114.

195/28

Greek and Roman Art
3 a.h.
Villanovan and Etruscan art, religious and cultural art until defeat of Rome by Barbaresque; Same as Latin 20:121.

195/23

Roman Art
3 a.h.
Roman architecture, sculpture, painting and mosaic of Republic, Empire and Late Antique periods. Same as Greek 20:150.

195/20

Roman Art II
3 a.h.
Floor, wall and vault mosaics in the Roman world from the 1st century B.C. to the 5th century A.D. Same as Latin 20:112.

195/28

Early Christian and Early Byzantine Art
3 a.h.
Architecture, sculpture, painting and mosaic from 4th to 10th centuries in the West and to 15th century in the East. Same as Greek 20:113 and Religion 20:197.

195/27

Byzantine Art
3 a.h.
Same as Greek 14:120.

195/19

Medieval Art
3 a.h.
Art of early medieval period, from Dark Ages in Europe through Ottonian period. Including contemporary minor art.

195/19

Art of Renaissance and Celtic periods.
3 a.h.
Late Gothic period.

195/19

Northern Renaissance Art
International style art; French and Netherlandish art to 1500.

195/19

Northern Renaissance Art
German 15th and 16th centuries, 16th century Netherlandish art through Brueghel.

195/19

Northern Art
Netherlands art from Bruges to Rubens.

195/19

Italian Renaissance Art
Painting, sculpture and architecture in Italy from 1300 to 1500.

195/19

Italian Renaissance Art
Painting, sculpture and architecture in Italy from 1400 to 1525.

195/19

Italian Renaissance Art
Painting, sculpture and architecture in Italy from 1500 to 1600.

195/19

17th Century Masters in Southern Europe
Bernini, Caravaggio, Poussin, Rembrandt, Rubens, Velazquez.

195/19

French Art
French painting, sculpture and architecture, 15th-1700.

195/19

Spanish Painting
From El Greco to Goya (1570-1800).

195/19

Southern Baroque Art
Painting, sculpture and architecture in Italy and Spain from 1750 to 1750.

195/19

Northern Baroque Art
Painting, sculpture and architecture in the Netherlands and England from 1620 to 1700.

195/19

18th Century Art
Art in general in Europe and America. Same as Greek 20:150.

195/19

18th Century Art
Architecture, sculpture and painting in the 18th century in Western Europe.

195/19

19th Century Art
Architecture, sculpture and painting in Europe and United States from late 18th century to mid-19th, from Neoclassicism to Realism.

195/19

19th Century Art
Architecture, sculpture and painting in the Western world in second half of the 19th century. Realisme, Impressionism.

195/19

Modern Architecture
Architecture from 1900 to present in Europe and America.

195/19

Modern European Painting
Art of the 20th century B.: Fauvism, Expressionism, Cubism, Precisionism, Dada, Surrealism and Abstraction.

195/19

Modern Architecture
From Rodin to Surrealism: from Impressionism to modern European developments.

195/19

American Art II
Architecture, painting and sculpture in United States from 1825 to 1925. Same as American 20:150.

195/19

Modern American Art
Architecture, painting and sculpture in the United States from the Armory Show to World War I.

195/19

American Art IV
Painting and sculpture in the United States since World War II.

195/19

Contemporary Art
Development in America and Europe from World War II to the present.

195/19

Contemporary Art
Architecture, sculpture and painting throughout the world since World War II. Same as Greek 20:150.

195/19

History of Prints
Preservation of the style, symbolism and cultural impact of prints and woodcuts from the 15th century, particularly in Europe from Renaissance.

195/19

History of Prints
The development and role of theory and criticism since 1500.

195/19

Prints and Illustrations in Modern Art
The development and role of theory and criticism since 1900.
Art and Art History

18:196 Theory and Criticism in Contemporary Art 3 s.h.
European and American relation and theory from World War II to present.
18:197 Theory and Form in Western Art 3 s.h.
Relationship of criticism and theory to painting and sculpture in Europe.

Courses Primarily for Graduates
18:222 Advanced Modern and Metropolitan Art 3-4 s.h.

18:215 Advanced Oriental Art: India 3 s.h.

18:218 Seminar: Problems in Oriental Art 3-4 s.h.
Same as East Asia Language and Literature 3:151.

18:228 Seminar: Problems in Ancient Art 3-4 s.h.
Same as Greek 14:330.

18:235 Seminar: Problems in Early Chinese and Indian Art 3 s.h.
Same as Greek 14:322.

18:244 Seminar: Problems in Northern Renaissance Art 3-4 s.h.

18:247 Seminar: Problems in Italian Renaissance Art 3-4 s.h.

18:250 Vanished Painting 3 s.h.

18:259 Seminar: Problems in 19th Century Art 3-4 s.h.

18:282 Seminar: Problems in Modern Art 3-4 s.h.

18:286 Seminar: Problems in American Art 3-4 s.h.
Same as American Civilization 41:236.

18:285 Art History Workshop I 3 s.h.

18:283 Art History Workshop II 3 s.h.

18:297 Art History Workshop III 3 s.h.

18:296 Seminar: Methodology of Art History and Criticism 3-4 s.h.
Use of library and other investigative resources; different types of problems in art history and criticism and their varying research requirements; scholarly presentation of research findings.

18:303 Directed Studies 3 s.h.

18:303 M.A. Written Thesis 3 s.h.

18:303 M.A. Written Thesis 3 s.h.

18:304 Ph.D. Thesis 3 s.h.

18:101 Individual Instruction in Elements of Art 2 s.h.

18:601 Ceramics I 3 s.h.
Basic methods of forming, firing and glazing clay. May not be repeated. Prerequisite: 18:5 or permission of instructor.

18:601 Ceramics II 3 s.h.
Intermediate throwing and shaping techniques; clay and glaze formulation and preparation in kilns, firing. May not be repeated. Prerequisite: 18:40 or equivalent.

18:607 Economic Sculpture 3 s.h.
Substantial problems in various clay bodies and glazes. Prerequisites: 18:15, 18:50 and permission of instructor.

18:170 Ceramic III 3 s.h.
Individual projects as approved by the instructor. Prerequisite: 18:601. May not be repeated. Prerequisite: 18:50 or equivalent.

18:171 Ceramic Workshop 2 s.h.
Prerequisite: 18:170 and permission of instructor.

18:172 Glaze Calculations 3 s.h.
Empirical and practical methods of glaze formulation; effects of various types of oxides, firing atmospheres and glazes. Prerequisites: 18:170 or equivalent and permission of instructor.

18:174 18th Century 3 s.h.
The Theory and construction of color. Prerequisites: 18:170 or equivalent and permission of instructor.

18:175 Advanced Instruction in Ceramics 3 s.h.

18:210 Problems in Design I - Form and Structure 3 s.h.
Materials and their formal and structural possibilities. Prerequisite: 18:5.

18:220 Problems in Design II - Form and Function 3 s.h.
Problems of a design element: how are they designed? Will develop modeling skills and the graphic communication skills necessary to technical project development. Prerequisite: 18:5.

18:250 Lettering I 2 s.h.

18:255 Lettering II 2 s.h.

18:265 Exploring communicative potential of visual material on two-dimensional surfaces; combining media and form; developing a visual vocabulary. Prerequisite: 18:4.

18:280 Graphic Design I 3 s.h.
Exploring communicative potential of visual material on two-dimensional surfaces; combining media and form; developing a visual vocabulary. Prerequisite: 18:4.

18:281 Graphic Design II 3 s.h.
Combination of 18:250; individual property; development of calligraphic skills; both design and graphic skills. Prerequisites: 18:250 or equivalent and permission of instructor.

18:283 Design Seminar 3 s.h.
Clarity: studying graphic problems; giving weight from one area to another in problems in graphics design; discussions and interaction with other students. Prerequisites: 18:5 or permission of instructor.

18:300 Graphic Design Workshop 3 s.h.
Advanced problems in visual and written communications; individual projects; both design and graphic skills; architectural and environmental graphics. Prerequisites: 18:4, 18:283, and permission of instructor.

18:307 Environmental Design I 3 s.h.
Design in relation to human factors—psychological and physiological—and to physical environments and their psychological influences on man. Same as Urban Studies 7:122.

18:308 Environmental Design II 3 s.h.

18:310 Interior Design I 3 s.h.

18:312 Interior Design II 3 s.h.

18:317 Environmental Design 3 s.h.

18:301 Interior Design 3 s.h.

18:319 Interior Design 3 s.h.

18:320 Interior Design 3 s.h.

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18:347 Interior Design 3 s.h.

18:348 Interior Design 3 s.h.

18:349 Interior Design 3 s.h.
Botany

Biological sciences  9-10 s.h.
37:3 Principles of Animal Biology and either 2:1 Introduction to Botany or 61:157 General Microbiology
Chemistry  17-20 s.h.
Biochemistry  23-31 s.h.
99:100 Seminar Undergraduate  (each semester)
99:120 The Chemistry of Biological Materials  3 s.h.
99:130 Metabolism  3 s.h.
99:131 Molecular Genetics  4 s.h.
99:140 Experimental Biochemistry  4 s.h.
99:155 Senior Research, Independent Study  at least 6 s.h.
Advanced biochemistry courses 1-3 s.h.
Advanced science electives at least 17 s.h.

Bachelor of Arts
In addition to the College of Liberal Arts general education requirements, the bachelor of Arts degree in biochemistry requires:
22M:15 Mathematics for the Biological Sciences  4 s.h.
22M:16 Calculus for the Biological Sciences  3 s.h.
29:1-2 College Physics  8 s.h.
Biological sciences  9-10 s.h.
37:3 Principles of Animal Biology; and either 2:1 Introduction to Botany or 61:157 General Microbiology
Chemistry  17-20 s.h.
4:1 and 4:4 Principles of Chemistry I&II; 4:6 Elementary Chemistry Laboratory; 4:121 Organic Chemistry I and 4:122 Physical Chemistry for the Life Sciences
Biochemistry  17-25 s.h.
99:100 Seminar Undergraduate  (each semester)
99:120 The Chemistry of Biological Materials  3 s.h.
99:130 Metabolism  3 s.h.
99:131 Molecular Genetics  4 s.h.
99:140 Experimental Biochemistry  4 s.h.
99:190A-203 Advanced courses 2-3 s.h.
Advanced science courses 19 s.h.
Additionally, B.A. students intending to go on to advanced degrees in the biological or health sciences are advised to include four semester hours of senior research among their electives (as well as 4:122 Organic Chemistry II).

Honor's Program
Honors may be earned by special work in 99:140, Experimental Biochemistry, and in research (99:155). In the latter case, work completed on the problem investigated shall be presented to the Department as a written report and oral presentation in 99:100 Seminar Undergraduate.

Teacher Certification
Biochemistry students planning to qualify for teacher certification should include 75:100 Introduction to Secondary School Teaching, 75:151 Methods: Physical Science and 75:152 Methods: Biological Science among the College of Education courses taken to meet certification requirements.

Graduate Programs, Facilities, Faculty, Courses
See "Biochemistry" in the College of Medicine section of the Catalog for descriptions of the Department's graduate programs and facilities and for its faculty roster and course offerings.

Botany
Department Chairperson: Robert L. Hultberg
Faculty: professors: Wayne L. Galston, Robert R. Nies, associate professors Wayne B. Carle, Robert W. Danks, Stanley D. Deam (retired), Robert W. Sants, Thomas E. Webster, Jerry T. Williams, Richard D. Spalding, assistant professors: Stephen D. Hendrix, Robert A. Freuden, Won-Yoo Yang
Degrees offered: B.A., M.S., Ph.D.
Botany is a science contributing to our understanding of plants, their structure, reproduction, function, distribution on the earth, diversity, evolution, behavior and relation to human affairs. The Department functions in the preparation of professional botanists for teaching and research positions. Many students majoring in botany are preparing to enter careers in fields related to the plant sciences, such as agriculture, forestry, horticulture, plant breeding, microbiology, and the chemistry of natural products, ecology, medicine, pharmacy, zoology.

The Bachelor of Arts Degree
In addition to the general requirements of the College of Liberal Arts, students majoring in botany are required to take:
Introduction to Botany  4 s.h.
One course in each of the following areas 20 s.h.
Genetics (2:102, 2:104, 2:160)
Botany of Vascular Plants (2:111, 2:112, 2:113, 2:120, 2:121)
Botany of Non-Vascular Plants (2:103, 2:106, 2:107)
Two (00-level) courses in botany or cognate fields (zoology, biochemistry, microbiology) 8 s.h.
Organic chemistry/biochemistry 16 s.h.
Mathematics: 22M:15 Mathematics for the Biological Sciences, 22M:20 Elementary Functions or equivalent 3 s.h.
Botany majors are advised to obtain a sound background of courses in zoology.
Students preparing to teach in secondary schools should consult the College of Education regarding requirements for teacher certification.

The Honors Program
An undergraduate program leading to graduation with Honors provides opportunities for participation in independent research.
projects guided by professional staff members. Prerequisites for admission to the program are senior standing and cumulative grade-point averages of 3.0 overall and 3.5 in botany.

In addition to the regular requirements for the B.A. degree, Honors students must complete three semester hours of research (2:124 Honors in Botany) during the senior year, maintain the grade-point average required for admission to the program, and pass an Honors examination at the end of the senior year.

Graduate Study

The Department offers graduate training in diverse areas. Many involve interdisciplinary training, and some, such as genetics and ecology, require extensive study outside the Department. For these reasons, each student will be assigned a faculty guidance committee to help set goals for graduate training and to plan the course requirements necessary to achieve them. Candidates for advanced degrees in botany are required to perform some service in teaching or research assistance.

The Master's Degree in Botany

Advanced study may be undertaken with emphasis in anatomy, histology, cell biology, ecology, genetics, development and morphogenesis, mycology, paleobotany, physiology, botany, or taxonomy. The master's degree may be earned by completing at least 30 semester hours of graduate study, including six semester hours in 2:225 Research Botany. The requirements of a thesis is optional. Each student must:

Submit a program of study approved by a guidance committee consisting of three members of the graduate faculty, one of whom may be from another department. Normally, the program of study should be prepared during the first semester in residence as a regular graduate student.

Complete at least 16 semester hours of graduate courses in botany, as prescribed by the guidance committee. No more than six semester hours of 2:225 Botany Research and 2:229 Thesis Botany may be used to fulfill this requirement.

Achieve a grade-point average of 3.0 on all courses other than research—attempted up to the time of the final examination.

Take a written and oral examination during the term in which he or she is to graduate. These examinations cover the course and research experience the student has had up to this point.

Master's Degree in Biology

A student who has been regularly admitted as a graduate student in either the Department of Botany or the Department of Zoology may elect a course of study leading to the Master of Science degree in biology. The M.S. degree in biology requires at least 34 hours of graduate study without thesis, or 30 hours with thesis. Non-thesis candidates must take 4 or 5 semester hours of research, and thesis candidates must take at least 8 semester hours of research. Research credit can be earned by taking 2:225 Research Botany, 37:199 Introduction to Research and 37:303 Independent Study in Zoology. In addition, each student must:

Submit, during the first semester in residence or in the program, a program of study to be approved by the department in which the student is enrolled. The program must include at least 8 semester hours of graduate courses in each of the two departments, exclusive of research. Six to 10 hours may be taken in supportive areas including biochemistry, microbiology, geology and mathematics.

Achieve a grade-point average of 3.0 in all courses other than research attempted at the time of the final examination. Pass a written comprehensive final examination covering the graduate program, followed by an oral examination for those candidates based mainly on the work reported in the thesis.

Doctor of Philosophy

The general requirements of the Graduate College apply to all students (see "Graduate College"). Specialization may be in any one of the fields listed under the master's degree. Normally the student prepares his or her Ph.D. program proposal during the first semester in residence. The student's guidance committee prepares formal courses or proficiency requirements, taking into account the student's background, educational and career goals, and current or prospective research interests. The committee also establishes which portion of the formal coursework or specific proficiency (such as ability to read certain foreign languages) will be required, before the student is permitted to take the oral and written comprehensive examinations. The comprehensive examinations cover the student's fields of concentration and research.

At least 72 semester hours of graduate credit are required. The doctoral thesis must be submitted before the final examination, which is primarily a defense of the ideas and the methods of obtaining the data.

Graduate Admission

General Requirements

All students should become thoroughly familiar with the requirements of the Graduate College. Applicants for admission should take the Graduate Record Examination and submit scores on the aptitude tests. A sum of scores on the verbal and quantitative sections of the G.R.E. of at least 1100 is recommended but is an absolute requirement. For those applying for financial support, a score on the Advanced G.R.E. test is desirable. Students applying for admission to the masters degree programs should have a grade-point average on all undergraduate work of at least 2.5. Those with a masters degree and applying for the Ph.D. program should come with a G.P.A. of at least 3.0 on all graduate work taken.

Departmental Requirements

If the entering student has little or no training in botany or biology, some introductory coursework will be required in accordance with the academic needs of the individual. In addition, mathematics at the level of analytic geometry and a year of organic chemistry are usually required of entering students. Courses prescribed by the student's guidance committee should be made up during the first year of residence; these courses may be taken for reduced graduate credit.

Special Facilities and Activities

Students conducting experiments of research projects requiring the cultivation of plants have access to greenhouses and special culture
rooms with controlled environments. A plant physiology labora-
tory is available, with associated greenhouses. There is
an excellent department library in the building.
A member of the research laboratories are equipped with standard
and more sophisticated apparatus. A new electron microscope is
in operation. Students and staff may use the Scanning Electron
Microscope Laboratory in the Zoology Building.
An herbarium for research and general study includes collec-
tions of more than 200,000 specimens. These standard specimens
include extensive collections of seed plants and ferns from Iowa
and the Midwest, special research specimens from Mexico and
Central America, the Cordilleras of the Himalayas and the
Martis collection of ferns and slime molds.
Within a few miles of the campus, a forest preserve is available
for field trips and experimental projects. A biological field station
at Iowa Lakeside Laboratory (see "Extension Division") on West
Lake Okoboji in northeastern Iowa affords excellent conditions
for summer study in field biology, limnology, physiology, aquatic
ecology and plant taxonomy. Students frequently participate in
field expeditions in the Canadian Northwest, Mexico and Central
America.
Qualified graduate students may use the University Computer
Center in their research projects.

Courses

For Undergraduates

2106 Botany

E. P. Beeley

Botany

Introduction to Botany

Cultural exposure with biology of plant life, structure, function, reproduction
and inheritance in plants. Recommended for students in general science, ecology
and those preparing to teach science. May be continued by 2111 or 2113 to satisfy
the natural science core requirements.

2107 Botany

E. P. Beeley

Botany

Identification and field study of flowering plants representative of families
commonly found in 2 New York; field reproductive biology and identification.

2108 Botany

E. P. Beeley

Botany

Evolution of Plants

A survey of plant life emphasizing the structure, reproductive biology, ecological
adaptations and the evolutionary relationships of major plant groups. Prerequisite: 2106 or equivalent.

2109 Botany

E. P. Beeley

Botany

Habitats of the Living Earth

Identification, recognition and importance of angiosperms and gymnosperms
of Midwestern importance. The ecology of woodland and prairie communities
and plant distribution in plant communities. Field work when feasible. Prerequisite: 2111 or equivalent.

2110 Botany

E. P. Beeley

Botany

Plant morphogenesis

Lectures and laboratory relating basic plant biology to early development and
agricultural practices. Topics covered include seed and rooting development,
cell growth, nutrition, disease control and reproductive processes.

2111 Botany

E. P. Beeley

Botany

Evolutionary Genetics

Basic principles of Mendelian and modern genetics; mechanism of heredity
with emphasis on its effect in plants, nutrition and human.

For Undergraduates and Graduates

2110 Plants and Human Affairs

E. P. Beeley

Botany

Study of the ways plants are useful to man for food, clothing and shelter.
The social economic and ecological significance of plants is considered.

2112 Plant Taxonomy

E. P. Beeley

Botany

Principles of plant taxonomy as illustrated by study of variation within and
taxonomy between selected families and orders of angiosperms. Prerequisite: 2110 or equivalent.

2121 Genetics

E. P. Beeley

Botany

Structure, behavior and function of hereditary material; one-dimensional
biology basic patterns of inheritance. Prerequisite: 2111 or 2112 or equivalent.

2124 Cytogenetics

E. P. Beeley

Botany

Genetics of invertebrates and of vertebrates; process of meiosis; chromosomal
structure, including translocations, inversions, duplications, deficiencies, distri-
butions and stability. Discussion of the importance of the differences in chromosome
number in some animal and human cells; controlling elements. Prerequisite: 2102 or 2128.

2125 Plant Physiology

E. P. Beeley

Botany

Structure and function of living plants, including cytochemistry and
physiology of representative of major taxonomic groups. Prerequisite: 2110 or equivalent.

2126 Botryology

E. P. Beeley

Botany

Lectures, laboratory and field work dealing with development, structure and evolu-
tion of roots and stems. Prerequisite: 2111 or equivalent.

2127 Botany

E. P. Beeley

Botany

Morphology, cytology and taxonomy of fungi with study of representative groups.
Prerequisite: 2111 or equivalent.

2131 Plant Physiology

E. P. Beeley

Botany

Experimental study of functions in plants; cell physiology, water metabolism,
chemical synthesis. Prerequisite: 2111 and organic chemistry.

2132 Plant Physiology

E. P. Beeley

Botany

Experimental study of internal nitrogen, metabolism, growth and development
of seed plants. Prerequisite: 2111 and organic chemistry.

2133 Plant Ecology

E. P. Beeley

Botany

Adaptations and interactions between organisms and their environment; major
groups include communities, succession, climax, history of geomorphology, current
distribution, breathing systems, reproduction systems. Prerequisite: 2111 or equivalent; a
course in geology is helpful.

2134 Plant-Animal Interactions

E. P. Beeley

Botany

Ecology and evolution of plant-animal associations, effect of animals, especially
insects, on individual plants or communities; sequence of plants in successional
patterns, plant evolution. Prerequisite: 2131 or 2132 or consent of instructor.

2135 Plant Anatomy

E. P. Beeley

Botany

Structure and organization of fundamental tissue systems of and plants including
development and differentiation of cell types exemplifying these tissues; relationships
between structure and function. Prerequisite: 2131 or equivalent.

2136 Structure and Physiology of Plant Cells

E. P. Beeley

Botany

Lectures and laboratory work on plant cells and cellular organelles with emphasis
on the relationship of these structures to their functions; behavior of cellular components
and evaluation of morphological evidence obtained by light and electron microscopv.
Prerequisite: 2131 or equivalent.

2137 Botanical Microtechnique

E. P. Beeley

Botany

Lectures and practical instruction in preparation of permanent microscopic slides;
methods of cutting, mounting and staining plant materials; standard cytological techniques;
necessary for research in various fields of botany. Prerequisite: 2131 or equivalent.

2138 Field Botany

E. P. Beeley

Botany

Correlation of vegetation and environmental factors: derivation of plant community
and physiological characteristics; population dynamics and analysis of field data; methods for
describing vegetation in quantitative terms. Prerequisite: 2111 or 2132 or consent of
instructor.

2139 Experimental Techniques

E. P. Beeley

Botany

Lectures and laboratory work with plant culture, microscopy, spectroscopy, chromatography,
and use of radioactive and stable isotopes. Prerequisite: consent of instructor.

2140 Experimental Techniques

E. P. Beeley

Botany

Study of methods to test as independent units; chemical analysis, enzyme analysis,
enzyme studies and measurement of photosynthesis and respiration. Prerequisite: 2131 or equivalent.

2142 Paleobotany

E. P. Beeley

Botany

Identification of groups of fossil plants; their structure, evolution, physiological
relationships and geological distribution. Prerequisite: 2111 or equivalent or consent of
instructor. Same as Geology 137.

2144 Paleobotany

E. P. Beeley

Botany

Study of plant remains from paleoecological sites. Prerequisite: consent of instruc-
tor. Same as Geology 137.

2146 Honors in Botany

E. P. Beeley

Botany

Studies in botany. Prerequisite: under 2:00 and grade-point average 3.0 overall,
2:50 in the major.

2153 Developmental Plant Physiology

E. P. Beeley

Botany

The effect of developational conditions on plant physiology, particularly photosynthet-
ically. Prerequisite: 2111 or 2131 or equivalent. Same as Geology 138.

2154 Developmental Physiology Laboratory

E. P. Beeley

Botany

Development and biochemical studies to determine the developmental and
environmental aspects of plant physiology. Prerequisite: Completion of 2111.

2155 Plant Anatomy Laboratory

E. P. Beeley

Botany

Nature and function of genetic mechanisms; classical, embryological, developmental,
protoplasmic and environmental aspects. Prerequisite: 2111 or equivalent; chemistry
through 4-132 or Biochemistry 69-120 recommended. Same as Zoology 57-120.
Primarily for Graduates

2:301 Systematics
Hydrozoa, coelenterates, polychaetes, holothurians, echinoderms, gastropods, cephalopods, bivalves, echinoids, asteroids, crustaceans, and molluscs. Taxonomic classification, systematic relationships of living and fossil forms. Course may be repeated for credit.

2:302 Ecological Zoology
Animal ecology, ranging from the algal-bacterial-coral relationship to the interdependence of plant and animal life. Prerequisites: physiological ecology and 2:307; consent of instructor.

2:303 Population and Community Ecology
Theoretical and practical aspects of population and community structure and function. Prerequisites: 2:302 or 2:307; consent of instructor.

2:304 Animal Nutrition
Topics in animal nutrition. Prerequisites: 2:302 or 2:307; consent of instructor.

2:305 Principles of Environmental Management
Principles of environmental management. Prerequisites: 2:302 or 2:307; consent of instructor.

2:306 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:307 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:308 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:309 Marine Ecology
Ecological processes and biogeochemical cycling in marine ecosystems. Prerequisites: 2:302 or 2:307; consent of instructor.

2:310 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:311 Oceanographic Analysis
Analysis of oceanographic data. Prerequisites: 2:302 or 2:307; consent of instructor.

2:312 Oceanography
Introduction to oceanography. Prerequisites: 2:302 or 2:307; consent of instructor.

2:320 Aquatic Ecology
Ecological processes and biogeochemical cycling in freshwater ecosystems. Prerequisites: 2:302 or 2:307; consent of instructor.

2:330 Marine Ecological Studies
Ecological processes and biogeochemical cycling in marine ecosystems. Prerequisites: 2:302 or 2:307; consent of instructor.

2:340 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:350 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:360 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:370 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:380 Biogeography
Biogeography of marine and freshwater ecosystems. Prerequisites: 2:302 or 2:307; consent of instructor.

2:390 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:400 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:410 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:420 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:430 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:440 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:450 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:460 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:470 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:480 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:490 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:500 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:510 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:520 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:530 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:540 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:550 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:560 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:570 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:580 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:590 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:600 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:610 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:620 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:630 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:640 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:650 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:660 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:670 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:680 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:690 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.

2:700 Marine Geophysical Exploration
Geophysical exploration of the ocean floor. Prerequisites: 2:302 or 2:307; consent of instructor.

2:710 Marine Biology
Introduction to the biology of marine organisms. Prerequisites: 2:302 or 2:307; consent of instructor.

2:720 Marine Geology
Geological processes of the sea. Prerequisites: 2:302 or 2:307; consent of instructor.
in such fields as biochemistry, microbiology, pharmacology, physiology, medicinal chemistry, oceanography, geochimistry, and metallurgy.

Chemistry courses in the first two years of the bachelor’s program also provide a good background in general and organic chemistry for biological science majors. General science majors should select their chemistry courses from those listed in the B.A. curriculum: Elementary Quantitative Analysis (4:11) and Physical Chemistry for the Life Sciences (4:130) may also be included in the general science curriculum. Core courses 11:25 (offered jointly with the Physics Department) and 11:26 provide an introduction to physical sciences for the non-science major.

Students majoring in chemistry must meet the basic skills and core course requirements for a liberal arts degree. Chemistry majors should attempt to complete courses in organic chemistry, integral calculus, and introductory physics prior to their junior year. A special undergraduate advisor is available to help students design their own programs.

The Bachelor of Science Degree

The B.S. curriculum in chemistry is the professional training program leading to employment in the chemical industry and in government research laboratories. The present and future demand for B.S. chemists for research, control or process development work is excellent. The B.S. program also provides all of the prerequisites for graduate work in chemistry or biochemistry.

Chemistry Courses

4/1:4 Principles of Chemistry I-II
4/6 Elementary Chemistry Laboratory
4/12:1-12 Organic Chemistry I-II
4/11-11 Physical Chemistry I-II
4/13:1-132 Physical Chemistry I-II
4/15:1-152 Advanced Chemistry Laboratory I-II
4/13:1-134 Advanced Chemistry Laboratory I-II
4/17 Advanced Inorganic Chemistry
4/161 Introduction to Senior Research
4/162 Senior Research
4/50 Chemistry Orientation

Mathematics

Selected courses to include integral calculus. (Mathematics 22M:35, 36 Engineering Mathematics I, II recommended. 22M:25, 26 Calculus I, II acceptable.)

Physics

Two semesters (either 29:1-2 College Physics or 29:17-18 Introductory Physics I-II; 29:17-18 are recommended).

Foreign Languages

15:11 First-Semester German and 13:12 Second-Semester German, or the equivalent of two semesters of German.

Electives

Advanced science elective courses plus credit earned in senior research must total a minimum of seven semester hours. Advanced science electives may be chosen in the areas of chemistry, mathematics, astronomy, physics, engineering, nuclear sciences, biochemistry, microbiology, pharmacology, cosmetology, zoology, geology, physiology.

The Bachelor of Arts Degree

The B.A. curriculum in chemistry provides a general education with some concentration in fundamental chemistry but with wider choice of electives. Students electing this program may qualify for high school teaching; provided the required hours of education are elected. By choosing the proper electives, students planning to enter medicine, dentistry or some other scientific field may meet the entrance requirements for such professions and also obtain the B.A. degree.

Chemistry Courses

4/1:4 Principles of Chemistry I-II
4/6 Elementary Chemistry Laboratory
4/12:1-12 Organic Chemistry I-II
4/11-12 Analytical Chemistry
4/13-132 Physical Chemistry I-II
4/14 Intermediate Chemistry Laboratory I
4/160 Advanced Chemistry Laboratory I
4/50 Chemistry Orientation

Mathematics

Selected courses to include integral calculus. (22M:35-36 Engineering Calculus I-II recommended; 22M:25-26 Calculus I-II acceptable.)

Physics

Two semesters (either 29:1-2 College Physics or 29:17-18 Introductory Physics I-II; 29:17-18 also recommended).

Foreign Languages

A minimum of four semesters in one language, which must be chosen from German, French or Russian.

Electives

Advanced courses in chemistry, biology, mathematics, physics or in other scientific areas are recommended.

Teaching Certification

The chemistry courses required for the B.S. or B.A. degrees satisfy the requirements for a major for teaching in secondary schools. Chemistry courses through organic chemistry satisfy the requirements for a teaching minor in chemistry. (See “College of Education.”)

Graduate Study

The Department offers a full program of courses, research and seminars leading to the M.S. and Ph.D. degrees in the areas of analytical, inorganic, organic and physical chemistry and in chemical physics. Students seeking the Ph.D. degree in chemistry are required to demonstrate competence in each of four areas of chemistry. This can be accomplished by receiving a minimum 2.75 grade-point average in the courses listed below or by department examination. Candidates for the M.S. degree are required to obtain minimum grades of "C" in three of these courses or to meet the requirement by examination.

4/170 Advanced Inorganic Chemistry
4/171 Advanced Analytical Chemistry
4/172 Advanced Organic Chemistry
Facilities
The Department is housed in a five-story building containing two auditoria, ten lecture rooms, 21 undergraduate laboratories, 48 graduate research laboratories and a number of special purpose instruction rooms. Modern scientific equipment valued in excess of $2.5 million is available for research.
The Department's excellent library facilities are available to all students. The library contains standard reference works, textbooks and complete volumes of chemical and chemical engineering journals, and subscribes to 300 current scientific journals.

Courses
Primary for Undergraduates
(Students planning to minor more than one year of chemistry should take 4.3, 4.4 and 4.5. Students requiring only one year of chemistry may take 4.2, 4.3 and 4.5. Students requiring 5 or 6 b. of organic chemistry should take 4.12, 4.13 and 4.14.)

4.1 Principles of Chemistry I
Continuation of 4.1. Perquisites: 4.2 or 4.7.

4.8 Elementary Chemistry Laboratory
Introduction to laboratory techniques for students using Principles of Chemistry. Perquisite: Precalculus.

4.7 General Chemistry I
Introduction to basic concepts of chemistry for students who do not plan to take more than one year of chemistry.

4.6 General Chemistry II
Introduction to organic and inorganic chemistry for students who do not plan to take more advanced courses in chemistry.

4.8 General Chemistry Laboratory
Introduction to laboratory techniques for students taking General Chemistry I.

4.11 Elementary Quantitative Analysis
Plan principles of quantitative analysis. Two lectures and two laboratory analyses weekly. Perquisite: 4.6.

4.06 Chemical Analysis
Analysis of water, food, soil, air, and gases. Identification of unknowns and preparation of specified chemicals. Perquisite: Principles of Chemistry. No credit for students majoring in chemistry each semester. One meeting per week required. No perquisite.

4.08 Chemistry in Our Lives
Contemporary issues involving chemistry, particularly factors in which chemical developments affect our way of life.

4.155 Inorganic Synthesis
Preparation of a variety of inorganic compounds. Perquisite: 4.170.

4.111 Analytical Chemistry I
Principles of modern analytical chemistry with an emphasis on instrumental methods of analysis. Perquisite or concurrent: 4.132.

4.112 Analytical Chemistry II
Continuation of 4.111, which is prerequisite.

4.121 Organic Chemistry I
General principles of structure, properties, and analytical methods of organic chemistry. Perquisite: 4.4 or 4.8.

4.122 Organic Chemistry II
Continuation of 4.121, which is prerequisite.

4.127 Introduction to Polymer Chemistry

4.130 Physical Chemistry for the Life Sciences

4.131 Physical Chemistry I
Applications of thermodynamics to inorganic and chemical phenomena. Perquisite: Physics 26.10, Mathematics 224.56 or 224.56.

4.132 Physical Chemistry II
Chemometrics of 4.131, which is prerequisite.
as for advanced work in classics. Recent graduates have become secondary and university teachers, lawyers, doctors, librarians, museum curators, and bankers.

The Department offers majors in Greek, Latin, classics (combines the two), and, jointly with other departments, ancient civilization.

Major in Greek

Thirty semester hours minimum are required, of which 24 must be in Greek-language courses. The following or their equivalents are the normal elementary courses and count toward the 24-semester-hour minimum:

14:1 and 14:2 Elementary Greek 8 s.h.
14:11 and 14:12 Second-Year Greek 6 s.h.
14:171 Elementary Greek Composition 3 s.h.

The remaining hours are usually satisfied by third-year Greek, "Homeric and Herodotus," and fourth-year Greek, "Greece and Persia," and "Fifth Century Athens." A student majoring in Greek graduates knowing not only how to read the Greek language, but also knowing some of the major works of Greek literature, and something of the history of ancient Greece and the Near East of the seventh through the fifth centuries B.C., when most of the modern notions of political, artistic, and social life began.

Major in Latin

Thirty semester hours minimum are required, of which 24 must be in Latin-language courses above 20:15 Latin Review, and which include 20:11 Elementary Latin Composition or its equivalent. For most undergraduates, the concentration will be on the era of the last century of the republic and the first century of the Roman empire, roughly the period from 132 B.C. to 64 A.D. when Rome established its hegemony over the Mediterranean basin and laid the foundations for law and the republican form of government which have persisted into the modern world.

Major in Classics (Greek and Latin)

Thirty-six semester hours are required, 24 in one language and 12 in the other. The course requirements for the major language are the same as those indicated for Greek or Latin. For the minor language the student needs at least two reading courses (6th semester hours) and three hours of composition. The classics major allows, in effect, the programs of the other two majors, and is primarily designed for those who intend to go on to graduate work in classics.

Major in Ancient Civilization

(Sponsored by the School of Art and Art History and the departments of Classics, History, and Religion)

The major concentrates on the ancient civilization of the Mediterranean world and draws on courses currently offered by various departments of the College: V. It is not primarily a preparation for a graduate degree program; nevertheless, it could be used as a very sound basis for preparation for teachers at the secondary and junior college levels. In addition to the normal college requirements for the B.A. degree, the following are the specific requirements of the major:

Ancient art 6 s.h.
Ancient history 6 s.h.
Ancient philosophy or religion 6 s.h.

Classics—either courses in translation or upper division undergraduate courses in Latin or Greek 6 s.h.
Appropriate courses in art, history, philosophy, religion or linguistics 3 s.h.
Senior seminar 3 s.h.

Core Requirements

Undergraduate majors in Greek, Latin, classics or ancient civilization are excused from four semester hours of the literature-core requirement for the College of Liberal Arts, but must complete 11:1 The Interpretation of Literature. Ancient civilization majors' core requirements in the historical-cultural sequence are limited to four semester hours.

Honors

For exceptional seniors who attained a 3.5 grade average in their first three years of classics courses, two courses are offered in honors reading, one each semester of the senior year, for three semester hours of credit each semester. The readings and discussions are on either an ancient author or a field in ancient history or literature chosen by the student and the instructor. During the first semester the student presents an essay every other week; at the end of the second semester the student presents a long paper which is examined by at least three members of the department.

Graduate Program

For the general requirements of the Graduate College, including the comprehensive examinations, see "Graduate College." Graduate students in classics may include in their program no more than six semester hours of courses numbered 101-160 and/or six semester hours of courses numbered 161-199, for a total of six credit hours from courses numbered 101-199.

M.A. in Greek, Latin or Classics

A minimum of 30 semester hours of courses numbered 101 and above is required. Candidates in Latin who have had no Greek are normally expected to include at least elementary Greek in their programs. In addition, the course 14:201 Preparation for Advanced Study (three semester hours) is required. Special programs will be arranged for candidates who wish to prepare for teaching classics in English (general education courses, world literature, etc.).

Ph.D. in Classics

The degree requires an ability to read and write Greek and Latin, as tests in qualifying examinations; the reading of considerable portions of Greek and Latin literature as outlined on a reading list prepared by the student and his or her advisor and approved by the Department; a tested reading knowledge of German and French; passing written comprehensive examinations on ancient history, on Greek and Latin literature, and on a special field of study, together with a one-hour general oral examination; and writing and defending a dissertation embodying original research or interpretation of a classical subject.

Required courses are:

A one-year course in Greek readings: 14:204-205 6 s.h.
A one-year course in Latin readings: 20:204-205 6 s.h.
Advanced Greek composition (may be satisfied by examinations) 3 s.h.
Advanced Latin composition (may be satisfied by examination).

A three-hour course in ancient art above the 200 level 3 s.h.
A three-hour course in classical linguistics or Semitic: 20-225 3 s.h.
A three-hour course in paleography 3 s.h.
A one-year Greek seminar 6 s.h.
A one-year Latin seminar 6 s.h.
A three-hour prosopography 3 s.h.

One of the seminars (six semester hours) will normally be taken after the comprehensive examinations.

Special Facilities

Extensive collections of classical texts and periodicals in the University Library and the Art Library facilitate research in the major areas of Greek and Roman civilization.

The Department has a varied collection of slides on classical subjects, and a small library.

Associated with the Department, the Classical Museum contains a valuable collection of coins, vases, and faience figures from Mycenae, Pergamum, and Hierakonpolis.

The University is also a contributing member of an international group which is spearheading the uncovering and publication of information about the art-nas-tiles mosaics of Tunia. Annually a team from the University goes to Tunisia to work on this project.

Courses

Greek

For Undergraduates Only

Students wishing to satisfy the B.A. foreign language requirement by studying Greek should take 1411 and 1412.

1411 Elementary Greek 4 s.h.

Participating in Latin and 1425 or 1426

1422 Elementary Greek 4 s.h.

Continuation of 1411; selection from Greek authors as read.

1425 New Testament in Greek 3 s.h.

Rapid reading of selections from the New Testament. May be taken with or after 1412.

1411 Second-Year Greek 3 s.h.


1412 Second-Year Greek 3 s.h.

Continuation of 1411, which is a prerequisite.

For Undergraduates and Graduates

14131 Homer and Herodotus I 3 s.h.

For third-year Greek students; selection from Homer's Iliad and Odyssey and from Herodotus: The Wars of Agesilaus and Thucydides. Read in Greek. Complete works read in translation.

14212 Homer and Herodotus II 3 s.h.

Complementation of 14131, which is a prerequisite.

14183 Greek and Persia 3 s.h.

For students in the fourth year of Greek: reading leading to the Persian war, course of the war, and its consequences in art. Metaphor, Periclean, and selections from Herodotus read in Greek; supplementary readings in English.

14183 Ptolemaic Athens 3 s.h.

Changing intellectual climate of late Hellenistic world: background and the aims of his history.

14171 Elementary Greek Composition 3 s.h.

Review of syntax and poetic and Greek sentence structure; composition of short passages in Greek.

14172 Advanced Greek Composition 3 s.h.

Practice in writing formulaic Greek prose with styles of Lyric and Domestic. 2 credit hours.

14180 Hellenistic Greek Historical Texts 3 s.h.

Readings in Polybius and Eutychides.

14181 Honors Reading 3 s.h.

Supervised reading on special author or topic leading to several short essays. In seminar, a long paper in second semester. Both 14181 and 14182 required for Honors standing.

14182 Honors Reading 3 s.h.

Lecture on several short courses in first semester. A long paper in second semester. Both 14181 and 14182 required for Honors standing.

14183 Private Tutoring 1-3 s.h.

For classical majors who have completed four years of Greek or equivalent.

14188 Private Assignments 1-3 s.h.

Supervised individual study. Available to classical majors who are not majors in the Department. May be repeated.

For Graduates

14201 Prosopography: Introduction to Advanced Study 3 s.h.

Advanced methods and disciplines: bibliography, textual criticism, paleography, literary history of classical scholarship. Required of all graduate students. Offered alternate fall semester.

14202 Advanced Reading 1-3 s.h.

Open only to graduate students in the Department.

14203 Indo-European Philosophy 3 s.h.

Depression of comparative method as applied specifically to Greek and Latin, and study of philosophic and metaphysical laws.

14204 Rapid Readings in Greek 3 s.h.

Offered alternate fall semesters.

14205 Rapid Readings in Greek 3 s.h.

Continuation of 14204. Offered alternate spring semesters.

14206 Greek Paleography 3 s.h.

Study of Greek papyri, manuscript, early printed books, illumination and textual criticism.

14207 Seminar: Problems of Ancient Art 1-3 s.h.

Same as 14256.

14211 Problems of Ancient Art 3 s.h.

Continuation of 14210.

14212 Seminar: Problems in Early Christian and Byzantine Art 3 s.h.

Same as 14213.

14213 Hebrew 3 s.h.

14214 Greek-Latin Literature 3 s.h.

14215 Homer 3 s.h.

14216 Greek-Latin Poetry 3 s.h.

Dedication and critical reading of works from Greek lyric poetry.

14217 Greek Drama 3 s.h.

Critical reading of selected plays of Euripides.

14218 Sophocles 3 s.h.

Critical reading of selected works.

14224 Aeschylus 3 s.h.

14234 Aristophanes 3 s.h.

Critical reading of selected plays.

14251 Plato Papers 1-3 s.h.

Examination of Plato's presentation of justice.

14257 Apuleius, Methodius 3 s.h.

14258 Mithridates 3 s.h.

Study of Greek history and critical reading of selected works.

14259 Herodotus 3 s.h.

Critical reading of the history.

14263 Greek Prose 3 s.h.

Reading and critical study emphasizing Thucydides' intellectual background and the aims of his history.
Communication Studies

Program chairperson: John Ziel Brosen
Faculty: professors John Ziel Brosen (Speech), Darrell R.E. Harri (Journalism), Robert S. Wacht (Language), associate professor James J. Soder (Speech); assistant professors Larry K. Sobel (Journalism), Larry Martin (Language)
Degree offered: B.A.

In Communication Studies, the phenomenon of primary interest is instrumental symbolic behavior. Important questions include: How do we learn to use symbols? How does symbolic usage differ across cultures and subcultures? How are linguistic and nonlinguistic symbols expressed in various media? What are the effects of linguistic and nonlinguistic symbols on attitudes and behavior? What evaluative criteria are appropriate for various classes of symbol-using behavior?

Diverse methods are appropriate for the study of communication. The scientific approach includes hypothesis generation, theory building, measurement, and other standard features of social science. Communication also can be studied with the critical and speculative tools of history and philosophers.

The undergraduate program requires a minimum of 27 semester hours to be planned in consultation with an advisor so as to emphasize multidisciplinary approaches to communication.

Four courses are required for all majors:

123/380 Communication and Contemporary Culture
Same as Speech and Drama 324:80, Sched of Letters 108:80. Spring semester.

123/509 Senior Seminar
Synthesis of various methods in a common project. Spring semester.

123/100 Communication and Communication System
Same as Journalism 19:100.

123/101 Introduction to Linguistics
Same as Linguistics 205:100, English 210:100.

Comparative Literature

Program chairperson: Gavril Spivak
Faculty: professors Barney Div😃 (Language), Paul Herbst, P. Herbie-Babst, Gavril Spivak; associate professors S. J. Koford, Allen F. Nagel
Degree offered: M.A., Ph.D.

Faculty assisting in the Program: In addition to be own faculty, the Program in Comparative Literature is supported in part by faculty specialists in the departments of English, History, Art, and Music.

The purpose of the Comparative Literature Program is to present literature as an interdisciplinary and international study and to provide a basis for intensive work in literature, literary theory and critical method. Undergraduates interested in comparative studies are encouraged to investigate the major in letters, which is closely coordinated with comparative literature.

Master of Arts Degree

The degree of Master of Arts in comparative literature requires 36 semester hours of study of literature in an international context, with courses both for two or more national literatures and for the theory and general study of literature as a single phenomenon. The student in consultation with faculty advisors chooses courses in the program and in the individual departments to design a coherent course of study.

Formal degree requirements may be satisfied by a written examination on reading lists agreed upon by student and advisor, or by a written thesis and oral examination on the thesis and its relation to problems and issues in comparative literature. This
M.A. may also be awarded after 45 semester hours of graduate study with a grade-point average of 3.52 and successful completion of the qualifying examination for the Ph.D.

Doctor of Philosophy Degree

Students seeking the doctorate in comparative literature study at least three literatures. One literature is studied in historical depth together with limited areas of specialization in two other literatures. An interdisciplinary area of concentration is encouraged. All candidates devote a portion of their program to comparative study which brings the several areas into focus. Specific areas and interrelations of these areas are selected by the student in consultation with appropriate faculty members.

Some typical critical and comparative areas are:

- European Renaissance
- Romanticism
- Structuralism and post-Structuralism
- Narrative theory
- Symbolist poetics and modern literature
- Post-Kantian philosophy and literature
- Satire, rhetoric and the theory of social interaction
- Literature, history and criticism
- Literary-critical and psycho-analytic theory

Dissertation

The Ph.D. dissertation should demonstrate the candidate's ability to write a substantial piece of scholarship or criticism. A translation of a work of sufficient significance and linguistic complexity, presented by a critical introduction, may be acceptable as a dissertation. The final oral examinations center on the dissertation and its background.

Admission

Interested students who meet the requirements for admission to graduate study in the University should address the chairman of the Program. Formal application is made to the University Office of Admissions.

A study of literature across linguistic boundaries requires special training in languages. A thorough knowledge of at least one foreign language is required for admission to the M.A. course of study; knowledge of at least two foreign languages is a prerequisite for doctoral study. Students are strongly encouraged to offer at least one classical language.

For further information, the procedural guide for graduate students in comparative literature is available by request from the program offices.

Courses

Upper Division

46:106 European Literature of the 19th Century 3 s.h.
- Historical and critical perspectives on literary movements, works and authors from 1800. Same as English 310 and Letters 108:106.

46:137 Romanicism and Wilde around 1900 3 s.h.
- Focus on similarities between current and English Romanticism and writers around 1900 concerning the nature of poetry, myth, reality, style, language, the role of art and time, and the role of the artist.

46:115 Literary Genres in European Literature 3 s.h.
- These genre definitions constitute the understanding of related literary works; may deal with one or more genres (e.g., romance, comedy, historical and epic, etc.). May form a two-term sequence.

46:116 Literary Genres in European Literature II 3 s.h.

46:1167 Contemporary Scene in Poetry 3 s.h.
- Same as Letters 108:116.

46:139 Modern Poets 3 s.h.
- Same as English 8:16.

46:1168 Contemporary Square in Fiction 3 s.h.
- Same as Letters 108:116.

46:1169 Current Literature and Society 3 s.h.

46:1161 Literature and Anthropology 3 s.h.

46:1164 Greek Drama in Translation 3 s.h.
- Same as Letters 108:130, 109:130.

46:1165 Literature and Revolution 3 s.h.
- Topic range from literary representation to instigation of revolution, from dictatorial ideology. Same as Letters 108:162.

46:1179 Literary History and Psychology 3 s.h.
- Literary text, themes and theory, with emphasis on the interactions of literary criticism, linguistics and psychology. Same as English 8:175, School of Letters 108:175.

46:179 Roman Satire 3 s.h.
- Same as Letters 108:175, School of Letters 108:179.

46:1169 Dante and Roman Poetry 3 s.h.

46:1169 Individual Study

For advanced B.A. candidates with international and comparative literature projects, and for M.A. candidates in comparative literature.

Graduate Courses

46:290 Comparative Approaches I

46:250 Studies in Verse
- Same as Spanish 20:250. Offered in Spanish.

46:251 Comparative Stylistics
- Same as Letters 9:135.

46:289 Theory of Literature
- Experimental or theoretical courses in one classical or modern foreign language and philosophy of literature. Same as English 8:250.

46:281 History of Criticism: Plato to the Romanesque
- Theory of literature, emphasis on philosophical implications of literary analysis as it occurred in classical antiquity, the Renaissance and post-Renaissance Europe, up to the age of romanticism. Same as English 8:281, Dramatic Art 301:477.

46:282 History of Criticism: Coleridge to Crane

46:295 Theory of Literature from Romanticism to present. Same as English 8:282, Dramatic Art 301:413.

46:274 Seminar: Essentialism and Hispanic Literature 3 s.h.

46:276 Narrative Modes
- Same as Letters 20:276.

46:286 Theory and Technique of Oral Literature
- Experimental course covering oral tradition in society, media of and modern world. Same as English 8:276.

46:251 Comparative Approaches II
- Advanced comparative theory and method.

46:200 Historical Criticism and the Study of Literary Periods
- Same as English 8:220.

46:271 Byzantine and Post-Classical Studies I
- Late classical and Byzantine in modern Greek. Pre-requisite: reading knowledge of classical or modern Greek.

46:272 Byzantine and Post-Classical Studies II
- Late Latin and romance literature, including Romanesque. Pre-requisite: upper-division language study in Latin or early romance languages.

46:273 Egyptian Renaissance
- Literature of the Renaissance, emphasizing genre and theme. Same as English 8:273.
Dental Hygiene

See "College of Dentistry."

East Asian Languages and Literature

Department chairperson: Marilyn Ryan
Professor, professor emerita of Comparative Literature, held professorships in Asian Languages and Literatures at the Universities of California, Berkeley, and Harvard.

Supporting faculty: Michael R. Kaczynski (fellow), Robert Aikens (fellow), Wayne Maguire (English and Asian Studies), Paul Goodwin (History), Cheng Lin (sociology), Vincent Cheung (sociology), Jennifer Wong (sociology), and other faculty.

Degree offered: B.A.; M.A.

Undergraduate Programs

The major purpose of the Department of East Asian Languages and Literatures is to provide general courses through which all Iowa students have the opportunity to acquire knowledge and understanding of Asian cultures.

For students who want to concentrate in this area, the Department offers two programs leading to the B.A. The first, with a major in either Chinese or Japanese, is intended for students primarily interested in developing their ability in one of these languages as well as studying literature and linguistics. The second, the Program in Asian Studies, is designed for students interested in studying any one of a wide range of disciplines as they pertain to China, Japan, or Korea.

Graduates of the baccalaureate programs will find careers available in government, banking, and computer industries. The under-graduate programs also provide a background for further study in such areas as literature, history, art, religion, political science, geography, anthropology, or sociology. Career opportunities are plentiful at present and there is every indication that they will increase markedly in the next decade as trade and cultural exchanges with Asia develop further.

Major in East Asian Languages and Literature

The program is designed to introduce students to the culture and civilization of China, Japan, and Korea, both ancient and modern, and to give students competence in reading, writing, and speaking Chinese or Japanese, or in reading Sanskrit. The requirements include:

Satisfaction of the historical-cultural core requirement by completion of 39:55-56 Civilization of Asia, eight semester hours.
Satisfaction of the literature core requirement by completion of 39:19-20 Asian Humanities, eight semester hours;
A minimum of 36 semester hours in courses offered by the Department of East Asian Languages and Literatures;
Demonstrated competence equivalent to that attained at the end of third year Chinese or Japanese, or second year Sanskrit.

Students with previous knowledge of Chinese, Japanese, or Sanskrit are urged to consult with the faculty. Those who demonstrate basic knowledge of one of these languages are placed in the appropriate intermediate or advanced language course, and choose the balance of their 36 hours among other courses offered in the

Computer Science

See "Mathematical Sciences."
Department. Those with the required competence select their 36 hours from among advanced courses in language and culture, or from the basic language courses offered in another language (i.e., students competent in Chinese may begin Japanese or Sanskrit). Six credits for work done at other institutions may be applied to the 36 semester hours required of majors.

Program In Asian Studies
Central to the major is the Program in Asian Studies. It is a two-semester course encompassing the history, philosophy and literature of India, China, and Japan. The major comprises:

39:19-20 Asian Humanities 8 s.h.
39:55-56 Civilizations of Asia 8 s.h.
39:101-102 Elementary Chinese and
39:103-104 Second Year Chinese or
39:101-102 Elementary Japanese and
39:103-104 Second Year Japanese or
Four semesters of Sanskrit 16 s.h.
39:193-194 Modern Asia Seminar 6 s.h.

Additional courses relating to Asia (may include courses offered by such departments as Anthropology, Art, Comparative Literature, Geography, History, Political Science and Religion.)

Honors Program
Students who maintain a 3.0 G.P.A. or above are eligible for the Honors Program. Application should normally be made at the beginning of the junior year. To qualify for a B.A. with Honors, the student is required to register in the special 39:191-192 Honors Tutorial, and write an undergraduate thesis while registered in 39:193 Senior Honors Thesis.

Graduate Study
M.A. Program in Asian Civilization
Graduate study in Asian civilization is designed to train students either for continuing study on an advanced level ultimately leading to the doctorate, or for preparation for high school teaching, government service or careers in business requiring knowledge of an Asian language and a broad regional background.

The program comprises 30 semester hours of coursework. All students will be required to write an M.A. thesis using Chinese or Japanese language sources. The M.A. thesis will count for no more than four of the thirty hours. Students will normally be expected to maintain at least a 3.0 grade-point average.

Before graduation, the student is given a written and spoken language examination at a level of competence equal to that attained at the end of a four-year modern Chinese course and at the end of one year of a classical Chinese course for students of Chinese civilization, and at the end of a four-year modern Japanese course for students of Japanese. Intensive summer institutes afford opportunities to make up language deficiencies. In addition, the student is examined on the history of the country of his or her choice (China or Japan), and in two of these areas:

- Chinese Linguistics
- Chinese Literature
- Chinese Philosophy
- Chinese Anthropology
- Chinese Art
- Japanese Art
- Japanese Literature
- Japanese Anthropology
- Japanese Politics
- Asian Religions

The Department can accommodate native speakers of Chinese or Japanese who wish to work toward professional competence in Asian civilizations. A curriculum for such a student would exclude any language work, and would include 26 semester hours of content courses on Asia, and the four semester hours for the M.A. thesis.

All candidates are expected to fulfill the general requirements of the Graduate College.

Graduate Admission
Applicants for admission must meet the general admission requirements of the Graduate College, except that a minimum grade-point average of 3.75 is required for conditional admission, 3.0 for regular admission. In addition, applicants must submit a specimen of their writing—such as a term paper, seminar paper, or graduation thesis—to the Department of East Asian Languages and Literature. All applications for graduate awards for the following academic year are due March 15. Applications for admission without support will be accepted until July 15 for the fall semester or December 15 for the spring semester. The candidate is advised to take the Graduate Record Examination at an early date, since an admission decision cannot be made until scores are received.

Library Facilities
Since 1960 the University Library has been purchasing all books on East Asia issued by major publishers in Western languages. The Library's reference collection in the Chinese and Japanese languages is more than adequate for basic research; it includes approximately 38,000 books, periodicals and microforms. It is particularly strong in literature, history, art and philosophy, and it is constantly being augmented by purchases of books and periodicals necessary for research on contemporary society. The Library regularly acquires publications from India in Pali, Sanskrit and English.

Courses
For Undergraduates

39:18 Asian Civilization: China 3 s.h.
Harrowed and explicit study of Chinese civilization, considering background, foun-
dations, history, characteristics. Slides, models and tape demonstrations of arti-
ne works.
Economics

Department Chair—J. Holt, B.S., B.B.A., N.A., Ph.D.

Economics is concerned with the organization of production and consumption in society, and the associated welfare of the people. It involves the systematic study of topics such as wealth and poverty, money and income, income and consumption, government expenditure and taxation, prosperity and depression, inflation and unemployment, big business and labor unions and hundreds of other matters that intimately affect the way people live.

Economics seeks to develop an understanding of how complex economic systems work, along with providing critical thinking methods of economic analysis that can be applied to a wide range of economic problems. Study of economics is desirable simply from the standpoint of being an informed citizen capable of exercising rational choices at the voting booth. Accordingly, the Department offers a wide range of coursework to meet the needs of the non-major as well as the major.

Undergraduate Programs

The baccalaureate programs in economics provide an excellent background for a variety of positions in business and government. Graduates find employment in banking, financial institutions, industrial firms and trade organizations, and in federal, state and local government agencies dealing with economic policy, regulation, and analysis. Economists are also considered excellent preparation for law school and for graduate study in such fields as business management, public administration, health and hospital administration, urban and regional planning, transportation, journalism, political science and statistics.

The Department offers three undergraduate degrees: the Bachelor of Science and Bachelor of Arts in the College of Liberal Arts and the Bachelor of Business Administration in the College of Business Administration.

The B.A. and B.B.A. have the same major requirements, but their degree requirements differ. The B.A. program is designed to allow the student maximum flexibility in obtaining a well-rounded liberal arts education, while the B.B.A. program is designed to provide a background in the business fields of accounting, finance, marketing, business law and management.

The B.B.A. program requires one year of a foreign language; the B.B.A. two years.

Program for the B.A. Degree

In addition to the general College of Liberal Arts requirements in skills and core courses, including at least two years of a foreign language, these are the requirements for the B.A. major in economics:

Courses outside the Department

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>225:05</td>
<td>Elementary Probability and Statistics</td>
<td>3.0 h.</td>
</tr>
<tr>
<td>225:07</td>
<td>Quantitative Methods I and II</td>
<td>3.0 h.</td>
</tr>
</tbody>
</table>

Program for the B.S. Degree

In addition to the general College of Liberal Arts requirements in skills and core courses, including one year of a foreign language, the B.S. in economics requires these courses and electives:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>224:25-26</td>
<td>Calculus I-II</td>
<td>9.0 h.</td>
</tr>
<tr>
<td>225:120</td>
<td>Probability and Statistics</td>
<td>3.0 h.</td>
</tr>
<tr>
<td>66:180</td>
<td>Mathematics for Economists (Module A)</td>
<td>4.0 h.</td>
</tr>
</tbody>
</table>

20 semester hours of credit in 100-level courses, including 66:103, 66:104 and 66:104 Methods of Quantitative Economists. 66:101 and 66:2 satisfy the social science core requirement. Credits gained in 66:101 Print, Employment and Production Theory cannot be counted toward the 30 semester hours of 100-level economics courses required for the B.A. degree.

Honors in Economics

Undergraduate students working toward the B.A. or B.B.A. degree with a major in economics are eligible to participate in the honors programs in economics. The Honors Program offers the high-achieving student an opportunity to pursue special research interests. An Honors student must complete four 100-level economics courses including 66:101. Before the senior year, register for 66:197 Senior Thesis in Economics for three hours of credit both semesters of his or her senior year, complete a senior thesis under direction of an economics faculty member of professional rank and take (during the final semester of the program) an examination covering his or her departmental honors work. A student satisfyingly completing the Honors Program receives his or her degree with "Honors."
Coursework for Non-Majors
4E:1-2 Principles of Economics satisfies the College of Liberal Arts social science core requirement, and provides an introduction to specialized topics of upper division courses. 6E:7 Contemporary Economic Problems and Policy gives students with limited exposure to economics an opportunity to examine the economics behind some current policy issues. Course work in economics can be related to majors in many other fields—for example, in environmental studies, 4E:133 Economic Growth and Environmental Decay and 4E:103 Macroeconomics; or in political science, 6E:119 Economics of the Government Sector and 6E:141 Industrial Organization. A number of students combine related interests by pursuing double majors in economics and, for example, computer science, geography, history, mathematics, political science, sociology or statistics.

Graduate Study
The Department offers graduate programs leading to the Master of Arts and Doctor of Philosophy degrees. The Department enjoys a respected position in current national academic rankings for its excellence of graduate program and faculty. Graduates of the Department have gone on to occupy professional positions in education, government and industry. They hold academic positions in major universities and colleges all over the nation. Many have positions in branches of the federal government, e.g., departments of State, Agriculture, Commerce and the Treasury; District Federal Reserve Banks; Federal Reserve Bank; and the U.S. Tariff Commission. Others have made careers in industry and in private research organizations such as RAND, the Brookings Institution and Arthur D. Little. Still others have served in various economic capacities abroad for the State Department, the United Nations and the Ford Foundation. Requirements for the M.A. and Ph.D. degrees are outlined under "Economics" in the College of Business Administration section of the Catalog.

Courses
All courses offered in the Department are listed in the College of Business Administration section of the Catalog.

Education
See "College of Education" section.

English

The Undergraduate Program

The English Major
The broad purpose of the major in English is to provide a program of human learning focused on the study of language and literature and the discipline of writing.

The immediate aims of the study of literature are to help students read the literary work in a variety of ways and to aid them in relating the work to other aspects of culture. The chief aim of the study of language is to help students examine historically and analytically the possibilities and limitations of language.

The chief aim of the training in writing is to help students explore and define human experience, especially their own. This training may involve either artistic or functional writing—or both. In one case the immediate goal is written expression that is both precise and forceful. The English major is valuable training for every type of position calling for orderly and clear expression. Students who have majored in English at Iowa are now teaching in colleges as well as primary and secondary schools. They are practicing law and medicine; working for advertising firms, newspapers and book publishers; and for state and federal government. Many others hold responsible positions in business and industry.

The only absolute requirement for the major in English is 30 hours of work in courses offered by the Department of English, including at least nine semester hours of work in courses dealing primarily with literature written before 1800. In practice an English major ordinarily takes about 45 semester hours in English; at least 15 hours of coursework in English must be taken in residence.

With their advisers, students work out programs which seem best to meet their special needs and interests. Normally they begin with courses emphasizing close reading of selected literary works; later they study particular literary genres, and the literature and culture of selected historical periods. Often they take courses in such diverse subjects as folklore, literature and film, and printing and design. Concurrently they typically elect work in the history and nature of the English language and advanced training in writing. The latter may be imaginative writing (poetry, fiction, plays), functional writing (technical instruction, argument, technical reports, writing for social action) and/or the theory of rhetoric and stylistics. To biomass their study in the Department, English majors are encouraged to take as much work as possible in such fields as history, classical and modern foreign literatures, and speech and the fine arts. Students planning to teach in secondary schools will, of course, have to add appropriate courses in education.

As soon as students decide to undertake a major in English, they should confer with the Director of Undergraduate Study in the English Office, 398 EPh, who will assign them permanent advisers. In 308 EPh, too, they may obtain a pamphlet on Designing a Major in English, and other leaflets explaining departmental programs.

The Literature Semesters
Available as laws in all undergraduates, the two literature semesters presently offered are English Literature before 1500, and American and Contemporary Literature. The latter covers American literature from its beginnings through the present day as well as British Literature since 1800. Each literature semester carries
English

12 hours of credit and involves as much reading as would be
conducted in four ordinary courses. Classes meet two hours a day,
five days a week. Three professors attend all sessions, and
the instruction is divided equally among them. Since all works are
discussed and compared within and across the conventional his-
torical divisions, the students undergo an intensive discipline in
practical criticism. They write a paper a week, practice oral
reading and recitation of scenes from plays, and often with
parodies, imitations and other exercises as measures of increasing
their sensitivity to literary style.

The English Major with Honors

This major has the same general purposes as the regular major.
In addition, it provides an opportunity for especially talented students to
work independently and to graduate with special distinction.
The program for Honors majors permits considerable submis-
sion of advanced work for the more elementary courses, requires
registration in a special Honors seminar and requires the writing of an
undergraduate thesis. Each student works out his or her program with his or her
advisor.

Creative Writing

Many undergraduates come to Iowa because of the excellence of its
creative writing program. With the consent of his or her
advisor, any student may elect the undergraduate courses in this
program. However, admission to the undergraduate workshops in
diction and poetry (8W: 85-86 Undergraduate Writers Workshop,
Fiction-Poetry) is by permission of the instructors. Manus-
scripts of representative work must be submitted to the Writers' Workshop no earlier than a week before registration and no later
than the last day of registration.

English and Education

The Department offers a flexible undergraduate program for stu-
dents planning to teach English in elementary and secondary
schools. Aside from the necessary preparatory courses in education, there are
no requirements other than those mentioned above for the general
major in English. However, students planning work which will help them in their first teaching experiences should remember that they
will have to be able to work with details of expression in
English. They will probably need advanced training in writing—
nonfiction, poetry and fiction are all important— or rhetoric or
linguistics or all of these. Their literary study should emphasize a
range of close reading experiences in different kinds of literature,
and the skills for exploring a literary text. Especially, they
should remember the importance of a broad educational experience for their own study and as a basis for understanding the
interests of their students. Finally, they should remember that an
undergraduate degree represents minimal training for good teach-
ers, so they may wish to consider a program which will permit graduate study at a later date.

English majors who are working for teacher certification must
devote one semester of the senior year to professional training
apart from coursework in the English Department.

The Department also participates in a joint major in English and
collegiate education. Those interested in such a program should
consult their advisors in elementary education.

Students who seek certification for secondary teaching in fields
other than English may seek minor certification in English. Such
certification is particularly appropriate for students majoring in
speech or journalism. Such a student must complete 20 semester
hours of English excluding freshman courses in rhetoric, speech or
writing. The program must include a course in each of these areas:
advanced composition, Shakespeare, American literature and
British literature of the 19th or 20th centuries. In addition to the
20 semester hours of English, the student is required to take
methods in Teaching High School English in the College of
Education. While this program meets minimum requirements for
certification, the Department believes that anyone desiring to teach
English should have considerably more training in the field.

Sloan Summer Scholarships

Two $1,500 Sloan Scholarships are available to University of
Iowa English majors for study at either Oxford, London or
Edinburgh universities, or the University of Birmingham at Strat-
ford-upon-Avon, during the summer following the recipient's junior
year. Applications must be submitted to the English Office or to the
professor in charge not later than February 25 for the following
summer. The application must include the applicant's University of
Iowa transcript, letters of recommendation from two members of
the English faculty and a statement of the applicant's reasons for
writing to study abroad and of the contributions the applicant
expects such study to make to his or her senior year of study at
Iowa.

Graduate Programs

Master of Arts

The aims of the Master of Arts program are much the same as
those of the undergraduate programs, except, of course, that the
M.A. program is more demanding. It prepares students to teach
English in high schools and community colleges, or to continue
advanced study as candidates for the doctoral degree.

The program requires at least 30 semester hours of graduate
credit, at least 24 of which must be earned in residence; one
departmental seminar with at least 3 graduate courses leading to
performance in a four-hour written examination covering a pre-
scribed reading list. Students admitted to Ph.D. candidacy may qualify for the M.A.
degree by satisfying the foreign language requirements for the
Ph.D., completing at least 45 semester hours of graduate course-
work with at least a 3.25 grade-point average and performing
satisfactorily on a master's examination.

Master of Arts with Emphasis in Expository Writing

This program emphasizes the theory, analysis, practice and
writing of expository writing. It is designed to meet the needs of
students who wish to become teachers or critics of expository
writing, students who wish to become professional writers, or
students who have no specific career objectives but still wish to
improve their writing and to pursue a course of study that will help
them to understand the nature and practice of expository writing.

To qualify for the M.A. with emphasis in expository writing, a
student must complete 30 semester hours of graduate work with a
grade-point average no lower than 3.00. At least 24 of these hours
must be earned in residence, including 9 hours of work in
advanced composition at Iowa with a grade of "B" or "A".

In conjunction with an advisor, the student must plan a coherent
program of study to be completed before the degree is awarded.
This plan must be approved by an advisory committee which will
certify that the stipulations of the program in expository writing
are manifest in each student's program.
Finally, the student must submit to his or her committee a proposal for a thesis, which will be the extended basis of a final draft for approval and must receive the committee’s approval of the completed work. Students interested in this program should consult the Director of Advanced Writing.

Master of Arts and Specialist in Education
This is a two-year, 60-hour program for students who wish to prepare for teaching in community colleges. The program includes five hours in linguistics, five in literature, six in advanced writing and 24 in professional courses taught by specialists in English and in education. Each student spends one semester learning in a community college, such as Miami, Miami, and one semester in the Graduate College, where the course in English and education. Each student is required to have a minimum of 48 semester hours of graduate credit, earned chiefly in the Writers Workshop, a book-length collection of poems or short stories, a novel, a play, a major translation project or a work of creative writing in some other appropriate form; and satisfactory performance on an examination in modern literature in the form the student is employing.

Master of Fine Arts with Emphasis in Translation
This alternative to the MFA in Creative Writing emphasizes the discipline of translation, viewed as a distinct literary genre. Students are encouraged to develop skills in source and target language and culture. The course includes the development of the tradition of translation and the history of translation. The program normally requires 48 semester hours of graduate credit, including a minimum of 11 hours of Translation Workshop, a collection of translated poetry, fiction, or drama, and an examination in practical criticism involving problems of translation.

Doctor of Philosophy
Since most doctoral graduates earn college and university teaching, the Department expects to prepare Ph.D. candidates for the teaching, publication and service required of faculty members. The minimum time required is 72 semester hours of graduate credit, of which at least 30 must be earned in residence at Iowa. Within specified limits, the program may be accomplished to the student’s special needs and interests. For example, concentrations are possible in areas of literary history, literary criticism, writing, rhetorical theory and style, folklore, bibliography, pedagogy, comparative literature and linguistics. The requirement specified by the English department includes formal admission to candidacy by a vote of the faculty; demonstration of a high level of competence in two foreign languages and their literatures; distribution course work depending upon needs in historical areas, criticism and linguistics; three seminars, two part-written, part-oral comprehensive examinations in three areas, two of which are usually historical periods of English and American literature, a dissertation which may be either a scholarly work or a piece of imaginative writing; and a final examination in defense of the dissertation. All doctoral candidates are required to gain teaching experience, preferably in the Rhetoric and Literature Core programs of the College of Liberal Arts. Interested students should write to the Director of Financial Aids and Doctoral Admissions in English for more detailed explanations.

Financial Aid
Aid is available to graduate students in the form of scholarships, fellowships and teaching and research assistantships. It is awarded on a competitive basis to the best qualified applicants, without regard to race, sex, sex or other non-qualifying criteria. Since sources are limited, normally fewer than half the applicants for aid receive it. New students are at some disadvantage and should expect to support themselves throughout their first year. Applicants are considered only from students who have been admitted to the Graduate College. Applications and all necessary supporting material must be submitted by February 15 for the following fall semester. Forms are available from the Department and the University Office of Admissions.

Admission
All applicants for admission to any graduate program in English must meet the general requirements for admission to the Graduate College, and must submit at least two letters in support of their application. In addition, M.F.A. applicants should submit samples of their poetry or fiction to the director of the M.F.A. Program. Ph.D. applicants should submit a representative sample of their writing—a course paper, seminar paper or thesis chapter—in the Department’s Associate Director of Graduate Study.

Writing Program
For the past fifty years, Iowa has exercised strong national leadership in virtually all areas of the teaching of writing. It was the first institution to, in 1952, accept creative dissertation for advanced degree programs. Founded in 1936, the Writers Workshop has been a principal venue in the field of creative writing and multitudes of distinguished poets and novelists among its alumni. The Workshop provides opportunities for students at all levels to work with outstanding teacher-authors, and also brings numerous prominent authors to campus each year for lectures and readings. The International Writing Program, founded in 1966, brings renowned foreign writers to campus each year, and has added a unique dimension to the opportunities available to students in the area. Iowa has also been a leader in the area of experiential writing and rhetorical theory, and is one of the few academic institutions in the nation which offers a full range of graduate coursework in this area. Beginning in the fall of 1976, Iowa will offer two new degree alternatives in the writing area: the M.A. with a concentration in creative writing, and the M.F.A. with a concentration in translation.

Special Facilities
The University Library is large and convenient. Some in all areas of English and American literature. It is equipped for research for the collection of American periodicals, and in holdings in 19th- and 20th-century works. Graduate students may also
enrich their experience with work in the Center for Textual Study, in helping with The June Review, the Philosophical Quarterly and the Windhover Press; and in procuring the Curt Zimansky Memorial Reading Room. They are welcome to participate in such activities as the English Graduate Student Society, the Humanities Society, the Friends of Old Time Music and the Midwest Modern Language Association. Visiting writers and lecturers are on the campus almost every week, and occasional conferences and literary "festivals" enliven the routine of classroom.

Courses

For Undergraduates

Lecture courses for all undergraduates who have satisfied the elective requirement:

- 8:11 Modern Fiction 3-4 a.h.
- 8:23 Modern Poetry 3-4 a.h.
- 8:33 Modern Drama 3-4 a.h.

Same as Speech and Dramatic Arts 597:61.

- 8:38 Classical and Biblical Literature 3-4 a.h.
- 8:36 Shakespearean Literature 3-4 a.h.

Same as Speech and Dramatic Arts 597:89.

Introductory Courses in Close Reading of Texts

Limited-enrollment discussion courses, in which a small number of seats are reserved to illustrate representative problems in interpreting and evaluating literature:

- 8:20 Critical Approaches to Literary Works 3 a.h.
- 8:21 Selected Prose 3 a.h.
- 8:22 Selected Plays 3 a.h.

Same as Speech and Dramatic Arts 597:62.

- 8:24 Selected Films 3 a.h.
- 8:25 Selected Essays 3 a.h.

Same as Speech and Dramatic Arts 597:54.

- 8:26 American Literature 3 a.h.
- 8:28 Selected Works of the Middle Ages 3 a.h.
- 8:30 Selected Works of the Renaissance 3 a.h.
- 8:32 Selected Works of the 16th Century 3 a.h.
- 8:33 Selected Works of the 19th Century 3 a.h.
- 8:34 Selected American Works Before 1900 3 a.h.
- 8:35 Selected British and American Works 3 a.h.
- 8:39 Selected Works of the 20th Century 3 a.h.

Major Authors Courses

Limited-enrollment discussion courses. Each author is represented by several major works. Continuances of courses are changed regularly. By permission of the instructor, a student may repeat regions for same course number if author has been changed:

- 8:71 Chaucer 3 a.h.
- 8:72 Shakespeare 3 a.h.

Same as Speech and Dramatic Arts 597:13.

- 8:73 Selected English Authors 3 a.h.
- 8:74 Selected American Authors 3 a.h.

Same as Speech and English Authors 3 a.h.

- 8:76 Selected English and American Authors 3 a.h.
- 8:77 Selected Modern Authors 3 a.h.

Same as Speech and English Authors 3 a.h.

Literature Seminar Courses

Limited-enrollment, two-lecture discussion courses emphasizing the reading of whole works (or separate departmental arrangement). Literature Seminars I (8:30-32) fulfill requirements of the major for literature before 1820. Students should have taken at least one college-level literature course before registering for either of these courses. Prerequisites are required:

- 8:30-32 English Literature Before 1800 12 a.h.
- 8:34-37 American and Contemporary Literature 12 a.h.

Honor Courses

Enrollment limited to students in the undergraduate Honors program and to others by special permission of the instructor:

- 8:36 Honors ProseSeminar 3 a.h.
- 8:39 Honors ProseSeminar 3 a.h.

For Undergraduate and Graduate Students

Literature and Culture Courses

Primarily for apprentices and beginning graduate students, these lecture courses are designed to exhibit major works and authors within the context of the social, political, intellectual and artistic movements of their time; literary history is the base part of the work, but the main goal is to show how literature has contributed to the contemporary intellectual life. Students who have an established background in literary history should consult the professor. Undergraduate majors in English are urged to include at least one course of this type in the senior half of their major:

- 8:190 Introduction to Critical Prolegomena 3 a.h.
- 8:191 Literature and Culture of the Middle Ages 3 a.h.
- 8:192 Literature and Culture of the Renaissance 3 a.h.
- 8:198 Literature and Culture of 18th-Century England 3 a.h.
- 8:199 Literature and Culture of 19th-Century England 3 a.h.
- 8:194 Literature and Culture of 19th-Century America 3 a.h.
- 8:195 Literature and Culture of 20th-Century America 3 a.h.
- 8:196 Anglo-American Criticism and Culture 1900 to Present 3 a.h.

Same as American Civilizations 43:155.

- 8:197 American Literature and Civilization 3 a.h.

Same as American Civilizations 43:156.

- 8:198 European Literature of the 18th Century 3 a.h.

Same as Comparative Literature 48:108 and 508:110.

- 8:110 Selected Authors 3 a.h.
- 8:111 American Folk Literature 3 a.h.

Same as American Civilizations 43:132.

- 8:112 American Jewish Writers 3 a.h.
- 8:113 American Indian Literature 3 a.h.

- 8:114 American Regional Literatures 3 a.h.

- 8:115 Literature of Iowa 3 a.h.

- 8:116 Afro-American Literature 3 a.h.

Same as American Civilizations 43:113.

- 8:117 Afro-American Literature II 3 a.h.

Same as American Civilizations 43:117.

- 8:118 Ottoman Literature 3 a.h.

Same as Speech 53:177; American Civilizations 43:227; Letters 106:127.

- 10:110 African Literature 3 a.h.

Same as American Civilizations 43:119 and Letters 106:119.

- 8:124 Literary Genre in European Literature II 3 a.h.

Same as Comparative Literature 48:113 and Letters 508:126.

- 8:141 Literature and Culture of America Before 1800 3 a.h.

- 8:142 Literature and Culture of America 1800 to 1900 3 a.h.

- 8:143 Literature and Culture of the 20th Century 3 a.h.

- 8:190 European Literature: St. Augustine to Dante 3 a.h.

- 8:193 Dante and Renaissance Poetry 3 a.h.

Liberal Genres Courses

Limited to discussion of a single genre, and usually further restricted to a limited six and rarely: these lectures or large discussion courses are appropriate for any apprentice who wishes to explore a genre in depth.
Poetry
8-105 Chaucer
8-107 British Poetry
8-123 Milton
8-135 American Poetry
Simultaneous American Civilization 45.105.
8-150 Modern British and American Poetry
8-157 Contemporary British Poetry
Same as Comparative Literature 44.127 and Letters 106/125.
8-158 Selected Modern Poets
Same as Comparative Literature 44.128.
8-159 English and Scottish Ballads
8-163 Studies in the Poetry of Afro-Americans
Same as American Civilization 45.177.

Fiction
8-136 30th Century Afro-American Fiction
Same as American Civilization 45.126.
8-131 The Early Narrative Tradition
8-134 The English Novel: Defoe to Austen
8-135 English Novel: Scott to Butler
8-134 American Novel 1900
8-135 American Novel since 1960
8-138 American Short Story
8-137 American Hunter and Safari
8-136 The European Novel 1700-1850
8-138 The European Novel 1850 to Present Same as Letters 106/166.
8-148 Contemporary Scene in Fiction
8-145 Popular Literature
8-152 Studies in the Fiction of Afro-Americans
Same as American Civilization 45.167.
8-151 Literature of Our Time: Prose
2 a.h.

Drama
8-152 Shakespeare
8-143 Selected Dramatists
Same as Speech and Dramatic Art 45.143.
8-144 Modern Drama
Same as Speech and Dramatic Art 45.171.
8-146 Restoration Drama
Same as Speech and Dramatic Art 45.179.
8-148 Restoration Drama
Same as Speech and Dramatic Art 45.179.
8-147 English Drama of the 18th Century
8-148 Selected Modern Dramatists
Same as Speech and Dramatic Art 45.177.
8-134 American Drama
8-134 American Drama
8-135 Modern American Drama
8-135 Modern American Drama
8-134 American-American Drama
Same as American Civilization 45.180, Speech and Dramatic Art 45.185.
8-159 Continental Drama 1700 to 1850
Same as Letters 106/175 and Dramatic Art 45.176.
8-155 Continental Drama 1850-1900
Same as Letters 106/175 and Letters 106/165.
8-157 Principles of Drama
8-158 Studies in Modern Drama
8:216 Capital Literature 5 s.h.
8:216 Nel Horse 2 s.h.

Literary Period Courses
8:219 Early Renaissance Literature 5 s.h.
8:221 17th Century Literature 5 s.h.
8:222 Neoclassical Literature 1 s.h.
8:223 Romantic Literature 3 s.h.
8:224 Early Victorian Literature 3 s.h.
8:225 Late Victorian and Edwardian Literature 3 s.h.
8:226 Contemporary British Literature 3 s.h.
8:227 Literary History of the United States I 3 s.h.
8:228 Literary History of the United States II 3 s.h.
8:229 Early American Literature 3 s.h.
8:230 American Romantic Literature 3 s.h.
8:232 American Realistic Literature 3 s.h.
8:234 Early 20th-Century American Literature 3 s.h.
8:235 Contemporary American Literature 3 s.h.
8:244 Augustaniant: History and Literature 1 s.h.
Same as History 3.364.
8:248 Modern Literature and its Backgrounds 3 s.h.

Author Courses

Apudus Courses
8:331 Chaucer 3 s.h.
8:333 Shakespeare: Early Works 3 s.h.
Same as Speech and Drama 4:307.2.
8:352 Shakespeare: Later Plays 3 s.h.
Same as Speech and Drama 4:307.313.
8:354 Milton 3 s.h.
8:356 Selected Authors 3 s.h.

Literary Criticism Courses
8:261 History of Criticism I: Methods in the Renaissance 3 s.h.
Same as Comparative Literature 18:301 and Speech and Drama 3:207.417.
8:262 History of Criticism: Elizabethan to the 19th 3 s.h.
Same as Comparative Literature 41:302 and Speech and Drama 4:207.418.
8:263 Issues in Contemporary Literary Criticism 3 s.h.
8:264 Dramatic Theory I 3-2 s.
8:266 Dramatic Theory II 3-2 s.
8:267 Critical Methodology 3-4 s.
Same as Speech and Drama 4:360.161.
8:268 Renaissance and Modern Rhetoric 2-4 s.
Same as Speech and Drama 4:360.302.
8:269 Contemporary Themes 2-4 s.
Same as Speech and Drama 4:360.303.

Literary Modes Courses
8:271 The Tragic Mode 2 s.h.
8:272 The Comic Mode 2 s.h.
8:273 The Vedic Mode 2 s.h.
8:274 Poetic Mode 1 s.h.
8:275 Dramatic Modes 2 s.h.
8:276 Heroic Modes 2 s.h.
Same as Comparative Literature 4:376.
8:277 Unidimensional Modes 3 s.h.
8:278 Theory and Technique of Oral Literature 3 s.h.
Same as Comparative Literature 4:378.

Special Period Studies Courses
8:301 Medieval Studies 3 a.h.
8:302 Renaissance Studies 3 a.h.
8:303 Neoclassical Studies 3 a.h.
8:304 Victorian Studies 3 a.h.
8:305 American Studies 3 a.h.
8:306 American Studies in Black Culture 3 a.h.
Same as American Civilization 4:321.3.
8:307 Modern Studies 3 a.h.
8:312 Short-Period Studies 3 a.h.
8:350 Medieval Themes of Poetry and Criticism 3 a.h.

Literary Criticism Courses
8:352 Historical Criticism and the Study of Literary Periods 3 a.h.
Same as Comparative Literature 4:321.
8:353 Intellectual Background of Literary Periods 3 a.h.
8:354 Literary Genre and Modes 3 a.h.
8:355 Poetic Theory and Criticism 3 a.h.
8:357 Dramatic Theory and Criticism 3 a.h.
8:358 Theory and Analysis of Literary Forms 3 a.h.
8:359 American Criticism and Culture 3 a.h.
Same as American Civilization 4:366.

Comparative and European Literature
8:375 European Renaissance 3 s.h.
Same as Comparative Literature 4:367.
8:376 Baroque Neoclassicism 3 s.h.
Same as Comparative Literature 4:367.
8:378 Age of Enlightenment 3 s.h.
Same as Comparative Literature 4:379.
8:379 Baroque Realism 3 s.h.
Same as Comparative Literature 4:379.
8:384 Modern European Poetry 3 s.h.
Same as Comparative Literature 4:377.
8:385 Intellectual Backgrounds of Literary Periods 3 s.h.
Same as Comparative Literature 4:380, Special 22:373.
8:388 Movements in European Literature 3 s.h.
Same as Comparative Literature 4:381.
8:389 Literary Genre and Modes 3 s.h.
Same as Comparative Literature 4:381.
8:392 Patterns of Style and Literary Forms 3 s.h.
Same as Comparative Literature 4:383.
8:394 Theories of Modern Criticism 3 s.h.
Same as Comparative Literature 4:384, Special 23:284.

Bibliography
n.390 Literary Tools and Research Methods 3 s.h.

Graduate Seminars
Three workshops represent the most advanced work in English and American Literature and in minor disciplines. The enrollment of a given seminar may vary from semester to semester. Permission of the instructor is required for registration.
8:402 Seminar: Medieval Literature 3 a.h.
Same as Comparative Literature 4:402.
8:403 Seminar: Middle English Literature 3 a.h.
8:404 Seminar: Chaucer 3 a.h.
8:405 Seminar: Renaissance Non-Dramatic Literature 3 a.h.
8:411 Seminar: Shakespeare 3 a.h.
8:413 Seminar: 17th-Century IpoDramatic Literature 3 a.h.
### Independent Study

**Advanced Studies**  
(Courses for one or several students reading under the guidance of a faculty member)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/929</td>
<td>Advanced Studies in an Author</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/955</td>
<td>Advanced Studies in a Literary Period</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/919</td>
<td>Advanced Studies in a Literary Form</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/920</td>
<td>Advanced Studies in a Literary Genre</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/921</td>
<td>Advanced Studies in a Literary Mode</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/922</td>
<td>Advanced Studies in a Literary Movement</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/923</td>
<td>Advanced Studies in a Literary Theme</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/956</td>
<td>Advanced Studies in Literary Criticism</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/955</td>
<td>Advanced Studies in Rhetoric</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/950</td>
<td>Advanced Studies in an Interdisciplinary Subject</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/958</td>
<td>Special Project for Graduate Students</td>
<td>3 a.h.</td>
</tr>
</tbody>
</table>

### Dissertation

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/959</td>
<td>Ph.D. Thesis</td>
<td>3 a.h.</td>
</tr>
</tbody>
</table>

### Linguistics and Language Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/100</td>
<td>Elements of Linguistics</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/101</td>
<td>Introduction to Linguistics</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/114</td>
<td>Language Data Processing</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/118</td>
<td>Language Data Programming</td>
<td>3 a.h.</td>
</tr>
</tbody>
</table>

**Special Interest Courses**

These courses are designed to serve the special interests and needs of undergraduate and graduate students in all areas of the University. They offer practice in various areas of composition and various kinds of alternative, persuasive, and expressive writing.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/110</td>
<td>Expository Writing</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/115</td>
<td>Theoretical Rhetoric</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/116</td>
<td>Technical and Scientific Writing</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>8/117</td>
<td>Advanced Expository Writing</td>
<td>3 a.h.</td>
</tr>
</tbody>
</table>

**Expository Writing Courses**

These courses are designed to serve the special interests and needs of advanced undergraduate and graduate students in particular academic and professional areas of the University. They offer practice in specialized forms of writing for specialization purposes and audiences.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/111</td>
<td>Writing for the Humanities</td>
<td>3 a.h.</td>
</tr>
</tbody>
</table>
Independent Study

French and Italian

Department chairman: John T. Noebeau, Jr.

Degree offered: B.A. (French or Italian), M.A. (French), Ph.D. (French)

Undergraduate Programs

The Department offers a variety of major programs in French and Italian, electives for nonmajors with prerequisite linguistic skills and flexible means to meet the formal language requirements of the College of Liberal Arts and to satisfy individual needs and interests.

The Department's purpose is to introduce students to the culture of countries of historical and contemporary importance, facilitate the development of proficiency in the language and foster critical appreciation of the civilization and literature of the country.

Majors may combine their studies with courses in education (see "College of Education") to secure jobs in high school teaching. They may continue their studies in graduate school in such areas as French, comparative literature and history, as preparation for college-level teaching. Or, in combination with other skills and studies, majors may find challenging career opportunities in the international areas of government, business, finance, travel, or communications, where the knowledge of a foreign language is essential.

French

The undergraduate major in French may be completed with an orientation in literature, civilization or teaching.

Requirements for the literature program include:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:27</td>
<td>Second-Year Composition and Conversation</td>
<td>8.0 s.h.</td>
</tr>
<tr>
<td>9:111</td>
<td>Third-Year Composition</td>
<td>6.0 s.h.</td>
</tr>
<tr>
<td>9:126</td>
<td>French Conversation: Third Level</td>
<td>2.0 s.h.</td>
</tr>
<tr>
<td>9:136</td>
<td>French Conversation: Fourth Level</td>
<td>2.0 s.h.</td>
</tr>
<tr>
<td>9:157</td>
<td>Advanced French Pronunciation</td>
<td>2.0 s.h.</td>
</tr>
<tr>
<td>9:25</td>
<td>French Pronunciation</td>
<td>2.0 s.h.</td>
</tr>
</tbody>
</table>

A minimum of four 100-level courses in literature, plus a fifth 100-level course in a choice of literature, advanced language or civilization, totaling 15 semester hours. Requirements for the literature program total 35 semester hours.

Requirements for the civilization program include:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:27</td>
<td>Second-Year Composition and Conversation</td>
<td>8.0 s.h.</td>
</tr>
<tr>
<td>9:111</td>
<td>Third-Year Composition</td>
<td>3.0 s.h.</td>
</tr>
</tbody>
</table>
A choice of one among these three courses:
9:112 Third Year Composition 3 s.h.
9:126 French Conversation: Third Level 2 s.h.
9:136 French Conversation: Fourth Level 2 s.h.

A minimum of four 100-level courses in French civilization and three 100-level courses in literature, totaling 21 semester hours. 
Requirements for the civilization program total 34-35 semester hours.

Requirements for the teaching major include:
9:27-28 Second-Year Composition and Conversation 8 s.h.
9:111-112 Third-Year Composition 6 s.h.
9:157 Advanced French Pronunciation 2 s.h.
9:126 French Conversation: Third Level 2 s.h.
9:136 French Conversation: Fourth Level 2 s.h.

A minimum of five 100-level courses of which at least two are in literature and two in civilization totaling 15 semester hours.

Requirements for the teaching major total 35 semester hours. The student in a teaching major must also complete the requirements of the College of Education for certification.

Italian
Requirements for the major in Italian include:
18:11-12 Intermediate Italian 6 s.h.
18:111-112 Advanced Composition and Conversation 8 s.h.
18:105-106 Introduction to Italian Literature 6 s.h.
18:119-120 Dante and His Times 4 s.h.
18:101 Literature of the 19th Century 3 s.h.
18:102 Literature of the 20th Century 3 s.h.
Total 27 s.h.

Honors
The Department participates in the College of Liberal Arts Honors Program, which provides enrichment opportunities for qualified students.

Summer Program in France
The Department is co-sponsor of a Summer Program in France for students enrolled in the three Iowa Regents' universities. Eligibility for the program requires at least one-year of college French or the equivalent, but does not require that the student be a French major. Centers in Rouen and Paris, the eight-week program combines formal class work in language skills with an integrated course in the culture and civilization of France, with visits to points of cultural and historical interest. Students may earn up to nine semester hours of credit in the program.

Graduate Programs

Master of Arts
Three different programs are offered leading to the Master of Arts degree in French.

Master of Arts with Thesis
This program requires a minimum of 30 semester hours, the passing of a written and oral examination, and the preparation and defense of a thesis, for which the student may earn six hours of credit toward the 30-hour requirement. The program must include 9:157 Advanced French Pronunciation, 9:209 Advanced Grammar and Lexicology, 9:210 Comparative Syntaxics, and at least four graduate level (200 and above) literature courses. Candidates may occasionally take courses in related fields.

Master of Arts Without Thesis
The requirements for the nonthesis program are the same as for the M.A. with thesis, except that in the nonthesis program the candidate must earn all of the required 30 semester hours in regular coursework.

Master of Arts in French Education
This program is intended primarily for prospective secondary and junior college teachers. Requirements include a total of 38 semester hours at the advanced level, of which eight may be taken in education or related fields and at least nine must be taken in education or related fields and at least nine must be in graduate courses in French literature.


Doctor of Philosophy
The Ph.D. degree in French is awarded after completion of at least three years of graduate study of which one must be spent in residence at the university, the passing of a comprehensive examination, and the oral defense of a dissertation.

Specific requirements for the Ph.D. in French include: 9:251 Introduction to Old French Grammar; proficiency in a foreign language other than French, (i.e., four semesters of college study or equivalent); and completion of three graduate courses (minimum of eight semester hours) in a related field, such as another literature, history, philosophy, etc. The choice of second language and field are to be determined by the candidate and advisor in consultation.

Graduate students working toward an advanced degree are required to spend at least one year teaching as graduate assistants in the Department.

Admission
Candidates for an advanced degree must have completed the equivalent of the undergraduate major in French. Deficiencies in previous training may be removed by taking appropriate courses.

In addition to the Graduate Record Examination scores required by the Graduate College, the Department requires the GRE Advanced Test in French.

Appointments
Teaching and research assistantships and University fellowships and scholarships are available to qualified graduate students (see "Graduate College"). The Department may notify one Teaching/Research Fellow annually. Inquiries should be addressed to the departmental office.
Exchange assistantship agreements with the French Ministry of Education and the University of Poitiers provide a limited number of graduate student one year of residence in France.

French Courses

Primarily for Undergraduates

Students who have had significant experience with French through study or foreign residence are required to take placement tests. A student may not repeat, for either credit or quality points, an elementary course if he or she has already completed a higher-level course for which the elementary course or its equivalent is a prerequisite.

* 91 Elementary French 4 a.h.
  For students who have no knowledge of French.
* 92 Elementary French 4 a.h.
  Prerequisite: 91 or equivalent.
* 93 Elementary French Intensive Course 4 a.h.
  First-year French for non-majors.
* 97 French for Travellers 2 a.h.
  Best conversational French for the traveller. Given in Summer and Evening Class Program.
* 108 French Literature of Government 4 a.h.
  Course limited to English. Same as Core Literature 11:02; may be taken as part of core literature requirement.
* 111 Intermediate French 3 a.h.
  Recommended for students who plan to enrollize their study of French with second year. Prerequisite: 92 or equivalent.
* 112 Intermediate French 3 a.h.
  Continuation of 91. Prerequisite: 9:11 or equivalent.
* 220 French Pronunciation 2 a.h.
  May be taken in conjunction with 9:7, 9:7, 9:11, 9:12.
* 226 French Conversation: First Level 2 a.h.
  May be taken independently or in conjunction with 9:11, 9:12, 9:27, 9:28. Prerequisite: 9:2 or equivalent.
* 228 Second-Year Composition and Conversation 4 a.h.
  Required for seniors who wish to continue study of French; or who wish to improve their active and passive knowledge of the language. Prerequisite: 9:2 or equivalent. (Covers Vincent de Paul, Francois de La Harpe, and Francois de La Bruyere. Prerequisite: 9:2; or equivalent. (Introduction to French conversation. Prerequisite: 9:27 or equivalent. 9:28 French Conversation Second Level 2 a.h.
  Prerequisite: 9:26 or equivalent.
  911 Ph.D. French I 0 a.h.
  For candidates for degrees in other departments who want reading ability for purposes of major study in French.
  828 Ph.D. French II 0 a.h.
  829 Ph.D. French III 0 a.h.
  846 Ph.D. French IV 0 a.h.
  856 Advanced Level Work 0 a.h.
  Prerequisite: 9:12 or equivalent.

For Undergraduates and Graduates

A detailed description of courses offered each semester is available in the department office. All courses are given in French unless otherwise indicated. Courses numbered from 150-199 are intend-
ed primarily for advanced undergraduates; a graduate student should consult with his or her advisor before registering for these courses.

9:100 Regents' Summer Abroad Program 8-9 a.h.

9:108 Introduction to French Literature 19th-20th Centuries 3 a.h.
  Prerequisite: 9:12, 9:28, or equivalent.
  Prerequisite: 9:12, 9:28, or equivalent.
9:108 Themen in French Literature 3 a.h.
  Prerequisite: 9:12, 9:28, or equivalent.

References

9:108 Introduction to French Literature 20th Century 3 a.h.
  Prerequisite: 9:28 or equivalent.
9:108 Introduction to French Civilization 4 a.h.
  Prerequisite: 9:28 or equivalent.
9:123 Third Year Composition 3 a.h.
  Continuation of 9:111. Prerequisite: 9:111 or equivalent.
9:124 Third Year Composition 3 a.h.
  Continuation of 9:111. Prerequisite: 9:111 or equivalent.
9:124 French Civilization 3 a.h.
  A survey of social history from Middle Ages to 1870. Prerequisite: 9:12, 9:28, or 9:46.
9:134 French Civilization 3 a.h.
  A survey of social history from 1870 to the present. Prerequisite: 9:12, 9:28, or 9:46.
9:131 French Composition 4 a.h.
  Prerequisite: 9:36 or equivalent.
9:130 Methods: Foreign Language 3 a.h.
  Ordinarily offered as Education 75:116. Same as Spanish 20:130, Latin 20:197.
9:131 Language Laboratory Procedures 1-2 a.h.
  Same as Spanish 75:115, Education 75:125 and East Asia Language and Literature 9:131.
9:130 French Conversation: Third Level 3 a.h.
  Prerequisite: 9:36 or equivalent.
9:130 Methods: Foreign Language 3 a.h.
  Ordinarily offered as Education 75:116. Same as Spanish 20:130, Latin 20:197.
9:131 Language Laboratory Procedures 1-2 a.h.
  Same as Spanish 75:115, Education 75:125 and East Asia Language and Literature 9:131.
9:130 French Conversation: Fourth Level 5 a.h.
  Prerequisite: 9:46 or equivalent.
9:147 The French Cinema 3 a.h.
  Same as Spanish 20:146, French 20:147.
9:152 Contemporary French 3 a.h.
  Prerequisite: 9:46 or equivalent.
9:152 Study: Analysis and Application 3 a.h.
  Analysis of French literature through self-study programs. Exercises and essays will be included in thetext.
9:154 Textual Analysis 3 a.h.
  Study of literary styles through analysis of representative texts. Follows 9:153 but may be taken independently.
9:157 Advanced French Pronunciation 2 a.h.
  Required for teachers. Prerequisite: 9:111 or equivalent.
9:165 Studies in the Novel 3 a.h.
  The French novellistic tradition through selected major texts and critical studies. Given in English.
  Corensson 13:150. Same as German 18:146.
9:202 20th-Century French Fiction 3 a.h.
  Corensson 13:150. Same as German 18:153.
9:204 20th-Century French Theater 3 a.h.
  Corensson 13:150. Same as German 18:154.
9:205 Masterpieces of French Literature 3 a.h.
  Major works from Middle Ages to 19th century; given in English, readings in French. Prerequisite: 9:12, 9:28, or equivalent. Same as German 18:155.
9:205 Masterpieces of French Literature 3 a.h.
  Major works from Middle Ages to 19th century; given in English, readings in French. Prerequisite: 9:12, 9:28, or equivalent. Same as German 18:155.
9:206 Narrative and Related Art Forms 3 a.h.
9:215 The French Writer and Social Criticism 3 a.h.
  Prerequisite: 9:112 or equivalent.
9:217 Current Issues, Approaches, and Materials in Foreign Language Education 3 a.h.
9:218 Critical Approaches to French Literature 3 a.h.
  Prerequisite: 9:112 or equivalent.
9:218 Introduction to the French-Speaking World 3 a.h.
  Survey of African and Caribbean literature written in French with focus on Négritude movement. Prerequisite: 9:112 or equivalent. Same as American Civilization 25:35.
  Prerequisite: 9:112 or equivalent.
9:226 French Civilization Through the Arts 3 a.h.
  Prerequisite: 9:112 or equivalent.
  Prerequisite: 9:112 or equivalent.
9:227 Aspects of Poetry 3 a.h.
  Prerequisite: 9:112 or equivalent.
### General Science Program

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>18-3</td>
<td>Elementary Italian</td>
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### For Undergraduates and Graduates

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<tbody>
<tr>
<td>18-191</td>
<td>Literature of the 16th Century</td>
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### Italian Courses

#### For Undergraduates

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<td>Elementary Italian</td>
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#### For Graduates

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<th>Course Code</th>
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<tr>
<td>18-287</td>
<td>Alberto Moravia and the 20th Century Novel</td>
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### Italian Graduate Programs

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<td>18-289</td>
<td>Critical Theory and Practice</td>
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<tr>
<td>18-277</td>
<td>Thesis</td>
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<td>18-278</td>
<td>Special Work</td>
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<td>18-279</td>
<td>Seminar</td>
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</tr>
<tr>
<td>18-383</td>
<td>Seminar in Modern Criticism</td>
<td>3.0</td>
</tr>
<tr>
<td>18-385</td>
<td>Seminar in Medieval Civilization</td>
<td>3.0</td>
</tr>
<tr>
<td>18-275</td>
<td>Interdepartmental Seminar</td>
<td>3.0</td>
</tr>
</tbody>
</table>

### General Science Program

Head: Robert S. Yager

Graduate Program: Robert S. Yager; associate professors George W. Courten, Vincent N. Lawrence, James A. Rymonkey, and David R. Phillips; assistant professor John E. Pearson; and David S. Rollets and John E. Wilson.

Degree offered: B.A., B.S.
while satisfying preprofessional requirements and/or continuing with courses in multiple science fields. The program provides some depth of preparation while encouraging continual breadth of experiences—a combination attractive for preparation for secondary school teaching, health-related professions including medicine, dentistry, medical technology, optometry, physical therapy, and similar fields, and certain specialized and interdisciplinary graduate areas.

Undergraduate Programs
There are three categories of programs leading to the bachelor's degree in General Science, each having differing requirements, as follows:

General Science (non-teaching and non-health related)
A student must earn 44 semester hours (48 for the B.S. degree) of credit for courses from any three of the science-mathematics areas in the College of Liberal Arts (Biology/Chemistry, Botany, Chemistry, Mathematical Sciences, Geology, Microbiology, Physics-Astronomy, and Zoology), with at least 20 semester hours in one of these areas.

All students who graduate with a degree in General Science (non-teaching) and are not in a joint degree or professional program listed below must complete one of the following mathematics courses, its equivalent, or a higher level mathematics course at the college level:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>22S.8</td>
<td>Quantitative Methods II</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>22M.11</td>
<td>Fundamentals of College Mathematics II</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>22M.16</td>
<td>Calculus for the Biological Sciences</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22M.20</td>
<td>Elementary Functions</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

Any 22C course except 22C.1

Additional electives in botany or zoology, with at least 8 s.h. in botany and 8 s.h. in zoology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>41:4-4</td>
<td>Principles of Chemistry I-I</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>41:121-122</td>
<td>Organic Chemistry I-I</td>
<td>6 s.h.</td>
</tr>
<tr>
<td></td>
<td>Chemistry Elective</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>

12:3 Principles of Physical Geology 2 s.h.
12:4 Principles of Historical Geology 2 s.h.
29:1 College Physics 4 s.h.
97:123 Meaning of Science 2 s.h.
97:130 Science in Historical Perspective 2 s.h.
54 s.h.

General Science (Health-Related—Joint Programs)
A student must earn 44 semester hours (48 for the B.S. degree) of credit for courses from any three of the science-mathematics areas in the College of Liberal Arts (Biology/Chemistry, Botany, Chemistry, Mathematical Sciences, Geology, Microbiology, Physics-Astronomy, and Zoology), with at least 20 semester hours in one of these areas.

Students admitted into the College of Dentistry or Medicine prior to obtaining a bachelor's degree, and students admitted into the professional programs in Medical Technology, Nuclear Medical Technology or Physical Therapy, may substitute from their first year of professional training 30 semester hours of credit toward the 124 hours needed for graduation including:

Eight semester hours of science toward the 44 or 48 needed toward the General Science major; and

Four semester hours of science toward the 20 needed in one area in the major.

Students should consult other appropriate sections of this catalog for further information concerning other features of these professional and preprofessional programs. The description here pertains only to the Liberal Arts requirements for a bachelor's degree in general science, and should not imply anything further concerning specific program requirements in a particular health field.

General Science (Teaching)
A student may earn a B.A. or B.S. degree in General Science Teaching by completing one of the approved sequences in Science Teaching which specify 50-54 semester hours. Students majoring in science teaching must also complete the requirements necessary for certification. This includes a 26 semester hour sequence of courses in education. The approved sequences in science teaching include:

Biological Emphasis
Adviser: John E. Penick

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>21:1</td>
<td>Introduction to Botany</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>37:3</td>
<td>Principles of Animal Biology</td>
<td>5 s.h.</td>
</tr>
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</table>

Additional electives in botany or zoology, with at least 8 s.h. in botany and 8 s.h. in zoology 19 s.h.

41:4-4 Principles of Chemistry I-I 6 s.h.
41:121-122 Organic Chemistry I-I 6 s.h.
Chemistry Elective 2 s.h.

12:3 Principles of Physical Geology 2 s.h.
12:4 Principles of Historical Geology 2 s.h.
29:1 College Physics 4 s.h.
97:123 Meaning of Science 2 s.h.
97:130 Science in Historical Perspective 2 s.h.
54 s.h.

Chemistry Emphasis
Adviser: Norman C. Baenziger, Vincent N. Lunetta

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>41:4-4</td>
<td>Principles of Chemistry I-I</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>41:121-122</td>
<td>Organic Chemistry I-I</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>41:141</td>
<td>Intermediate Chemistry Lab I</td>
<td>2 s.h.</td>
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<tr>
<td>41:11</td>
<td>Elementary Quantitative Analysis</td>
<td>4 s.h.</td>
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<tr>
<td>41:131-132</td>
<td>Physical Chemistry I-I</td>
<td>6 s.h.</td>
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<tr>
<td>29:1</td>
<td>College Physics</td>
<td>4 s.h.</td>
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<tr>
<td>29:17</td>
<td>Introductory Physics I</td>
<td>4 s.h.</td>
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<tr>
<td>29:2</td>
<td>College Physics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>29:18</td>
<td>Introductory Physics II</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>29:19</td>
<td>Introductory Physics III</td>
<td>4 s.h.</td>
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Electives 3 s.h.

22M:35-36 Engineering Calculus I-I 8 s.h.
22M:25-25 Calculus I-II 8 s.h.
<table>
<thead>
<tr>
<th></th>
<th>Title</th>
<th>Credits</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>97:128</td>
<td>Meaning of Science</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:130</td>
<td>Science in Historical Perspective</td>
<td>2 s.h.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>53 s.h.</td>
<td></td>
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<tr>
<td>524:155</td>
<td>Limnology</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>68:2</td>
<td>Principles of Economics</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>4:121-122</td>
<td>Organic Chemistry I-II</td>
<td>6 s.h.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>53 s.h.</td>
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<tr>
<td>Earth Science Emphasis</td>
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<tr>
<td>Advisers: Keene Swett, Edward L. Fizzini</td>
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<tr>
<td>12:3</td>
<td>Principles of Physical Geology</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>12:4</td>
<td>Principles of Historical Geology</td>
<td>2 s.h.</td>
<td></td>
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<td>or</td>
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<tr>
<td>12:5</td>
<td>Introduction to Geology</td>
<td>4 s.h.</td>
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<tr>
<td>12:9</td>
<td>Geology of Iowa</td>
<td>2 s.h.</td>
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<tr>
<td>12:41</td>
<td>Mineralogy</td>
<td>4 s.h.</td>
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<tr>
<td>12:121</td>
<td>Principles of Paleontology</td>
<td>3 s.h.</td>
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<tr>
<td>12:162</td>
<td>Regional Stratigraphy</td>
<td>3 s.h.</td>
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<tr>
<td>12:171</td>
<td>Geomorphology</td>
<td>3 s.h.</td>
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<tr>
<td>4:1 and 4:4</td>
<td>Principles of Chemistry I-II</td>
<td>6 s.h.</td>
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<tr>
<td>4:6</td>
<td>Elementary Chemistry Laboratory</td>
<td>2 s.h.</td>
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<tr>
<td>29:1-2</td>
<td>College Physics</td>
<td>8 s.h.</td>
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<tr>
<td>29:61-62</td>
<td>General Astronomy</td>
<td>8 s.h.</td>
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<tr>
<td>44:123</td>
<td>Geography of Natural Resources</td>
<td>3 s.h.</td>
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<tr>
<td>44:101</td>
<td>Introduction to Weather and Climate</td>
<td>3 s.h.</td>
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<tr>
<td>97:128</td>
<td>Meaning of Science</td>
<td>2 s.h.</td>
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<tr>
<td>97:130</td>
<td>Science in Historical Perspective</td>
<td>2 s.h.</td>
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<td></td>
<td></td>
<td>52-54 s.h.</td>
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<tr>
<td>Adviser: John E. Penuck</td>
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<tr>
<td>2:1</td>
<td>Introduction to Botany</td>
<td>4 s.h.</td>
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<td>2:13</td>
<td>Biology of the Local Flora</td>
<td>4 s.h.</td>
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<tr>
<td>37:3</td>
<td>Principles of Animal Biology</td>
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<td>37:109</td>
<td>Genetics</td>
<td>3 s.h.</td>
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<td>37:131</td>
<td>Evolution</td>
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<td>37:132</td>
<td>Ecology</td>
<td>4 s.h.</td>
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<td>97:128</td>
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<td>97:130</td>
<td>Science in Historical Perspective</td>
<td>2 s.h.</td>
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<td>4:1, 4:4</td>
<td>Principles of Chemistry I-II</td>
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<td>4:6</td>
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<td>At least nine semester hours from the following:</td>
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<tr>
<td>12:5</td>
<td>Principles of Physical Geology</td>
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</tr>
<tr>
<td>12:5</td>
<td>Introduction to Geology</td>
<td>4 s.h.</td>
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<tr>
<td>12:125</td>
<td>A Planet in Crisis</td>
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<tr>
<td>12:183</td>
<td>Principles of Mineral Economics</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>44:19</td>
<td>Natural Environmental Issues</td>
<td>1 s.h.</td>
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<tr>
<td>44:122</td>
<td>Natural Resources of the United States</td>
<td>3 s.h.</td>
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<tr>
<td>or 44:123</td>
<td>Geography of Natural Resources</td>
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<td>At least eight semester hours from the following:</td>
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<td>527:102</td>
<td>Technology of Environmental Pollution Control</td>
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<tr>
<td>524:154</td>
<td>Environmental Microbiology</td>
<td>3 s.h.</td>
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<td>524:254</td>
<td>Environmental Toxicology</td>
<td>2 s.h.</td>
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<tr>
<td>527:103</td>
<td>Environmental Health</td>
<td>3 s.h.</td>
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<td></td>
<td>53 s.h.</td>
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<tr>
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<tr>
<td>Advisers: George W. Cosman, Edward B. Nelson, Vincent N. Luens</td>
<td></td>
<td></td>
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<tr>
<td>29:1</td>
<td>College Physics</td>
<td>4 s.h.</td>
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<td>or</td>
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<tr>
<td>29:17</td>
<td>Introductory Physics I</td>
<td>4 s.h.</td>
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<td>or</td>
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<tr>
<td>29:2</td>
<td>College Physics</td>
<td>4 s.h.</td>
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<tr>
<td>29:18</td>
<td>Introductory Physics II</td>
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<td>29:19</td>
<td>Introductory Physics III</td>
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<td>29:28</td>
<td>Electromics</td>
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<td>22M:25</td>
<td>Engineering Calculus I</td>
<td>4 s.h.</td>
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<td>22M:36</td>
<td>Engineering Calculus II</td>
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<td>22C:37</td>
<td>Introduction to Computing with FORTRAN</td>
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<td>4:1 and 4:4</td>
<td>Principles of Chemistry I-II</td>
<td>6 s.h.</td>
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<td>4:6</td>
<td>Elementary Chemistry Laboratory</td>
<td>2 s.h.</td>
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<td>4:8</td>
<td>General Chemistry I</td>
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<td>4:9</td>
<td>General Chemistry Laboratory</td>
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<td>4:131</td>
<td>Physical Chemistry I</td>
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<tr>
<td>97:128</td>
<td>Meaning of Science</td>
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<td>97:130</td>
<td>Science in Historical Perspective</td>
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<td>53 s.h.</td>
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<td>Minors in Science Teaching</td>
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<td>Five teaching minors in science are available for persons with teaching majors in other academic areas. Only these combinations of courses qualify a person for certification in the area specified with each heading.</td>
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<td>Biology</td>
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<td>Introduction to Botany</td>
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<td>37:3</td>
<td>Principles of Animal Biology</td>
<td>5 s.h.</td>
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<td>97:128</td>
<td>Meaning of Science</td>
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<td>97:130</td>
<td>Science in Historical Perspective</td>
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<td>or 75:151</td>
<td>Electives in Botany and Zoology</td>
<td>8 s.h.</td>
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<td>75:152</td>
<td>Methods: Biological Science</td>
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<td>Principles of Chemistry I-II</td>
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<td>Elementary Chemistry Laboratory</td>
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<td>Meaning of Science</td>
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<td>97:130</td>
<td>Science in Historical Perspective</td>
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<td>or 75:151</td>
<td>Electives in Chemistry</td>
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<td>75:152</td>
<td>Methods: Physical Science</td>
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<td>or 75:152</td>
<td>Methods: Biological Science</td>
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Physical Science
4:1 and 4-4 Principles of Chemistry 1 B 6 s.h.
29-1-2 College Physics 8 s.h.
97-128 Meaning of Science 2 s.h.
97-130 Science in Historical Perspective 2 s.h.
Electives in Chemistry or Physics 3 s.h.
75-151 Methods: Physical Science 2 s.h.
75-152 Methods: Biological Science 2 s.h.
25 s.h.

General Science
2-1 Introduction to Botany 4 s.h.
29-61 General Astronomy 4 s.h.
12-3 Principles of Physical Geology 2 s.h.
or 12-4 Principles of Historical Geology 2 s.h.
4-1 Principles of Chemistry I 3 s.h.
29-1 College Physics 4 s.h.
97-128 Meaning of Science 2 s.h.
97-130 Science in Historical Perspective 2 s.h.
75-151 Methods: Physical Science 2 s.h.
75-152 Methods: Biological Science 2 s.h.
25 s.h.

Earth Science
12-3 Principles of Physical Geology 2 s.h.
12-4 Principles of Historical Geology 2 s.h.
29-61-62 General Astronomy 8 s.h.
97-128 Meaning of Science 2 s.h.
97-130 Science in Historical Perspective 2 s.h.
Electives in Geology 5 s.h.
75-151 Methods: Physical Science 2 s.h.
75-152 Methods: Biological Science 2 s.h.
25 s.h.

Special Rules
Since the General Science Program involves large numbers of students heading for a variety of professional and graduate areas, large numbers of facility advisors, and several colleges and departments, some special rules and regulations have been approved by the General Science Advisory Committee of the College of Liberal Arts (consisting of the department executive officers of biochemistry, botany, chemistry, geology, physics-astronomy, microbiology and general science). These special rules include:

At least an semester hours of graded credit in science must be earned at The University of Iowa.

Transfer students using any of the joint programs must complete their last 30 semester hours in residence at the College of Liberal Arts at The University of Iowa in order to be eligible for the B.A. or B.S. degree one year later.

General Science majors should meet their language requirement with German, French, or Russian. An academic advisor may approve the use of another language if there are circumstances making such a choice desirable. Letters approving other languages are filed with the student’s records in the Registrar’s Office.

No "11" numbered science core courses or credit from the CLEP Natural Science General Examination may be used toward the major in General Science (44 or 48 semester hours).

Science courses taken in other colleges within the University (for example, Colleges of Engineering and Medicine) will not be accepted toward the 44 or 48 semester hours needed for the major unless one of the science departments of the College of Liberal Arts listed above certifies that the course is equivalent to one offered or required of majors in that department.

No courses taken in the three departments used for the major (non-teaching, based-related, or teaching) may be taken Pass/Fail. Grades from all courses in the three departments used for the General Science major will be used in computing a student’s grade-point average in the major both at The University of Iowa and overall.

Since mathematics forms an integral part of so many aspects of modern science, all General Science students are urged to complete numerous appropriate advanced courses in both pure and applied mathematics (including statistics and computer science) in order that they may be qualified as a later date to do graduate work and quantitative research.

Genetics
Program chairperson: J. Devon Moler
Funds: professor Roger Clatworthy (Biochemistry), Thomas Convey (Biochemistry), Joseph Felsen (Zoology), Vian Issameto (Pathology), Roger Miller (Zoology), Devon Moler (Zoology), North 84 (Otolaryngology), George Walker (Otolaryngology), Jesse Merz (Physiology), James King (Physiology), Gerald Sebrell (Pharmacology), assistant professor Raymond Calon (Pathology), John Donelan (Biochemistry), Michael Pfeifer (Biochemistry), James Provost (Pathology), Carol Kravetz (Zoology), National Science (Medical Science), University of Iowa (Biochemistry).
Degree offered: Ph.D.

Interdepartmental Ph.D. Program in Genetics
The Interdepartmental M.D. Program in Genetics is designed to promote collaborative investigations and strong intellectual interactions among individual students and faculty participants who may be formally affiliated with different departments.

Students majoring in the program are encouraged to obtain a broad background in genetics, ranging from molecular to population genetics. Within this context, course requirements are nevertheless flexible enough to permit students to tailor their formal coursework to fit their individual needs. All students enrolled in the Interdepartmental Genetics Ph.D. Program are required to take three specific courses—General Biochemistry, Advanced Genetics and a one-hour seminar course given each semester. In addition, upper-level courses are grouped roughly into three areas—molecu-
lar and microbial genetics, cell and developmental genetics, and quantitative and population genetics; students are required to enroll in three semester hours of courses in each of the three areas. Additional courses in genetics or related disciplines can be elected to provide supplementary background in the student’s particular area of specialization.

Even more important than formal coursework is the opportunity to do meaningful research. Faculty members participating in the Ph.D. Program in Genetics conducts active, stimulating research programs. Students are encouraged to enter the laboratory of their choice and begin their own research as quickly as possible.

Research interests of the participating faculty range broadly from bacteriology to human medical genetics. In each area of genetics there is a group of faculty members with closely related or overlapping interests. In addition, the University is strong in several related disciplines, including microbial physiology, enzymology, virology, protein biochemistry, development, cell and population biology, all of which contribute significantly to the overall training program.

In addition to research and coursework, students must also pass a comprehensive examination, which should usually be taken within the first two years in the program.

Entrance Requirements

It is expected that prospective students will have a strong undergraduate background in science and a strong commitment to research and teaching in genetics. Students should have taken courses in general genetics, organic chemistry, introductory physics and mathematics. Deficiencies in a particular can be made up during the first year of graduate school. Criteria for admission include undergraduate academic record, performance on the Graduate Record Examination (GRE) verbal and quantitative aptitude tests, and letters of recommendation. Requirements for admission are not rigid. Although all of the students in genetics currently at Iowa have undergraduate grade-point averages (GPA’s) greater than 3.2 and GRE totals (verbal plus quantitative) exceeding 1200, students with lower GPA’s or GRE scores may be admitted depending on other indicators of their academic potential.

Applications for admission will be accepted any time but should be received by March 1 to insure consideration for entrance the following academic year.

Financial Aid

The most highly qualified applicants will be supported as National Institutes of Health predoctoral trainees. Traineeships include a stipend of $3,000 for 2 years, complete tuition scholarships, and additional support by the trainee’s research. In addition, stipends can be supplemented by occasional teaching assistantships at the trainee’s option. (Trainees are encouraged to do part-time teaching as part of their development as scientists and teachers.) Students may also be supported by half-time teaching or research assistantships, with stipends of about $4,500 per year. Students receiving assistantships may also apply for full or partial tuition scholarships.

The M.D.-Ph.D. Program

Students may combine study toward a M.D. and a Ph.D. in genetics. Those interested in doing so should apply to the Ph.D. Program in Genetics and to the College of Medicine for admission. Further information about the M.D.-Ph.D. program can be obtained from the Registrar of the College of Medicine.

Departmental Ph.D. Programs

The Department of Biochemistry, Botany, Microbiology and Zoology offer degree programs in which students may specialize in a particular aspect of genetics. Students are referred to departmental descriptions elsewhere in this catalog for further information about these programs.

Courses

Biochemistry

69:121 Molecular Genetics

Same as Zoology 77:121.

69:216 Genetics Seminar


69:218 Genetics Seminar


Botany

2:102 General Botany

4 a-h.

2:103 Botany Laboratory

2 a-h.

69:210 Cell Biology

Same as Zoology 27:210.

69:212 Plant Biology Seminar

Same as Zoology 27:212.

69:213 Plant Physiology Seminar

Same as Zoology 27:213.

69:216 Genetics of Cell Organelles

3 a-h.

69:218 Genetics Seminar

69:219 Genetics Seminar


Microbiology

61:170 Microbial Genetics

3 a-h.

61:270 Topics in Molecular Biology

3 a-h.

61:285 Genetics Seminar


Zoology

27:109 Genetics

Same as Zoology 27:109.

27:121 Plant Anatomy and Genetics Laboratory

3 a-h.

27:122 Plant Physiology Laboratory

3 a-h.

27:123 Plant Development Laboratory

3 a-h.

27:124 Plant Genetics Laboratory

3 a-h.

27:125 Plant Development Laboratory

3 a-h.

27:126 Plant Genetics Laboratory

3 a-h.

27:127 Plant Development Laboratory

3 a-h.

27:128 Plant Genetics Laboratory

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27:129 Plant Development Laboratory

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27:130 Plant Genetics Laboratory

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27:131 Plant Development Laboratory

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27:170 Plant Genetics Laboratory

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27:171 Plant Development Laboratory

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27:172 Plant Physiology Laboratory

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27:201 Plant Physiology Laboratory

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27:202 Plant Physiology Laboratory

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27:203 Plant Physiology Laboratory

3 a-h.
Geography
Department chairman: Clyde F. Kohn
Degree offered: B.S., M.S., Ph.D.

Modern geography is concerned, mainly, with the spatial aspects of human geography and with man-environment relations. Students who select courses in geography soon find that the insights and methods of inquiry they develop are applicable to the solution of many of the complex problems confronting modern societies, such as air and water pollution, transportation problems, the development of ghettos in large cities, distribution and consumption of natural resources, rapidly increasing populations and conflicts between nations. Studies in geography provide students with concepts and methods for organizing such mosaic units as urban areas, market regions, school districts, and other kinds of service areas. Thus, today's geography contributes to the decision-making processes involved in determining how individuals or groups of individuals can improve the quality of life in this complex age. Much of modern geography is problem-oriented. It is scientific as well as humanistic in its approach to the solution of these problems. It is involved with two basic considerations: the best means to obtain accurate facts or data; and the tools and techniques necessary for analyzing these data to see if they verify or alter existing explanations for the facts as they are observed.

Career opportunities for majors in geography exist in various branches of government and in business. There is a demand for persons capable of dealing with resource management, economic development, market area analysis and other problems related to the distribution and spatial interaction of physical, economic, social and political phenomena in the world as a whole or in major parts of it.

There is also a growing demand for young people concerned with where to locate points of research and subsequent interactions with the total environment. Courses in geography are commonly required of students preparing for such knowledge application at the elementary and secondary school levels, of students who want to work in urban and regional planning, and as a background for many related professions, including law, health care delivery systems and transportation engineering.

The Undergraduate Program

The geography faculty has developed an undergraduate instructional program which provides educational opportunities for a variety of students: (1) for the nonmajor interested in one or more elective courses as they relate to a liberal education; or for those interested in electing a cluster of courses in conjunction with another discipline, or for the B.G.S. degree; and (2) for those interested in acquiring a major in geography. The Department also joins in significant interdepartmental programs involving regional, urban and environmental components.

Courses for the Non-major

Students in the College of Liberal Arts or other schools and colleges of the University who do not plan to major in geography find meaningful and useful courses in: Physical Geography (44:116), Natural Hazards (44:120), The Inner City (44:136), Urban Problems (44:139), The Third World (44:162), The Changing World (44:165) and Energy in Contemporary Society (44:191). These students are able to pursue their own intellectual curiosity; sometimes to gain breadth of knowledge, or sometimes to fulfill specific curricular needs, such as Maps and Mapping (44:107) or Environmental Impact Studies (44:125).

Students in several related disciplines and in the Bachelor of General Studies program take clusters of courses in geography according to their individual interests. These specializing in environmental studies might elect such upper-division courses as Introduction to Weather and Climate (44:101), Natural Environmental Issues (44:119), Natural Hazards (44:203), Streams and Water (44:213), Environmental Resources of the United States (44:122), Geography of Natural Resources (44:123), Environmental Impact Studies (44:125) and Field Techniques in Natural Environmental Problems (44:180).

For students interested in a cluster of advanced courses in urban geography, the Department offers Introduction to Urban Transportation (44:111), Urban Political Geography (44:116), Urban Geography (44:155), The Inner City (44:136), Metropolitan Growth and Development (44:137) and Urban Problems (44:139).

Students in business may benefit from taking such locational analysis courses as Introduction to Economic Geography (44:030), Location of Services (44:130) and Industrial Location (44:132).

Alternative Programs for the Undergraduate Major

Students electing a major in geography will be exposed to concepts and methods of inquiry in physical, economic, social and political geography, especially as they relate to urban areas. They will be taught how to state problems from a geographic point of view, where and how to find relevant data for analyzing these problems, how to relate their findings to existing theories and how to apply their findings to real world situations.

Students majoring in geography may choose alternative programs depending on their interests. The substantive strengths of the Department fall into three areas: environmental studies, urban and regional studies, and locational analysis. Students may choose to develop expertise in one of these areas, or they may choose to develop an individualized program within the curricula offered by the departmental chairman or their academic advisor, and the Undergraduate Seminar for Geography Majors (44:150). Other than these two courses, the requirements vary with the specific program selected by the student.

Bachelor of Science students must complete either Introduction to Computing with FORTRAN (220:105) or Calculus I (224:025).

Environmental Studies

The undergraduate program in environmental studies is designed for students with career expectations or personal interests in resource management or environmental protection, or who have interests in physical geography per se. The program provides a knowledge of physical processes in landform development, atmospheric conditions, soil development and biotic communities. It addresses the interrelationships among these processes and gives the
student knowledge necessary to assess the impact of human activities on physical systems. Training in field observation, quantitative analysis, computer methods and cartographic representation are included in this concentration.

Required technique courses include Introduction to Quantitative Methods in Geography (44:108), Undergraduate Seminar for Geography Majors (44:130), Field Techniques in Natural Environmental Problems (44:180) and Introduction to Computing with FORTRAN (22C:100) or Calculus I (22M:025).

Students concentrating in environmental studies are advised to select substantive courses from among the following:

44:001 Introduction to Human Geography
44:002 Natural Environment and Man
44:101 Introduction to Weather and Climate
44:119 Natural Environmental Issues
44:120 Natural Hazards
44:121 Streams and Water: Processes and Resources
44:123 Natural Resources of the United States
44:123 Geography of Natural Resources
44:125 Environmental Impact Studies

Also recommended are Maps and Mapping (44:107) and Computer Methods in Geographical Analysis (44:109).

Under the direction of an advisor, students should select courses in related disciplines.

Urban and Regional Studies

Students with interests in urban and regional analysis or in development problems will find this concentration relevant, either as background training for graduate work or as preparation for entry level positions in government and private businesses. This track stresses the problems and potentials of towns, cities and regions. The decision-making processes of individuals and institutions are stressed. Dealing with such problems as assessing sites for development, potential, locating facilities and gauging neighborhood change bring the student "inside" the dynamic of contemporary cities. Required skills in quantitative analysis, cartography and computer usage are developed. Opportunities for experience in working with real problems are included.

In addition to the required Introduction to Quantitative Methods in Geography (44:108), Spatial Organization (44:130), Undergraduate Seminar for Geography Majors (44:130), Introduction to Computing with FORTRAN (22C:100) or Calculus I (22M:025),

Students concentrating in urban and regional analysis or in problems of development are advised to select substantive courses from the following:

44:001 Introduction to Human Geography
44:002 Natural Environment and Man
44:011 Introduction to Social Geography
44:030 Introduction to Economic Geography
44:033 Introduction to Transportation Geography
44:035 Introduction to Urban Geography
44:111 Introduction to Urban Transportation
44:136 Urban Political Geography
44:130 Location of Services
44:132 Industrial Location
44:135 Urban Geography
44:136 The Inner City
44:138 Metropolitan Growth and Development
44:139 Urban Problems

Also recommended are Maps and Mapping (44:107) and Computer Methods in Geographical Analysis (44:109).

Under the direction of an advisor, students should select courses in related disciplines.

Locational Analysis

The concentration in locational analysis is designed for students who wish to gain expertise in this more traditional problem-solving field within human geography. Students learn to use modern technology to help them calculate solutions to such locational problems as selecting the best site for a store or public facility, estimating demand in an area, developing models of consumer behavior and gauging the impact of locational decisions.

The required professional courses include Introduction to Quantitative Methods in Geography (44:108), Spatial Organization (44:130), Undergraduate Seminar for Geography Majors (44:130), Introduction to Computing with FORTRAN (22C:100) or Calculus I (22M:025).

Students concentrating in locational analysis are advised to select substantive courses from the following:

44:001 Introduction to Human Geography
44:030 Introduction to Economic Geography
44:033 Introduction to Transportation Geography
44:111 Introduction to Urban Transportation
44:130 Location of Services
44:132 Industrial Location
44:137 Metropolitan Growth and Development
44:139 Urban Problems

Two additional technique courses are also recommended: Maps and Mapping (44:107) and Computer Methods in Geographical Analysis (44:109).

Under the direction of an advisor, students should select courses in related disciplines.

General Program

For those who do not wish to concentrate in any particular area of interest, a pool general liberal arts program in geography may be designed to provide such majors with a broad understanding of the discipline. The students must elect Introduction to Quantitative Methods in Geography (44:108) and Undergraduate Seminar for Geography Majors (44:130). Other courses should be chosen under the direction of an advisor. Such courses selected should be appropriate to each student's interests and needs.

Individual Programs

If none of these four alternatives are appropriate, students may design their own individual programs of instruction with the help of their advisors. Such programs, however, must include Introduction to Quantitative Methods in Geography (44:108), Spatial Organization (44:130), Undergraduate Seminar for Geography Majors (44:130), and either Introduction to Computing with FORTRAN (22C:100) or Calculus I (22M:025).

Students who wish to specialize in such areas as the geography of the third world, political geography or social geography, may want to design individual programs.

The Cooperative Education Program

The Department of Geography is a participant in the University's Cooperative Education Program, which provides opportunities for both undergraduate and graduate students to secure cooperative training assignments related to their academic programs.
The Graduate Program

The goals of the Department at the graduate level are to prepare students to carry on creative and productive research in geography involving the use of theory, modeling and formal verification methods; to prepare students for careers in research, teaching, or some area of applied geography; and to help students develop their ability to apply knowledge of facts, theories and methodology to specific societal programs. The achievement of these goals is demonstrated in large measure by the demand for Iowa graduates to fill positions in college and university faculties, in research-oriented institutions and in business and government.

The graduate program at Iowa is concerned with the locational analysis of physical, economic, social and political phenomena; the spatial aspects of human behavior; and the interaction of humans and their environment. The Department offers specialized instruction in the teaching geography at the college level (44:206 Teaching College Geography and 44:306 Research Seminar: The Teaching of Geography) for those interested in academic careers. Opportunities are provided for all graduate students to gain practical teaching experience through service as departmental teaching assistants or through other supervised teaching duties. Graduate students who plan to become college teachers are strongly encouraged to complete 44:206 Teaching College Geography.

Master of Arts Programs

The Department offers two programs leading to the Master of Arts degree, with and without thesis. Within this framework, there are two major tracks: one for students who wish to prepare for positions in research or teaching; the other for students who are interested in some area of applied geography. Students whose objective is the Master of Arts degree leading to a career in teaching or research are required to complete a minimum of 30 semester hours of graduate work including 44:201 Geographical Analysis I and 44:208 Quantitative Analysis I. The remainder of their programs must be composed of graduate-level course work in geography, and must be acceptable to the student's advisor. A maximum of six semester hours of credit may be earned by the satisfactory completion of a thesis for those who wish to take the Master of Arts degree with thesis. All students must pass a final examination.

Students whose objective is the Master of Arts degree leading to a career in some area of applied geography (commonly referred to as the Master of Arts program in Applied Geography) are required to complete a minimum of 30 semester hours of graduate work including 44:208 Quantitative Analysis I and 44:300 Seminar in Applied Problems. A computer language course, a cartography course or an equivalent and 44:206 Quantitative Analysis I, are required as prerequisites for 44:300. The remainder of the program will be composed of courses in geography and related departments as approved by the student's faculty advisor. Students are advised that it is desirable to complete the Master of Arts program in applied geography in one year if they enter with sufficient background. Those whose background is not adequate should plan additional time. All students must pass a final oral and/or written examination. The coordinator of the program will conduct an initial screening and advising of incoming students. An appropriate advisor in the student's specified area of interest will be assigned to assist in tailoring a program to suit the needs of the student. The approved program must have been formulated and may be used as guidelines. Students should inquire about the internship program.

Doctor of Philosophy

Students whose objective is the Doctor of Philosophy degree are required to complete 44:201-202 Geographical Analysis I-II and 44:208-209 Quantitative Analysis I-II. The courses 44:201, 208 and 209 should be effective during the first year in residence; the course 44:202 may be taken at any time during the student's residence. Students may meet these requirements with a satisfactory performance in written examinations during the first week of the first semester for which they register.

All doctoral students must complete two research seminars, preferably during their second year in residence, under the direction of different faculty members. They are also required, unless excused by the faculty, to register for 44:350 Research Staff Seminar each semester while in residence. One semester hour of credit will be awarded each semester on a satisfactory/fail-unfail basis for this course.

The remainder of the Ph.D. program includes appropriate graduate courses, seminars and research in geography chosen by students to reflect their area of interest; courses in disciplines closely related to the student's objectives and interests; and courses which satisfy the test requirements. Students develop their programs with the advice and consent of their advisors.

Programs for students who wish to study for the Ph.D. in geography are established separately for each student. For this reason, as soon as possible after beginning graduate work, doctoral students are urged to declare a general area of specialization within the discipline and to secure a faculty advisor. No later than their fourth semester in residence, doctoral students should declare a field of specialization within their general areas of interest and secure a faculty advisor to direct their program of study.

Preferably during their second year in residence, and not later than the fifth semester, doctoral students who have been admitted to the graduate program without advanced credit, must submit an original research paper to the faculty, with the approval of their advisor. Students who have been admitted with advanced graduate credit in 24 semester hours or more, or the equivalent, must meet this requirement no later than their third semester in residence. The faculty will pass upon the merits of the research thus demonstrated. Students become Ph.D. candidates when their qualifying paper has been accepted. No graduate appointment can be extended beyond the third semester in residence for students admitted with 24 semester hours of advanced graduate credit, or beyond the fifth semester in residence of other students, unless the student has completed an acceptable qualifying paper and has thereby become a candidate for a doctoral degree.

Research tool requirements for the Ph.D. candidates are of two kinds. One is the course 44:350 Quantitative Analysis II; the other may be satisfied by completing any other appropriate course, as approved by the faculty at the time the student declares his or her specific research interests.

Candidates for the Ph.D. degree are required to pass a comprehensive examination at the beginning of the second year in residence, demonstrating analytical proficiency in a major area of specialization and a general knowledge of the discipline, including both content and methodology. Prior to taking the comprehensive examination, students must present a definition and review of their area of specialization in an appropriately scheduled open meeting, as for example, 44:350. Upon passing the comprehensive examination, the doctoral candidate will prepare a research design to be presented before the staff seminar. After receiving the critical comments of faculty and students, the candidate is expected to conduct the necessary research and to present his or her findings in
a dissertation which must be defended in a final oral examination.

All doctoral candidates are expected to have supervised experience as classroom instructors and research assistants before being awarded the Ph.D. degree.

Graduate Admission

In determining the admission of a student to the graduate program, the Geography Department considers the total record of each student individually. In addition to the general rules and regulations set forth in the Manual of Rules and Regulations of the Graduate College, the Department considers the student's undergraduate grade-point average, especially during his or her junior and senior years; scores on the Graduate Record Examination Aptitude Test; letters of recommendation from those with whom he or she has taken courses; and an essay in which the applicant states his reasons for wanting to study geography at The University of Iowa. An applicant with an undergraduate grade-point average between 2.3 and 2.75 will be admitted only for the M.A. degree, on condition that he or she achieves a grade-point average of 2.75 or better on the first 12 hours of graduate work as approved by the Department. Foreign students and those others from undergraduate institutions which evaluate students on a basis other than grade-point averages will be considered according to their relative academic standing in their respective institutions. Applicants for graduate appointments are usually considered at the end of the second week in February.

Special Facilities

The Department possesses substantial equipment in the computer-mapping area including a Grid pen digitizer supported by the IM-LAC-PSD-4 mini-computer with a CRT for on-line editing of digitizing work. It is expected that this system will be relabeled to include additional core space, a magnetic disc drive system and a hard copier. The University has an IBM 360 Model 65 computer and a CALC-NPC plotter available to the Department. In addition an HP 2000F system with back-end terminals is available for instructional use. Located on the third floor of the Main Library, the Map Library contains more than 75,000 maps, a total of 2020 atlases and reference books, and about 80,000 aerial photographic prints, primarily of Iowa. The map collection in the library is a depositary library for maps of the U.S. Army Topographic Command, formerly Army Map Service. The Geography Library contains approximately 50,000 maps, including both geologic maps and U.S. Geologic Survey topographic maps. The Department of Geography has its own collection of topographic maps, maps of large urban centers and aerial photographs for use by students in working out laboratory exercises.

Courses

Courses open to undergraduate students may be taken in any order or simultaneously. No undergraduate course in geography has any prerequisites. It is recommended, however, that majors take 44:106, 44:138 and 44:150 in that sequence. All courses below the 100-level are open to freshmen; 44:1, 44:2, 44:11, 44:19, 44:20, and 44:35 are available for science social science core credit.

Primarily for Undergraduates

44:1 Introduction to Human Geography 4 a.h.

Application of geographic principles in contemporary social, economic and political problems. Problems of the ethnic diffusion of Euro-Atlantic, Indian, and Negro societies.

44:3 Natural Environment and Men 4 a.h.

Social distribution of the world's natural resources including climate, water, minerals, soils, vegetation and water; human role in defining nature of resource base; economic and environmental evolution and its interaction with the natural environment; population pressure on agricultural resources, energy and mineral resource requirements and quality of environment.

44:11 Introduction to Environmental Issues 3 a.h.

Issues arising from human use of natural environment and related problems resulting from expanding world population; air, water and land pollution; population pressure on agricultural resources, energy and mineral resource requirements and quality of environment.

44:12 Introduction to Economic Geography 3 a.h.

Location and spatial organization of world's major types of economic activities and minerals, manufacturing, transportation and trade and service centers.

44:13 Introduction to Transportation Geography 3 a.h.

Basic concepts of transportation and their relationship to geography, spatial distribution and spatial structure associated with transportation.

44:14 Introduction to Urban Geography 3 a.h.

Processes of urbanization and city growth; spatial pattern and structure of urban activities; geographic considerations of contemporary urban problems; the city and its physical setting; comparative urban studies.

44:15 Readings for Undergraduates 3 a.m.

Supervised readings in geography. Prerequisite: credit in 44:1.

Courses for Undergraduates and Graduates

44:11 Introduction to Weather and Climate 3 a.h.

General distribution of weather elements, air circulation, air masses, and general world climate conditions including air pollution and climate change; laboratory work in study of weather maps and climatic data.

44:165 Geography in the School Curriculum 3 a.h.

Conception and creation of geographic material in effective educational program; methods of geographic inquiry; use of individual media in teaching geography.

44:167 Maps and Mapping 3 a.h.

Qualities of a good map or diagram; types of maps or diagrams for particular uses; major types of mapping; procedures for the compilation of maps and diagrams; laboratory experiments in cartographic drawing and compilation.

44:108 Introduction to Quantitative Methods in Geography 3 a.h.

Applications of mathematics and statistics in geography.

44:180 Computer Methods in Geographical Analysis 3 a.h.

Use of computer equipment and geographic analysis, various mapping programs including ENMAP, CALFMAP and others.

44:191 Introduction to Urban Transportation 3 a.h.

Urban transportation defining the urban transportation system and the urban transportation planning process; transportation problems, especially as evidenced in Iowa City. Same as 30:211.

44:193 Urban Political Geography 3 a.h.

Relationships between urban internal political behavior and the functional and geographical organization of urban political systems. U.S. metropolitan areas and the neighborhoods of citizens preferring the public goods and services.

44:194 Natural Environmental Issues 3 a.h.

Issues arising from human use of the natural environment and related problems resulting from expanding world population; air, water and land pollution; population pressure on agricultural resources, energy and mineral resource requirements and quality of the environment.

44:195 Natural Resources 3 a.h.

Human-environment relationships under adverse environmental conditions; causes, characteristics and consequences of extreme events such as earthquakes, floods, hurricanes, drought and floods; issues associated with these events, ranging from immediate responses to the details of occurrence and evacuation to long-term responses like the building of flood control, wind control, and irrigation.

44:211 Streams and Water: Processes and Resources 3 a.h.

Water as a resource and as an agent shaping the form of the land surface; characteristics of stream drainage; lateral and vertical hydrologic, floods and their interactions.

44:212 Geophysical Resources of the United States 3 a.h.

Nature and potential of regional differences in the natural resource base for agriculture and industry including; land, water and climate, environmental problems and conflicts arising from resource development.
Geology

Department chairman: Richard A. Heppie
Faculty: professors William Fennel, Ben Glaberson, Richard Heppie, Obert Kiger, George R. McCann, Horace Sandell, Kansas Stueen, Marshall Truex; associate professors Stanley Grant, George Halden, Walter Schrader; associate professors Richard Bailer, John Caron, Kenneth Clark, Lee Drake, Phil Hulac, Jeffery Schubel; research associates Hermit Stimpf

Geology is the theoretical and practical application of all scientific disciplines to the study of the earth. How the earth was formed, what it looks like now, how man acquired his material needs from it, and how man is changing it for future generations—all are geological concerns.

Career opportunities are available to professional geologists in industry, teaching, urban planning, geological and resource surveying, government and research organizations. The mineral's degree is regarded by many hiring agencies as the professional degree in geology. However, an undergraduate degree is fully satisfactory in certain teaching, liberal and industrial situations.

Many of Iowa's geology graduates find employment in the petroleum industry as exploration geologists. Others go on to graduate school or take jobs with government conservation agencies. Some intend to enter law, medicine or business. Others are interested in urban planning, environmental studies, engineering, archeology, wildlife education or cartography as advanced areas.

Geology is suited to all these.

The program at Iowa stresses theoretical geology and paleontology more than the engineering or agricultural phases of the discipline. The Department specializes in relating scientific thought to the study of the earth. Geology majors receive at least an academic year's work in basic scientific areas—physics, biochemistry, chemistry and mathematics—in addition to a core in each major area of geology.

Each year more than 1,000 students enroll in Earth Science 111:23 Earth History and Resources and 111:24 Man and His Physical Environment, a team-taught, laboratory-lecture course designed to fulfill the College of Liberal Arts requirement for natural science core studies.

Undergraduate Programs

Students expecting in geology must meet the general requirements of the College of Liberal Arts. It is recommended that they satisfy the language requirement with French, German or Russian, and the social science requirement with approved courses in economics, geography and/or anthropology.

Bachelor of Science Degree

The Bachelor of Science professional program is designed primarily as preparation for graduate study and for employment in industry. Required courses in this program (12:5 and 12:6) are the preferred introductory courses for geography majors.

Geology Courses

12:5 Introduction to Geology

12:6 Evolution of the Earth

12:41 Mineralogy

12:52 Elementary Petrology and Geochemistry

12:112 Geologic Field Methods

12:113 Summer Field Course

12:121 Principles of Paleontology

12:191 Structure Geology I

12:198 Junior Seminar

Two elective geology courses

Total credit hours: 37

11:23 and/or 11:24 may substitute for 12:5.

Supporting Sciences

The geology major requires at least ten semesters of college-level mathematics, including either one semester of calculus or 224:25 Engineering Mathematics I (computer science or statistics courses may be counted toward the ten-hour requirement), and eight hours of physics, eight hours of chemistry and five hours of college-level zoology or botany.

Bachelor of Arts Degree

The B.A. program is designed to provide a general background in geology, with a broader choice of electives than in the B.S. program, for students who are not planning to become professional geologists. With appropriate courses in education, the B.A. program provides a base for high school or community college
teaching. A general background in geology and allied fields is also applicable to interests in such areas as conservation and environmental problems. Course requirements (12:5 and 12:6 are the preferred introductory courses for geology majors):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:5</td>
<td>Introduction to Geology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>12:6</td>
<td>Evolution of the Earth</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>12:10</td>
<td>Geology and Air Photo Interpretation</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>12:11</td>
<td>Principles of Paleontology</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>12:116</td>
<td>Field Trip (two sections)</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>12:198</td>
<td>Junior Seminar</td>
<td>1 s.h.</td>
</tr>
<tr>
<td></td>
<td>Geology electives</td>
<td>12 s.h.</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>35 s.h.</td>
</tr>
</tbody>
</table>

Mathematics
Ten semester hours of university-level mathematics, which may include computer science or statistics.

Related Areas
Eight semester hours of chemistry, and recommended courses in other sciences and social sciences appropriate to the student's objectives.

The Junior Seminar
All geology majors take part in a once-a-week junior seminar designed to help consolidate accumulated knowledge in geology. The participating student chooses two staff members to work with and presents two papers to the class and faculty. Students present research results, reviews of topics in geology or analyses of current geologic events. Different faculty members provide each week, and student discussion is lively.

Joint Programs
Joint programs may be arranged, typically with chemistry, physics, zoology and anthropology.

Original Research
A junior or senior who is ready to pursue original research for credit may assist a faculty member or graduate student with a current research project, or initiate a small-scale project involving a combination of field, laboratory and library investigation. Independent study is encouraged. Undergraduate classes have produced term reports which subsequently were published.

The Honors Program
A degree "with Honors" in geology is offered. Students in the Honors Program can elect a senior thesis.

Graduate Programs
Students planning to take graduate work in geology should have completed geology and supporting courses equivalent to those required of undergraduate geology majors at Iowas. Deficiencies may be remedied at the beginning of graduate study. Geology Oceanography (12:107) is required for all entering graduate students.

All graduate students in geology are required to perform teaching, research or other appropriate services for the Department, as part of the degree program.

The Master of Science Degree
The M.S. degree programs are designed to complete the student's broad, fundamental background in geology and the supporting sciences. They prepare the student for a professional career in geology, or for more advanced and specialized studies—although in certain situations and with faculty approval the student may pursue a specialized program at the master's level.

The Department chairman assigns each entering graduate student to a faculty advisor and designates two additional faculty members to form the student's advisory committee. The committee is responsible for approving a suitable program of coursework, guiding the student in the development of research plans, and—before the end of the student's first year of residence—approving his or her thesis topic, if he or she is taking the degree with thesis.

The degree requires at least 30 semester hours of credit in graduate level coursework, including not more than eight semester hours of thesis and research credit, and at least 24 hours in residence at Iowa.

Master's degree candidates complete at least one-half of the Ph.D. language and tool requirements as part of the master's program. Coursework taken to satisfy these requirements does not count toward the semester-hour requirements for the degree.

To qualify for the final master's examination, the candidate must have at least a 2.75 (4.0 = A) grade-point average on University of Iowa graduate courses offered toward a degree.

The Master of Science Degree with Thesis
Students are encouraged to select thesis topics involving a variety of geological disciplines and scientific skills. Mapping themes are considered particularly appropriate. Other topics may be equally acceptable.

The Master of Science Degree without Thesis
Relatively few students are encouraged to pursue this program, which requires that the applicant have approximately three months' experience working under supervision of a professional geologist, or equivalent experience in some phase of geologic activity.

If possible the student should receive prior faculty permission to apply the experience toward the degree.

The student must submit a written report on the activity and on the geologic principles it involved and its value and broader implications and applications. No college credit is granted for this activity.

The M.S. degree without thesis requires at least 38 semester hours of graduate coursework, of which at least eight hours must be earned in other departments of the University.

The faculty in geology may also require the student to submit a formal scientific report dealing with an appropriate subject or project. Credit may be granted for this report.

The final examination covers coursework and work done in lieu of the thesis.
The Master of Arts in Teaching (Earth Science)
This program enables students to combine certification to teach secondary school with participation in a specialized graduate curriculum. Awarded by the College of Education, the M.A.T. degree requires at least 20 semester hours of graduate study in professional education and at least 18 hours of graduate coursework in earth science.

The Doctor of Philosophy Degree
The Doctor of Philosophy degree in geology requires at least 72 semester hours of graduate coursework, including at least two full-time semesters in residence beyond the first 24 hours of graduate study.

Departmental language and tool requirements for the Ph.D. degree may be met either by achieving competence in two languages or in one language and one tool, or by achieving proficiency in one language.

Competence is normally achieved by satisfactory completion of a one-year sequence of appropriate courses, proficiency by satisfactory completion of a two-year sequence.

French, German and Russian are languages which meet Departmental requirements; statistics and computer science are suitable tool areas. In exceptional circumstances, the faculty may approve other languages or tool areas.

Courses in such related disciplines as botany, chemistry, physics and zoology are not regarded as satisfying tool requirements, although they may provide indispensable background for the various areas of geological specialization.

Coursework taken to satisfy language and tool requirements may not be applied to credit requirements for the degree.

These are minimum requirements:

Satisfaction of course requirements for the M.S. degree in geology at Iowa. Where appropriate, additional work in one area may be approved as satisfying requirements in another.

An appropriate graduate course in another discipline. Courses crosslisted between geology and other departments are not generally considered to meet this requirement.

At least 24 semester hours of graduate coursework, exclusive of credits for dissertation research and beyond coursework applied toward the M.S. degree.

The comprehensive examination covers—in depth—all subdivisions of one major field and one subdivision in each of three other major fields. It is also presumed that the doctoral candidate is proficient in the basic elements of general geology, as presented by current elementary textbooks. These are the major and minor fields:

Economic Geology
Petroleum
Economic Minerals
Exploration Geophysics

Petrology-Mineralogy
Mineralogy
Igneous and Metamorphic Petrology
Experimental Petrology

Structural Geology
Geotechnics
Structural Analysis
Remote Sensing

Sedimentary Geology
Physical Stratigraphy
Biostratigraphy
Depositional Environments

Sedimentary Petrology
Sedimentation
Sedimentary and Carbonate Petrology
Physical Sedimentology

Pliocene Studies
Pliocene Geology
Varves and Palaeontology
Palynology

Palaeontology
Palaeeoecology
Palaeoecology
Biostratigraphy

Geomorphology
General Geomorphology
Geomorphology
Remote Sensing

Environmental Geology
Ground Water
Remote Sensing
Ecology

Other Minor Subject
Botany
Zoology
Chemistry
Physics
Geography
Hydrology
Archaeology-Antropology
Science Education
Others
Cooperative Activities

The Department has joint professorships with the Iowa Geological Survey and the Department of Botany and Zoology. It also undertakes work on projects for the survey.

There is also cooperation between the geology, geography, anthropology, chemistry, botany, zoology and physiology departments in service, expertise, joint instruction and equipment.

Field Trips

Field trips are integral parts of several courses in geology. Weekend general-interest events are frequent. Iowa City is situated in the midst of the richly fossiliferous Paleozoic bedrock. Marine and terrestrial fossil assemblages, extensive reefs and unique geologic features are available within a few hours' drive. All four Pleistocene glaciations are represented in Iowa, and each offers distinctive landforms and fossil assemblages.

Spring breaks provide time for longer trips which are available to all geology students. In recent years these have included the Grand Canyon, the Florida Keys, the southern Appalachians, the Big Bend Region of Texas and the Ozarks. Advanced courses for seniors and graduate students visit Colorado, Ontario, Kansas, Oklahoma and California.

Courses

Primarily for Undergraduates

121 Lecture in Earth History and Geosystems 2 a.h.
Not open to those who have had Core 1123, 123, 123 or 126.

125 Lecture in Man and His Physical Environment 2 a.h.
Not open to those who have had Core 1123, 121 or 123 except seniors and graduate students on and after earth and physical courses by which they evolved. Registration of one is left to the discretion of the instructor.

123 Principles of Physical Geology 2 a.h.
Introductory course focusing on processes that have generated and currently are shaping our physical environments. Emphasis on landforms and the processes that have created them. Geologic maps, surface features, structure, rocks, earthquakes, volcanoes, plate tectonics, and internal processes will be studied.

126 Introduction to Geology 2 a.h.
Lectures and laboratory include rocks and minerals, weathering, soils, erosion, stream systems, glaciation, mountain building, earthquakes and interiors of the earth; soil profile studies subject to change. Recommended for science majors and interested non-science majors. Not open to students who have had Core 1123, 121 or 123.

126 Evaluation of the Earth 2 a.h.
Lecture and laboratory, discussions and field trips, covering the broad and interrelated aspects of the earth's environment and history. Topics include origin of the earth, history and evolution of the earth's structure, dating of geologic events, ecological processes, weathering and soils, and human influence on the earth's systems and methods of study. Not open to students who have had 126.

126 Geology 4 a.h.
Survey of geological features in the state; for students whose work has provided previous courses in geological lectures and field trips.

126 Honors Thesis in Geology arr.
Prerequisite: consent of the Department.

126 Field Trip 2 a.h.
Serves for no credits in science majors: subjects of rocks, soils, valleys, glaciers, soils, stream systems, mountain building, earthquakes, plate tectonics, and internal processes will be studied.

126 Evaluation of the Earth 2 a.h.
Lecture and laboratory, discussions and field trips, covering the broad and interrelated aspects of the earth's environment and history. Topics include origin of the earth, history and evolution of the earth's structure, dating of geologic events, ecological processes, weathering and soils, and human influence on the earth's systems and methods of study. Not open to students who have had 126.

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Survey of geological features in the state; for students whose work has provided previous courses in geological lectures and field trips.

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Prerequisite: consent of the Department.

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Lecture and laboratory, discussions and field trips, covering the broad and interrelated aspects of the earth's environment and history. Topics include origin of the earth, history and evolution of the earth's structure, dating of geologic events, ecological processes, weathering and soils, and human influence on the earth's systems and methods of study. Not open to students who have had 126.

126 Geology 4 a.h.
Survey of geological features in the state; for students whose work has provided previous courses in geological lectures and field trips.
German

Department chairman: Edward Diversity

Faculty members: Edward Diversity, John A. and Mary, professors; Edward Diversity, associate professor; Edward Diversity, assistant professor; Edward Diversity, research assistant; Edward Diversity, research assistant.

The primary function of the Department of German is to transmit to American liberal arts students knowledge of the language and literature, the civilization and culture traditionally designated as German, as, for example, in East and West Germany, Austria and Switzerland.

University graduates with a major in German frequently enter the teaching profession. They may also find positions in government, foreign service and commercial enterprise, where their specialized knowledge of the language and literature, the history and culture of Germany is indispensable.

The Undergraduate Program

Advanced Placement

Normally, for purposes of tentative placement, two units of high school language instruction are considered equivalent to one unit on the college level. For example, a student who has completed 2 years of high school German language instruction is ordinarily expected to register for the second year of college German (13-21 Second-Semester German) if such a student is not sufficiently prepared for 13-21, he or she can secure permission to register for 13-12 Second-Semester German. Minimum placement exams may be given to students for whom the regular procedure does not seem suitable. In addition to the general requirements of the College of Liberal Arts (see "College of Liberal Arts"), students majoring in German are normally required to complete a minimum of 24 semester hours of coursework in the Department beyond the 15 semester-hour basic program. The following coursework sequence or the equivalent is required of majors who have had no previous experience with the German language:

Basic Program

First and Second Year

13-11 First-Semester German 3 s.h.
13-12 Second-Semester German 3 s.h.
13-21 Third-Semester German 3 s.h.
13-22 Fourth-Semester German: Reading 3 s.h.
13-23 Fourth-Semester German: Elementary Composition and Conversation 3 s.h.

(13-12 and 13-22 may be taken concurrently, if desired, or in sequence.)

Third Year

13-31 Introduction to Modern German Literature I 3 s.h.
13-32 Introduction to Modern German Literature II 3 s.h.
13-33 Intermediate Composition and Conversation I 3 s.h.
13-34 Intermediate Composition and Conversation II 3 s.h.

(13-31 and 13-33, and 13-32 and 13-34 may be taken concurrently.)

Fourth Year

13-101 German Syntax 3 s.h.
13-105 German Cultural History 3 s.h.
13-111 Survey of German Literature I 3 s.h.
13-112 Survey of German Literature II 3 s.h.
Courses are to be taken in sequence after initial placement, unless a variation in the sequence is approved by the faculty.

Students who intend to go on for an advanced degree are encouraged to add 13:103 German Phonology (three semester hours) to the above.

German majors, graduate as well as undergraduate, are urged to supplement their degree programs with 16:141 and 16:142 (German History courses).

A student who handles German with native proficiency may declare German as a second major but is expected to complete a full first major in a subject in which he or she has no such obvious advantage over his or her peers.

Teacher Certification
Because the College of Education requirements for teacher certification are subject to change and could conflict at times with the sequential requirements of the major in German, it is imperative that the student consult with the Department chairperson or undergraduate advisor to help ensure the successful completion of the certification program.

The Teaching Minor
In addition to the basic program of the first and second year, these courses or their equivalents constitute a teaching minor in German:

- 13:31 Introduction to Modern German Literature I
- 13:32 German Grammar
- 13:33 Intermediate Composition and Conversation I
- 13:34 Intermediate Composition and Conversation II
- 13:101 German Style/Issues

Honor in German
German majors of junior or senior standing with a grade-point average of at least 3.0 overall and 3.3 in German may enroll in this program.

During the junior and senior years the honor student in German is expected to engage in extra readings, discussions and the writing of a term paper (if feasible) for each of the courses in which he or she is enrolled. A senior essay, written under the supervision of a faculty member, and a comprehensive oral examination terminates the program.

Special Facilities
Students have the opportunity to improve their comprehension and command of German by working with recorded materials in the Language Media Center. Students may also benefit from our new Computer Assisted Instruction program.

An extensive collection of works and periodicals in the University Library facilitates research in all major areas of German literature and Germanic linguistics at all levels of study.

Foreign Study
The Department of German participates in the Summer Program in Austria and Germany. Sponsored by the three Iowa Regents Universities, this Program is open to students of all disciplines. The Program is designed to provide a sound linguistic, cultural, and academic experience in all parts of Germany.

The Summer Program consists of an 8-week experience in Austria and Germany. The first 3-week session is conducted at St. Radegund, near Graz, Austria. Instruction in both language and culture is provided on three levels—intermediate, advanced, and very-advanced. A second 4-week session is held in Vienna where faculty of the International University at the University of Vienna conduct morning classes daily, again on several levels. A 10-day tour of Germany and Austria concludes the program.

To be admitted to either program, the prospective participant must qualify for admission to one of the three Iowa Regents Universities, and must have completed a minimum of 12 semester hours (or the equivalent) of college-level German.

Tuition grants and loans are available for qualified applicants. For further information, write to the Department of German, The University of Iowa.

Graduate Study Requirements

Master of Arts Degree with Thesis
Graduate students of German who demonstrate an interest in and potential for productive scholarship and who plan to continue to the doctorate should elect the program with thesis. The thesis program requires a minimum of 30 semester hours, or equivalent, of graduate-level work. If the student has not completed major courses, or equivalents, in the Department's undergraduate program, he or she will include them along with the courses required for the Master of Arts. Under some circumstances, the candidate may qualify for graduate credit for such make-up work.

Additional courses are selected with the approval of the graduate advisor.

With the graduate advisor's approval, some of the 30 semester hours required for the degree may be taken outside the Department, in such related subjects as philosophy, history, linguistics or other languages.

Normally two semester hours of credit may be received for satisfactory completion of the thesis. The thesis may be either linguistic or literary, and is subject to the approval of the faculty.

Students planning to go on to the Ph.D. degree are required to write a thesis unless they have Department approval to do otherwise.

Before the M.A. exam can be administered—usually after acceptance of the M.A. thesis, the candidate must show a competence level in a foreign language other than German equivalent to two years of college study or four years of high school study, with a grade of "B" or higher.

M.A. Degree Without Thesis
A graduate student who desires his or her program to be oriented in the direction of optimum preparation for secondary school teaching, government service, translation, etc., may elect the one without thesis. This program requires a minimum of 38 semester hours of coursework and is considered terminal. The same course requirements outlined for the M.A. with thesis apply to candidates for the M.A. without thesis; however, students in this program should, with the approval of the graduate advisor, choose those courses which will best prepare them.

Suggested Courses for the Master of Arts Degree

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:102</td>
<td>Advanced German Style/Issues</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:103</td>
<td>German Phonology</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:201-2</td>
<td>German Prosèenier</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>13:285</td>
<td>Goethe</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

Any one of the following:

- 13:241 History of the German Language 3 s.h.
- 13:243 Middle High German 3 s.h.
- 13:245 Old High German 3 s.h.
Any one of the following:
15:251 Early German Literature 3 s.h.
15:261 German Literature of the Renaissance and Reformation 3 s.h.
15:271 German Literature of the Baroque 3 s.h.

Any one of the following:
15:182 Lessing 3 s.h.
15:281 The Age of the Enlightenment and the Early Period of Storm and Stress 3 s.h.
15:286 Schiller 3 s.h.

Any one of the following:
15:291 German Romanticism 3 s.h.
15:294 German Realism 3 s.h.
15:295 Naturalism, Impressionism and Expressionism in German Literature 3 s.h.

Doctor of Philosophy Degree
The Ph.D. degree is awarded upon the satisfactory completion of 30 semester hours of graduate credit or the equivalent beyond the requirements for the M.A. degree, and fulfillment of other requirements of the Department of German and the Graduate College (see "Graduate College"). The candidate may concentrate in either Germanic linguistics or Germanic literature.

Credit received toward the M.A. degree may be applied to the Ph.D. The remainder of the program is planned by the candidate in consultation with the graduate advisor in such a way as to ensure satisfactory balance and concentration. The student may earn up to 12 additional semester hours of credit for satisfactory completion of the Ph.D. dissertation. Some graduate courses outside the Department in related subjects may be counted toward the degree with the approval of the graduate advisor. Wherever possible the Department will afford the opportunity and privilege to deserving graduate students to gain valuable teaching experience under supervision by making available such awards as teaching-research fellowships, teaching assistantships, etc.

A candidate concentrating in literature must demonstrate a reading knowledge of French and of another language which his or her adviser certifies is pertinent to the student's research interests. A reading knowledge of French or Russian and of a modern Scandinavian language or Dutch is required of all doctoral candidates in Germanic linguistics. Competence in these languages may be demonstrated by two years of college study or four years of high school study, with a grade of "B" or higher, or through testing by the Department. The requirements must be met before the comprehensive exams can be administered.

Courses
Primarily for Undergraduates
13:11 First-Semester German 3 s.h.
Student has the option to take 13:11A, 13:11B, and 13:11C. Reading Approach: emphasis on reading and basic structure of the language, or (b) Composition: emphasizes on helping the person to become familiar with the language through listening and speaking, with one additional hour of language laboratory per week.
13:12 Second-Semester German 3 s.h.
Consists of 13:11, with some aspects of either approach. Greater emphasis on pronunciation, vocabulary.
13:13 Intensive Elementary German 6 s.h.
Consists normal first and second semester courses. Additional hours of language laboratory will be required. Undergraduates only.

15:17 German Hermes and Erotic Literature of the Middle Ages 4 s.h.
Requirements of this period, including
Parzel, Die Nibelungenlied, and Themen, read in English translation; satisfies one general-education requirement in literature; also designated for honors majors and may be taken by other interested undergraduates. Same as Core 11:17.
15:21 Third-Semester German 3 s.h.
Basic structure of German language reviewed; emphasis on exact reading, basic conversation and composition. Students may also take 15:21 in "Business German" course (meeting, reading and grammar). No business background required. (A student who has had all three parts of the basic course sequence, 15:11, 15:12 and 15:21 or equivalent, has the option of taking either 15:22 or 15:23 for his or her fourth semester. Courses 15:22 and 15:23 in no way duplicate each other, so may be taken concurrently or in sequence for full credit.)
15:22 Fourth-Semester German: Reading 3 s.h.
Standard fourth-semester course; satisfies foreign language requirement for B.A. degree; reading of short but representative literary works.
15:22 Fourth-Semester German: Elementary Composition and Conversation 3 s.h.
Also satisfies foreign language requirement for B.A. degree; recommended for students who want further training in active use of the language; emphasis on writing compositions, carrying on conversations in German, etc.
15:28 Intensive Second-Year German 6 s.h.
Consists normal third and fourth semester courses. Emphasis on speaking as well as reading. Additional hours of language laboratory will be required. Undergraduates only.
15:31 Introduction to Modern German Literature I 3 s.h.
Reading and discussion of representative German authors whose works influence modern times. Prerequisite: 15:22 or equivalent. Same as School of Letters 108:31.
15:32 Introduction to Modern German Literature II 3 s.h.
Continuation of 15:31. Prerequisite: 15:31 or equivalent. Same as School of Letters 108:32.
15:33 Intermediate Composition and Conversation I 3 s.h.
Précis in translation of selected English texts, preparing of German texts, learning of German conversational patterns, intensive study of word comprehension and oral expression. Prerequisite: 15:22 or equivalent.
15:34 Intermediate Composition and Conversation II 3 s.h.
Continuation of 15:33, with more emphasis on original composition and comprehension speaking. Prerequisite: 15:33 or equivalent.
15:35 South German Feast 3 s.h.
Reading, discussion of Part I of Faust. Same as School of Letters 108:33 and Speech German 15:35.
15:98 Honors Program in German er.

For Undergraduates and Graduates
(Some of the courses listed below are offered at irregular intervals)
15:100 Individual German er.
Open only to German majors and minors.
15:121 German Realities er.
Oral and written exercises; required of undergraduate German majors and minors. Prerequisite: 15:100.
12:102 Advanced German Stylistics er.
Literary composition, vocabulary building, exercises in comprehension, skills. Primarily for first-year graduate students; permission of instructor required. May be repeated for credit. Prerequisite: 15:110 or 15:210.
15:103 German Phonology er.
Analysis of sound system of German language and introduction to problems of German phonology and syntax, basic linguistics course. Same as School of Letters 110:143.
15:105 German Cultural History er.
Brief history of Germany from earliest beginnings to present, with special emphasis on development of art, philosophy and literature.
15:107 Teaching of German as a Second Language er.
On-the-job training course for graduate teaching assistants in the Department.
15:108 Margarete Program Advanced er.
A study-week of the German language and culture in Austria and Germany. Given in alternate years. Prerequisite: 15:12 er. for college-level German or the equivalent.
15:111 Survey of German Literature I 3 s.h.
Requirements for the survey program as in 15:17. Prerequisite: 15:12 or equivalent. Same as School of Letters 108:121.
A minimum of 16 to 18 semester hours in related courses in anthropology, economics, fine arts (excluding studio courses), geography, literature (excluding workshop courses), philosophy, political science, psychology, religion, and sociology; or by a second major in one of these areas. Core courses and courses taken to satisfy core requirements will not be counted toward the related-areas requirement.

It is recommended but not required that the student pursuing the general major meet the College of Liberal Arts historical-cultural-core requirements with either 11:25-30 Problems in Human History, 11:31-32 Western Civilization, or 11:35-36 Civilizations of Asia.

Prospective Transfer in History
To enroll in this program, the student must secure approval from one of the advisors (in the College of Education) for majors who intend to become teachers. The program requirements are:

- At least 18 semester hours in courses offered by the History Department, including at least eight hours in American history and at least three hours in ancient world or medieval European history.
- At least 24 semester hours of work in basic courses in three of these areas of the social sciences: anthropology, economics, geography, political science, and sociology; courses taken to fulfill the core requirements will not be counted toward this requirement.
- Required courses in teaching methods and practice teaching. (See "College of Education.")

Honors
The honors major is for students of superior ability who want an extremely flexible program enabling them to pursue special interests and enjoy the experience of individual research. To undertake the honors major in history, the student must be admitted to the College of Liberal Arts Honors Program by the director of that program, and to the Honors Program in History, by the department. Application usually must be made by the beginning of the junior year, and may be made earlier. Successful completion of the honors major leads to the Bachelor of Arts degree with Honors in History. Requirements are:

- A minimum of 24 semester hours of work in history, with at least nine hours in the department's honors offerings, which may include up to six semester hours of honors thesis credit. Colloquium courses may also be counted for honors credit in lieu of honors seminars.
- Related courses outside the department (same as regular major requirement).
- Successful completion and oral defense of an honors thesis.
Graduate Study

The graduate programs in history prepare students to teach in high schools or colleges, and for such occupations as publishing, commercial research, and government or other public service. With additional specialized training, students of history become qualified for careers in archival work, library work, or historical site preparation and display. Some students enter the program leading to degrees in both law and history (see "College of Law").

Qualified graduate students are invited to apply for fellowships and assistantships. Inquiries should be directed to the departmental office.

The Master's Degree

There are two M.A. programs in the History Department. The first is for students who plan to work for the Ph.D. degree. It requires a minimum of 30 semester hours of credit, including the completion of a research essay. The candidate must earn at least 24 semester hours of credit in history, two-thirds, including at least one seminar, must be in the area of the student's essay topic, and at least six must be in a second division, including either a seminar or a readings course.

The essay in the major division is based on original research and should be in the vicinity of 10,000 to 15,000 words in length, depending on the magnitude of the subject. Work on the essay will normally begin in the semester in the major division and be continued with 16:256 Individual Graduate Study, in which rewriting will be completed under the guidance of the supervisor. In exceptional cases where the essay completed in seminar is judged to be of outstanding quality, other courses may be substituted for Individual Study.

Students who complete the M.A. under the alternative plan may not become candidates for the doctorate in history. The M.A. candidate must earn at least 34 semester hours of credit in history. Of these, at least 12 must be taken in one division, and must include at least one seminar or seminar course. The program must also include at least six semester hours in each of two other divisions in history, or six hours in one other division in history and six hours in a related department. These hours must include at least one readings or seminar course in history.

After completing these requirements, or in the semester in which they are to be completed, the M.A. candidate must take an oral and written comprehensive examination in the major division.

Doctor of Philosophy

Students who earn the M.A. with research essay are admitted to the Ph.D. program upon the favorable recommendation of the examining committee. Students who earn an M.A. at another university must meet the general requirements for admission to the Graduate College (see "Graduate College") and must submit a specimen of their writing, such as a seminar paper or an M.A. thesis.

The candidate must earn at least 72 semester hours of credit, including credit for work done toward the master's degree. The 72 semester hours must include at least 24 semester hours in 200-level courses in history, apart from thesis credit. At least 16 of these 24 hours must be completed before taking the comprehensive examinations, and at least 16 of these 24 hours must be completed at The University of Iowa. The candidate must also earn two semester hours of credit in the philosophy of history, historiography, or methodological research. The department has no common language requirement for the Ph.D., but the supervisor may require the candidate to demonstrate a reading knowledge of one or more foreign languages and proficiency in the use of other tools of study. The candidate may not complete the comprehensive examination until these requirements have been met.

The comprehensive written and oral examination will cover four distinct fields, at least three of them in history. The fields in history must be chosen from at least two different divisions among these:

- The Ancient World
- Medieval Europe
- Europe, 1500 to 1815
- Russia and the Soviet Union
- United States History
- Latin American History
- History of China
- History of Japan
- History of India

The committee may define and delimit the individual fields for examination. It may also set, separately for each field, the character of the written portion of the comprehensive examination, which may take the form of a syllabus, a critical bibliography, a topical paper, or any other form or combination of these or other forms that the committee deems suitable. The oral portion of the comprehensive examination will focus on issues and problems arising from the examination papers.

Graduate Admission

All applicants for admission, whether for the M.A. or the Ph.D. degree, must meet the general requirements for admission to the Graduate College. In addition, they must submit a specimen of their writing—such as a term paper, seminar paper, or M.A. thesis— to the History Department. All applications for graduate awards are considered at the time of the individual's application for admission. Applications for admission are due April 15 and November 10 for the following semesters. An applicant must take the Graduate Record Examination (aptitude test) in order to be considered for admission. An undergraduate history major is not required for admission to the graduate program.

Guide to Graduate Study

Further information on graduate study is contained in the department's Guide to Graduate Study sent to all applicants for admission. The Guide is revised every spring to include the latest changes in the faculty, the courses to be offered the following year, and the research interests of the members of the faculty, as well as detailed regulations on study-toward advanced degrees and other information of interest to prospective students.

Special Facilities

The University Library is strong in all aspects of U.S. history. It houses the Henry A. Wallace papers and related collections, as well as other historical materials. In European history, the special strengths are in French and English materials. The Iowa State Historical Society in Iowa City and the Herbert Hoover Presidential Library in West Branch possess additional research materials

of great value.

Courses

All courses numbered below 200 are open to business provided they have already satisfied the liberal-cultural requirements.
Most courses numbered below 200 are offered to freshmen students. Most courses numbered 200 and above are offered to sophomore students.

16:631 College for History Majors: American 3 s.h.

Offered every semester. Topics in U.S. history varying with the instructor. Fulfill this 360 s.h. requirement by all majors. Open to other than history majors by consent of instructor. May be repeated.

16:637 Curriculum for History Majors 3 s.h.

As 15:20, but with topics in European or Asian history varying with the instructor.

16:641 Introduction to Afro-American History 3 s.h.

A cultural history of the black United States approached through literature, the humanities, and the social sciences. Same as American Civilization 4534.

16:641 American History 1450-1777 3 s.h.

First half of the introductory sequence in the history of the American people.

16:642 American History 1777-1860 3 s.h.

Continuation of 16:641 may be taken independently.

16:724 Religion in American History 1700-1860 3 s.h.

Development of religious thought, noting early influence of the Puritans in the 17th century. Same as Religion 2272.

16:725 Religion in American History 1860-1930 3 s.h.

Development of religious thought and life from the Great Revival to "cultural history." Same as Religion 2275.

16:86 Culture and Politics of Latin America 3 s.h.

Emphasis on an awareness of social and institutional continuity from colonial times to the present.

16:91 Individual Study-Undergraduate 3 s.h.

Rated for students who wish to pursue subjects beyond the required curriculum. Prior arrangement with individual instructor is necessary. May be repeated.

16:94 Honors Tutorial 3 s.h.

16:96 Historical Background of Contemporary Issues 3 s.h.

Varying topics, depending on instructor.

16:100 Historical background of the present conflict 3 s.h.

May be repeated with the consent of the instructor.

16:11 Individual Study-Undergraduate 3 s.h.

Intended for students who wish to pursue subjects beyond or not available in existing courses. Prior arrangement with individual instructor is necessary. May be repeated.

16:12 Honors Tutorial 3 s.h.

Individual study for honors majors. May be repeated.

16:13 Honors Tutorial 3 s.h.

Supervised research and writing. May be repeated.

16:14 Honors Tutorial: Problems in European History 3 s.h.

Colloquium for honors majors. May be repeated.

16:14 Honors Tutorial in European History 3 s.h.

Colloquium for honors majors. Problems in Euro-American History. May be repeated.

16:15 Survey of Ancient Near East and Greece 3 s.h.

Survey of the ancient Near East and Greece civilization from its rise in antiquity to the end of Alexander the Great.

16:16 The Modern World and Russia 3 s.h.

Social, economic, political, and intellectual history of the Euro-Russian world from 1860 to the present. Same as Russian Civilization 4536.

16:17 National and Religious Resistance to Ancient Empires 3 s.h.

Study of the phenomena of Non-Biblical, Prehistoric and Biblical empires, and in Italy under the Roman Empire.

16:18 Religion in Medieval Europe 3 s.h.

Includes a study of major themes in medieval thought, including the growth of the monastic ideal, the development of lay religious communities, and the rise of the universities.

16:19 Survey of Early Medieval Civilization 3 s.h.

Society, economy, and cultural life of the Western Roman Empire from the 3rd century B.C. to 500 A.D. May be repeated.

16:20 Survey of Latin American Civilization 3 s.h.

Europe from High Middle Ages to Renaissance, with emphasis on medieval thought and institutions. Continuation of 16:11, may be taken independently.

16:21 Survey of Eastern Civilization 3 s.h.

Society, economy, demographics, and political and cultural changes, 500-1500, emphasis on impact on such groups as peasants, kings, women, students, merchants, artisans.

16:414 Foundations of English Law 3 s.h.

From the origins of the common law to early modern times.

16:115 Medieval England 1066-1485 3 s.h.

16:116 History of the English Church 3 s.h.

16:117 Medieval France 3 s.h.

Social, political, and institutional history of the Feudal and French monarchy, 5th to 16th century.

16:118 Readings in French Medieval History 3 s.h.

Documentary course, based on historical novels and chronicles in translation, dealing with French history from the 10th to the 15th centuries. Prerequisite: 16:117 or 16:118 or French 5102.

16:130 Tradition and Technology (300-Pre-1800) 3 s.h.

Conceptual and cultural problems of modernization; emphasis on the Intransitives and their impact on science and technology.

16:131 Early Modern Europe 1500-1848 3 s.h.

Europe from the Reformation through the Thirty Years' War.

16:132 Early Modern Europe 1648-1815 3 s.h.

Europe from the Peace of Wimpole to the Congress of Vienna.

16:133 Age of the Renaissance 3 s.h.

A study of the transition from medieval to early modern Europe, with emphasis on Italy, France, and Spain from the early 15th to the late 16th century.

16:134 Religion and Revolution 1500-1700 3 s.h.

European political, social, and economic developments and their impact on religion; emphasis on how individuals in this era affected their lives in terms of everyday life.

16:135 Dynasties, States, and Corporations 3 s.h.

Discuss such dynasties as the Habsburgs, Stuarts and Sais, Bourbon, Spain, and others; theories and practices of the state and nobility, 1500-1700.

16:136 Renaissance and European Intellectual Paradoxes 3 s.h.

Institutional changes underlying basic aspects of European life, 1400-1600, including the changing economy, humanism, science, art, and politics.

16:137 17th-Century European Intellectual Paradoxes 3 s.h.

Institutional changes underlying basic aspects of the 17th century, including the rise of the scientific revolution, the rise and decline of the Counter-Reformation, and the Baroque.

16:138 Germany: 1500-1789 3 s.h.

Survey of German and Imperial history from the Peace of Augsburg to the outbreak of the Revolution of 1848.

16:139 French Revolution and Napoleon 3 s.h.

Survey of the French Revolution and Napoleon, principal events in France, impact of the Revolution on Europe.

16:140 Early Modern England 1350-1700 3 s.h.

England before and after the Industrial Revolution.

16:141 England: Revolution to Civil War 1640-1660 3 s.h.

Political and social consequences of the English Reformation and the economic development of the 16th and early 17th centuries.

16:142 England: Civil War to the American Revolution 1649-1776 3 s.h.

England's war with the execution of King Charles I and the American Revolution.

16:143 European Women: Sex, Society, and Culture 3 s.h.

A consideration of women's roles in European Life since 1500.

16:144 Social Movements and Politics 3 s.h.

Minor factors in European history: political, economic, social, and intellectual.

16:145 Twentieth Century Europe 3 s.h.

Minor factors in European history: political, economic, social, and intellectual.

16:146 Europe During World War II and After 3 s.h.

16:147 History of Western Literature 3 s.h.

Same as French Civilization 1571.

16:148 History of France 1918-Present Continuation of 16:146 may be taken independently.

16:149 History of Russia 1780-1850 3 s.h.

16:150 Modern Scandinavian 3 s.h.

16:151 Modern English 1780-1850 3 s.h.

16:152 Modern German 1807-Present 3 s.h.

16:153 Modern French 1940-Present 3 s.h.

16:154 Modern Russian 1940-Present 3 s.h.

16:155 Modern Greek 1940-Present 3 s.h.

16:156 Modern Italian 1940-Present 3 s.h.

16:157 Modern Spanish 1940-Present 3 s.h.

16:158 Modern Chinese 1940-Present 3 s.h.

16:159 Latin American Languages and Literatures 3 s.h.

16:171 Modern Comparative Literature 3 s.h.

16:172 Modern Comparative Literature 3 s.h.

16:173 Modern Comparative Literature 3 s.h.

16:174 Modern Comparative Literature 3 s.h.

16:175 Modern Comparative Literature 3 s.h.

16:176 Modern Comparative Literature 3 s.h.

16:177 Modern Comparative Literature 3 s.h.

16:178 Modern Comparative Literature 3 s.h.

16:179 Modern Comparative Literature 3 s.h.

16:180 Modern Comparative Literature 3 s.h.
**Food and Nutrition**

This program prepares students for careers in dietetics, in the food industry, and for service with community and government agencies.

**Required:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:131</td>
<td>Food Study</td>
<td>2 h</td>
</tr>
<tr>
<td>17:132</td>
<td>Food Service Laboratory</td>
<td>2 h</td>
</tr>
<tr>
<td>17:133</td>
<td>Food Management</td>
<td>3 h</td>
</tr>
<tr>
<td>17:134</td>
<td>Experimental Food I</td>
<td>3 h</td>
</tr>
<tr>
<td>17:135</td>
<td>Experimental Food II</td>
<td>3 h</td>
</tr>
<tr>
<td>17:145</td>
<td>Advanced Nutrition</td>
<td>3 h</td>
</tr>
<tr>
<td>17:142</td>
<td>Nutrition</td>
<td>3 h</td>
</tr>
<tr>
<td>17:190</td>
<td>Seminar: Home Economics</td>
<td>2 h</td>
</tr>
<tr>
<td>4:1</td>
<td>Principles of Chemistry I</td>
<td>3 h</td>
</tr>
<tr>
<td>4:4</td>
<td>Principles of Chemistry II</td>
<td>3 h</td>
</tr>
<tr>
<td>4:8</td>
<td>Elementary Chemistry Laboratory I</td>
<td>2 h</td>
</tr>
<tr>
<td>4:121</td>
<td>Organic Chemistry I</td>
<td>3 h</td>
</tr>
<tr>
<td>4:141</td>
<td>Intermediate Chemistry Lab I</td>
<td>2 h</td>
</tr>
<tr>
<td>6:1157</td>
<td>General Microbiology</td>
<td>4 h</td>
</tr>
<tr>
<td>72:13</td>
<td>Introduction to Human Physiology</td>
<td>4 h</td>
</tr>
<tr>
<td>99:120</td>
<td>The Chemistry of Biological Materials</td>
<td>3 h</td>
</tr>
<tr>
<td>99:130</td>
<td>Metabolism</td>
<td>3 h</td>
</tr>
</tbody>
</table>

One course from each of the following areas:

- Design and housing
- Family economics
- Textiles and clothing

Electives should be selected from home economics and the natural sciences.

**Concentration in nutrition with emphasis on dietetics requires:**

<table>
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<td>3 h</td>
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<tr>
<td>17:135</td>
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<td>3 h</td>
</tr>
<tr>
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</tr>
<tr>
<td>4:4</td>
<td>Principles of Chemistry II</td>
<td>3 h</td>
</tr>
<tr>
<td>4:6</td>
<td>Principles of Chemistry II</td>
<td>3 h</td>
</tr>
<tr>
<td>4:8</td>
<td>Elementary Chemistry Laboratory I</td>
<td>2 h</td>
</tr>
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<td>General Microbiology</td>
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</tr>
<tr>
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<td>Introduction to Human Physiology</td>
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</tr>
<tr>
<td>99:130</td>
<td>Metabolism</td>
<td>3 h</td>
</tr>
</tbody>
</table>

Elective courses in the following areas:

- Food study
- Food Service Laboratory
- Food Management
- Experimental Food I
- Experimental Food II
- Principles of Chemistry I
- Principles of Chemistry II
- Elementary Chemistry Laboratory
- Organic Chemistry I
- The Chemistry of Biological Materials
- Metabolism
- Principles of Economics
- Employment Relations in the Public Sector
- Educational Psychology and Management

Educational Psychology 3-4 h

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>34:1</td>
<td>Educational Psychology</td>
<td>3-4 h</td>
</tr>
<tr>
<td>34:1</td>
<td>Introduction to Sociology: Principles</td>
<td>4 h</td>
</tr>
<tr>
<td>31:1</td>
<td>Elementary Psychology</td>
<td>4 h</td>
</tr>
<tr>
<td>61:157</td>
<td>General Microbiology</td>
<td>4 h</td>
</tr>
<tr>
<td>72:13</td>
<td>Introduction to Human Physiology</td>
<td>4 h</td>
</tr>
<tr>
<td>113:3</td>
<td>Introduction to the Study of Culture and Society</td>
<td>4 h</td>
</tr>
</tbody>
</table>

**Family Development**

This program prepares students for careers in family studies and为目标的其他家庭和社会服务.

**Required:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:10</td>
<td>Growth and Development of the Young Child</td>
<td>3 h</td>
</tr>
<tr>
<td>17:111</td>
<td>Management of Family Resources</td>
<td>3 h</td>
</tr>
<tr>
<td>17:112</td>
<td>Family Economics</td>
<td>3 h</td>
</tr>
<tr>
<td>17:114</td>
<td>Parent-Child Relationships</td>
<td>3 h</td>
</tr>
<tr>
<td>17:115</td>
<td>Parent-Child Relationships</td>
<td>3 h</td>
</tr>
<tr>
<td>17:119</td>
<td>Directed Studies in Family Develop- ment</td>
<td>3 h</td>
</tr>
<tr>
<td>17:122</td>
<td>Materials and Methods in Family Life Education</td>
<td>3 h</td>
</tr>
<tr>
<td>17:190</td>
<td>Seminar: Home Economics</td>
<td>3 h</td>
</tr>
<tr>
<td>21:1</td>
<td>Elementary Psychology</td>
<td>4 h</td>
</tr>
<tr>
<td>34:1</td>
<td>Introduction to Sociology: Principles</td>
<td>4 h</td>
</tr>
</tbody>
</table>

One course from the following areas:

- Design and housing
- Family economics
- Textiles and clothing

Electives from education, social work, psychology and sociology are recommended.
Home Economics Education
This program leads to certification and vocational approval in home economics. Students are qualified to teach home economics in vocational and nonvocational secondary schools, to work in home economics extension and other agencies, and to teach in nonschool settings. Students must be admitted to the teacher education program and complete the professional education requirements. (See College of Education.)
To be eligible for student teaching, the student must have completed 28 semester hours with a 2.2 cumulative GPA, a 2.2 GPA on education courses and a 2.5 GPA on home economics courses with no grade below "C" on those home economics courses required for home economics endorsement and vocational approval.

Required:

| 17:10 | Growth and Development of the Young Child | 3 s.h. |
| 17:11 | Introductory Food Study | 3 s.h. |
| 17:131-132 | Food Study—Food Study Laboratory | 4 s.h. |
| 17:153 | Meal Management | 3 s.h. |
| 17:141 | Contemporary Nutrition | 3 s.h. |
| 17:142 | Nutrition | 3 s.h. |
| 17:150 | Design for the Home | 3 s.h. |
| 17:155 | Family Housing | 3 s.h. |
| 17:171 | Intermediate Clothing Construction | 3 s.h. |
| 17:172 | Clothing Design and Selection | 3 s.h. |
| or | | |
| 17:170 | Advanced Clothing Construction and Tailoring | 3 s.h. |
| 17:41 | Textile Fibers | 4 s.h. |
| 17:111 | Management of Family Resources | 3 s.h. |
| 17:112 | Family Economics | 3 s.h. |
| 17:113 | Marriage and Family Interaction | 3 s.h. |
| or | Parent-Child Relationships | 3 s.h. |
| 17:122 | Materials and Methods in Family Life Education | 3 s.h. |
| 17:121 | Curriculum: Home Economics | 3 s.h. |
| 17:128 | Evaluation: Home Economics | 2 s.h. |
| 17:190 | Seminar: Home Economics | 2 s.h. |
| or | | |
| 17:190 | Elements of Art | 2-3 s.h. |
| 6E:1 | | |
| 17:75 | Principles of Economics | 4 s.h. |
| 75:91 | Educational Psychology and Measurement | 3 s.h. |
| 75:100 | Pre-Education Practicum | 2 s.h. |
| 75:125 | Introduction: Secondary School Teaching | 2 s.h. |
| 75:187 | Method: Home Economics | 3 s.h. |

Electives should be selected according to the student's professional objective from the natural sciences, business administration, psychology, computer science, statistics, education and home economics.

Electives should be selected from education, journalism, psychology, sociology and communication.

Textiles and Clothing
This program prepares students for careers in merchandising.

Concentration in fashion merchandising requires:

| 17:70 | Introductory Clothing Construction | 3 s.h. |
| 17:72 | Clothing Design and Selection | 3 s.h. |
| 17:81 | Textile Fibers | 4 s.h. |
| 17:170 | Advanced Clothing Construction and Tailoring | 3 s.h. |
| 17:173 | Fashion Merchandising | 3 s.h. |
| 17:181 | Textile Dyers, Finishes and Detergents | 4 s.h. |
| 17:182 | Textile Analysis | 3 s.h. |
| 17:183 | Textile Economics | 3 s.h. |
| 17:190 | Seminar: Home Economics | 2 s.h. |

One course from each of the following areas:

Design and housing

| 17:170 | Advanced Clothing Construction and Tailoring | 3 s.h. |
| 17:181 | Textile Dyers, Finishes and Detergents | 4 s.h. |
| 17:182 | Textile Analysis | 3 s.h. |
| 17:183 | Textile Economics | 3 s.h. |
| 17:190 | Seminar: Home Economics | 2 s.h. |
| or | | |
| 17:170 | Advanced Clothing Construction and Tailoring | 3 s.h. |
| 17:181 | Textile Dyers, Finishes and Detergents | 4 s.h. |
| 17:182 | Textile Analysis | 3 s.h. |
| 17:183 | Textile Economics | 3 s.h. |
| 17:190 | Seminar: Home Economics | 2 s.h. |
| or | | |
| 17:170 | Advanced Clothing Construction and Tailoring | 3 s.h. |
| 17:181 | Textile Dyers, Finishes and Detergents | 4 s.h. |
| 17:182 | Textile Analysis | 3 s.h. |
| 17:183 | Textile Economics | 3 s.h. |
| 17:190 | Seminar: Home Economics | 2 s.h. |

Electives from computer science, statistics, engineering, psychology, chemistry, economics, and design and housing are recommended.

Electives should be selected from education, journalism, psychology, sociology, and communication.
The Bachelor of Science

The B.S. programs are recommended for students contemplating graduate study and for those interested in research positions in colleges and universities or in industrial, governmental, or medical research laboratories.

Food and Nutrition

In addition to the requirements for the B.A. degree emphasizing food or nutrition, the following courses must be completed:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>22M:2</td>
<td>Mathematical Techniques I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22M:3</td>
<td>Mathematical Techniques II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22M:20</td>
<td>Elementary Functions</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22M:25</td>
<td>Calculus I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>25:1</td>
<td>College Physics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>25:2</td>
<td>College Physics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>4:130</td>
<td>Elementary Physical Chemistry for the Life Sciences</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>or 99:140</td>
<td>Experimental Biochemistry</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

Home Economics Education

Graduates can enter the careers described for the B.A. degree. The B.S. program enables students to obtain greater depth and breadth in the natural and social sciences. In addition to the courses listed for the B.A. degree, the following are required:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:7</td>
<td>General Chemistry I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>4:8</td>
<td>General Chemistry II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>4:9</td>
<td>General Chemistry Laboratory</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>4:8</td>
<td>A course in statistics</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>or two courses from the natural sciences and/or courses numbered 100 or above in anthropology, economics, psychology or sociology</td>
<td>6-8 s.h.</td>
<td></td>
</tr>
</tbody>
</table>

Electives should be selected from journalism, communication, sociology, education and psychology.

Textile Science

This program prepares students for positions in the textile industry, and for graduate studies. Required:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:81</td>
<td>Textile Fibers</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>17:181</td>
<td>Textile Dyes, Finishes and Detergents</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>17:182</td>
<td>Textile Analysis</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>17:183</td>
<td>Textile Economics</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>17:184</td>
<td>Textile Quality Control</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>17:200</td>
<td>Seminar: Home Economics</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>4:11</td>
<td>Elementary Quantitative Analysis</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>4:121</td>
<td>Organic Chemistry I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>4:122</td>
<td>Organic Chemistry II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22M:3</td>
<td>Mathematical Techniques II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22M:20</td>
<td>Elementary Functions</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22M:25</td>
<td>Calculus I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>29:1</td>
<td>College Physics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>29:2</td>
<td>College Physics</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

One course from each of the following areas:

- Design and housing
- Family development
- Food and nutrition

Electives should be selected from chemistry, engineering, computer science, statistics, microbiology, and clothing.

The Honors Program

To be eligible for Honors, the student must have junior standing, 30 semester hours in residence at the University, an overall cumulative grade-point average of 3.0 or above, a grade-point average of 3.3 in all home economics courses, and at least 12 semester hours completed in home economics. Honors work consists of 17:191 Honors Seminar: Home Economics and 17:192 Honors Problems: Home Economics in which students do creative work or a research project. A written report or Honors Thesis and an oral examination are required.

The Graduate Program

The demand for well qualified professional home economists far exceeds the number of graduates with advanced degrees. The master's degree graduate may qualify for positions in college, secondary school, business, industry, and government. The graduate program enables students to obtain depth through specialization in one of five major subject areas: design and housing, family development, food and nutrition, home economics education, and textiles and clothing.

The department offers both thesis and non-thesis programs. The thesis plan is recommended for students preparing to teach and research in colleges and universities, for positions in industry, and for continued study beyond the master's degree. The thesis program permits more intensive experience in research procedures or the opportunity for extensive creative work. The thesis may be undertaken in the department, or in cooperation with related departments or colleges.

In addition to the general requirements of the Graduate College, degree candidates must complete specific requirements of the department.

To be admitted unconditionally, the student must have an overall grade-point average of 3.8 with 3.0 in the area that is to be the major interest in graduate study.

Master of Arts, Master of Science

For either of these two degrees, students must complete a minimum of 30 semester hours of graduate work with a thesis for 18 semester hours of graduate work without a thesis, in addition to adequate prerequisites for courses selected. Approximately one-third of the student's coursework is completed in departments other than home economics. The designation of the degree, M.A. or M.S., depends on the area of major work.

All students in the M.A. and M.S. programs are required to complete 17:290 Seminar: Home Economics Research. Those in the thesis program complete 17:291 Thesis.

Design and Housing

Graduate study in design and housing may be planned as a specialized program in interior design or textile design or as a more general program including a wider variety of courses. Applicants to this program must present a portfolio prior to admission. A variety of career opportunities is available to the graduate student in design and housing. These include college teaching, interior design, textile design, historic preservation and restoration, and positions in business and industry.

Required (depending on previous coursework):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:156</td>
<td>Survey of Modern Interiors</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>17:250</td>
<td>Seminar: Design and Housing</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>17:269</td>
<td>Research: Problems in Design and Housing</td>
<td>2-4 s.h.</td>
</tr>
</tbody>
</table>
Family Development

The graduate student gains both psychological and sociological perspectives in understanding the family. Graduates work with agencies concerned with the family or prepare for college and university teaching.

Required:
17:118 Sexuality and the Family 3 s.h.
17:212 Seminar: Family Dynamics arr.
17:213 Theory in Family Development 3 s.h.
17:290 Seminar: Home Economics Research 2 s.h.
7P:106 A course in statistics 3 s.h.

Food and Nutrition

Graduate work emphasizes foods, nutrition, or nutrition education. Graduates qualify for positions in educational institutions, business, industry, government, and the health field. Applicants need background courses in foods, nutrition, general and organic chemistry, mathematics, physiology, and microbiology.

Required:
17:134 Experimental Food I 3 s.h.
17:238 Seminar: Food 2 s.h.
17:239 Research: Problems in Food and Nutrition 2-4 s.h.
17:241 Seminar: Nutrition 2 s.h.
17:290 Seminar: Home Economics Research 2 s.h.
225:101 Biostatistics 3 s.h.
7P:143 Introduction to Statistical Methods 3 s.h.
99:130 The Chemistry of Biological Materials 3 s.h.
99:130 Metabolism 3 s.h.

Additional requirements for food specialization:
17:135 Experimental Food II 3 s.h.
61:195 General Microbiology 4 s.h.

Courses for Nutrition Education Specialization (M.A.):
17:124 Nutrition Work with Children 3 s.h.
17:145 Advanced Nutrition 3 s.h.
7P:141 Seminar: Nutrition 2 s.h.

Textiles and Clothing

This program prepares students for careers in merchandising, textile research, teaching, extension, service, and communication.

Required:
17:279 Research: Problems in Clothing arr.
17:290 Seminar: Home Economics Research 2 s.h.
7P:143 Introduction to Statistical Methods 3 s.h.

Master of Arts in Teaching

The M.A.T. program is designed for students with an undergraduate degree in home economics who have had few or no professional education courses. The program is nonthesis and requires written and oral comprehensive examinations. Graduates obtain a home economics teacher's certificate with vocational approval.

Applicants must have a bachelor's degree in home economics, a minimum grade-point average of 2.7, and be admitted to the M.A.T. program in the College of Education.

Twenty semester hours of graduate coursework in education and at least 14 semester hours of graduate work in home economics are required. For certification, the student must have completed (at the undergraduate and/or graduate level): a course in American politics or an American government course in the Secondary School 12 s.h.
A course in philosophy or history of education 2 s.h.
17:158 Experimental Food II
3 a.h.
Continuation of 17:154, which is a prerequisite.

17:158 Institution Management I
3 a.h.
Quantity food production and service; equipment utilization, maintenance, and layout; observation and practice in food service units and residence halls. Prerequisite: 17:153, or consent of instructor.

17:157 Institution Management II
3 a.h.
Quantity food purchasing; organization and management of food service units; observation in hospitals. Prerequisite: 17:153, or consent of instructor.

17:186 Directed Studies in Food and Nutrition
arr.
Prerequisites: junior, senior or graduate standing and consent of instructor.

17:186 Workshop: Current Topics in Food and Nutrition
arr.
Recent developments in food and nutrition with discussion of the scientific principles on which they are based; summer sessions only.

17:188 Nutrition
3 a.h.
Principles of human nutrition. Prerequisites: Chemistry 4:6 or 4:131 and a course in human physiology, or consent of instructor.

17:189 Advanced Nutrition
3 a.h.
Continuation of principles of human nutrition; introduction to nutrition research. Prerequisite: 17:182 and Biochemistry 99:130, or consent of instructor.

17:187 Diet Therapy
arr.
Therapeutic use of diet in metabolic diseases and in certain diseases. Prerequisites: 17:182 and Biochemistry 99:20, or consent of instructor.

17:184 Physical Growth and Nutrition
3 a.h.
Physical growth and nutritive requirements from infancy to adulthood.

17:182 Current Topics in Design and Housing
arr.
Advanced undergraduate and graduate. Prerequisite: consent of instructor. May be repeated for credit. May not be counted toward major.

17:183 DesignRA Design: Principles and Practices II
arr.
Design problems and concepts for creative interior spaces, including program development, space analysis, lighting, and other professional procedures and practices. Prerequisite: 17:183.

17:181 Interior Design: Principles and Practices III
3 a.h.
Design problems for residential and commercial interiors; business procedures and practices for interior design professionals. Prerequisites: 17:184 and 17:125.

17:186 Survey of Traditional Interiors
3 a.h.
Development of home furnishings from 19th century to 1950; correlation with architecture and culture of the period.

17:186 Survey of Modern Interiors
3 a.h.
Development of modern home furnishings; correlation with architecture and culture of 20th century.

17:187 Interior Restoration Management
3 a.h.
Interior decoration as a business development. Studies in design and business development in Old Capitol; orientation to work in museums and historic sites. Prerequisite: second semester junior.

17:188 Premdium in Historic Restoration Management
arr.
Intermediate management of historical properties, supervised experience as docent in Old Capitol. May be repeated for credit. Prerequisites: 17:187.

17:189 Advanced study of interior design. Prerequisites: senior or graduate standing, and consent of instructor.

17:180 Textile Design: Printing and Dyeing
3 a.h.
Introduction to textile design: block-printing, silk-screening, batik, tie-dye, and other forms. Prerequisite: Art 19:11 or 19:12, a two-dimensional studio art course, or consent of instructor. Same as Ar 19:391.

17:182 Textile Design: Basic Weaving
3 a.h.
Basic principles of weaving through experiences with eight, twelve, and basic weave types. Prerequisites: 17:180, 17:182, or basic studio art course, or consent of instructor. Same as Ar 19:392.

17:183 Textile Design: Intermediate Weaving
3 a.h.
Experiences in eight, twelve and supplementary weave techniques, with emphasis on design and creativity. Prerequisite: 17:180 or 17:182, or consent of instructor. Same as Ar 19:393.

17:184 Family Housing
3-4 a.h.
Basic social, cultural, and economic principles of residential environments.

17:188 Directed Studies II in Housing Design
arr.
Advanced study in housing design. Prerequisites: senior or graduate standing, and consent of instructor.

17:190 Directed Studies in Textile Design
arr.
Advanced study in textile design. Prerequisite: senior or graduate standing, and consent of instructor.

17:176 Advanced Clothing Construction and Tailoring
3 a.h.
Advanced construction techniques and selection of fabrics and designs for informal garments. Prerequisites: 17:156, 17:157, or consent of instructor.

17:169 Fashion Merchandising
3 a.h.
History and analysis of the fashion industry; production and distribution; promulgation of clothing consumption. Prerequisites: Economics 66:1 or 66:2, or consent of instructor.

17:170 Directed Studies in Clothing
arr.
Prerequisites: senior or graduate standing and consent of instructor.

17:191 Textile Dyers, Finishes, and Dyeing Processes 4 a.h.
Dye, chemical processes, dyes, finishing; microwaving, methods of application and effect on reversibility of dyes. Prerequisites: 17:181 and Chemistry 4:6 or 4:6 or consent of instructor.

17:182 Textile Analysis
3 a.h.
Basic fiber properties, and fabric structure: quantative analysis and use of basic test equipment. Prerequisites: 17:181 and Chemistry 4:6 or 4:6 or consent of instructor.

17:189 Textile Economics
3 a.h.
Economics and industrial history of textiles; current developments and problems in production and marketing. Prerequisites: Economics 66:1 or 66:2 or consent of instructor.

17:196 Quality Control
3 a.h.
Quality control systems: analysis of data in identify areas of product variability; design of performance tests. Prerequisites: 17:182 and Education 17:143 or consent of instructor.

17:186 Directed Studies in Textiles
arr.
Prerequisites: senior or graduate standing and consent of instructor.

17:190 Seminar: Home Economics
3 a.h.
Exploration concerning professional scope of home economics; orientation, development, philosophy, current problems influencing curricula in higher education, research, and the profession.

17:196 Honors Seminar: Home Economics
3 a.h.
Review of literature in area of interest, open to both majors and non-majors.

17:190N Honors Problems: Home Economics
3 a.h.
Research project or creative work; open to both majors and non-majors. Prerequisites: 17:190.

Primary for Graduates
17:213 Seminar: Family Dynamics
3 a.h.
Study and discussion of family interaction in family interaction.

17:213 Theory in Family Development
3 a.h.
Theory in relationship of developmental research and theory to family interaction; current research processes within families over the life span. Prerequisite: Sociology 24:161 or consent of instructor.

17:216 Research: Problems in Family Studies
arr.
Individual research problems of advanced students. Prerequisites or consent: 17:250.

17:217 Seminar: Home Economics in Higher Education
3 a.h.
History and philosophy of home economics education; historical and international development of the home economics curriculum in right-thinking institutions. Prerequisites: graduate standing and consent of instructor.

17:228 Workshop in Home Economics Education
3 a.h.
Recent developments in home economics education with discussion of the theory and research on which they are based. Summer sessions only.

17:235 Seminar: Readings in Home Economics Education
5 a.h.
Critical review of current literature in home economics education. Prerequisite: consent of instructor.

17:229 Research: Problems in Home Economics Education
arr.
Individual research problems of advanced students. Prerequisites or consent: 17:228.

17:228 Seminar: Food
3 a.h.
Readings, reports and discussions of current literature in food science. May be repeated for credit.

17:239 Research: Problems in Food and Nutrition
arr.
Research project or creative work; open to both majors and non-majors. Prerequisites: 17:228.

97 Home Economics
Journalism

19:381 Seminar: Nutrition 3 s.h.
Critical review of current periodical literature in nutrition. Prerequisite: 17:143, or consent of instructor.

19:382 Seminar: Design and Housing 2 s.h.
History and philosophy of interior design, textile design, and housing; readings, reports, and discussion of current literature. Prerequisite or completion: 17:391.

19:383 Seminar: Historic Housing and Interiors 2 s.h.
Methodology and procedures in historic restoration and preservation; readings, reports, and discussion of current literature. Prerequisite: consent of instructor.

19:390 Studio Workshop in Fiber 4 s.h.
Fiber projects in a specific medium; emphasis on aesthetic direction; related readings. Prerequisites: 17:186, 17:192, 17:146 and consent of instructor.

19:399 Research: Problems in Design and Housing arr.
Individual research problems for advanced students. Prerequisite or completion: 17:390.

19:723 Clothing for the Physically Handicapped and the Aged 3.0 s.h.
Problems in satisfying clothing needs; solutions to some problems; review of research; work of selected agencies; analysis of specialty-designed clothing. Summer sessions only.

19:726 Readings: Clothing arr.
Readings, reports and discussion of current literature in clothing.

Individual research problems for advanced students. Prerequisite or completion: 19:723.

19:728 Instrumental Analysis of Textile Materials 4 s.h.
Computer-assisted analysis of fibers and fabric properties and the study of methods for scientific evaluation of these properties.

Readings, reports, and discussion of current literature in textiles.

Individual research problems for advanced students. Prerequisite or completion: 19:390.

Methods and techniques of research in home economics and closely allied fields. Prerequisite or completion: a course in statistics, or consent of instructor.

19:701 Thesis Master’s degree candidates.

19:783 Workshop on Aging: Social Gerontology for Home Economists 3.5 s.h.
Characteristics, attitudes, and behavior of older people; physical, social, economic, and psychological problems and needs; current legislation and community resources. Summer sessions only.

Hospital and Health Administration

See "College of Medicine."

Italian

See "French and Italian."

Journalism

School director: Kenneth Stack
Faculty: professors James Carey, Nuncio Herit, Kenneth Stack, Allen Tabor; professional faculty: Alice Laski, D. Miller; associate professors Joseph Amelot, John Erickson, William Price Fry, William Zinn; associate professor Lary Bennes, Nancy Norman, Jeffrey Moulton, Earle Olsen, James Waller, Thomas Zuckel, William Zinn; instructors Robert Ganser, Richard Janka, Jan Miller, Harby Stowe, Richard Woodard

Degrees offered: B.A., B.S., M.A., Ph.D. in mass communications

Undergraduate Programs

Whereas a journalist chooses to work, he or she will be in a vital role requiring extensive knowledge of the diversity of human experience. Competent journalists must understand themselves, their relationship to the events they report, the mechanics of their profession and the effects of their work on the readers, viewers, or listener. Preparation for a career in journalism therefore requires two kinds of education—education in journalism and education for journalism.

At Iowa, professional training in the School of Journalism builds on a solid base of liberal arts education. Journalism students take subjects from three-fourths of their coursework outside the School, and are required to develop a second major, or the equivalent of one, to ensure that each has an array of special professional competencies.

The School offers undergraduate students a choice of three emphases—journalism, mass communication, or communication. All have these common basic requirements, or foundations courses:

- Communication and Communication Systems
- Legal and Ethical Foundations of Communication Systems
- Cultural and Historical Foundations of Communication Systems
- Communication Systems Theory and Research
- Introduction to Journalism and Mass Communication

Total 15 s.h.

(Mass communication students may substitute an approved course of a conceptual/theoretical nature for one of the Foundations courses.)

Both the Bachelor of Arts and the Bachelor of Science degree require at least 30 semester hours of coursework in journalism. To satisfy the second-major requirement, the B.A. student may either complete a standard program in another discipline, or complete an approved concentration of 25-30 hours of related coursework in several departments. Additional requirements for the B.S degree are either 26-104 Introduction to Philosophy of Science or 26:103 Introduction to Logic, and one of the following:

A full B.S. major in a natural or social science;

A 24-semester-hour concentration in the natural or social sciences, beyond university core requirements; or

12 semester hours in courses emphasizing natural or social science methods.

(Course selections for either of the latter two options must be approved in advance.)

Except as already noted, the B.A. and B.S. requirements are the same. General requirements for both are outlined in the College of Liberal Arts section of the Catalog.

Before beginning the final 45 semester hours of his or her baccalaureate program in journalism, the student must design a plan of study and present it for advisor approval.

Journalism Emphasis

This emphasis is concerned with the gathering, organizing and effective writing of news and other information from printed, human and environmental sources, and with the processing, packaging and display of news stories, articles and illustrations.
for printed and broadcast media. This emphasis also provides for the development of the various technical skills required for work in the student's choice of media. Journalism coursework required for this emphasis:

19:109 Introduction to Journalism and Mass Communication 3 s.h.
19:112 News Reporting and Writing 4 s.h.
19:114 News Processing 3 s.h.
19:116 Advanced Reporting 3 s.h.

Maximum journalism credit allowed toward graduation: 36 s.h.

Mass Communication Emphasis

In this emphasis, students develop and employ strategies of inquiry and information-gathering, create and distribute information packages and learn to see human and other resources in identifying and solving mass communication problems.

In the Mass Communication Laboratory, competing enterprises organized and staffed by advanced students produce publications using various technologies, such as print, videotape, audio tape, still and motion picture photography and multimedia. Beginning students work with specific enterprises, preparing material for publication.

Publications usually are of a documentary nature, dealing with significant topical issues. Undergraduates, graduate students and faculty members of the school comprise the defined audience for these publications, providing systematic feedback to each enterprise.

In the Laboratory, students are confronted with a wide range of problems and issues important to the creation, evolution and maintenance of mass media. They develop their own basic understanding of the issues, problems and processes involved in the complex relationships between mass communication and society. As they move from situation to situation, they also develop understanding of their own interactions with other students, and of the satisfactions and frustrations necessary to their own intellectual and professional growth.

The special requirements for this emphasis are:

19:122 Mass Communication Laboratory II: Printlancing and Media 2 s.h.
19:124 Mass Communication Laboratory III: Media Production 3 s.h.
19:126 Mass Communication Laboratory IV: Media Production Management 4 s.h.

Approved communication skills/laboratory electives 7 s.h.

Maximum journalism credit allowed toward graduation: 40 s.h.

Communication Emphasis

This emphasis provides a non-laboratory, theoretical/conceptual approach to the study of communication and mass communication. Its requirements:

Non-technical journalism courses at least 9 s.h.
Non-technical communication courses in other University departments at least 7 s.h.

Maximum journalism credits allowed toward graduation: 40 s.h.

Graduate Programs

Master of Arts

The Master of Arts degree program in journalism combines professional practice in the media with consideration of the effects, responsibilities and significance of the media. It prepares students for a wide variety of positions in communication, and for study at the doctoral level.

The degree is offered with or without thesis, with either a professional journalism or a communication mass communication emphasis, both requiring a minimum of 30 semester hours of graduate-level coursework.

Professional Journalism Emphasis

This program is designed for individuals who want to improve their technical skills and broaden their understanding of the role and function of the profession in contemporary society, but who do not plan to go on to doctoral study.

For students with no prior academic or professional experience in communication and journalism, requirements for the M.A. in professional journalism are:

19:201 Master's Seminar 3 s.h.
19:240 News Communication: Principles and Practice 5 s.h.
19:245 Specialized Reporting or Editing, or appropriate sequence of related graduate courses approved by the advisor 7 or 8 s.h.

Effective in mass communication, including courses in other departments, consent of advisor 16 or 17 s.h.

19:251 Master's Research 3 s.h.
Final examination, last enrollment period

For students with academic or professional experience in communication and journalism, the M.A. in professional journalism requires:

19:201 Master's Seminar 3 s.h.

Electives in mass communication (consent of advisor) 9 s.h.

Electives in other departments (consent of advisor) 15 s.h.

19:251 Master's Research 3 s.h.
Final examination, last enrollment period

Communication and Mass Communication Emphasis

This program focuses on communication phenomena, and particularly on theory and methodology. Graduates of this program may petition for admission to the School's doctoral program in mass communication.

Requirements for the M.A.:

19:201 Master's Seminar (section 2, two semesters) 4 s.h.
19:205 Journalism Practicum (two semesters) 6 s.h.

Electives in communication and mass communication and in other departments (consent of advisor) 17 s.h.
Doctorate in Mass Communication

The doctoral program in mass communication is an interdisciplinary program whose central objective is to develop scholars who will make significant contributions to teaching and research in communication. The background it provides is applicable in a number of fields, including university teaching, news communication, international communication and various other requiring ability to develop effective communication strategies. The program is designed around a small core of graduate work in communication, and encourages the student to work with his or her sponsor and committee in the development of an appropriate, individualized plan of study.

Iowa Center for Communication Study

The Center encourages and facilitates inquiry into communication problems by faculty members and by graduate and undergraduate students, via diverse approaches--philosophical, systems design, historical, legal, behavioral, literary. Center services include consultation, training, publication in appropriate outlets, assistance in obtaining financial support for projects and assistance in computer use and data analysis. Another area of Center activity involves the design, development and application of simulations and games for communication instruction and research.

Other Special Facilities:

In the Communications Center the School has specialized laboratories for photography, typography, audiotaping, videotaping, typing, copy preparation and print production. Many students use the newsroom of the University student newspaper, The Daily Iowan, as a professional laboratory. The School also has its own Resource Center and Gallery.

Courses

19:251 Master's Research (section 2, last period of enrollment, M.A. thesis) 3 a.h.
Final examination, last enrollment period

Traces the development of the technologies and economic factors that undergird the various communication systems of which modern society consists, and explains the major problems and opportunities involved in their further development, particularly with respect to the globalization of communication systems.

19:108 Cultural and Historical Foundations of Communication Systems 3 a.h.
Traces the history of mass as a communication tool and as a designer of communication systems; sees historical framework as diverse cultural, political and social environments of communication and the functions of communication systems within these environments.

19:107 Visual Communication

Visual communication is media considered as an interactive process shared for individual perception and experience, cultural perspective and technological change. Emphasis is placed on developing an understanding and critical awareness of contemporary visual media, with reference to theories of visual perception, cultural differences and the historical development of graphic design and still and moving picture imagery. No prerequisite. Offered once a year.

19:106 Communication Systems Theory and Research

A description and critical examination of the development of research on the effects of mass communication will be pursued using the analytical studies in a variety of research approaches to formulate subsequent examples of "offensives" investigations. The intercommunication will cover the historical context of American communication research, the questions asked about communication effects, the methods used to answer these questions and the findings derived by the particular methods employed.

19:109 Introduction to Journalism and Mass Communication 1-3 a.h.
Broad overview of journalism and mass communication with an emphasis on work for news media. Spring course for the three laboratory emphases, Journalism, Mass Communications and Computer Information. Includes current topics and discussion of news, news agents and news media, and the reporter as language user and writer. Also includes critical look at newspapers, their work and their organization.

19:344 News Processing

A description of news-gathering and handling writing and their legal considerations. Preparations of written material for publication, including design and printing of printed matter, particularly newspapers, with some comparative understanding of other media. Emphasis on the role of the editor in the technological age.

19:114 Advanced Reporting

Final course in journalism laboratory sequence. Depth reporting projects of publishable quality with topics meeting the approval of the instructor and arranged in consultation with the instructor. Final examination and writing methods and strategies. Prerequisites: 19:112 and 19:114.

19:133 Mass Communication Laboratory III

19:134 Mass Communication Laboratory III: Media Production 3-4 a.h.

19:153 News Reporting and Writing

Basic techniques of copy collecting and headline writing and their legal considerations.

19:113 News Reporting and Writing

Basic techniques of copy collecting and headline writing and their legal considerations.

19:153 News Reporting and Writing

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pursue graduate study in comparative or national literature may choose the B.A. in letters. Future professionals in each field, as medicine and law may find the major a satisfying concentration toward the B.A.

The program of study for the B.A. in letters encourages the undergraduate student to work closely with one or more advisors in developing an individual course of study. A typical student might study classical and modern theatre, oral literature and fiction from several countries or he or she might include work in film or practice in printing on a hand press. The major in letters requires that a student do work in three different national literatures or literary traditions, with some experience of historical diversity. Students doing all their reading in English and translation must complete at least 35 hours of coursework in literary subjects; students who complete at least six hours of study in a foreign literature in the original language are required to take a total of at least 30 hours in literature for the B.A. Appropriate courses in linguistics, creative writing, translation and interdisciplinary studies concentrating on literary materials may be included toward completion of the major.

There are no requirements for admission to the major; interested students should see the chairman or one of the advisors to the major.

Courses

International or Comparative Themes and Problems

198:35 Crosscurrents in Western Literature 3-4 a.h.
198:36 Crosscurrents in Modern Literature 3-4 a.h.
198:36 Introductory course in the international study of literature; specific topics selected for each semester, with subjects including work from several countries on a common theme or in a common range of literary forms; topics 1974-76 included Literature and Psychology, Literature and Death, Literature and Philosophy, and Poetry and Song. Open to freshmen who do not have a requirement.
198:37 Literature and Art History 3 a.h.
Same as Art and Political Science 360:867.
198:38 European Civilization and Control 3 a.h.
Same as Business and Political Science 360:136.
198:39 Western Literature 3 a.h.
198:40 Western Literature 3 a.h.
198:42 Western Literature 3 a.h.
198:43 Western Literature 3 a.h.
198:44 Western Literature 3 a.h.
Three-nights-a-week of the varieties of western literature; meets two hours daily for one semester, with three faculty and a maximum of 30 students. In any particular semester, the course might concentrate upon a literary genre or mode, e.g., narratives, or upon a literary period or period.
198:188 Literature and Society 3 a.h.
Same as Comparative Literature 46:150 and English 8:179.
198:187 Literature and Anthropology 3 a.h.
Same as Comparative Literature 46:141, English 8:151.
198:185 East-West Literary Exchange 3 a.h.
Same as Comparative Literature 46:138.
198:186 Literature and Revolution 3 a.h.
Same as Comparative Literature 46:142.
198:175 Changing Concepts of Women in Literature 3 a.h.
198:173 Women in Literature 3 a.h.
Same as American Civilization 45:144, English 8:189.
198:186 Literature and Psychology 3 a.h.
Same as Comparative Literature 46:175, English 8:115.
198:188 Film and Art Movements 3 a.h.
Same as American Civilization 45:157 and Speech and Dramatic Art 360:137.
198:486 Bachelor Modern Letters 3 a.h.
Same as English 8:485.

Literary-Historical Periods

198:26 Crosscurrents of Western Literature 3-4 a.h.
198:27 Crosscurrents in Modern Literature 3-4 a.h.
198:31 Introduction to Modern German Literature I 3 a.h.
198:32 Introduction to Modern German Literature II 3 a.h.
198:60 Communication and Comparative Literature 3 a.h.
Same as Comparative Literature Studies 322:800, English and Political Science 360:100.
198:100 Greek Literature in Translation 3 a.h.
198:101 Great Drama in Translation 3 a.h.
Same as Greek 14:108, Speech and Dramatic Art 360:109.
198:106 Russian Drama in Translation 3 a.h.
198:107 Latin Drama and Translation 3 a.h.
198:108 Classical Mythology 3 a.h.
Same as Greek 14:112.
Same as English 8:179.
198:110 Concept of Revolution in 20th Century Writings 3 a.h.
Same as Sociology 55:109.
198:111 European Literature of the 19th Century 3 a.h.
Same as Comparative Literature 46:127, English 8:119.
198:112 Contemporary Latin American Novels and Short Story 3 a.h.
Same as Spanish: 35:112.
198:114 Contemporary Public Communications 3 a.h.
Same as Rhetoric and Public Address 360:130.
198:122 Contemporary Books in Poetry 3 a.h.
Same as Comparative Literature 46:127, English 8:127.
198:127 Twentieth Century German Fiction 3 a.h.
Same as German 13:137.
198:139 Anglo-American Public Communication Later Period 3 a.h.
Same as Rhetoric and Public Address 360:125.
198:148 Contemporary Books in Fiction 3 a.h.
Same as Comparative Literature 46:140, English 8:140.
198:143 Comparative Japanese Literature 3 a.h.
Same as East Asian Language and Literature 39:143.
198:144 Modern Chinese Fiction 3 a.h.
Same as East Asian Language and Literature 39:158.
Same as French 46:121.
198:155 African and South African Literature 3 a.h.
198:158 Modern Spanish Poetry in Translation 3 a.h.
198:159 Spanish-American Spanish in Poetry 3 a.h.
198:161 Nineteenth Century French Novel 3 a.h.
Same as French 9:15.
198:162 Twentieth Century French Fiction 3 a.h.
198:164 Twentieth Century French Theatre 3 a.h.
Same as French 9:14.
198:165 Continental Drama: 1900-1970 3 a.h.
198:167 Literature of the 19th Century 3 a.h.
198:179 Roman Decree 3 a.h.
198:181 Series Literature in Translation 3 a.h.
Same as German 13:141.
198:182 Arte y Romance 3 a.h.
Same as Comparative Literature 46:179, English 8:179.

National or Ethnic Traditions

198:186 American Humor 3 a.h.
Same as East Asian Language and Literature 39:19, Literature 11:19.

National or Ethnic Traditions
Library Science

Director of Bands: Frederick Wimmer


Degree offered: M.A.

The School of Library Science offers a program of basic professional preparation for careers in all types of libraries—public, school, academic, and special. It seeks to recruit and prepare librarians, to provide public service and to contribute to the advancement of librarianship through research. In accordance with these goals, the following objectives have been defined:

Instructional Objectives

To introduce students to a basic understanding of the history and theory of librarianship, the changing role of the library in today's society and the library's importance in the communication process.

To help students develop a philosophy of librarianship which includes a commitment to the cause of intellectual freedom and to the ideal of free dissemination of information; a professional attitude toward the librarian's role as facilitator between user andmaterial; and a determination to improve the quality of library service in response to the needs of the people to be served.

To provide students with a foundation in the techniques and procedures of effective library service (i.e., the selection, acquisition, organization, storage, retrieval and dissemination of information).

To familiarize students with bibliographic techniques and sources of information in a broad range of subject fields and media formats.

To introduce students to management theory as it applies to library administration and to prepare the student to assume professional responsibilities of identifying needs, setting goals, analyzing problems and formulating solutions.

To provide students with opportunities for clinical library experience under supervised direction and the pursuit of related courses of study to meet special career needs.

To increase awareness of the contributions of other disciplines to librarianship, a critical understanding of the role of research in the advancement of the profession, and the importance of continuous professional growth.

Public Service Objectives

To offer all library personnel and library trustees opportunities for continuing education to advance and update their awareness of current developments in library operations and services.

To provide consulting services to individuals, libraries and organizations in order to promote better library service for the citizens of Iowa and surrounding areas.

To participate in professional organizations at local, state, regional and national levels in the pursuit of common goals within the profession.

Research Objectives

To engage in systematic and continuing research on library problems and areas related to library service which advance both the theoretical and practical knowledge of librarianship.

To give emphasis to research which directly supports the instructional program of the School of Library Science or which may have special relevance to library service in the State of Iowa.

Undergraduate Study

Although there is no undergraduate major in library science, juniors and seniors may enroll in the introductory library science and children's literature courses (100-level).

The Master of Arts Program

Professional preparation for careers in all types of libraries is provided by the school's Master of Arts program, accredited by the American Library Association.

The School also offers a non-degree graduate program for certification in school librarianship. Its graduates hold positions, in approximately equal numbers, in public, school and academic libraries, serving in such roles as administrators, bibliographers, catalogers, reference specialists or children's librarians.

The Master of Arts degree in library science requires 33 semester hours of graduate credit with a minimum grade-point average of 2.5. In addition, the student must pass a comprehensive examination. The program consists of a small core of required courses basic to all areas of librarianship, additional required courses in a type of library and in bibliography, and electives. The plan of study should be related to developing special competencies in a particular field of librarianship.
Basic Plan of Study

Core courses (required of all M.A. candidates) 9 s.h.
21:151 Reference 1
21:152 Cataloging and Classification
21:153 Selection of Library Materials

Type of library course (one required) 3 s.h.
21:231 The Public Library
21:232 The College and University Library
21:233 School Media Center Administration

Bibliography course (one required) 3 s.h.
21:241 Bibliography of the Humanities
21:242 Bibliography of the Social Sciences
21:243 Bibliography of the Sciences

Electives 18 s.h.

Students are expected to take their elective hours in library science courses. However, when a student has had extensive undergraduate coursework in library science, when career objectives so indicate, and with the advisor's consent, the student may take elective hours in other University departments, especially in closely related areas such as computer science, educational media, urban and regional planning, municipal government, etc.

With the director's approval, a student with a strong background in library science may elect to write a thesis, for which six semester hours of credit may be earned. However, most students are advised to undertake the non-thesis program.

The program normally requires two semesters and one summer of resident study, or, in the case of students attending summers only, a minimum of four summer sessions.

Public Library Work

The major concern of public librarians is to design innovative service programs to reach those segments of the population now underserved, as well as to provide a full range of services to all members of the community. Management skills are often needed in these positions.

Required courses:
Core courses
Bibliography course

Suggested electives:
21:213 Library Services to Adults
21:222 Multi-Media Concepts in Libraries
21:246 Introduction to Information Science
21:251 Advanced Reference
21:252 Advanced Cataloging
21:263 Problems in Library Management

Additional bibliography courses:

School Library Work

The school media center makes a wide range of print and audio-visual materials accessible to students and teachers. The work of the media specialist includes such activities as providing instruction to students in the use of media, consulting with teachers about the use of media in the teaching program, producing new materials, offering reading guidance and providing reference service. State certification is required for a career as a librarian in elementary and secondary schools.

Required courses:
Core courses
Bibliography course
21:233 School Media Center Administration
7V:101 Operation of Audio-Visual Equipment
7V:105 Selection and Utilization of Educational Media (or equivalent audio-visual course)

Suggested electives:
21:123 Children's Literature
21:124 History of Children's Books
21:125 Literature and Storytelling for Children
21:193 Literature for Adolescents
21:222 Multi-Media Concepts in Libraries
21:234 Library Services to Children and Young Adults
21:251 Advanced Reference
21:262 School Media Center Problems
7B:300 Elementary Curriculum
7B:281 Junior High School and Middle School Curriculum
7B:290 Secondary School Curriculum

College and University Library Work

The academic library, whether in a community college or a university, provides service to students, faculty and staff relating to their information, education and research needs. Management or supervisory responsibility is often required. Special competencies may be called for, such as a subject or language specialty or an activity specialty (classification and indexing, information systems, etc.).

Required courses:
Core courses
Bibliography course
21:232 The College and University Library

Suggested electives:
21:251 Introduction to Information Science
21:252 Advanced Reference
21:254 Advanced Cataloging
21:263 Problems in Library Management
21:264 Medical Librarianship and Bibliography
22C:106 Introduction to Programming with PL/1
22C:117 Computing with PL/1
7D:200 Computer Applications in Education
Work in Special Libraries

Special libraries function in such settings as government agencies, industrial firms, hospitals, museums and publishing companies. In addition to management skills, the special librarian often needs a subject specialty.

Required courses:
- Core courses
- Type-of-library course
21:230 Special Libraries

Suggested electives:
21:246 Introduction to Information Science
21:251 Advanced Reference
21:252 Advanced Cataloging
21:254 Advanced Bibliography
21:263 Problems in Library Management
21:364 Medical Librarianship and Bibliography
21:282 Practicum in Librarians
22C:106 Introduction to Programming with PL/I
22C:107 Computing with PL/I

Certification in School Librarianship

Students who desire to become school librarians may fulfill certification requirements within the M.A. program, or they may pursue the non-degree certification program described below. The certification program, a 30-semester-hour sequence, accepts both undergraduate and graduate coursework, and does not require a foreign language for admission. The student must hold an elementary or secondary school teaching certificate, as specified by the State Department of Public Instruction. All candidates for certification must complete the following course requirements:

Required courses:
- Reference I 15 s.h.
- Cataloging and Classification
- Selection of Library Materials
- School Media Center Administration
- Three hours of audio-visual coursework

Elective courses:
- 15 s.h.

Students are encouraged to take a curriculum course for the grade level (elementary, junior high or high school) at which they expect to work. Other suggested courses: 21:123 Children's Literature, 31:234 History of Children's Books, 21:126 Literature and Storytelling for Children, 21:193 Literature for Adolescents, 21:222 Multi-Media Concepts in Librarians, 21:234 Library Services to Children and Young Adults, 21:282 Practicum in Librarianship. With consent of his or her adviser, the student may select other library science courses.

Joint Program in Business Administration and Library Science

Today's professional librarian faces ever-increasing demands for knowledge and expertise in the functional areas of administration and management. In addition to understanding the principles of library science, the librarian, whether in an academic or public setting, is discovering the importance of understanding and applying the principles for effective management of complex organizations. In order to offer students an opportunity to gain a solid understanding of the problem solving techniques of each area, the College of Business Administration and the School of Library Science have developed a joint program which leads to two degrees—the Master of Business Administration (M.B.A.) and the Master of Arts (M.A.) in library science.

To enroll in the joint program the student must apply to and be accepted by both Graduate Studies in Business and the Library School. The joint program enables the student to apply six semester hours of business electives toward the M.B.A. in library science and nine hours of library science toward the M.B.A. A minimum of 60 hours must be completed in order to receive the two degrees. Students not having previous coursework in business administration may be required to complete up to 72 hours in the joint program.

Facilities and Resources

Quarters for the School of Library Science in the south wing of the University's Main Library provide well-planned facilities for the varied instructional and research activities of the school. Included are laboratories for bibliography, cataloging and multi-media study, as well as a separate departmental library science library. A teletype terminal provides direct communication with the University's IBM 360/65 computer, and a teletype (TWN) connects the school with a network of 26 academic and public libraries in the state.

All of the resources of the University Libraries are available to students and faculty of the school. The system contains more than 1.8 million volumes in the Main Library and its 12 departmental branches.

In addition to the University Libraries, students have access to a variety of libraries in Iowa City and nearby communities for clinical and laboratory purposes; the State Historical Society Library in Iowa City; the Iowa City and Cedar Rapids public and school libraries; the Core, Cornell and Grinnell college libraries; and, by arrangement, the Herbert Hoover Presidential Library in West Branch, Iowa.

Financial Assistance

The School of Library Science annually awards several tuition scholarships, as well as quarter-due graduate assistantships. Prospective students are urged to apply for these awards before March 1. Students interested in part-time employment should contact the libraries of the Iowa City area.

Admission Requirements and Procedures

Scholastic requirements for admission to the M.A. program include:

A baccalaureate degree from an accredited college or university, with a minimum grade-point average of 2.5 on a 4.0 scale, and at least 15 semester hours of study in the liberal arts and sciences;

One year of college credit in a foreign language with a grade of C or better or an equivalent level of achievement;

Satisfactory scores on the Graduate Record Examination Aptitude Test.

Personal qualifications and aptitude for library work are assessed by means of letters of recommendation and a personal interview with the director of the school and a member of the faculty. Because of the large number of applications, the school cannot
There are many indicators that such organizing principles exist in language. Children normally learn to use their native language before they enter school, and without much direct instruction. People can speak and understand sentences they have never heard before. All languages have several ways of saying the same thing and all have sub-linguistics. All languages change through time. Damage in a particular part of the brain may be related to a particular type of linguistic problem, whatever the language. All languages are systems with some unique properties, some universal properties, and some properties shared with other languages which may or may not be historically related.

Linguists do not attempt to learn many languages. Rather, they consider the languages of the world as data to be analyzed by common principles.

Linguistics is a science with many laboratories. One linguist’s laboratory may be his or her mind and a notebook and paper. Another may work with acoustical equipment. Others need computers. Some go into seldom visited places to study, describe, and analyze little-known languages which may be in danger of extinction. Some go into their own communities to study the relationship between language variation and socio-economic structure, or race, or sex. Still others, interested in language change, spend time studying ancient languages.

Linguistics is not limited to scientific research for its own sake. Linguists may teach English as a foreign language. They may help design school programs which are relevant for Chicanos, blacks and Indians. They may help intelligence and achievement test-makers avoid discriminations against non-middle-class white Americans, or help librarians use computers to manage massive amounts of information. They may work with speech clinicians to retrain people with linguistic disabilities.

Undergraduate Program

Because language is the medium of informational, emotional and aesthetic communication, yet can be analyzed scientifically, a major in linguistics teaches a student much about language and understanding human beings.

High scores on verbal and quantitative aptitude tests are indicators of success in linguistics. Although few aspects of the field deal with memory, it is very important to be able to reason logically and explicitly and to be able to deal with formulas and abstract symbols.

From the standpoint of vocational goals, prospective linguists should consider either pursuing their study through the M.A. in linguistics with a professional focus, or through the doctorate, or they should take a second major. Appropriate companion fields include foreign languages, English, anthropologie, sociology, social psychology, phonology, mathematics, computer science, philosophy, and elementary, secondary and special education.

The Bachelor of Arts degree in linguistics prepares the student to do basic language analysis in syntax-semantics (sentence word patterns and their relation to meanings) and phonology (sound patterns). Elective courses in a variety of sub-specialties enable each graduate to tailor a program to his or her own interests.

The major in linguistics requires 24 semester hours of work in the Department. It includes a general introduction, and courses in syntax, phonemics, phonology, methods of analysis and language history. Electives and an undergraduate seminar complete the program.

Graduate Programs

Emphasis in all graduate programs is on theory and research. Students interested in non-university careers may also take advantage of a number of courses in related linguistics or in other fields, either in connection with doctoral work or as a standard option of the M.A. program.

Master of Arts in Linguistics

All students take a required set of core courses followed by comprehensive examinations in phonology and syntax-semantics. Students choosing to write a thesis take at least nine semester hours of elective course work. Students choosing to take a thesis without a thesis must do a focus area (consisting of 12 hours of course work and a comprehensive examination) and take at least three semester hours of elective course work. The major purpose of the focus area is to qualify the student for immediate career opportunities. The focus may either be designed in advance by the student (subject to departmental approval), or be one of a set of predesignated options (e.g. Teaching English as a Foreign Language). All electives must be chosen from an approved list furnished by the Department. Students without prior training in linguistics should expect either to take 33 hours of course work and write a thesis or to take 39 hours of course work. All students must have a minimum of 30 hours of gradew earn to receive the degree, regardless of prior preparation.

Ph.D. in Cultural Anthropology and Linguistics

The Ph.D. in cultural anthropology and linguistics prepares the student for professional teaching and research in the linguistic and nonlinguistic aspects of cultural behavior and the nature of the relationship between them. The program consists of three years of academic work, including participation in interdisciplinary courses and, in most cases, a period of field work.

The context of the anthropological-linguistics doctoral program may be expanded to accommodate an emphasis either in anthropology of linguistics, or it may be a balance of the two. Abstract explicit requirements are:

Acquisition of two appropriate research tools from a list which includes foreign languages, statistics, symbolic logic, and computer programming.

Satisfactory completion of a basic series of courses in linguistics (courses in general linguistic theory, phonetics, grammatical analysis, phonological analysis and historical-comparative linguistics); and in anthropology (courses in anthropological history, theory or methods, social anthropology, social institutions and an ethnographic area); and

Satisfactory completion of a series of interdisciplinary courses in language and culture, ethnological field methods, and ethnological theory.

Ph.D. in English with a Major in Linguistics

The program of study leading to the Ph.D. degree in English with major in English linguistics combines a thorough foundation in linguistic theory and the methods of linguistic research with intensive study and research in the structure and history of the English language and some study of English and/or American literature.
The linguistics area of the program is planned in consultation with the student’s adviser. It is expected to include work in syntax, phonology and dialectology. Old English, Middle English, the structure of English, the history of the English language, and the teaching of English as a second language. An important part of the program is a semester of directed research—usually in the last year of course work—in the structure of Modern English, the historical development of English, and the period of the history of the English language which corresponds to the literary period the student has chosen for study.

Literary study includes at least Beowulf, Chaucer, and Shake- speare, as well as a literary period of the student’s choice. The student of English linguistics is encouraged to take at least one course in an older Germanic language and at least one additional course in Germanic or one of the other old Indo-European lan-
guages.

The comprehensive examination for the degree includes the following areas: general linguistics, the structure of Modern Eng-
lish (including American dialects), the history of the English language, and the literary period selected.

The dissertation must treat some topic in the history of English, in the structure of English at any stage of its historical development or in any of its dialects, or in applied English linguistics.

Special Facilities

The Department of Linguistics has an acoustics laboratory, con-
sisting of a sound spectrograph, a studio-type tape recorder and an audiometric chamber. There is also a remote typewriter terminal connected with the IBM 360/65 computer at the University com-
puter center.

The departmental reading room function to allow a close relationship between faculty and students, a considerable influence of students upon departmental affairs, and a high degree of individual instruction. A large part of the student’s education in linguistics is conducted informally through daily conversations among students and faculty members. Students and faculty members also meet monthly in an informal colloquium to discuss research in which students and staff are engaged.

The department also has a research laboratory to provide experience in teaching English as a foreign language.

Departmental Financial Aids

Teaching assistantships and research assistantships are available to qualified graduate students. Application should be made by March 1 for the following academic year. Students applying for financial aid and admission concurrently should submit their GRE scores.

Courses

Special English Courses for Foreign Students: 101-10; 101-19; 197.

For Undergraduates and Graduates

103-10 Language and Society

4 s.h.

Correlations between social and linguistic behavior. Methods for discovering and describing significant linguistic behaviors. Historical and political forces of lilnguistic behavior. Social support course core.

103-20 Elements of Linguistics

3 s.h.

Basic introductory course for majors. General theoretical concepts common to syntax, phonology, and semantics. Nature of language history. Relations of linguistics to education, psychology, sociology, anthropology. Same as English 120.

103-21 Basic Phonetics

3 s.h.

Acquisition of speech sounds, hearing, processing and recognizing natural speech sounds. Introduction to acoustic theory. Co-endorsement required: 103-20.

103-22 Introduction to Phonology

3 s.h.

The nature of speech sounds. Phonemic-principle, distinctive-feature theory, Types and indicating relations of phonological rules. Experiments. Prerequisites: 103-20 or equivalent.

103-23 Elements of Syntax

3 s.h.

Relating words and sentences. Recitation devices as models of linguistic compre-nhension. Principles of Types and indicating relations of syntactic rules. Problems from a variety of languages. Prerequisites: 103-20 or equivalent.

103-24 Methods in Linguistics

3 s.h.

Basic skills for working English as a foreign language: laboratory, and library research problems; scope and accuracy of analysis; observational techniques and experimental design. Prerequisites: 103-22 and 103-23.

103-25 Practicum in Semantics

3 s.h.

Each student solves one or more assigned problems in in-depth study. Seminars are structured to give tutorial help. Review of work submitted for major. Prerequisite: 103-34.

103-26 Special Project

arr.

Independent research on a linguistic topic directed by number of staff.

For Undergraduates and Graduates

120-101 Introduction to Linguistics

3 s.h.

Variety of topics in general linguistics. Same as English 110 and 122.

120-102 Introduction to Language and Communication

3 s.h.

Methods and research areas of communication between linguistics and computer science.

120-104 Language, Society, and Education

3 s.h.

Social and conditional attitudes to language use; development of prescriptivist, linguistic interference of sociolinguistic status, meaning of a "correct" language and dialects of a language. No prerequisites. Same as English 110.

120-105 Teaching English as a Foreign Language

3 s.h.

Development of corrective analysis. Teaching foreign language skills. Survey of ESL. Reading and writing themes. Teaching. Prerequisites: 120-120, 120-110 or 103-220, and 120-173, Computer 100-141.

120-106 Basic Phonetics and Articulatory Phonetics

3 s.h.

Basic pronunciation and practical phonetics theory. Laboratory practice in phonetic transcription.

120-107 Syntactic Analysis

3 s.h.

Problem-oriented introduction to simple generative models dealing with a wide range of syntactic phenomena. Knowledge of English or an introductory course in linguistics. Prerequisites: 120-110 or 120-202.

120-108 Phonological Analysis

3 s.h.

Survey of the methods of the generation of language. Prerequisites: 120-100 or 120-300; 120-110.

120-109 Language and Field Methodology

3 s.h.

Introduction to methods of analysis of language data in field; theory and practical problems; field method: case study of language from the historic stage. Prerequisites: 120-110, 120-120.

120-114 Data Processing

3 s.h.

Introduction to computer use, introductory text analysis, introduction to existing program systems. Comparative computer analysis. No prerequisites. Same as English 111.

120-115 Language and Computer Science

3 s.h.

Introduction to computer science, programming techniques, and data analysis. Same as English 111.

120-120 Modern and Comparative Linguistics

3 s.h.

Principles of linguistic change, comparative methods and genetic classification of linguistic groups. Introduction to linguistic typology. Same as English 112.

120-121 Historical Theory

3 s.h.

Techniques involved in the study of language history. Historical and critical analysis. Prerequisites: 120-115.

120-122 Phonological Theory

3 s.h.

Basic course in generative phonological theory. Prerequisites: 120-112.
Division of Mathematical Sciences

Degree offered: B.A., B.S., M.S., Ph.D.

Undergraduate Program

The Division of Mathematical Sciences has a comprehensive undergraduate program in which students who seek a major in mathematical sciences may plan studies which will lead to (and may include) advanced work in one or more departments of the division.

The division offers a general major in mathematical sciences, in which the student may choose courses from any of the three departments in the Division of Mathematical Sciences and which must include substantial work in at least one of the three departments. A number of suggested programs for completing this major are listed below.

The Department of Computer Science offers a major in computer science. See "Computer Science" below.

Students may earn a B.A. by meeting the requirements outlined below. Alternatively, students may earn a B.S. by meeting these requirements and, in addition, completing two additional one-semester courses (each having at least 2 s.h. credit) in the division. In addition to the requirements listed here, each student must satisfy the general requirements of the College of Liberal Arts. Credit may be transferred from other institutions, but transfer students must take a minimum of nine semester hours beyond the first year of calculus or beyond the first course in computer science (22C:16 Introduction to Programming with P/L/I).

Requirements for a Major in Mathematical Sciences

The student must take at least one year of calculus (either 22M:25 and 22M:26 Calculus I, or 22M:35 and 22M:36 Engineering Calculus I-II) and six additional courses, each carrying at least three hours of credit, offered by the division, but not including:

22C:1 Survey of Computing
22C:9 Programming with COBOL
22C:100 Introduction to Computing with FORTRAN
22C:106 Introduction to Programming with P/L/I
22C:107 Programming with P/L/I
22C:108 Assembly Language Programming
22C:117 Computing with P/L/I
22M:1 Basic Mathematical Techniques
22M:2-3 Mathematical Techniques I-II
22M:4 Linear Algebra
22M:7 Quantitative Methods I
22M:10-11 Fundamentals of Computer Mathematics I-II
22M:15 Mathematics for the Biological Sciences
22M:16 Calculus for the Biological Sciences
22M:20 Elementary Functions
22M:25-26 Calculus I-II
22M:29 Computer Laboratory for Calculus and Linear Algebra
22M:33-36 Engineering Calculus I-II
22M:80 Theory of Arithmetic
22M:81 Geometry for Elementary Teachers
22S:8 Quantitative Methods II, computer science
22S:25 Elementary Probability and Statistics
22S:80 Insurance Mathematics
22S:102 Introduction to Statistical Methods

Except for students seeking a secondary teaching certificate, the seven courses must include two of these:

22C:116 Operating System Principles
22C:122 Advanced Computer Organization and Architecture
22C:123 Advanced Programming Language Concepts
22C:135 Introduction to Computation Theory
22C:145 Artificial Intelligence I
22M:100 Introduction to Ordinary Differential Equations
22M:118 Complex Variables
22M:170 Numerical Analysis: Nonlinear Equations and Approximation Theory
22M:171 Numerical Analysis: Differential Equations and Linear Algebra

or one of these:

22M:103-104 Foundations of Mathematics I-II
22M:110-111 Elementary Topology I-II
22M:115-116 Introduction to Analysis I-II
22M:120-121 Abstract Algebra I-II
22M:130-131 Theoretical Mechanics I-II
22M:131-132 Statistical Methods with Applications, Linear Statistical Models with Applications
22M:124 and 167 Introduction to Probability, Introduction to Stochastic Processes
22M:133-134 Introduction to Mathematical Statistics I-II
22S:177-178 Numerical Analysis for Actuarial, Graduates

Students who complete the requirements for a secondary teaching certificate may take any two 100-level courses among their seven courses in mathematics.

Students should not change from one of the calculus sequences (22M:25-28 and 22M:35-38) to the other, since the material is organized differently in the two sequences.

Suggested Programs

Some typical programs in various areas are listed below. They need not be followed exactly, rather, it is expected that each student will meet with his or her advisor and work out a program which reflects his or her mathematical interests. The requirements are flexible enough to show for changes in student's interests.

General Program

Unless a student has a strong interest in a special area in mathematics, a rather general program is suggested. This type of program should include 22C:7 Introduction to Computing with FORTRAN, preferably along with calculus during the freshman year. The program should also include courses such as 22M:30 Elements of Group Theory, 22M:55 Fundamental Properties of Spaces and Functions, or 22M:133 Foundations of Mathematics I, and it should include at least a semester's work in statistics and probability.

Additional work, in particular the required 100-level course, should be taken in whatever area of mathematical sciences is of most interest to the student. Students contemplating employment in government or industry upon completion of the B.A. degree...
should consider 22C:17 Programming with PL/I and courses in numerical analysis, applied statistics and operations research.

Actuarial Science


Normally a student would not complete all of these courses during the undergraduate year. Instead he or she would be advised to take a more general program and to consider completing the actuarial courses as part of a graduate program. Students of actuarial science are also advised to take at least one course in computer science and to consider a substantial program of courses from among those offered by the College of Business Administration.

Applied Mathematics

All students interested in applied mathematics should take the sequence 22M:25-26, 28 Calculus I-II, and 22M:27 Introduction to Linear Algebra or the sequence 22M:35-38 Engineering Calculus I-IV.


Students in applied mathematics should be familiar with computer programming (22C:7 Introduction to Computing with FORTRAN) and use the basic ideas of probability and statistics (the courses 22S:153-154 Introduction to Mathematical Statistics I-II) or 22M:120 Probability and Statistics are appropriate). To acquire an understanding of how mathematics is used in other areas, it is recommended that the student take a set of courses, involving mathematics in a significant way, outside the Division of Mathematical Sciences. Students who plan to do graduate work in applied mathematics should take 22M:115 Introduction to Analysis I.

Mathematics Education

For general requirements for teacher education, see "College of Education." The following mathematics courses are required for students in mathematics education:

The sequence 22M:25, 26 Calculus I and II, and 22M:27 Introduction to Linear Algebra.

22M:30 Elements of Group Theory, 22M:70 Euclidean Plane Geometry, and 22M:55 Foundations of Mathematics I and Functions (to be taken before 75-135 Methods: Mathematics). A 100-level course in the same area of mathematics may be substituted for any one or more of these. Students are also required to have proficiency in one computer programming language.

The 100-level courses the student should strive for breadth. It is recommended that the student select at least one of these courses in the Department of Statistics. One hundred-level courses level which the student must select are 22M:120-121 Abstract Algebra I and II, 22M:115-116 Introduction to Analysis I and II, 22M:110-111 Elementary Topology I and II, 22M:120 Probability and Statistics, 22S:114 Introduction to Probability, 22S:153-154 Introduction to Mathematical Statistics I and II.

Pure Mathematics


Probability and Statistics

The basis for this program is the calculus sequence 22M:25-26, 28 Calculus I-II, and 22M:27 Introduction to Linear Algebra or 22M:35-38 Engineering Calculus I-IV, together with one of these three sequences: 22S:153-154 Introduction to Mathematical Statistics I-II, 22M:120-121 Introduction to Probability, Introduction to Stochastic Processes, or 22S:151-152 Statistical Methods with Applications. A Linear Statistical Models with Applications should also be selected: one or two courses in computer science from 22C:7 Introduction to Computing with FORTRAN, 22C:17 Programming with PL/I, or 22C:18 Assembly Language Programming: and one or two courses in mathematical analysis from 22M:55 Foundations of Mathematics I and Functions, 22M:105 Analysis for Applications and 22M:112 Introduction to Analysis I. Substantial work in one of the biological, social, physical or engineering sciences is also highly recommended.

Applied Mathematical Science

Committee chairman: John S. Kreider
Degree offered: Ph.D.

Creative activities of an applied mathematical scientist include the formulation of scientific concepts and problems in mathematical terms, the analysis of these mathematical problems, the discussion, interpretation and evaluation of the results of his or her analysis, the exploration of new ideas and areas of application, and the development of mathematical theories in areas which have not hitherto been subjected to systematic mathematical treatment. These efforts may, in turn, lead to the generation of new mathematical ideas and theories, as a result of abstraction or generalization.

Opportunities for careers include faculty positions in colleges and universities, research positions in industrial and government laboratories, professional consulting positions and software computer consulting. The mathematical modeling learned by the student is useful in a wide variety of situations in this technological world.

Applied mathematical science at Iowa is an autonomous, broadly-based interdisciplinary program leading to the Doctor of Philosophy degree. The program seeks to help the student achieve a basic command of advanced mathematics, at least one science (behavioral, biological, engineering, physical, or medical), and the methods of applied mathematics. Additionally, the program seeks to develop the "attitude" of an applied mathematical scientist by emphasizing the utility of the discipline.

Each student will have a committee of three or more faculty members to guide and carefully supervise his or her program. The individual plan of study will be specifically developed by incorporating the desired balance in the appropriate science, advanced mathematics and applied mathematical science with the student's background, interests and goals.

A major objective of the program is to have the development of each student's dissertation follow the full cycle of research in applied mathematical science. Guided by the supervising committee, each student is expected to recognize a significant problem within his or her science. Thus he or she develops an appropriate mathematical model for that problem, critically examines that model with respect to its tractability and success in predictions, and develops improvements if necessary.

Students may enter with either a bachelor's or a master's degree. These students are expected to have a strong background in science and mathematics, together with a desire to apply mathematics to the solution of relevant scientific questions. All applicants must satisfy the general requirements of the Graduate College.

Eligibility, graduate fellowship and assistantships are available to qualified applicants. Applications for these appointments must be received before March 1. For application forms and further information, contact the Academic Department of the University of Iowa, Iowa City, Iowa 52242.

Computer Science

Department chairman: Donald L. Foley
Faculty: professors Donald L. Foley, Robert C. Plumb, Charles F. Landis, and Thomas A. Hickey; associate professors Donald E. Allen, Robert J. Banas, Paul P. Bonczek, and Robert J. Price; assistant professors Larry Ragland, Anne E. Home, Charles F. Landis, and Charles C. Young

Degrees offered: B.A., B.S., M.S., Ph.D.

Undergraduate Program

Undergraduates majoring in computer science should gain a strong background in mathematics and in programming languages and computer systems. To accomplish this, the following core courses are required for a B.A. degree in computer science:

Mathematics Requirements

22C:25 Calculus I
4 s.h.
22C:26 Calculus II
4 s.h.
22C:27 Introduction to Linear Algebra
4 s.h.
(Students interested in taking 22C:55 Numerical Methods in Computing should take 22C:27. All students are urged to take both 22C:26 and 22C:27.)

Computer Science Core Requirements

22C:16 Introduction to Programming with PL/1
3 s.h.
22C:17 Programming with PL/1
3 s.h.
22C:18 Assembly Language Programming
3 s.h.
22C:21 Data Structures
3 s.h.
22C:23 Programming Language Concepts
3 s.h.
22C:31 Introduction to System Hardware and Software
3 s.h.
22C:50 Discrete Structures
3 s.h.
22C:35 Numerical Methods in Computing
3 s.h.
(All students are urged to take both 22C:50 and 22C:35. Students who plan to go on to graduate work are especially urged to take 22C:50 and either 22C:35 or 22C:170.)

To receive a B.S. degree, the student must take two additional courses (each having at least 2 s.h. credit) in the Division of Mathematical Sciences. In addition, the student pursuing this major for either a B.A. or B.S. must complete an approved elective program. The Handbook for Computer Science Undergraduates, available at the Mathematical Sciences Division Office, includes suggested elective programs, information concerning credit by examination for the computer science core requirements and other information. The student's adviser maintains an academic record sheet (discussed in the Handbook) concerning the approved elective program.

Graduate Program

To provide the broadest possible background for its students and to take advantage of courses offered in other fields, the normal curricula in computer science includes work in several related fields. Within limits, an advanced degree program in computer science can be constructed to serve the particular needs of a student. However, a certain core of courses should generally be taken by any candidate for an advanced degree in this field.

If a student is concerned about a specific subject area in which computer science is a necessary but not a major part of his or her goal, then the student may be better served by obtaining a degree in...
that other area with a heavy concentration of courses in computer science. For instance, the Computer Science department cooperates with the Program in Applied Mathematical Science in developing interdisciplinary doctoral programs.

Although the plan of study of each advanced degree student is individually arranged to fit his or her needs, each student will be expected to study in the areas of programming, computer systems and computation theory. The requirements for the M.S. and Ph.D. degrees are outlined below, and specific details including grade point requirements, comprehensive examination information, student review policies, and complete course descriptions are given in the departmental Graduate Student’s Handbook which is available at the Mathematical Sciences Division Office.

The M.S. graduates will find careers as programmers or systems analysts in industry, business or government, as well as in directing and teaching computer in four-year colleges. The Ph.D. student can find the same opportunities and in addition can find a career in research and teaching at the advanced level.

**Master of Science**

Adviser and student will draw up a plan of study which will ensure that the student achieves proficiency equivalent to that which can be gained by taking the following courses:

1. **22C:122 Advanced Computer Organization and Architecture** 3 s.h.
2. **22C:123 Advanced Programming Language Concepts** 3 s.h.
3. **22C:135 Introduction to Computation Theory** 3 s.h.
4. **22C:193 Programming Laboratory** 2 s.h.
5. **Other 22C courses selected from 116, 118, 127, 144, 145, 178, 199, or any 200-level course**
6. **Mathematics and statistics courses** 6 s.h.
7. **Additional courses selected by the student with the approval of the adviser** 7 s.h.
8. **Total** 30 s.h.

Recommended mathematics, statistics and additional courses depend upon the student’s career objectives.


Any M.S. candidate may elect to write a thesis, and with the adviser’s consent may apply up to six semester hours of thesis credit toward the total required for the M.S. degree. The minimum number of semester hours for the M.S. degree in computer science with or without thesis is 30.

**Final Examination**

The candidate for the M.S. degree must successfully complete one of the examinations listed below. Each examination is a three-hour written examination, except D which is oral examination.

- A. Programming and Programming Languages
- B. Computer Systems and Hardware
- C. Computation and Automata Theory
- D. Thesis defense

A student should consult the Graduate Student’s Handbook for further information.

**Thesis**

If the student elects to write a thesis, it must be a contribution of at least moderate importance to computer science. The thesis may be in any area deemed acceptable by the thesis committee. An oral defense of the thesis will be required and it is taken as the master’s final examination.

**Admission**

The student seeking admission to the M.S. program in Computer Science is subject to the general admission requirements of the Graduate College (see "Graduate College"). It is strongly recommended that the applicant have a B.A. or B.S. in computer science, mathematics, engineering or physical science. A student whose undergraduate program does not include equivalents of the courses required in the Computer Science graduate curriculum will be expected to complete these courses prior to admission to graduate courses, for which they are prerequisite.

**Doctor of Philosophy**

**Course Requirements**

Doctoral students are expected to complete about 90 semester hours of graduate work, including a thesis. The student need not have a master’s degree when beginning the Ph.D. program, and need not acquire one. Usually, however, the Ph.D. student acquires a master’s degree either in computer science or in some other mathematical or physical science. Every Ph.D. student in computer science is expected to be knowledgeable in the following four categories:

- Programming concepts, including programming, programming languages, applications programming, simulation, artificial intelligence and numerical analysis;
- Theory of computation, including automata theory, computability and formal languages;
- Mathematical foundations, including set theory, algebra, analysis, logic and graph theory;
- Computer systems, including operating systems, computer architecture, and logical design and switching theory.

Although the plan of study for each student will be drawn up by the student and his or her committee to fit any special needs, every student is expected to complete approximately half of the coursework in the four categories above. Finally, each student must complete two semester hours of 22C:193 Programming Laboratory. The student must complete three courses with grades of A or B, at least one of which is at the 200 level, in each of two areas:

- One area must be selected from: Algebra
Computer Science

Analysis
Logic and set theory
Statistics and probability
Numerical analysis

The second area may be selected from the above, or from:
Electrical engineering
Operations Research
Business administration
Linguistics
Other related area as approved by the department

If the student selects statistics and probability as one of the areas, the advanced course may be chosen at the 100 level.

Comprehensive examination
A student is admitted to candidacy for the Ph.D. degree in computer science only after completing the comprehensive examina-
tion. In addition, he or she must be recommended by a member of
the computer science faculty. The comprehensive examination will
normally be taken only when the student meets completion of
coursework as required by the plan of study. There are three
three-hour written examinations, which may be followed by an oral
review:

Part I: On all aspects of programming and programming lan-
guages;
Part II: On the principles of computer architecture and operating
systems; and
Part III: On the theoretical aspects of computer science, in-
cluding automata theory, computability and formal languages.

All examinations are described in the Graduate Student's Hand-
book

Thesis
After demonstrating competency in each of the three required
areas of computer science and maintaining the required GPA, the
student will prepare a written thesis proposal which will be
defended in an oral examination administered by the student's
committee. The student must demonstrate expertise in the area of
the proposed research and must also justify the originality and
significance of the proposed contribution. Upon completion of the
thesis, an oral defense will be required.

Graduate Admissions
The department has a highly selective admissions policy and
normally considers only students with a grade point average above
3.3.

Graduate Service Courses
Competence and experience in the use of a digital computer in
problem solving is useful and often prerequisite to advanced study
and research in many disciplines. For most students, the two-
semester sequence 22C:106 Introduction to Programming with
PL/I and 22C:107 Programming with PL/I is recommended.
Students in fields in which other programming languages are
heavily used may find 22C:108 Assembly Language Programming
or 22C:109 Programming with COBOL more appropriate. The
one-semester PL/I course 22C:110 Computing with PL/I is rec-
ommended only for students with considerable programming ex-
perience using other languages.

Courses

Primary for Undergraduates

22C:1 Introduction to Computing

Prerequisites: 22C:1

The nature, uses, and limitations of computers and computing are
observed by a broad sample of computing disciplines including
human and computer interaction, computer program design,
programming languages, algorithm design, and computer
organization. The emphasis depends on the needs and interests of
the students and is determined by the instructor.

22C:7 Introduction to Computing with FORTRAN

Prerequisite: 22C:1

Basic concepts of computer structure and programming techniques,
communication-orientated programming, algorithms, data representa-
tion, subprograms, loop and disk usage, major emphasis on programming with FORTRAN.

22C:9 Programming with COBOL

Prerequisite: 22C:9

Use of the business-oriented language COBOL; records, files, and
main storage devices; programming techniques for table heading, sorting, generation of reports
from files, and maintenance of sequential and indexed-files files. Prerequisite: 22C:1

22C:16 Introduction to Programming with PL/I

Prerequisite: 22C:1

Programming and program design techniques using portions of the PL/I program-
ning language; forms a conditional two-semester sequence with 22C:17; variable, constants,
expressions, conditional control structures, internal arithmetic representation and character data, input-output, arrays and structures, external procedures.

22C:17 Programming with PL/I

Prerequisite: 22C:1

Combination of 22C:16, block structure, same scope, memory allocation and design of
program structure using procedures, subprograms, input-output, data structures, project
report, and oral and written examinations. Prerequisite: 22C:16 or 22C:17.

22C:21 Data Structures

Prerequisites: 22C:17, 22C:22 Programming Languages and Concepts

Topics: arrays, lists, stacks, queues, trees, file and disk structures, files and file system interfaces,
abstract data types, linked lists, and linear list structures; algorithms for searching, sorting,
and other procedures; implementation of algorithms using structured programming techniques.

22C:58 Programming Language Concepts

Prerequisite: 22C:17

Topics: basic programming language concepts, language hierarchies, basic concepts of
computer control structures, data abstraction, type, structure, and function of logical
programming languages, mechanisms, and paradigms: functional, declarative, imperative, and
object-oriented programming, computer networks, and the internet.

22C:98 Introduction to Systems Hardware and Software

Prerequisite: 22C:17

Basic computer concepts, hardware, operating systems, computer architecture, computer
organization, and computer assembly lines; computer systems, computing system concepts
and computer design.

22C:105 System Analysis and Programming

Prerequisite: 22C:17

Topics in Computer Science

Reading, research, or programming projects in computer science not available in other courses.
Permission of instructor necessary.
Mathematics

119

SBCS587 Formal Languages 3 a.h.
Chomsky hierarchies, decision problems, closure properties and operations of
regular grammars, context-free grammars, context-sensitive grammars, and
linear languages; finite automata, pushdown stacks and Turing machines;
declarative programming languages: Lambda calculus, untyped lambda calculus,
and typed lambda calculus. Prerequisite: SBCS575.

SBCS588 Seminar on Artificial Intelligence 1 a.h.
Topics from concept formation, pattern recognition, game playing, problem solving,
theorem proving, question answering, robotics, and neural modeling. Prerequisite:
consent of instructor.

SBCS599 Independent Study 2 a.h.
Recent advances in the field of Computer Sciences. Prerequisite: consent of
instructor.

SBCS629 Seminar on Automata 1 a.h.
Topics from algebraic automata theory, models of parallel computation, interactive
automata, and logic of computation. Emphasis is given to the computational complexity,
formal grammars. Prerequisite: consent of instructor.

SBCS658 Seminar on Programming 1 a.h.
Topics from object-oriented translation, compilation, multithreading and fine
distributed and advanced programming language features; use of current hardware
facilities. Prerequisite: consent of instructor.

SBCS668 Readings and Research 3 a.h.
Prerequisite: consent of instructor.

Mathematics

Department chairman: Richard B. Goldberg

Faculty: professors Kanazawa, S. Adkins, Korous, T. Carter, K. Fuller, Richard
B. Goldberg, Eugene W. Johnson, William A. Kirby, Jerred Kivelis, Paul J.
Krieger, Sinthia Lee, Paul B. Mabry, Robert H. Ovstedal, Thomas M. Price, Paul E.
Weinstein, Marilyn J. Zomz; associate professors Edward W. Chittick, Nolan B.
Coffewright, associate professor Alfred J. Bede, George Burke, Victor P. Muller,
Michael A. Grady, Rachel Little, J. Logan, James Spear, Joanne J. Spear, Margaret
Ertisch, Peter C. Kinsch, Robert W. Laflair, Alan F. Loban,
Grace C. W. Chu, Neile, Dennis M. Amatya, Christopher C. Chen,
Joshua F. Jochen, Keith D. Slivnitz; assistant professors Joseph House, Matthew
Scarpone, Tszang Tong Pak.

Undergraduate Programs

See Division of Mathematical Sciences.

Graduate Programs

The Department of Mathematics offers the M.S. degree without thesis and the Ph.D. The M.S. degree may be taken as an education option. For all of these degrees the student is required to take a two-semester sequence in algebra and a two-semester sequence in analysis. A comprehensive examination covers the material in these sequences. In the case of prospective secondary school teachers, material in required education courses is also examined. The remaining of the student’s program may be chosen from any one or more of the departments in the Division of Mathematical Sciences and from outside the division as well. The programs include the preparation of candidates with a common core of knowledge and to allow maximum flexibility outside of this core.

In addition to these programs, there is an M.S. program (see III below) designed for students seeking the Ph.D. in other disciplines which require a good deal of mathematical knowledge.

Master of Science

Program I (designed for secondary school teachers)

Required Courses
Two from 22M:115-116 Introduction to Analysis I-II and 22M:210-211 Analysis I-II, including either 22M:116 or 22M:211.

Two from 22M:120-121 Abstract Algebra I-II and 22M:205-206 Introduction to Algebra I-II, including either 22M:121 or 22M:206.

Two in mathematics education.

Course Distribution

A minimum of 30 semester hours of graduate credit, including at least 24 semester hours in these Division of Mathematical Sciences courses.

Any course in the Department of Mathematics numbered 100 or above, except 22M:105 Analysis for Applications.

Either 22C:122 Advanced Computer Organization and Architecture, 22C:135 Introduction to Computation Theory, 22C:145 Artificial Intelligence I, 22C:199 Topics in Finite Automata Theory, or any 200-level course in computer science.


Comprehensive Examination

A six-hour examination over the required courses will assess the candidate’s knowledge of mathematics and his or her knowledge of the relevance of specific concepts to the teaching of secondary school mathematics.

Program II (designed for prospective doctoral students)

Required Courses
Two from 22M:115-116 Introduction to Analysis I-II and 22M:210-211 Analysis I-II, including either 22M:116 or 22M:211.

Two from 22M:120-121 Abstract Algebra I-II and 22M:205-206 Introduction to Algebra I-II, including either 22M:121 or 22M:206.

Course Distribution

A minimum of 24 semester hours in the Division of Mathematical Sciences, and a minimum of 18 semester hours in the Department of Mathematics from the courses listed below:

Any course in the Department of Mathematics numbered 100 and above except 22M:105 Analysis for Applications.

Any of the following courses in the Department of Computer Science: 22C:122 Advanced Computer Organization and Architecture, 22C:135 Introduction to Computation Theory, 22C:145 Artificial Intelligence I, 22C:199 Topics in Finite Automata Theory, or any 200-level course.

Any of the following courses in the Department of Statistics: 22S:153-154 Introduction to Mathematical Statistics I-II, 22S:134, 167 Introduction to Probability - Introduction to Stochastic Processes, or a course which has any of these as a prerequisite.

Comprehensive Examination

Two three-hour examinations over the required courses. (With
the permission of the graduate committee, a candidate in this program may substitute an appropriate part of the Ph.D. comprehen- sive examination for part of the master's examination."

Program III (nondepartmental students on route to a Ph.D. in another area)
No required courses.

Course distribution same as Program II.

Comprehensive Examination
The student in Program III will be considered to have passed the comprehensive examination for the master's degree in mathema-
tics upon satisfying the following two conditions:
Maintaining minimum grade-point average of 3.0 in all math-
ematics courses taken for the master's degree in mathematics.
Successful completion of comprehensive Ph.D. examinations in
chosen area.

A student in Program III will be assigned a mathematics adviser
who will work with the student and the student's adviser in his or
her area outside the division to establish an appropriate curriculum for
the master's degree in mathematics.

General Information
To be admitted to candidacy for the M.S. degree in mathematics, a
student must have completed work in undergraduate mathematics
roughly equivalent to the program previously described for an
undergraduate major in the Division of Mathematical Sciences. A
student whose preparation does not meet this requirement may be
required to take certain additional courses to correct the deficiency.
It is expected that candidates for the Master of Science degrees
will be able to complete their degree program in four summer
sessions or one academic year and one summer session.

Required courses in the programs and a broad selection of
electives are offered regularly during summer sessions. In addi-
tion, each semester of the academic year at least one course of
interest to teachers is offered by the Division of Mathematical
Sciences during the late afternoon or evening.

Doctoral Programs
Most of the recent graduates of the Ph.D. program have found
positions teaching in universities or colleges.

There is ample opportunity for Ph.D. candidates to take courses
in applicable mathematics, both in the mathematics department and
other departments in the division. There is thus no formal
departmental policy distinguishing between pure and applied
mathematics.

The Department of Mathematics also cooperates in interdisci-
plinary doctoral programs with the program in Applied Math-
ematical Sciences.

The requirements for the Ph.D. in mathematics include 72 hours of
graduate credit, at least three years of graduate residence,
including at least one at The University of Iowa, and passing of a
comprehensive qualifying examination as described below. Also
required in the field of research chosen by the candidates are a
comprehensive examination, the writing of a thesis, and a final
examination. Ordinarily, the candidate must demonstrate to the
adviser's satisfaction proficiency in French, German or Russian.

The qualifying examination covers three of the following areas:

algebra, analysis, logic and foundations, topology. Each student
decides in which three of the areas he or she wishes to be
examined. The examinations are regularly given each academic
year early in October and early in April. Further information on
these examinations is available in the mathematics office. Begin-
ning graduate students who plan ultimately to work for the Ph.D.
should follow the guidelines given above for the various M.S.
programs, and should seek their advisers' help in planning a
course of study that will prepare them for the comprehensive
qualifying examination. Students who enter after having taken
some graduate work elsewhere should likewise consult an adviser
for an evaluation of the previous work and the planning of further
study.

A Ph.D. in mathematics education is also offered. For further
information, consult the brochure "Advanced Studies in Educa-
tion," available from the College of Education.

Courses

Undergraduates: Lower Division

These courses are not open to graduate students except by special arrangement with
chairmen of the Department.

235E1 Basic Mathematical Techniques
3 s.h.

Functions, ratios, ratio and proportion, algebraic expressions and equations, simple
products, linear and quadratic equations, simultaneous equations, exponents and
radicals. Prerequisites: one year of high school algebra, one year of high school
geometry.

235E3 Mathematical Techniques II
3 s.h.

Equations and inequalities, functions and graphs, exponential and logarithmic func-
tions, systems of equations and inequalities. Prerequisite: 235E1 or one and one-
half years of high school algebra, one year of high school geometry.

235E5 Mathematical Techniques III
3 s.h.

Trigonometric functions, solutions of right and oblique triangles, complex numbers,
trigonometric graphs, empirical and analytic trigonometry. Prerequisites: 235E2 or
two years of high school algebra, one year of high school geometry.

235E6 Introductory Algebra
3 s.h.

Elementary manipulations of numbers and decimals, ratio and unitary of numbers,
systems of linear equations, transformations in the plane, introduction to trigonometric
theory; primarily for students who need some technical competence in use of
numbers. Prerequisite: 235E3 or three years of high school mathematics.

235G7 Quantitative Methods
4 s.h.

Quantitative methods in finding problems applicable to biological, management and
social sciences; computer programming, systems of linear equations, linear pro-
gression, descriptive statistics, probability. Three probability modules, diverse course
variation. Followed by Statistics 235E6. Prerequisites: two and one-half years of high school
mathematics or 235G7.

235G8 Quantitative Methods II
4 s.h.

Introduction to analysis of variance and block design; introduction to non-normal,
distributions, integrals, applications in medical and natural sciences; additional elemen-
tary topics in matrix theory, geometry or topology, as time permits. This course or
235G4 (but not both) may be used to satisfy four hours of core requirement in natural
science. Prerequisite: 235G3 or 235G6.

235G9 Quantitative Methods for the Biological Sciences
4 s.h.

Introduction to analysis of variance and block design; introduction to non-normal,
distributions, integrals, applications in medical and natural sciences; additional elemen-
tary topics in matrix theory, geometry or topology, as time permits. This course or
235G4 (but not both) may be used to satisfy four hours of core requirement in natural
science. Prerequisite: 235G3 or 235G6.

235G10 Colloquium for the Biological Sciences
3 s.h.

Differential and integral calculus; topics in differential equations, multivariable
calculus, matrices and complex numbers; applications in the life sciences. Prerequisites:
one year of high school mathematics or 235G9.
32#810 Topics in Topological Dynamics 3-3 s.h.
Prerequisite: Graduate standing. Topics acting on topological spaces: p-point, q-point, and uniformity in and around. May be repeated with consent of instructor.
Prerequisite: 22M:308.

32#810 Ordinary Differential Equations 3 s.h.
Examples include: theory, linear, and nonlinear systems, Picard-Bendixson theory, comparison and oscillation theorems, boundedness and bounded solutions. Prerequisite: 22M:114 or equivalent.

32#810 Topics in Ordinary Differential Equations 3-3 s.h.
Selected advanced topics in ordinary differential equations. Prerequisite: 22M:319.

32#811 Topics in Applied Mathematics 3-3 s.h.
Selected topics in applications of mathematics to other disciplines. Prerequisite: consent of instructor.

32#812 Partial Differential Equations 3 s.h.
Cauchy-Kovalevskaya existence; Cauchy problem: classification of second-order equations, elliptic, parabolic and hyperbolic equations. Prerequisite: 22M:101. 22M:118 or equivalent.

32#812 Topics in Partial Differential Equations 3-3 s.h.
Selected advanced topics in partial differential equations. Prerequisite: 22M:325 or consent of instructor.

32#817 Commutative Algebra 3 s.h.
Ideal theory in commutative rings, field extensions, usually closed rings. Prerequisite: 22M:316.

32#818 Theory of Groups 3 s.h.
Homomorphisms, abelian groups, cyclic groups, Sylow theorems, permutation groups, subdirect products, free groups, composition series, simple and nilpotent groups. Prerequisite: 22M:236.

32#819 Theory of Rings 3 s.h.
Ideals, ideals, modules, modules and simple rings, division rings, homomorphic images and rings of matrices, field extensions, division rings, simple and algebraic, simple and nilpotent groups. Prerequisite: 22M:236 or consent of instructor.

32#820 Topics in Algebra 3-3 s.h.
Selected topics, usually ideal theory, structure of rings, groups, group representations and their theory. Prerequisite: 22M:206 or consent of instructor.

32#821 Representation of Finite Groups 3 s.h.
Structure of group algebras of finite groups, linear representations, historical development, character tables, equivalence relations, equivalence relations, equivalence classes of representations. Prerequisite: 22M:206 or equivalent.

32#822 Algebraic Geometry 3 s.h.
Ideal theory and congruences theory in algebraic geometry; partial trx theory of varieties, theory of algebraic functions and related topics, theorems of Riemann, theorems of Hurwitz. Prerequisite: 22M:206 or consent of instructor.

32#823 Topics in Nonassociative Algebra 3 s.h.
Structure theory of various classes of algebras and their applications to the theory of groups, algebraic structures are geometric and geometric structures are algebraic. Prerequisite: 22M:206 or consent of instructor.

32#824 Homological Algebra 3 s.h.
Modules, tensor products, group of homomorphisms, cohomology, homology, tensor functors, projective and injective modules, derived functors, extensions and Ext functors, homological dimension. Prerequisite: 22M:206 or equivalent.

32#825 Algebraic Topology 3 s.h.
Simplex complexes, homology and homology theory of simplicial complexes, cohomology and cohomology theory, homology groups, relations between homology and homotopy. Prerequisite: 22M:226.

32#827 Topics in Algebraic Topology 3 s.h.
Topics chosen from algebraic topology at instructor's discretion, for example, topics from homotopy, homology, cohomology, homotopy theory, homology theory, homology groups, elements of homotopy.

32#828 Theory of Probability I 3 s.h.
Basic concepts: probability and characteristic functions; convergence theorems; cumulative distribution functions; stochastic processes. Prerequisite: 22M:311. Same as 22M:340.

32#829 Topics in Metric Geometry 3-3 s.h.
Topics selected from metric geometry, foundational analysis, fixed-point theory.

32#829 Foundations of Mathematics I 3 s.h.
Studies in set theory and set theory, including descriptions of first-order theories from standard models, axioms, theorems, and models. Prerequisite: consent of instructor.

32#830 Foundations of Mathematics II 3 s.h.
Continues theory of models or topics in recursive theory. Prerequisite: 22M:340.

32#830 Numerical Methods in Linear Algebra 3 s.h.
Solutions of linear systems, eigenvalues problems, inverse matrix, conditioned and ill-conditioned systems. Prerequisites: 22M:117 and 22M:150, or consent of instructor.

32#831 Numerical Equations of Partial Differential Equations 3 s.h.
Numerical solutions of wave type, partial differential equations, initial and boundary value problems. Prerequisite: 22M:117 and 22M:150, or consent of instructor.

32#832 Fourier Analysis 3 s.h.
Prerequisite: consent of instructor.

32#834 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#838 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#839 Banach Algebra 3 s.h.
Algebraic Topology 3 s.h.
Prerequisite: consent of instructor.

32#840 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#841 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#842 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#843 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#844 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#845 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#846 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#847 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#848 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#849 Banach Algebra 3 s.h.
Prerequisite: consent of instructor.

32#850 Reading and Research 3 s.h.
Prerequisite: consent of advisor.

Statistics

Department Chairperson: Burton V. Haag


Teaching Assistants: John J. Birr, James D. McPherson, Steven D. Cline, Desree H. Elder, Brandi L. Rabb, Croy G. Woodworth, assistant professors; Stuart J. McGinnis, Russell V. Krzysik, Brandon M. Sester.

Dissertation Office: B.A., B.S., M.S., Ph.D.

Statistics build mathematical models for processes which involve uncertainty, so that they may be better understood and perhaps controlled in the future. In addition, statisticians help design and analyze scientific experiments. Because uncertainty is such a pervasive feature of life, statisticians are employed in almost every facet of our technological advanced society. They are employed in industry (e.g., in the quality control of production processes) and in insurance firms as actuaries. In the government, they design and carry out statistical analyses, such as those of the Census Bureau and the Bureau of Labor Statistics. They serve in academic institutions, not only in statistics itself, but also in medicine, sciences, engineering, education and other fields where modern research techniques are applicable.

Undergraduate Program

See "Division of Mathematical Sciences."
With the approval of the Department, selected candidates may be granted admission on the basis of mathematical training through one year of calculus.

**Master's Degree Programs**

The Department offers five M.S. degree programs, each with or without thesis.

Non-Thesis

The non-thesis M.S. degree is awarded upon successful completion of a prescribed course of study, approved by an advisor, involving at least 30 semester hours of graduate work. Study culminates in a final examination usually consisting of at least two two-hour written examinations. The specific course requirements for the non-thesis M.S. degree programs are given below. If a specified course, or its equivalent, was taken while the student was an undergraduate, an appropriate graduate-level course, selected with the help of the student’s advisor, will be substituted in the degree program.

**Theoretical Statistics and Probability**

224:115 Introduction to Analysis I

225:133-154 Introduction to Mathematical Statistics I-II

225:167 Introduction to Stochastic Processes

At least six semester hours from among:

224:116 Introduction to Analysis II

225:210-211 Analysis I-II

225:100 Applied Statistical Decision Theory

225:170 Introduction to Nonparametic Statistics

225:172 Topics in Statistics

225:233 Probability and Statistics I

225:235 Linear Models

225:256 Multivariate Analysis

225:271-272 Statistical Inference I-II

**Applied Statistics**

The following courses are recommended and constitute the core of the program:

225:103 Introduction to the Design of Sample Surveys

225:138 Bayesian Statistics I

225:153-154 Introduction to Mathematical Statistics I-II

225:182 Analysis and Design of Experiments

225:162 Regression Analysis

225:172 Statistical Computation and Consulting

225:100 Introduction to Computing with FORTRAN

The remaining courses may be selected from among:

225:148 Quality Control, Reliability, and Engineering Statistics

225:140 Intermediate Statistical Methods

225:160 Applied Statistical Decision Theory

225:161 Application of Multivariate Statistical Techniques

225:170 Introduction to Nonparametric Statistics

225:229 Bayesian Statistics II

225:1704 Numerical Analysis: Nonlinear Equations and Approximation Theory

580:149 Digital Systems Simulation I

580:164 Quantitative Investment Analysis

Other courses relevant to applied statistics, but not appearing on this list, may be selected for inclusion in the M.S. program in consultation with the advisor.

**Actuarial Science**

225:133-134 Introduction to Mathematical Statistics I-II

225:177 Numerical Analysis for Actuaries

225:178 Graduation

225:179 Advanced Mathematics of Finance

225:180 Mathematics of Life Insurance

225:181-182 Actuarial Theory and Practice I-II

225:183 Construction of Demographic Tables

225:184 Risk Theory

225:270 Seminar: Actuarial Theory

At least one course from outside the Division of Mathematical Sciences, most students elect courses from the College of Business Administration.

**Operations Research**

225:155

154 Introduction to Mathematical Statistics I-II

225:160 Applied Statistical Design Theory

586:143 Quantitative Investment Analysis

586:242 Mathematical Programming I

It is also recommended that the following be taken:

225:147 Introduction to Stochastic Processes

586:243 Mathematical Programming II

**Biostatistics**

225:101 Biostatistics

225:140 Design Analysis of Experiments in Biomedical Sciences

225:130 Probability and Statistics

or

225:153 Introduction to Mathematical Statistics I

225:183 Construction of Demographic Tables

586:127 Engineering Management Science

or

586:176 Operations Management

225:158 Analysis and Design of Experiments

or

225:161 Application of Multivariate Statistical Techniques

225:103 Introduction to the Design of Sample Surveys

225:173 Statistical Computation and Consulting

In addition, each student is expected to take 15 hours in the health and/or biological sciences, although part of this may be satisfied by courses previously completed at the undergraduate level.

**With Thesis**

A student who chooses to earn the M.S. degree with thesis follows a course of study similar to those described above, except that up to eight semester hours may be earned by writing a thesis. Each candidate will have a committee of three members appointed by the chairman of the Department. This committee will have the responsibility of recommending action on the candidate’s degree application. This recommendation is usually based on the results of two two-hour examinations on the topics covered in the specified courses within each program.

**The Doctor of Philosophy**

All doctoral students in statistics must successfully complete two of these sequences: 225:255 Linear Models and 225:256 Multivariate Analysis, 225:264-265 Theory of Probability I-II, and/or 225:271-272 Statistical Inference I-II. Students in the applied
statistics program are also required to take 225:138 Bayesian Statistics I during their first year. During the first year or two, the student may wish to take coursework or seminars toward the achievement of certain auxiliary goals of the doctoral program in statistics—to obtain his or her area of specialization to other fields of knowledge, to acquire the ability to use electronic digital computing equipment, or to learn the language skills needed to read foreign scientific journals and be able to respond in personal contacts with foreign statisticians. Each student is required to include in his or her program a component which involves experience in either teaching or statistics consulting. At least by the end of the spring semester of the second year in the Department, the student should have taken the qualifying examination to determine if he or she has mastered the basic concepts of probability and statistics. Examination essentially covers topics studied in 225:151–154 Introduction to Mathematical Statistics I–II, 225:167 Introduction to Stochastic Processes and 225:158 Analysis and Design of Experiments. A study guide for this examination is available from the Department. This examination may be used in lieu of the master’s written examination. Typically, in the third year of graduate work and after passing the qualifying examination, the student should seek permission of the Department chairman to take the preliminary examination, consisting of the student’s choice of one of these:


Mathematical Analysis—covers material in 22M:210-211 Analysis I–II.

After passing the preliminary examination, the student should obtain a thesis advisor. The advisor should prepare a plan of study, then ask the Department to submit a request for the comprehensive examination, unless the student has exercised the option to take a preliminary and comprehensive examinations concurrently. A student’s performance on the comprehensive examination will be deemed satisfactory when he or she has passed the preliminary examination and a second examination from the three listed above.

Upon completion of the comprehensive examination, the student and the thesis advisor should petition the Department chairmen to appoint a committee to guide the dissertation investigation. After the student has become familiar with the background literature for the dissertation, but before extensive original work has been begun, the student should present an oral prospectus to his or her dissertation committee. The purpose of this presentation is to share the dissertation committee, at an early stage, to offer comments or suggestions concerning the topic of investigations for the dissertation. The student should present to each member of the committee a printed copy of the prospectus, about five typewritten pages in length, at least one week prior to the oral presentation. Typically, a student would present the dissertation prospectus during the fall semester of his or her fourth year, but in no case less than six months before the final oral examination.

A program which does not conform to the above requirements, but is of high excellence, may be approved by the Department chairman.

All doctoral programs end with an oral examination over the candidate’s dissertation.

Special Features

Remote computer terminals are available in MacLean Hall and are employed in several courses to give students experience using the computer.

Bayesian statisticians are often teamed with other scientists in research projects, it is important that students gain experience in group efforts. In several courses the Department tries to provide the experience. For example, a team of students, with faculty supervision, performed an extensive analysis of the factors relating to highway deaths in Iowa.

Courses

Primarily for Undergraduates

Note: No student who has received credit for a course offered by the Department of Statistics admitted above 225:105 may receive credit for a subsequently taking a course numbered below 225:100.

225:06 Quantitative Methods I 4 s.h.
Covers models, concepts of calculus, basic statistical models, regression and tests of hypotheses. Credit: 22M:17.

225:08 Elementary Probability and Statistics 3 s.h.
Set approach to probability, assignment of probability using permutations and combinations, distributions of random variables and statistics, descriptive statistics, large sample theory, introduction to estimation and test of significance. Prerequisites: college algebra or equivalent. Students with calculus should take 225:105, 225:110.

225:26 Probability and Statistics for Engineering and Physical Sciences 3 s.h.
Discs probability models, general probability models, random variables, functions of random variables, expectation, joint distributions, univariate distributions, characteristic functions, estimation, hypothesis testing, regression. Same as Engineering 260:109. Prerequisite: Mathematics 220:20 or equivalent.

225:49 Insurance Mathematics 3 s.h.
Bases of actuarial science and actuarial modeling, probability of ruin, insurance reserves, life contingencies, life insurance, life annuities, mortality tables, life expectancy. Prerequisites: Mathematics 225:26 or 225:110 should be taken before 225:108.

For Undergraduates and Graduates

225:111 Data Analysis 3 s.h.
Elementary course on statistical methods primarily for research in social sciences and related fields.

225:102 Introduction to Statistical Methods 3 s.h.
Primarily for students who are not majoring in statistics; student should see both 225:25 and 225:161; Same as Sociology 215:14; Psychology 31:04.

225:103 Introduction to the Design of Sample Surveys 3 s.h.
Same as Preventive Medicine and Environmental Health 315:16. Prerequisites: 225:111 or 225:102.

225:105 General Statistics 3 s.h.
Same as Sociology 12:155.

225:130 Probability and Statistics 4 s.h.
Probability and statistics, properties of random variables, characteristic functions, discrete and continuous distribution, estimation and hypothesis testing, regression. Prerequisites: 225:26 or 225:08.

225:134 Introduction to Probability 3 s.h.
An introduction to the theory and application of probability models including: elementary combinatorics, random variables, probability, expectation, moments, generating functions, random walks, Markov chains. Prerequisite: 225:26 or 225:130. Same as Mathematics 225:134.

225:131 Statistical Methods with Applications 3 s.h.
Same as Industrial and Management Engineering 260:131.
Microbiology

complete sufficient attention: minimize quantity and emphasized higher estimates. Possibility: 220-254 or equivalent. 220-272 Statistical Inference II 3 s.h.

Undergraduate Study

Microbiology

Department chairman: J.R. Pope

Degree offered: B.S., M.S., Ph.D.

Medical Technology

See "Pathology" in "College of Medicine" Section.

Microbiology

Microbiology is a science concerned with identification, structure and activities of bacteria, fungi, protozoa, algae and viruses. It also includes immunology, a discipline dealing with the response of man and animals to foreign material.

Microbiology involves study of the distribution of microorganisms in nature, their relationships to each other and to other living things, their beneficial and harmful effects on man, animals, and plants, and the physical and chemical changes they produce in the environment.

All branches of the science—general microbiology, food and dairy microbiology, soil microbiology, plant microbiology, water and sewage microbiology, medical and veterinary microbiology, dental microbiology, immunology, pharmaceutical microbiology, marine microbiology, geomicrobiology—have expanded rapidly in recent years and offer rewarding career opportunities to qualified persons.

Microbiology is an excellent major for undergraduate students who want a good general education with emphasis on an important and interesting science. For the graduate of a bachelor's degree program in microbiology, positions are available in government, hospitals, public health and industrial control, research and teaching laboratories.

Students who continue beyond the bachelor's degree have career opportunities in these same areas, plus college and university teaching, with greater responsibilities and correspondingly higher salaries.

The Bachelor of Science Degree

The objectives of the undergraduate program in microbiology are to prepare students for careers in science, especially in their chosen majors, and to provide them with a broad background in other subjects, so they may relate microbiology to other fields of human endeavor.

An undergraduate student majoring in microbiology at Iowa State must meet general College of Liberal Arts requirements. The student must complete a minimum of 14 semester hours in microbiology to obtain a B.S. degree, no more than two semester hours of special problems (61-161 Problems in Microbiology) may count toward this requirement. Students desiring to apply for certification by the National Registry of Microbiologists are required to take 20 semester hours in microbiology. Certification is required for employment or advancement in some areas. Mathematics and science courses required by the Department for the B.S. degree should be taken for letter grades, except under unusual circumstances with the consent of the adviser. This is a typical curriculum for undergraduate majors:

First Semester

220:20 Prerequisite: 220:20

220:21 Prerequisite: 220:21

220:22 Prerequisite: 220:22

220:23 Prerequisite: 220:23

220:24 Prerequisite: 220:24

220:25 Prerequisite: 220:25

220:26 Prerequisite: 220:26

220:27 Prerequisite: 220:27

220:28 Prerequisite: 220:28

220:29 Prerequisite: 220:29

Prerequisite: consent of instructor.

Prerequisite: consent of instructor.

Prerequisite: consent of instructor.

Prerequisite: consent of instructor.

Prerequisite: consent of instructor.

Prerequisite: consent of instructor.
Junior Year

First Semester
09:120 The Chemistry of Biological Materials 3 s.h.
29:1 College Physics 4 s.h.
Physical education 2 s.h.
Core, elective or advanced microbiology courses 6-8 s.h.
15-17 s.h.

Second Semester
09:130 Metabolism 3 s.h.
29:2 College Physics 4 s.h.
Core, elective or advanced microbiology courses 8 s.h.
15 s.h.

Senior Year

First Semester
Core, elective or advanced microbiology courses 15-17 s.h.

Second Semester
Core, elective or advanced microbiology courses 15-17 s.h.

*222M:16 or the 222M:25-26 combination is optional, but may be desirable for students planning to do graduate work.

**may also be taken the first semester of the junior year

The Honors Program
Open to seniors with a grade-point average of at least 3.0 overall and a 3.2 in microbiology courses. The Honors Program in Microbiology comprises an introduction to original research, directed projects, participation in a department seminar, the identification and resolution of a special laboratory problem, a report on the laboratory work and an Honors examination. A student successfully completing Honors work receives six semester hours of credit and is awarded the bachelor's degree with honors.

Graduate Study, Faculty Roster, Courses
See "College of Medicine."

Museums

Department head: George D. Schriemer
Facility: assistant professor George D. Schriemer

The Department offers courses which give the student a comprehensive background in the conceptual, design and production phases of exhibit preparation and the general operational procedures of small science museums. The museum field is expanding rapidly, and graduates of the University occupy positions of responsibility as directors, curators and exhibit specialists in museums throughout the United States and Canada.

A major in one of the natural science disciplines (zoology, geology or botany) anthropology for general science is recommended for students preparing for museum careers. Courses are offered during the annual eight-week Summer Session, as well as the regular academic year. They are elective college work, counting as credit toward the B.A. or B.S. degree. As graduate work, museum courses may be credited as a formal minor concentration on a master's degree in Anthropology or Science Education, or the Ph.D. degree in Science Education. Inquiries regarding program details should be directed to the appropriate major department.

Techniques presented in the Museum Laboratory are of value, not only to those intending to pursue museum careers, but also to pre-medical, zoology, geology and anthropology students. Advanced museum students are afforded the opportunity to gain practical working experience by participating directly in the Museum of Natural History exhibit program.

Courses

(All registration by consent of instructor.)
24:101 Museum Techniques 1-2 s.h.
Climbing, preparing and exhibiting biological materials for museums, classrooms and museums
24:102 Museum Techniques 1-2 s.h.
Continuation of 24:101, but may be taken as independent study.
24:103 Museum Administrative Work 1 s.h.
Techniques used in preparation of classroom projects with a minimum of laboratory work; section of course may be used in preparation of a master's thesis in education or in preparation of a master's thesis in education
24:105 Principles of Exhibit Theory and Design are. Directed study presentation of conceptual and design considerations employed in planning and executing exhibits of natural science exhibits (72, 75, 105, 110), or consent of instructor.
24:111 Principles of Exhibit Theory and Design are. Continuation of 24:105, but may be taken as independent study. Prerequisites: 24:101 and 105, or consent of instructor.

Music

Revised March 1991

Wanda Voclain

Pamela; Josphine; Keith; Andrews; Paul; Ann; James; Arvy; Walter; T. Anderson; Tom; Fred; John; Rita; Stephens; Venice; June; Diane; Richard; B. Herr; John; H. D.; Donald; James; Edward; L. Eccles; Herbert; Gerhard; Knell; Albert T. Loomis; Betty; Ben; Michael; Lyle; Milardo; Bill; Bob; Allen; Frank; Paul; William; loris; Todd; Grover; Merle; Vincen; associated professor and the Addl. Jean; Richard; I. Blanch; Paul; Paul; Lowell; Cross; Mayco; Kell; David; Donald; Robert; Albert; Bernt; William; Robert; James; Larry; Jim; Terry; David; Mickey; James; Merle; Jeannette; Trudy; Edward; George; John; Harvey; Dr.; Robert; Yean

Quinte, Percussion Quartet, Vocal Quartet and the Baroque Players. Private lessons with faculty members are offered in all band and orchestra instruments, voice, piano and organ.

At the undergraduate level, the School's curricula offer all qualified students an opportunity for the further study of music toward either professional or avocational goals. The graduate curricula are designed primarily as preparation for teaching in secondary schools, colleges and universities, and for careers in performance.

The School is a charter member of the National Association of Schools of Music.

Undergraduate Programs

The School offers two undergraduate degrees: the Bachelor of Arts and the Bachelor of Music. Curricula are the same for both, with these exceptions: candidates for the B.M. degree may, and candidates for the B.A. may not, count more than 50 semester hours of coursework in music toward the 124 semester hours required for graduation; and the foreign language requirement for the B.M. is one year of college-level study, while the requirement for the B.A. is two years. Areas of concentration offered in both programs are performance, music education, music therapy and composition/theory.

General Requirements

All undergraduate enrollments require School of Music approval. Entering undergraduate students planning to major in music are expected to audition either in person or by tape recording in advance of registration. All transfer students must also take the Advisory Examination in music theory (see "Graduate Degree"). Any serious deficiencies in theory must be removed through registration in 25:11 Review Theory. All baccalaureate candidates in music must satisfy all College of Liberal Arts general requirements except the historical-cultural core requirement (see the College of Liberal Arts sections of the Catalog for these requirements), and the following requirements of the School:

<table>
<thead>
<tr>
<th>Course</th>
<th>S.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>25:1-2 Literature and Theory I-II</td>
<td>3</td>
</tr>
<tr>
<td>25:5-4 Aural Skills I-II</td>
<td>3</td>
</tr>
<tr>
<td>25:5-6 Literature and Theory III-IV</td>
<td>3</td>
</tr>
<tr>
<td>25:7-8 Aural Skills III-IV</td>
<td>1</td>
</tr>
<tr>
<td>25:91-92 History of Music I-II</td>
<td>3</td>
</tr>
<tr>
<td>25:71-72 Group Piano Instruction I-II or adequate proficiency</td>
<td>1</td>
</tr>
</tbody>
</table>

Music Education

Areas of concentration in music education are instrumental music, vocal music, general music and music therapy. In addition to the B.A. or B.M. requirements in music and liberal arts, certification to teach music in Iowa schools requires satisfactory completion of specific requirements in the area of concentration. Requirements in the instrumental and vocal areas are listed below. The requirements in the general music area may be obtained from the Music Education Office, School of Music.

<table>
<thead>
<tr>
<th>Area</th>
<th>S.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>String Majors</td>
<td></td>
</tr>
<tr>
<td>Violin</td>
<td>2</td>
</tr>
<tr>
<td>Cello</td>
<td>2</td>
</tr>
<tr>
<td>Violin and viola majors take one year of cello instruction; cello and bass majors take one year of viola.</td>
<td></td>
</tr>
<tr>
<td>Class Strings</td>
<td>2</td>
</tr>
<tr>
<td>Violinists take viola and bass; violinists take violin and bass; cellists take viola and bass; bassists take cello and cello.</td>
<td></td>
</tr>
</tbody>
</table>

| 75:141 Instrumental Techniques (normally clerical, except for organ). | 2 |
| 25:107 Instrumental Conducting I | 2 |
| 25:108 Instrumental Conducting II | 1 |
| 75:130 String Techniques and Methods | 3 |
## 7E:145 Methods and Materials: Elementary School Music
2 s.h.

## 7E:140 Methods and Materials: Secondary School Instrumental Music
4 s.h.

## 7E:191 Observation and Laboratory Practice in the Secondary School
6 s.h.

## 7E:192 Laboratory Practice in the Elementary School
6 s.h.

## 7E:187 Seminar: Curriculum and Student Teaching
1 s.h.

### Brass, Woodwind or Percussion Majors

All brass, woodwind, and percussion majors in the music education program must participate in concert band eight semesters and in marching band for two fall semesters during the first two years in residence at the University. In the marching band program, students will be assigned by the Director of Bands to either Section 1—Football Marching Band or Section 2—Marching Band Techniques.

Courses required:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>7E:143</td>
<td>Instrumental Techniques</td>
<td>8 s.h.</td>
</tr>
<tr>
<td>25:107</td>
<td>Instrumental Conducting I</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>25:108</td>
<td>Instrumental Conducting II</td>
<td>1 s.h.</td>
</tr>
<tr>
<td>7E:145</td>
<td>Methods and Materials: Elementary School Music</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>7E:140</td>
<td>Methods and Materials: Secondary School Instrumental Music</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>7E:191</td>
<td>Observation and Laboratory Practice in the Secondary School</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>7E:192</td>
<td>Laboratory Practice in the Elementary School</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>7E:187</td>
<td>Seminar: Curriculum and Student Teaching</td>
<td>1 s.h.</td>
</tr>
</tbody>
</table>

### Vocal and Keyboard Majors

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>7E:147</td>
<td>Choral Methods and Conducting</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>7E:148</td>
<td>Choral Literature and Conducting</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>25:115-16</td>
<td>Diction for Singers I-II</td>
<td>2 s.h. each</td>
</tr>
<tr>
<td>7E:145</td>
<td>Methods and Materials: Elementary School Music</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>7E:142</td>
<td>Methods and Materials: Secondary School General Music</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>7E:191</td>
<td>Observation and Laboratory Practice in the Secondary School</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>7E:192</td>
<td>Laboratory Practice in the Elementary School</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>7E:187</td>
<td>Seminar: Curriculum and Student Teaching</td>
<td>1 s.h.</td>
</tr>
</tbody>
</table>

### Keyboard Majors—Nonvocal Area

Keyboard majors who elect to teach in the nonvocal area must complete the requirements in either the brass-woodwind-percussion or string areas.

### Music Teaching Minor for Elementary Education Majors

The minimum of 24 semester hours required in this program must include:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>7E:119</td>
<td>Methods: Basic Skills and Techniques in Music Education</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>7E:124</td>
<td>Methods: Music in the Elementary School</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>7E:192</td>
<td>Laboratory Practice in the Elementary School</td>
<td>2 s.h.</td>
</tr>
<tr>
<td></td>
<td>Applied music</td>
<td>2 s.h.</td>
</tr>
<tr>
<td></td>
<td>Ensemble participation</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>

In addition, a minimum of 12 semester hours are to be selected from other music and advanced music education courses (7E and 7G designations), with the approval of the advisor.

### Music Therapy

Admission to the program in music therapy is based on (a) demonstrated minimum keyboard skills, and (b) successful completion of the introductory course in music therapy (25:114). The number of students admitted to the program is limited by the types and amounts of clinical experience available on campus. In addition to the specific courses in music therapy listed below, specific courses are required in biology, sociology, abnormal psychology and social psychology. A six-month internship in an approved off-campus clinical facility is required before the completion of the degree and certification as a registered music therapist (RMT). For greater job opportunities, students also are strongly encouraged to complete the music teacher certification requirements. Complete information on the program is available in the music education office.

Course requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>25:114</td>
<td>Orientation to Music Therapy</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>7E:144</td>
<td>Psychology of Music I</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>7E:149</td>
<td>Laboratory: Psychology of Music</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>25:138</td>
<td>Influence of Music on Behavior</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>25:139</td>
<td>Principles and Procedures in Music Therapy</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>25:140</td>
<td>Internship in Music Therapy</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>

### Composition/Theory Major

Students are not admitted to this program earlier than the sophomore year. Upon application for admission to the program, the candidate shall be assigned a committee of three faculty members, in consultation with whom a course of study leading to the degree shall be determined. Admission is based on an evaluation of original compositions submitted to an admission and advisory committee; achievement in theory and composition courses; and keyboard competence, tested by an examination including sight reading (black chorale) and performance (black invention or work of comparable difficulty).
Course requirements:
25:1-8 Literature and Theory I-IV; Aural Skills I-IV
25:91-2 History of Music I-II
16 s.h.
6 s.h.

Thesis Requirement
The thesis replaces the senior recital required of applied music majors, and consists of one or more original compositions, approved by the student’s advisory committee and performed in regularly-scheduled School of Music recitals, and/or a committee-approved scholarly paper dealing with theoretical issues.

Applied Music Requirement
Until admitted to the program, the student must take private lessons on his or her major instrument or voice. Following admission, he or she will undertake applied music study as recommended by his or her advisory committee.

Ensemble Requirement
The candidate shall participate in an approved ensemble for four years.

Honors
A student with junior or senior standing may undertake Honors work in music with the approval of the director of the College of Liberal Arts Honors program, and provided a School of Music faculty member sponsors the student in Honors status and the student has maintained a minimum grade-point average of 3.0 on all previous work undertaken at the University.

A student maintaining the minimum 3.0 average qualifies for graduation “with Honors” by completing satisfactorily from six to eight semester hours in 25:97 Honors in Music. Types of Honors projects for which credit is given in 25:97 are Honors performances, solo and ensembles; Honors compositions, orchestrations, arrangements; and Honors essays, research papers, editorials, translations, etc.

A combination of at least two of these types of projects is required. None of the projects may duplicate projects assigned in other courses or required for graduation, such as 25:144 Senior Recital.

Honors students in music are encouraged to take graduate-level courses. Advanced coursework in music history, music theory and languages is particularly recommended. An Honors committee of at least three members is appointed by the Honors sponsor to evaluate the student’s work.

Financial Aid
A number of Music Activity Scholarships are available to qualified undergraduate music majors. For information write the School of Music.

Graduate Programs
The entering graduate student must take the School of Music Advisory Examination in music theory (harmony, ear training, forms and counterpoints), and history and literature, before his or her first registration. The Advisory Examination is given each session on the two days following the Sunday before registration. A leaflet describing the general content of these tests may be obtained from the Director’s Office, School of Music. (For general graduate admission, degree and examination requirements, see the "Graduate College" section of the Catalog.)

Master of Arts
Areas of concentration for M.A. degrees are composition, music history and musicology, music education, music theory and performance (including conducting).

General Requirements
Applicants for the Master of Arts degree must include: 25:321 Introduction to Graduate Study, in Music, and Theory. Two of the following:

25:146 Counterpuntal Forms
25:147 Tonal Forms
One elective from the analytical studies sequence (25:148-152) or equivalent

If excused from either 25:145 or 25:147 as a result of the Advisory Examination, the faculty must determine another course from the music history sequence (25:300-310). Courses 25:323, 25:330-332 and others offered by the musicology staff may be elected in special cases, with permission of the musicology adviser.

Ensemble Participation
25:185 University Choir, or Kantorei
25:191 Symphony Choir
25:192 Orchestra

Keyboard majors may substitute accompaniment for participation in a large ensemble, at the discretion of their adviser. Theory, composition, musicology and music education majors may, with their advisers’ permission, substitute other ensembles. Voice majors, with their advisers’ permission, may be excused from participation in large vocal ensembles during any semester in which they are singing major roles in opera theater. Any requests for adjustment of this requirement must be submitted to a reviewing committee.

Electives
Satisfactory courses in the student’s area of concentration.

Admission
Before an applicant will be considered for admission, he or she must have submitted supporting materials in his or her indicated area of concentration, as follows:

Music 131
The music literature designation is used for programs with major emphasis in choral or instrumental literature, and for programs combining emphasis in more than one area, such as musicology and opera production, theory and organ literature.

Information about specific admittance and curricular requirements for each area is available from the Director's Office.

**Doctor of Musical Arts**

Requirements for the D.M.A. degree in performance and pedagogy are the general doctoral requirements of the School, except that the D.M.A. dissertation contains three full-length recitals or two recitals and a concert performance with orchestra or other appropriate ensemble. Vocalists may substitute the execution of one or more major roles in a large-scale work for one of their recitals. Conductors will present two programs. D.M.A. candidates must also give evidence of their ability to make a scholarly investigation of limited scope by means of a written essay.

**Admission**

Before an applicant will be considered for admission to a doctoral program, he or she must have submitted supporting materials in his or her indicated area of concentration, as follows:

- Composition—representative musical scores
- Theory—analysis or commentaries on musical works
- Music Education—research papers
- Music Literature—research papers and audition
- Performance (including conducting)—audition
- Music History and Musicology—research papers

**Graduate Awards**

Qualified graduate students are invited to apply for teaching and research assistanship. Inquiries should be directed to the School of Music.

**Opportunities for Performance**

The following organizations provide many performing opportunities for qualified students:

- Camera Singers
- Old Gold Singers
- Kusorei
- University Choir
- Symphonic Choir
- Opera Theater
- Collegium Musicum
- Chamber Choir
- Symphony Orchestra
- Wind Ensemble
- Concert Band
- Marching Band
- Jazz Workshop/Stage Bands
- Percussion Ensemble
- Scottish Highlanders
Music for Non-Majors

Students who are not majoring in music but have an occupational interest in it may find 25:159 Late 18th- and 19th-Century Composers, 25:160 Early 18th- and 20th-Century Composers or 11:39-40 Masterpieces of Music, helpful in acquainting them with music as listeners.

The course 25:10 Fundamentals of Music for non-majors who have little or no experience with notation, theory and music skills. With the instructor's approval, non-majors with an elementary background in music may register for 25:12 Literature and Theory I-I and 25:224 Survey of Opera.

Non-Majors interested in performance should consult music advisors regarding appropriate courses in applied music (solo and ensemble).

Special Programs

The Center for New Music provides an environment for innovative composition and a vehicle for the performance of new works. Its repertoire includes the works of little-known young composers and works using electronic sounds, as well as compositions by recognized modern composers.

The Center for the New Performing Arts is an interdisciplinary unit linking the University's schools of music and art and its film, dance, theatre and creative writing areas. The Center's basic purpose is to encourage talented young artists to develop their creative skills through multimedia and intermedia classes, projects and performances.

Facilities

With completion of the new Music Building (1971) and adjoining Hancher Auditorium (1972), the University of Iowa Center for the Arts has one of the nation's finest facilities for teaching and performance in music. In addition to class and seminar rooms, the Music Building includes 55 teaching studios, 73 practice rooms, a large library, two electronic music laboratories, soundproof car training and listening facilities with 90 listening posts, four large rehearsal halls, ample solo and ensemble practice facilities, professional recording facilities, eight practice and recital organs and the 720-seat Clapp Recital Hall. Hancher Auditorium seats 2,680 for concerts, 2,400 for operas and other stage productions.

Library resources include more than 50,000 volumes, a wide variety of music and books—increasing at the rate of approximately 2,000 a year—and more than 2,100 sets of microfilms, a microfilm file of approximately 300 titles, nearly 5,000 LP records and 175 periodicals in several languages. The acquisition program gives particular attention to a strong reference collection, emphasizing resources for musical research and performance. The library’s quarters in the Music Building provide 24 study carrels, a microfiche reader, a typing room, a seminar and rare books room, a locating room and a separate area for the Golden Band Library, one of the world’s most famous collections of band music.

Courses

Primarily for Undergraduates

Theor y and Composition

part Literature and Theory I 3 h. Music, hearing, writing and singing skills; rudiments of music and fundamentals of harmony. Composers: 25:5.


25:6 Aural Skills 1 1 h.

25:6 Aural Skills II 1 h.


25:7 Aural Skills III 1 h.

25:8 Aural Skills IV 1 h.

25:10 Fundamentals of Music Musical notation, elementary melodic, rhythmic and harmonic theory; basic aural skills; e. students with little or no previous experience. Not open to music majors.

25:41 Review Theory 2 h.


History and Research

25:56 Recital Attendance 6 h.

25:51 History of Music I 3 h. Preparation: music majors. 25:5 and 25:6 or equivalent; non-majors, consent of instructor.

25:52 History of Music II 3 h.

25:52 Continuation 25:5-25:2, but may be taken as independent set. Preparation: same as 25:51.

25:57 Hermes in Music 1-4 h. May be repeated for credit.

Courses for Undergraduates and Graduates

Music Education

Where dual numbers are indicated, students preparing for Music Teacher Certificate should register under education number.

25:71 General Piano Instruction I 1 h.

25:71 General Piano Instruction II 1 h.

25:95 Class Vocal 1 h. open to music majors for secondary vocal study. By permission.

25:96 Choral Technique 1 all h. Open only to music majors for study of a secondary string instrument. 1

25:96 Instrumental Technique 1 all h. Open only to music majors for study of a secondary string instrument. 1

25:100 General Piano 1 h. Preparation: 25:10 or consent of instructor.

25:108 Chamber Methods and Conducting

25:108 Chamber Methods and Conducting 3 h.

25:110 Chamber Literature and Conducting 3 h.

25:110 Chamber Literature and Conducting 3 h.

25:111 Chamber Technique 2 h.

25:112 String Techniques and Methods 3 h.

25:113 String Techniques and Methods 3 h.

25:114 Methods of Teaching Piano 1 h.

25:114 Method of Teaching Piano 1 h.

25:117 Method of Teaching Piano 1 h.

25:117 Method of Teaching Piano 1 h.


25:119 String Ensemble and Methods 3 h.

25:119 String Ensemble and Methods 3 h.

25:121 English and French 2 h.

25:121 French and German 2 h.

25:117 Harmony for Band 2 h.
25-128 Influence of Music on Behavior 2 s.h.
Review of the theoretical bases and experimental evidence of the influence of music on human behavior. Prerequisite: 75:144, 75:149 or approval of instructor.
25-128 Principles and Procedures in Music Therapy 3 s.h.
Preparation for the use of music in clinical settings, with specific emphasis on the patient or client to be served. Prerequisite: 25:128, approval of instructor.
25-140 Internship in Music Therapy A six-month period of clinical training in an approved music therapy program under the direction of a registered music therapist.
Contemporary persuasion literature and current styles, emotions, techniques of performance and comprehension. Prerequisite: consent of instructor.
25-158 Advanced Conducting 2 s.h.
Prerequisite: elementary conducting skills.
25-211 Advanced String Methods and Literature 3 s.h.
Advanced pedagogy for orchestral instrumental ensembles. Open to undergraduates with consent of instructor.
25-214 Recording Techniques 3 s.h.
Prerequisite: consent of instructor.

Theory and Composition
25-101 Jazz Improvisation I 2 s.h.
Prerequisite: 25:1 or consent of instructor.
25-102 Jazz Improvisation II 2 s.h.
Prerequisite: 25:501 or consent of instructor.
25-106 History of Black Music 3 s.h.
Same as American Civilization 42:106.
25-118 Jazz Composition and Arranging 1-2 s.h.
Prerequisite: 25:8 (or equivalent).
25-140 Contemporary Forms 3 s.h.
Writing and analysis. Prerequisite: 25:2, 25:11 or equivalent.
25-146 20th-century Harmony and Counterpoint 3 s.h.
Prerequisite: 25:2, 25:11 or equivalent.
25-147 Tonal Forms 3 s.h.
Prerequisite: 25:1, 25:11 or equivalent.
25-148 Analysis of Music Literature, 1600-1750 3 s.h.
Prerequisites: 25:11 or equivalent and 25:12 or equivalent. May be repeated. Second semester.
25-149 Analysis of Music Literature, 1750-1820 3 s.h.
Prerequisite: 25:11 or equivalent and 25:12 or equivalent. May be repeated. First semester.
25-150 Analysis of Music Literature, 1825-1900 3 s.h.
Prerequisites: 25:11 or equivalent and 25:12 or equivalent. May be repeated. Second semester.
25-151 Analysis of Music Literature, 1890-1840 3 s.h.
Prerequisite: 25:3 or equivalent and 25:3 or equivalent. May be repeated. Both semesters.
25-152 Analysis of Music Literature, Special Topics 3 s.h.
Scope and content chosen by instructor.
25-153 Thorough Bass Realization I 1-2 s.h.
Practicum in writing accompaniments in 17th- and 18th-century music.
25-154 Thorough Bass Realization II 1-2 s.h.
Practicum in improving accompaniments at sight or by keyboard from figured bass, open to qualified students with sufficient keyboard proficiency.
25-198 Composition Seminar 0 s.h.
Prerequisite: advanced standing and permission of instructor.
25-199 orchestration 2 s.h.
Prerequisite: 25:16.
25-200 Advanced Conducting 3 s.h.
Performance practice and analysis of Gregorian chant; organization of Roman Liturgy; some tonal styles of Latin recommended.
25-201 fugue 5 s.h.
Writing and analysis. Prerequisite: mastery of materials of counterpoint and harmony.
25-202 Variation Forms 3 s.h.
Writing and analysis.
25-223 Advanced Composition 11 s.h.
Prerequisite: 25:7 or consent of instructor. Compose: 25:156. May be repeated for credit.

History, Literature, and Research
25-120 History of Music 2 s.h.
Prerequisite: 25:2 or equivalent.
25-120 Late 19th- and 20th-Century Composers 3 s.h.
Study of problems of organ music reaching through examination of methods and literature of a given period and its precursors, and instruction and performance in advanced organ literature. Offered alternate years. Spring semester. Consent required. Offered Spring.
25-125 Organ Pedagogy 3 s.h.
25-231 Interpretation of Oratorio and Operas 3 s.h.
Same as 25:170 and 25:171. Interpretation and performance in music of Haydn and Haydn composers as well as in the operas of the Baroque period to the present. Special attention in the manner in which Haydn and Haydn composers interpret the liturgical text, and in the contextual factors that have influenced these interpretations.
25-232 Interpretation of German Art Song 3 s.h.
25-271 Interpretation of Non-German Art Song 3 s.h.
25-215 Art and Technology I 3 s.h.
Prerequisite: consent of instructor.
25-215 Art and Technology II 3 s.h.
Prerequisite: consent of instructor.
25-225 Survey of Opera 3 s.h.
Historical study of operatic literature.
25-228 History of Organ Building and Design 3 s.h.
Development of organ building; history of actions and of stops from Renaissance to present; open to graduate students and to others by consent of instructor. May be repeated for credit. Offered alternate years; offered 1976-77.
25-227 Organ Improvisation and Literature I 3 s.h.
Improvisation of short two- and three-part forms in traditional and contemporary styles. May be repeated for credit. Offered in alternate years; full semester. Offered 1971-72.
25-228 Organ Improvisation and Literature II 3 s.h.
May be repeated for credit. Offered in alternate years; offered 1971-78.
25-228 Organ Literature I 2 s.h.
Pre-Durham literature from 13th through 17th century. Open to all graduate music students and to others by consent of instructor. May be repeated for credit.
25-229 Organ Literature II 4 s.h.
Organ works of Bach and contemporaries; literature of 19th and 20th centuries. Open to all graduate music students and to others by consent of instructor. May be repeated for credit.
25-230 Vocal Literature 3 s.h.
25-231 Orchestral Literature 3 s.h.
25-232 Piano Literature 3 s.h.
25-233 String Instrument Literature 3 s.h.
25-234 Wind Instrument Literature 3 s.h.
25-235 principles of Sound and Music 3 s.h.
Same as Physics and Astronomy 29:113.

Courses Primarily for Graduates
Music Education
25-201 Seminar: Band Problems 3 s.h.
25-201 Methods of Teaching Voice 3 s.h.
25-211 Methods of Teaching Voice 3 s.h.
25-233 Advanced Choral Conducting I 3 s.h.
Literature, style, related techniques and methods in conducting music from Gregorian chant through Bach. Compose: 25:391.
25-234 Advanced Choral Conducting II 3 s.h.
Style and technique dealing with music from Rouen through contemporary. Compose: 25:392.
25-235 Advanced Choral Conducting III 3 s.h.
25-236 Advanced Choral Conducting IV 3 s.h.
25-237 Advanced Choral Conducting V 3 s.h.
25-238 Advanced Choral Conducting VI 3 s.h.
Contemporary choral works. Compose: 25-344.
### Applied Music

A fee of $50 per semester is charged for each applied music course in the student's major field of performance. Courses consist of individual or a combination of individual and class lessons, at the option of the instructor. Lessons are a minimum of one hour per week. Students electing two courses in the same semester are assessed a $90 fee. All music majors are expected to attend seminars of the applied music courses for which they register.

Students not majoring in piano may register for only 25:120 Piano or for 25:120 Piano. Non-majors must have at least two years of previous piano instruction to register for applied piano.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>25:17 Voice</td>
<td>0-1</td>
<td>Fall</td>
</tr>
<tr>
<td>25:18 Piano</td>
<td>0-1</td>
<td>Fall</td>
</tr>
<tr>
<td>25:19 Organ</td>
<td>0-1</td>
<td>Fall</td>
</tr>
<tr>
<td>25:20 Harp</td>
<td>0-1</td>
<td>Fall</td>
</tr>
<tr>
<td>25:21 Violin</td>
<td>0-1</td>
<td>Fall</td>
</tr>
<tr>
<td>25:22 Viola</td>
<td>0-1</td>
<td>Fall</td>
</tr>
<tr>
<td>25:23 Cello</td>
<td>0-1</td>
<td>Fall</td>
</tr>
<tr>
<td>25:24 String bass</td>
<td>0-1</td>
<td>Fall</td>
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<tr>
<td>25:25 Tub子</td>
<td>0-1</td>
<td>Fall</td>
</tr>
<tr>
<td>25:26 Percussion</td>
<td>0-1</td>
<td>Fall</td>
</tr>
<tr>
<td>25:31 Voice</td>
<td>1</td>
<td>Summer</td>
</tr>
<tr>
<td>25:120 Piano</td>
<td>1</td>
<td>Summer</td>
</tr>
<tr>
<td>25:190 Organ</td>
<td>1</td>
<td>Summer</td>
</tr>
<tr>
<td>25:200 Harp</td>
<td>1</td>
<td>Summer</td>
</tr>
<tr>
<td>25:210 Violin</td>
<td>1</td>
<td>Summer</td>
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<tr>
<td>25:220 Viola</td>
<td>1</td>
<td>Summer</td>
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<tr>
<td>25:230 Cello</td>
<td>1</td>
<td>Summer</td>
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<tr>
<td>25:240 String bass</td>
<td>1</td>
<td>Summer</td>
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<tr>
<td>25:250 Tub子</td>
<td>1</td>
<td>Summer</td>
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<tr>
<td>25:260 Percussion</td>
<td>1</td>
<td>Summer</td>
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</tbody>
</table>

### Minor Field (open to non-majors)

Instruction in student's minor field of performance is for non-music majors listed for a fee of $35 per course per semester. A course consists of one half-hour lesson or two hours of class instruction weekly, at the option of instructor.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>25:17 Voice</td>
<td>0-1</td>
<td>Fall</td>
</tr>
<tr>
<td>25:18 Piano</td>
<td>0-1</td>
<td>Fall</td>
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<tr>
<td>25:19 Organ</td>
<td>0-1</td>
<td>Fall</td>
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<tr>
<td>25:20 Harp</td>
<td>0-1</td>
<td>Fall</td>
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<tr>
<td>25:260 Percussion</td>
<td>1</td>
<td>Summer</td>
</tr>
</tbody>
</table>
Philosophy

25:154 Baritone 1 a.h.
25:156 Treble 1 a.h.
25:158 Tuba 1 a.h.
25:157 Percussion 1 a.h.
Ensemble
No fee is charged for ensemble courses. Courses may be repeated for credit. Prerequisite for each: consent of instructor.
25:159 Scottish Highlanders 0-1 a.h.
25:154 Solo Roles arr.
25:152 Cameron Highlander 1 a.h.
25:155 Old Gold Singers 0-2 a.h.
25:152 Opera Theater arr.
25:153 Chamber Orchestra arr.
25:154 Collegium Musicum arr.
25:158 University Choir arr.
25:158 Piano Accompaniment arr.
25:157 Flano Chamber Music arr.
25:158 Strings Chamber Music arr.
25:158 Woodwind Chamber Music arr.
25:159 Brass Chamber Music arr.
25:1515 Symphonic Choir arr.
25:158 Orchestra arr.
25:158 Marching Band arr.
25:158 Chamber Jazz Band 1 a.h.
Lab fees for 3:15 and matriculants lead for music education majors.
25:157 Jazz Workshop arr.

Summer Instruction for Children
Children may enroll for applied music courses during the eight-week summer session. Fee is $35 for one-half-hour lesson weekly.

Nuclear Medicine Technology
See "College of Medicine."

Nuclear Science and Technology
See "College of Medicine."

Philosophy
Department chairman: Pennoet Buchmann

Undergraduate Program
The undergraduate program in philosophy provides knowledge of the basic theories and the main developments in Western philoso-

hphy, and strengthens logical skills which are useful in a wide variety of fields. A major in philosophy can provide preparation for the advanced studies necessary for a career in religion or law, for example, as well as for positions in government and business which require a general education and a capacity for clear and systematic thinking. Advanced degree work is necessary for college teaching positions in philosophy.

Undergraduate majors are required to take at least 27 semester hours of courses numbered from 26:101 to 26:190, including:
26:103 Introduction to Logic
26:111 Ancient Philosophy
26:113 Early Modern Philosophy

Honors Program
The Department administers an Honors program for undergraduate majors of superior ability. To be eligible for the program, a student must have a cumulative grade-point average of at least 3.0. The program is available both to students who intend to do graduate work in philosophy and to those who do not. An individualized Honors program is designed by the student in consultation with his or her adviser in the Department. A student who is eligible for and interested in the program should consult with his or her adviser about it as early as possible, preferably in the sophomore year.

Graduate Program
The graduate program in philosophy is designed to train future teachers and scholars in philosophy. The main areas in the graduate curriculum are metaphysics and epistemology, history of philosophy, ethics, logic and philosophy of science.

Master of Arts
The Master of Arts degree requires a minimum of 30 semester hours and may be taken without thesis. Requirements include passing, at a high level of performance, courses in metaphysics and epistemology, history of philosophy, logic and philosophy of science, and ethics. In addition, the student must pass an oral final examination. There is no foreign language requirement.

Doctor of Philosophy
The Doctor of Philosophy degree is granted primarily on the basis of achievements rather than the accumulation of semester hours but typically takes at least four years of graduate study to obtain. Candidacy for the doctoral program is formally determined by a vote of the faculty, usually after the completion of three semesters of graduate study. Requirements include passing, at a high level of performance, courses in metaphysics and ethics, the history of philosophy, logic and philosophy of science, and ethics. In addition, the student must pass a written comprehensive examination consisting of a dissertation area examination, a special area examination and a prospectus of the dissertation. Before taking the comprehensive examination, the student must show competen-
tice in French, German, Greek or Latin. The fourth year of graduate study is ordinarily spent in writing the doctoral disserta-
tion.

Courses

Freshmen and Sophomores Only
26:1 Problems of Moral Reasoning 3 a.h.
Philosophical study of ethical theories and their relation to decision-making.
26:2 Problems of Logical Reasoning 3 a.h.
Philosophical study of correct and incorrect reasoning.
26:3 Problems of Political Philosophy 3 a.h.
Philosophical study of the good society and the relation of the individual to the state.
Undergraduates Only

Philosophy 3 a.h.

Analytical and historical introduction to metaphysics. Focus on fundamental issues and arguments.

Modern and Medieval Philosophers 3 a.h.

Historical and philosophical introduction to ethical theory.

Introduction to Logic 3 a.h.

Modal logic and the techniques of modern logic.

Introduction to Philosophy of Science 3 a.h.

Major issues in contemporary philosophy of science.

Undergraduate Seminar in Philosophy 3 a.h.

Innovative small-group discussion of current philosophical problems.

Ancient Philosophy 3 a.h.

Major trends and major figures such as Plato and Aristotle.

Medieval Philosophy 3 a.h.

Major trends and major figures such as Augustine and Aquinas.

Early Modern Philosophy 3 a.h.

Major trends and major figures from Descartes to Kant.

Nineteenth Century Philosophy 3 a.h.

Major trends and major figures of the 19th century philosophy.

20th and Contemporary Philosophy 3 a.h.

Major trends and major figures of the 20th century philosophy.

Philosophical Issues 3 a.h.

Major problems and major figures of Western philosophy.

Philosophical Issues of the 19th Century 3 a.h.

Major problems and major figures of 19th century philosophy.

Philosophical Issues of the 20th Century 3 a.h.

Major problems and major figures of 20th century philosophy.

Philosophical Issues of the 21st Century 3 a.h.

Major problems and major figures of 21st century philosophy.

Graduates

Philosophical Problems of the 19th Century 3 a.h.

Major topics in the philosophy of science. Open to undergraduates with consent of instructor.

Philosophical Problems of the 20th Century 3 a.h.

Major topics in the philosophy of science. Open to undergraduates with consent of instructor.

Philosophical Problems of the 21st Century 3 a.h.

Major topics in the philosophy of science. Open to undergraduates with consent of instructor.

Graduate Seminar: Metaphysics 3 a.h.

May be repeated for credit.

Graduate Seminar: Epistemology 3 a.h.

May be repeated for credit.

Graduate Seminar: Philosophy of Language 3 a.h.

May be repeated for credit.

Graduate Seminar: Philosophy of Logic 3 a.h.

May be repeated for credit.

Graduate Seminar: Philosophy of Science 3 a.h.

May be repeated for credit.

Graduate Seminar: Ethics 3 a.h.

May be repeated for credit.

Graduate Seminar: History of Philosophy 3 a.h.

May be repeated for credit.

Graduate Seminar: History of Philosophy 3 a.h.

May be repeated for credit.
Physical Education and Dance

The University offers instruction in physical education on the west campus (Field House) and on the east campus (Halsey Gymnasium). The department on the west campus was formerly called the Department of Physical Education for Men and the department on the east campus, Department of Physical Education for Women. Courses and degree programs offered by the two departments are open to both men and women. The Dance Program is offered only on the east campus.

In its graduate program, the Department of Physical Education (Field House) offers opportunities for specialization in adapted physical education, administration and supervision, anatomy, biomechanics, evaluation and statistics, curriculum, exercise physiology, motor learning and therapeutics. On the undergraduate level, the teaching of physical education, the coaching of athletic teams and athletic training are emphasized.

The Department of Physical Education and Dance (Halsey Gymnasium) offers instruction in the teaching of physical education and coaching of sports on the undergraduate level, and on the graduate level emphasizes work in motor learning, sociology of sports, physical education teaching and corrections. The Dance Program and the women’s Intercollegiate Athletics Program are administered through this department.

The Dance Program offers a major in dance on both the undergraduate and graduate level. Students pursuing an advanced degree in physical education or in theatre may include dance as a part of their program of studies.

Physical Education and Dance—Halsey Gymnasium

Chairman: Margaret C. Fisk

Faculty: professor Margaret G. Fisk; associate professor Ann C. Glazier; associate professor L. Swoboda; assistant professor Judith N. Miller, Norman P. Dutko, Jane E. Clark, Christina A. Gray, Ann R. Leland, Jackie E. McGrew, Kathleen E. Miller, Yolanda L. Stinson, Carol G. Davis, associate professor Lynd L. Kristmanson, Katherine M. Carlson, Jerry Ann Atkinson, Christine J. Dobrow, Shirley A. Faust, Winifred A. Foss, Margaret A. Franz, John A. Hagen, Teresa Har-leman-Thomas, Steve M. Horn, Patrice A. Hossler, Deborah L. Woodside

Degree offered: B.A., B.S., M.A., Ph.D.

The Department of Physical Education and Dance (Halsey Gymnasium) offers instruction in the teaching of physical education, the coaching of sports and the teaching of dance on the professional level. Majors in dance performance, pre-physical therapy, sports communications and a nonprofessional major in physical education are offered also. Graduate work leading to an M.A. is offered in physical education and dance and to a Ph.D. in physical education.

Physical Education Major

Undergraduate Curricula

Each student in the physical education curriculum elects a wide variety of activities, thus preparing for general public school teaching. These activities include team and individual sports, gymnastics, dance and aquatics. The activity options permit advanced work in many activities, so that the student is prepared to teach at advanced skill levels in that area or to go into coaching in a particular sport. If the student chooses, practical experience may be gained in coaching a particular sport.

The theoretical background is provided through anatomical, kinesiological, physiological and health courses, with implications for the performance and teaching of activities. The emphasis is on preparation for teaching, but provision is made 'or entry in almost any graduate program of physical education. The student later wishes to undertake graduate work.

The student who plans to teach must meet certification requirements (see "College of Education"). The teaching curriculum leads to either the B.A. degree or the B.S. degree. Each student must make application not later than the sophomore year for departmental recommendation to the College of Education and professional education courses, as well as continuation in the physical education curriculum the student has elected. Any student failing to maintain a grade-point average of 2.2, or having displayed marked inadequacies for teaching or leadership role, may be dropped from the program. Transfer students coming into one of these programs are subject to all the requirements for students starting in the program.

The pre-professional therapy curriculum leading to a B.S. degree is modeled after the basic science program with electives in physical education. It is designed to prepare students for admission to graduate programs in physical therapy, but not for teaching.

The Department also administers a non-professional major in health and physical education, known as General Studies in Health, Physical Education and Recreation. The purpose of this program is to give a background in health, physical education and recreation, not as a preparation for a career but as a broad acquaintance with material relevant to personal and family recreation and healthful living. Each student's program is individually planned with an advisor following broad guidelines and oriented so the student's objectives in selecting this major.

Physical Education Teaching Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>4 s.h.</th>
</tr>
</thead>
<tbody>
<tr>
<td>28:1-4</td>
<td>Elective Physical Education</td>
<td></td>
</tr>
<tr>
<td>28:18</td>
<td>Senior Life-Saving and Water Safety Instructor's Course</td>
<td>1-2 s.h.</td>
</tr>
<tr>
<td>28:19</td>
<td>Orientation</td>
<td>1 s.h.</td>
</tr>
<tr>
<td>28:25-26</td>
<td>Coaching of Sports</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>28:27</td>
<td>Teaching of Social Forms of Dance</td>
<td>1-2 s.h.</td>
</tr>
<tr>
<td>28:31-32</td>
<td>Officiating</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>28:37</td>
<td>First Aid (or Red Cross Certification)</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>28:40</td>
<td>Tennis</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>28:41</td>
<td>Golf</td>
<td>1 s.h.</td>
</tr>
<tr>
<td>28:42</td>
<td>Badminton</td>
<td>1 s.h.</td>
</tr>
<tr>
<td>28:43</td>
<td>Volleyball</td>
<td>1 s.h.</td>
</tr>
<tr>
<td>28:47</td>
<td>Gymnastics</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>28:48</td>
<td>Basketball</td>
<td>1 s.h.</td>
</tr>
<tr>
<td>28:49</td>
<td>Field Hockey</td>
<td>1 s.h.</td>
</tr>
<tr>
<td>28:50</td>
<td>Softball</td>
<td>1 s.h.</td>
</tr>
<tr>
<td>28:51</td>
<td>Field Hockey</td>
<td>1 s.h.</td>
</tr>
</tbody>
</table>
Basketball 1 s.h.
Modern Dance I 1 s.h.
Modern Dance II 1 s.h.
Swimming 1 s.h.
Track and Field 1 s.h.
Recreational Sports 1 s.h.
Anatomy 4 s.h.
Kinesiology 3 s.h.
Physiological Implications for Teaching Physical Education 3 s.h.
Correctives 3 s.h.
Measurement 2 s.h.
Organization and Administration of Physical Education 3 s.h.
History of Physical Education 1-2 s.h.
Interrelationships of Health and Physical Education 3 s.h.
Methods and Materials in Elementary School Physical Education 4 s.h.
Methods and Principles of Physical Education 3 s.h.
Independent Projects in Laboratory Practice (Coaching Practicum) 2-3 s.h.
Laboratory Practice in Secondary School 6 s.h.
Laboratory Practice in Elementary School 6 s.h.
Seminar Curriculum and Student Teaching 1 s.h.

For certification requirements in education, see "College of Education." For general requirements of the College of Liberal Arts, see "College of Liberal Arts."

Curriculum Leading to Endorsement in Coaching for Women
28:14 Coaching for Women's Sports 2 s.h.
or 28:218 Advanced Coaching 2 s.h.
28:81 Kinesiology 3 s.h.
28:105 Care of Athletic Injuries 2 s.h.
28:106 Physiological Implications for Teaching Physical Education 3 s.h.
28:108 Principles and Administration of Intercollegiates for Women 2 s.h.
or 7E:71 Methods and Materials in Elementary Physical Education 2 s.h.
7S:190 Individual Projects in Laboratory Practice (Coaching Practicum) 2-3 s.h.

(Part of laboratory practice during the professional semester is waived on the basis of appropriate experience as a coach.)

General Studies in Health, Physical Education and Recreation
The purpose of this program is to give a background in health, physical education and recreation, not as a preparation for a career in this field but as a broad acquaintance with material relevant to personal and family recreation and healthful living. Each stu-
dent's program is planned with an adviser on the basis of the student's objectives. Basic courses for all in the nonprofessional major are:
28:1, 2, 5, 7, 40-37 or equivalent experience 7-8 s.h.
28-27, 28-37 3 s.h.
104-61, 65 3-6 s.h.

Supplementary courses of 20 to 24 semester hours may be elected to complete a major of 36 semester hours. These elective hours should be chosen from the following fields: art, dramatic art, environmental health, home economics, music, physical education, psychology, recreation or sociology. At least 18 of the 36 semester hours must be 100 level courses.

Honor's Program
The Honor's Program is designed to serve the interests of the superior student. To be eligible for Honor's, the student must have at least a "B" average at the beginning of the junior or senior year when Honor's courses are taken, and must continue to maintain a "B" average throughout the remainder of his or her college work. This is an opportunity to get some experimental research and gain a perspective on certain aspects of graduate work.

Graduate Programs
The Department was one of the pioneers in graduate physical education programs for women. In the more than half century of graduate work there has been a growing philosophy of education for women and many of the graduate of these programs have played and are still playing leadership roles in the profession, in their institutions and in their communities.

The curricula assume previous education in the respective fields. A program is planned with the individual in light of his or her previous education and anticipated future career. Completion of the graduate degree usually leads to teaching, administration or supervision in the schools or in a university. Research preparation is provided for anyone who wishes a career in that area. All M.A. students do some type of research, though the options are highly variable.

The outstanding characteristics of the graduate programs are flexibility of program planning for the individual student, and diversity of areas of research which are available to the student. Attendance at both summer sessions and the academic year is helpful in obtaining full opportunities for diversity of instruction.

The graduate student works primarily in the Department of Physical Education and Dance, but the resources of the entire University are available, as needed, for the individual student. Work outside the Department provides a broader view and enrichment for the selected specialization of the doctoral candidate. The most common areas of specialization have been administration, measurement, motor learning, anatomy and biomechanics, physical education for pre-school and elementary school age children, statistics and research, and adaptive-individualized programs. Others, such as sports communication, are possible. Occasionally an internship is possible in the specialization. The graduate student group is cosmopolitan and international in make-up.

A research laboratory is available in Halsey Gymnasium. It is equipped primarily for kinesiological and biomechanical research and motor learning, including equipment for electromyographic research. Other needs may be met on a cooperative basis. Complete computer service is available as needed for research.
The Master of Arts Degree

The M.A. degree is awarded on completion of at least 30 semester hours of graduate work including thesis and in addition to adequate prerequisites for this degree. The curriculum may lead to teaching, administration, supervision in the schools or coaching certification. Background is required in anatomy, kinesiology, physiology, health education, methods in physical education, administration of physical education and physical education techniques.

General Field Recommendations

*28:107 Correctives 3 s.h.
*28:113 Measurement 2 s.h.
*28:119 Methods and Principles of Physical Education 3 s.h.
*28:121 History of Physical Education 2 s.h.
28:205 Techniques of Research 3-4 s.h.
*28:215 Analysis of Human Motion 3 s.h.
28:401 Thesis 4 s.h.

*Not required of those having similar undergraduate courses. No more than 5 s.h. of these courses may be counted toward the M.A. degree.

Electives

The remainder of the program is planned with the approval of the advisor and the chairman of the Department. A student may be permitted to take a non-thesis M.A. Such a curriculum requires a minimum of 30 semester hours plus a project instead of a thesis and specified courses. Permission must be received from the Graduate Committee of the Department.

The Doctor of Philosophy Degree

The Ph.D. degree is awarded on completion of approximately 90 semester hours of graduate work, including general requirements for the master's degree and credit for the dissertation.

Prerequisites

Background is required in anatomy, kinesiology, physiology, health education, methods in physical education, administration of physical education and physical education techniques.

Tools of Research

Certain abilities are required as a basis for research and/or broad reading of international professional literature. The requirements are:

Reading ability in one foreign language.

The requirement may be satisfied by taking tests from the language department at Iowa certifying reading ability equivalent to the two semesters of study; or by passing the Graduate Record Examination in the language.

Statistical methods or computer science, which must be satisfied by passing a graduate course in statistical methods at The University of Iowa.

General Field Recommendations

28:106 Physiological Implications for Teaching Physical Education (or equivalent) 3 s.h.

*28:107 Correctives 3 s.h.
*28:113 Measurement 2 s.h.
*28:119 Methods and Principles of Physical Education 3 s.h.
*28:121 History of Physical Education 2 s.h.
28:201 Problems in Physical Education (unless student wrote an M.A. thesis) 6-4 s.h.
28:205 Techniques of Research 3-4 s.h.
28:215 Analysis of Human Motion 3 s.h.
28:219 Administration in Physical Education 3 s.h.
28:301 Seminar in Research 2 s.h.
28:401 Thesis 10 s.h.

*Not required of those having undergraduate courses. No more than 5 s.h. of these courses may be counted toward the Ph.D., and usually they will be taken for zero credit.

Specialization

At least 20 semester hours are required in one area or in two related areas at the discretion of the adviser. Suggested areas:

Anatomy
Administration
Correctives (Adaptive)
Curriculum
Elementary School Program
Health
Kinesiology (Biomechanics)
Measurement
Motor Learning
Motor Skills
Outdoor Education
Philosophy and History
Psychology of Sport
Physiology
Sociology of Sport
Sports Communication
Statistics and Research
Supervision

The dissertation should deal with some problem in the area of specialization (an additional 10 s.h.). The student is expected to declare the specialization by the time he or she writes the general comprehensive examination, and must also write a comprehensive examination in the area of specialization. The area comprehensives may be taken after writing the general comprehensive examination.

The student is required to take work in one or more allied fields. This may be done in the form of a minor of approximately 20 semester hours, which will be planned jointly with the minor department, or it may be applied to the specialization area and other needs.

Dance Major

The Undergraduate Program

Required:
280:112 Rhythmic Analysis of Dance 2 s.h.
or
280:129 Dance Accompaniment 2 s.h.
Physical Education and Dance

28:80 Anatomy 2 s.h.
28:81 Kinesiology 3 s.h.
28:114-115 History and Appreciation of Dance 6 s.h.
28:123-124 Beginning Composition 4 s.h.
28:121-122 Dance Company Class 2 s.h.
28:177 Labanotation 3 s.h.
Advanced 24 s.h.

Prerequisites
12 hours from the following or related subjects in threater, music, art:
*28:123-24 Teaching of Modern Dance 2-4 s.h.
*28:111 Children's Dance 3 s.h.
28:116 Dance in Education 2-3 s.h.
28:127,128 Dance Production 1-6 s.h.
28:170 Readings in Dance 3 s.h.
28:173,174 Advanced Choreography 3 s.h.
28:177 Labanotation 1-6 s.h.
28:181,182 Dance Company Class 1-6 s.h.
28:175,176 Theory and Criticism of Dance 3-6 s.h.

*Required of all dance majors in teaching curriculum. Also 28:37
First Aid or Red Cross certification is required of all majors
planning to teach. See "Catalog of Education" for certification
requirements for public school teaching.
Dance majors must take a technique class each semester with a
maximum of 14 hours allowed toward a degree. Included must be
a minimum of 4 s.h. of ballet and 4 s.h. of modern.
Dance majors are required to enroll in 28D:127 or 128 (Dance
Production) for 1 s.h. each year when a full time student.

The M.A. Program
The M.A. degree in dance is awarded on completion of at least 30
semester hours of graduate work including thesis. The curriculum
may lead to teaching of dance or to further work for a dance career.

Requirements
Auditions
Intermediate-level minimum modern or ballet
4 hours 28D:123 Beginning Composition or equivalent
28:80-81 Anatomy-Kinesiology or equivalent
28:26 Teaching of Modern Dance or equivalent

Required
*28:112 Rhythmic Analysis of Dance 2 s.h.
*28:114-115 History and Appreciation of Dance 3-6 s.h.
*28:173 Labanotation 3 s.h.
28:173,174 Advanced Choreography 3 s.h.
28:175,176 Theory and Criticism of Dance 3-6 s.h.
28:401 Thesis 3-4 s.h.
28:205 Techniques of Research 3-4 s.h.

*No more than 6 s.h. allowed toward M.A. degree.

Faculty
The faculty represents diversified backgrounds and specializa-
tions. Abilities and interests are complementary. Most faculty
members hold advanced degrees. Several bring educational
backgrounds from abroad. All are experienced teachers. Gradu-
ate faculty members are experienced in research and writing and
are available for the guidance of graduate students in their areas of
specialization.

Facilities
Gymnasiums, dance studios, special exercise rooms and pools are
used in the various programs in Halsey Gymnasium, North Hall,
the Field House, the Recreation Building and the recreation area
at the Materialis Union. The field for outdoor sports and hand
surfaced tennis courts are near Halsey Gymnasium. The proximity
of the river makes canoeing instruction feasible on a regular basis.
The archery range is located along the river in a natural setting;
outdoor fields and a track are available between the Field
House and the Recreational Building. The University golf course
is used for some classes and for the women's intercollegiate golf
team.

Courses
Physical Education

Primary for Undergraduates
28:1 General Physical Education 1 s.h.
28:2 Elective Physical Education 1 s.h.
28:3 Elective Physical Education 2 s.h.
28:4 Elective Physical Education 4 s.h.
28:5 Intermediate Physical Education 2 s.h.
28:6 Advanced Physical Education 3 s.h.
Introduction to the techniques and philosophy of coaching. Fall.
28:7 Senior Life Saving and Water Safety Instructor's Course 1-2 s.h.
Leads to Red Cross Senior Water Safety Certificate or Instructor's Certificate.
Registration after consultation with instructor. Spring.
28:9 Orientation 1 s.h.
Fall.
28:22 Teaching of Sports 2 s.h.
Teaching of basic sports. Fall.
28:23 Teaching of Sports 2 s.h.
28:27 Teaching of Dance 2 s.h.
Teaching of ballet, tap, and jazz. Fall.
28:30 Advanced Physical Education 3 s.h.
Vocal activities open to all students.
28:34 Officiating 1 s.h.
Officiating techniques for men's sports. 28:34. Spring.
28:35 Officiating 1 s.h.
May follow 28:34 or be taken as a separate unit.
28:37 First Aid 3 s.h.
Standard and advanced Red Cross courses; leads to first aid certification on comple-
tion of requirements.
28:40 Tennis 1 s.h.
Fall.
28:41 Golf 1 s.h.
Fall.
28:42 Badminton 1 s.h.
Fall.
28:43 Volleyball 1 s.h.
Fall.
28:47 Gymnastics 2 s.h.
Spring.
28:48 Bedroom Dance 1 a.h. Spring.
28:48 Field Sports 1 a.h. Spring.
28:49 Softball 1 a.h. Fall.
28:51 Field Hockey 1 a.h. Fall.
28:52 Basketball 1 a.h. Fall.
28:52 Modern Dance I 1 a.h. Fall.
28:56 Modern Dance II 1 a.h. Spring.
28:56 Swimming 1 a.h. Spring.
28:56 Track and Field 1 a.h. Spring.
28:71 Methods and Materials in Elementary School Physical Education 2 a.h.
28:71 Same as Education 72:71. Physical education majors only. Fall.
28:72 Methods and Materials in Elementary School Physical Education 2 a.h.
28:80 Anatomy 4 a.h.
28:80 Required of all students majoring in physical education; general biology survey, with emphasis on factors influencing movement. Fall.
28:81 Kinesiology 3 a.h.
28:91 Independent Study 4 a.h.
28:93 Honors Readings 3 a.h.
28:94 Honors Projects 3 a.h.
28:95 Honors Seminar 3 a.h.
For Undergraduates and Graduates
28:101 Fitness for the Individual 3 a.h.
28:101 Fitness needs of youth and adults, physiological process of conditioning.
28:102 Research on Women in Sports 3-2 a.h.
28:102 Review of research conducted, and planning for research related to women in competitive programs.
28:104 Health Education Workshop 1-0 a.h.
28:104 Care of Athletic Injuries 2 a.h.
28:104 Invasive care and rehabilitative treatment of injuries occurring in women's sports.
28:108 Physiological Implications for Teaching Physical Education 3-0 a.h.
28:108 Physiological effects of exercise and lack of exercise, methods of conditioning for various motoric programs. Fall.
28:107 Correlations 2-0 a.h.
28:107 Methods of general and concrete demonstrations of spine and foot, remedial work for functional conditions and athletic injuries. Prerequisites: 28:80 and 28:81 or equiv.
28:108 Principles and Administration of Intercollegiates for Women 3 a.h.
28:108 Principles designed to provide educational value for the participant.
28:109 Coaching 1-4 a.h.
28:109 Coaching for athletic majors; analysis and coaching techniques presented in workshop by experienced coaches. Fall.
28:110 Workshop: Methods of Teaching Sports 1-4 a.h.
28:110 Selected sports and the teaching of each for beginners as well as for the more skilled; analysis of different age levels; presented in workshop form by experienced teachers. Summer.
28:113 Measurement 3 a.h.
28:113 Selection and administration of physical measurements and motor tests; use of data. Spring.
28:119 Methods and Principles of Physical Education 3 a.h.
28:119 Philosophical bases of teaching and learning. Same as Education 75:146. Fall.
28:120 Organization and Administration of Physical Education 2 a.h.
28:121 History of Physical Education 1-2 a.h.
28:127 Advanced First Aid and Instructor Training 2 a.h.
28:128 Interrelationships of Health and Physical Education 3 a.h.
28:128 Physical education and other programs in schools as related to health of youth in today's society. Fall.
28:129 Health Problems of Youth 1 a.h.
28:130 Elementary School Physical Education 2-0 a.h.
28:130 Materials, methods, classroom planning; opportunities for improving performance skills in all program areas, as well as for teaching experience. Primarily for elementary education majors, junior standing or above. Fall. Same as TE:121.
28:130 Movement Education 1 a.h.
28:130 A problem-solving approach to teaching of fundamental movements, rhythm and activities included in elementary school physical education programs. Summer.
28:131 Seminar: Leadership in Extracurricular Activities 2 a.h.
28:131 Philosophical approach to programming and leadership of sports programs. Summer.
28:130 Workshop: Elementary Physical Education 1 a.h.
28:131 Sports Information 2 a.h.
28:131 Interrelationships between coach, physician, athletic director and the media. Introduction of methods and techniques to keep the news media informed about athletic affairs. Fall.
28:135 Elementary School Physical Education 2 a.h.
28:135 Development of sports education as influenced by individuals, governing organizations, special commission and legislation.
28:137 Seminar 4 a.h.
28:137 Individual opportunities to work with athletic teams, sport editors (newspapers, magazines, radio, television) and sport information directors.
28:138 Seminar 3 a.h.
28:138 Seminar on media with suitable persons in sport journalism and/or broadcasting.
28:139 Physio-Social Dimensions of Sport 3 a.h.
28:139 Overview of psycho-social factors in sport participation.
Primarily for Graduates
28:150 Problems in Physical Education 2 a.h.
28:150 Prerequisite: consent of instructor.
28:192 Seminar: Current Issues 2 a.h.
28:192 Problems in physical education and related areas. Fall.
28:195 Selecting and defining a problem; methods and design of studies. Fall, spring.
28:196 Seminar 2 a.h.
28:196 Cooperative work in planning and conducting investigative projects.
28:198 Interscholastic and Extramural Programs 3 a.h.
28:198 Design and administration of interscholastic and interscholastic programs. Fall, spring.
28:215 Analysis of Human Motion 3 a.h.
28:215 Advanced biomechanical study with application to teaching methods and problems in sports, dance, body mechanics, conditioning.
28:216 Advanced Coaching 2 a.h.
28:216 Reading and discussion concerning coaching and officiating procedures in light of recent research developments in motor learning.
28:218 Administration in Physical Education 3 a.h.
28:218 Prerequisite: consent of instructor (28:109, 28:113 only).
28:288 Motor Development of Children 3 a.h.
28:288 Neuroanatomical growth of motor activity.
29:243 Seminar: Health Concerns of Women
2 s.h.

29:243 Philosophies of Curriculum Construction
2 s.h.

29:244 Seminar: Health Education Program
2 s.h.
Planning and using opportunities in physical education for teaching of health.

29:245 Supervision of Physical Education
2 s.h.

29:246 Seminar: Supervision
2 s.h.
Problems in supervision; open only to those with experience in supervision.

29:247 Philosophy of Physical Education
2 s.h.
Spring.

29:248 Sociology of Sports
2 s.h.
Role and meaning of organized sports and individual peer participation in primitive and contemporary cultures. Fall.

29:249 Seminar: Improvement of Instruction in Elementary Physical Education
2 s.h.
Summer.

29:250 Seminar: Current Developments in Physical Education
2 s.h.

29:251 Comparative Physical Education
2 s.h.
Comparison of sites and programs in physical education around the world. Summer.

29:252 Individual Differences in Activity Classrooms
2 s.h.
Modification of activity curriculums for moderate mentally retarded students. Includes discussion of methods of teaching for the low-range individual and the physically disabled.

29:253 The Law and Sport
2 s.h.
Summer.

29:254 History of Women in Sports
2 s.h.
Summer.

29:256 Professional Writing
2 s.h.
Critical review of physical education and related writing of all sorts; individual projects on writing for publication or presentation at professional meetings.

29:260 Physical Education Program Planning
3 s.h.
Curriculum design for the high school student.

29:261 Seminar in Research
arr.
For Ph.D. candidates. May be repeated.

29:265 Advanced Chirotherapy
2 s.h.
Advanced study of muscle action and laboratory techniques for analysis of muscle action and motor performance. Prerequisites: anatomy, kinesiology, Fall.

29:268 Biomechanics
2 s.h.
Mechanical and cinematographic analysis of sports.

29:307 Visual Instruction and Research in Physical Education
2 s.h.

29:310 Neuromuscular Bases of Motor Function
2 s.h.
Research in perception and kinesiology involved in motor learning and skilled performance.

29:311 Seminar: Gross Motor Learning
2 s.h.

29:313 Expertise in Motor Learning
2 s.h.

describing studies in motor learning at various ages and levels of skill.

29:401 Thesis
arr.
Prerequisite: consent of the University.

29:402 Thesis
arr.

29:403 Thesis
arr.

Dance

29:603 Modern Dance
1-4 s.h.

29:604 Intermediate Modern Dance
2 s.h.
May be repeated.

29:605 Jazz
1-2 s.h.
Open to those who have completed requirement in physical education units.

29:611 Ballet
1-2 s.h.
Prerequisite: 29:609 or equivalent experience.

29:612 Intermediate Ballet
2 s.h.
Open to those who have completed 29:611 or 29:610 or equivalent. May be repeated.

29:613 Advanced Ballet
2 s.h.
Open to those who have completed 29:612 or equivalent. May be repeated.

29:614 Social Dance Forms
1-2 s.h.

29:615 Teaching of Modern Dance
2-4 s.h.

29:616 Teaching of Modern Dance to elementary schools and at college level.

29:617 Advanced Modern Dance
2 s.h.
Practical study of dance technique. Prerequisite: two semesters of dance or equivalent.

29:618 Advanced Modern Dance
2 s.h.
Combination of 29:617, but may be taken as independent unit.

For Undergraduates and Graduates

29:111 Children's Dance
2 s.h.
Dance for children in preschool to high school age.

29:112 Rhythmic Analysis of Dance
2 s.h.
Analysis and interpretation of movement and the composition of creative scores.

29:114 History and Appreciation of Dance
2 s.h.
Origins and development of dance; emphasis on changing forms and functions of dance in human culture; development of dance as professional art.

29:115 History and Appreciation of Dance
3 s.h.
Combination of 29:114.

29:216 Dance in Education
2-3 s.h.
Adaptation of these forms in such different levels of elementary and secondary grades; reading, discussion. Summer.

29:213 Beginning Composition
2 s.h.

29:214 Advanced Composition
2 s.h.

29:216 Dance Techniques
1-2 s.h.
May be repeated.

29:218 Dance Techniques
2 s.h.
May be repeated.

29:219 Workshop: Artist in Residence
1-4 s.h.

29:220 Dance Production
1-2 s.h.
The organization and procedure of all aspects of dance production. May be repeated.

29:219 Dance Production
1-2 s.h.
May be repeated.

29:220 Dance Production
1-2 s.h.
May be repeated.

29:221 Dance Accompaniment
2 s.h.
An overview of music as it pertains to dance; analysis of scores for dance; sources of original accompaniment.

29:275 Reading in Dance
arr.
By permission only.

29:276 Dance Company Class
1-2 s.h.
Experience in performing group. May be repeated.

29:277 Dance Company Class
2 s.h.
By permission only. May be repeated.

29:278 Advanced Choreography
1-2 s.h.
Experience in creating dance in groups and solo numbers. Prerequisite: 29:613, 121 or equivalent. May be repeated.

29:279 Advanced Choreography
arr.
Combination of 29:277 and 29:278. Requires choreographing, casting, making dances, casting numbers. May be repeated.

29:284 Theory and Criticism of Dance
3 s.h.
Philosophy of art and evaluation as applied to dance. Pleas to prevent depth.

29:285 Theory and Criticism of Dance
3 s.h.
Combination of 29:284.

29:286 Laboratory
3 s.h.
Theory and practice in notation of movement. May be repeated.

29:287 Laboratory
3 s.h.
Prerequisite: 29:286 or equivalent.

29:288 Dance Company Class
4-5 s.h.
Participation in concert work. May be repeated.

29:289 Dance Company Class
1-3 s.h.
Participation in concert work. May be repeated.

29:290 Techniques of Research
3-4 s.h.
Selecting and defining a problem; methods and design of research.

29:403 Thesis
3-4 s.h.

Physical Education-Field House

Penalty: professor Louis S. Albee - Oliver M. Appley, Donald R. Connoly, Charles M. Jeter, association professor Cyril V. Claffey, gravel P. Hansen, James G. Henry, N....
Pre-Doctoral Program

The pre-doctoral Bachelor of Arts program, which is open only to students with superior academic records, is designed to prepare students for graduate work in physical education with emphasis on exercise physiology, adapted physical education, anatomy, biomechanics or evaluation and instruction. The curriculum consists of a core of courses in physical education, and selected courses in mathematics, the biological sciences and the physical sciences, which are basic to advanced study in the area in which the student is interested. Because the student need no meet certification requirements for teaching in the public schools, this curriculum offers considerable latitude in the choice of electives to fit individual interests and needs.

Foundation courses required:
4-1, 4 Principles of Chemistry I-II
4-12 Organic Chemistry I
22M-3, 3 Mathematical Techniques I-II
22M-20 Elementary Functions
291-2 College Physics

Professional courses in physical education and related areas required:
27-11 Introduction to Physical Education
27-21, 22 Teaching of Recreational Sports I-II
27-33 Human Anatomy
27-97 Leadership Training I
27-105 Adapted Physical Education
78-75 Educational Psychology and Measurement
78-145 Methods in Secondary Physical Education
72-13 Introduction to Human Physiology
72-102 Exercise Physiology
99-120 The Chemistry of Biological Materials
99-130 Metabolism

Endorsement for Coaching

The State Department of Public Instruction has provided for the endorsement of certified teachers for the coaching of athletic teams in schools. This endorsement is intended for teachers who hold majors in subjects other than physical education but who wish to coach interscholastic athletic teams. The endorsement does not permit the teacher to teach physical education classes in the schools.

To be certified for coaching athletic teams at the junior high and secondary school levels, the following courses must be satisfactorily completed:
27-12 Human Anatomy
27-56 First Aid
27-57 Introduction to Athletic Training
27-103 Administration of Physical Education and Athletics
27-197 Biomechanics of Physical Education
27-108 Introduction to Human Perceptual-Motor Performance
27-141 Elementary Exercise Physiology
76-192 Observation and Laboratory Practice in the Secondary School

*This course may be waived on the basis of appropriate experience as a coach.

Undergraduate Programs
Preparation for Teaching and Coaching

The Bachelor of Science degree program in teaching and coaching prepares students for teaching physical education and related subjects in elementary and secondary schools, and for coaching athletic teams. Although the major job assignment in teaching and coaching has led to a high level of competition among applicants for teaching positions, graduates in physical education from this department have had a high percentage of placement.

Program requirements:
27-11 Introduction to Physical Education
27-21-22 Teaching of Recreational Sports I-II
27-31 Teaching of Gymnastics

One of these seven coaching courses:
27-32 Coaching of Gymnastics
27-33 Coaching of Basketball
27-34 Coaching of Baseball
27-35 Coaching of Track and Field Athletics
27-36 Coaching of Racketball
27-38 Coaching of Competitive Swimming
27-39 Coaching of Wrestling
27-37 Teaching of Swimming
27-53 Human Anatomy
27-56 First Aid
27-57 Introduction to Athletic Training
27-103 Administration of Physical Education and Athletics
27-105 Adapted Physical Education
27-107 Biomechanics of Physical Education
27-145 Introduction to Human Perceptual-Motor Performance
27-141 Elementary Exercise Physiology
72-13 Introduction to Human Physiology
63-101 Health Science I

Courses required for certification in physical education: 76-71-72 Methods and Materials in Elementary School Physical Education
or
27-20 Social Forms of Dance

79-75 Educational Psychology and Measurement
75-91 Pre-education
75-100 Introduction to Secondary School Teaching
75-145 Methods in Secondary Physical Education
76-187 Seminar: Curriculum and Student Teaching
75-190 Individual Projects in Lab Practice (Student Coaching)
75-191 Observation and Laboratory Practice in the Secondary School
76-192 Laboratory Practice in Elementary School
Endorsement for Athletic Trainers

The endorsement is provided for students who want to be certified as trainers for athletic teams at either the secondary school level as a part of their regular teaching duties, or at the college and university level. The courses are designed to meet the standards for certification by the National Athletic Trainers Association and include:

17:41 Contemporary Nutrition
or
17:142 Nutrition
31:1 Exercise Physiology
79:75 Educational Psychology and Measurement
72:13 Introduction to Human Physiology
63:101 Health Science I
27:53 Human Anatomy
17:56 First Aid
17:59 Introduction to Athletic Training
27:05 Adapted Physical Education
27:101 Biomechanics of Physical Education
27:141 Elementary Exercise Physiology
27:171 Medical Supervision of Athletics
27:182 Evaluative Techniques in Athletic Training
27:183 Athletic Training Modalities and Therapeutics
27:184 Laboratory Practice in Athletic Training

Pre-Physical-Therapy Program

The pre-physical-therapy program capitalizes on a unique juxtaposition of resources at Iowa. Within a six-block radius are located the Field House (which houses this department), the College of Medicine, the University Hospital, the Veterans Hospital, the Psychopathic Hospital and the University Hospital School for handicapped and mentally retarded children.

The proximity of these facilities, together with the close working relationships between the faculty of this department and the faculties of various departments in the College of Medicine, affords the student an opportunity for a pre-physical-therapy program. Because of this rapidly increasing demand for physical therapists who are training to serve as athletic trainers for school, college and university teams, the pre-physical-therapy program in physical education renders a valuable service to schools and colleges, as well as to the paramedical aspects of physical therapy.

Students who wish to complete the requirements for admission to the training program in physical therapy must complete the following courses:

27:21-22 Teaching of Recreational Sports I-II
27:31 Teaching of Gymnastics
27:37 Teaching of Swimming
27:53 Human Anatomy
31:56 First Aid
21:57 Introduction to Athletic Training
27:56-59 Practicum in Special Physical Education
27:102 Administration of Physical Education and Athletics
27:105 Adapted Physical Education
27:107 Biomechanics of Physical Education
27:108 Introduction to Human Perceptual-Motor Performance
27:141 Elementary Exercise Physiology
27:143 Advanced Anatomy and Kinesiology
4:1:4 Principles of Chemistry I and II
4:6 Elementary Chemistry Laboratory
79:74 Educational Psychology and Measurement
29:1:2 College Physics
31:1 Elementary Psychology
31:13 Psychology of Adjustment
or
11:163 Abnormal Psychology
35:3 Principles of Animal Biology
37:41 Principles of Human Genetics
37:100 Principles of Modern Embryology
or
11:103 Comparative Vertebrate Anatomy
63:101 Health Science I
72:13 Introduction to Human Physiology
A course in mathematics

Graduate Programs

M.A. Without Thesis

The program leading to the M.A. degree without thesis is designed as a terminal unit of advanced study for teachers of basic physical education and for athletics coaches. Emphasis is placed on the application of research findings to the organization, teaching and evaluation of basic physical education programs for all students in schools and colleges, and to the counseling of intercollegiate and intercollegiate athletic teams. Particular attention is given to problems associated with teaching and coaching in public schools and community colleges in Iowa. The placement of students with the M.A. degree without thesis has been excellent.

Graduate prerequisites:

The undergraduate coursework listed below is required. Any or all of this coursework may be taken after the student has been admitted to graduate study, but it should be taken at the earliest opportunity.

Human anatomy 2 h.s.

Human physiology 2 h.s.

Biological science of equivalent 2 h.s.

Administration of physical education and athletics 2 h.s.

Practical teaching experience 2 h.s.

Teaching of gymnastics 1 h.s.

Teaching of swimming 1 h.s.

Coaching (one sport) 1 h.s.

Electives in physical education and related areas 13 h.s.

Total 30 h.s.

Credit may be given for experience and competence in techniques when such competence is demonstrated by examination.

Graduate requirements:

For the M.A. degree without thesis, the student must complete a minimum of 30 semester hours, at least 24 of which must be in physical education, including 27:101 Non-thesis Seminar. At least one course must be selected from each of these three groups:

Course I

27:105 Adapted Physical Education (may not be elected if
student has completed equivalent course in undergraduate study)
27:167 Measurement and Evaluation in Physical Education

Group II
27:199 Supervision of Physical Education
27:237 Public School Curriculum in Physical Education
27:308 Human Perceptual-Motor Performance

Group III
27:157 Biomechanics of Athletics
27:241 Scientific Principles of Physical Conditioning

M.A. with Thesis
The study program leading to the M.A. with thesis is designed primarily as a first step in a program of graduate study leading to the Ph.D. degree. There is particular emphasis upon techniques of research as applied to problems related to physical education and athletics. A secondary purpose of this program is to provide advanced preparation for those who are teaching, or intend to teach, in programs for undergraduate majors in physical education in four-year colleges, but who do not plan to continue on to the doctorate. An attempt is made to thoroughly acquaint candidates with the nature and extent of research in all areas of physical education.

Undergraduate prerequisites:
The undergraduate coursework listed below is required. Any or all of it may be taken after the student has been admitted to graduate study in physical education, but it should be taken at the earliest opportunity.

- Human physiology 3 s.h.
- Human anatomy 2 s.h.
- Methods in physical education or Administration of physical education and athletics 3 s.h.
- Intermediate algebra (or equivalent) 3 s.h.
- Teaching of recreational sports (or equivalent) 4 s.h.
- Practice teaching (or equivalent) 2 s.h.
- Electives in physical education and related areas 13 s.h.
- Total 30 s.h.

In addition to these courses, undergraduate courses in chemistry, physics, zoology, mathematics and the physiology of exercises are highly desirable and may be included as electives in related areas.

Graduate requirements:
The courses listed below, together with elective courses sufficient to total 30 semester hours in physical education and related areas, are required for the M.A. degree with thesis.

- 27:202 Adapted Physical Education
- 27:257 Biomechanics of Human Motion
- 27:287 Advanced Measurement and Evaluation in Physical Education
- 27:308 Human Perceptual-Motor Performance
- 27:337 Seminar: Research in Physical Education Curriculum
- 27:401 Seminar in Scientific Writing

27:402 Research Methods in Physical Education
27:403 Seminar: M.A.
27:404 Thesis: M.A.
72:102 Exercise Physiology
7P:143 Introduction to Statistical Methods or 63:161 Introduction to Biostatistics

Ph.D. Program
The Ph.D. program in physical education is based on the concept that the successful candidate should have a broad knowledge of all areas of physical education, a working knowledge of the research techniques which may appropriately be applied to problems in physical education and athletics, and knowledge in depth in at least one of the accepted areas of specialization in physical education.

The areas of specialization offered in physical education are adapted physical education, administration and supervision in physical education, anatomy, biomechanics, curriculum in physical education, exercise physiology, measurement and evaluation in physical education, motor performance and learning, and therapeutics.

A broad background in all areas of physical education, together with a working knowledge of appropriate research techniques, is provided through the required courses in the M.A. with thesis curriculum and the core of courses required for all Ph.D. candidates. With the exception of six semester hours of electives, all of these courses are taught by members of the physical education faculty.

The candidate is required to complete a minimum of 30 semester hours of graduate work in the specialization of his or her choice and to write a thesis on a problem in that area. The thesis must be submitted to a reputable journal for publication before the Ph.D. is granted. Most of the courses in the areas of specialization are offered by departments other than the Department of Physical Education—Field House. Professors from these departments participate in writing and evaluating the comprehensive examinations, serve on thesis committees for the initial presentation of the proposed problem, and participate in the final examination in which the candidate defends his or her thesis. In addition to writing a comprehensive examination in physical education, the candidate specializing in exercise physiology writes a comprehensive examination prepared and evaluated by faculty members of the Department of Physiology and Biophysics in the College of Medicine. Such candidates graduate with a minor in physiology.

Graduates of the Ph.D. program in physical education have obtained excellent positions in highly reputable colleges and universities throughout the United States and in a number of foreign countries.

Prerequisites:
Completion of the requirements for the M.A. degree with thesis is required. Any or all of these requirements may be completed after the student has been admitted to graduate work in physical education, but they should be completed at the earliest opportunity. If the student has the M.A. degree without thesis, the equivalent of the M.A. thesis must be completed before taking the comprehensive examination for the Ph.D. degree.

Requirements:
The student must complete the core requirements and the require-
ments for at least one area of specialization.

The core requirements include 27-403 Thesis: Ph.D., and either
7P-242 Selected Applications of Statistical Techniques or 63:161
Introduction to Biostatistics.

The foreign language requirement differs for each area of
specialization. All candidates not required to demonstrate profi-
cency in a foreign language must satisfactorily complete 7P-248
Data Processing or 25C:100 Introduction to Computing with
FORTRAN.

A minimum of 30 semester hours of required and elective
courses must be completed in the candidate's area of specializa-
tion.

The courses required by area of specialization are:

Adapted Physical Education

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>7U:130</td>
<td>Exceptional Children</td>
</tr>
<tr>
<td>27:201</td>
<td>Research-Adapted Physical Education (may be repeated)</td>
</tr>
<tr>
<td>27:205</td>
<td>Adapted Physical Education: Special Topics and Research</td>
</tr>
<tr>
<td>60:109</td>
<td>Human Anatomy and Neuramnatomy</td>
</tr>
<tr>
<td>60:110</td>
<td>Neurobiology and Behavior</td>
</tr>
</tbody>
</table>

Administration and Supervision in Physical Education

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>7D:201</td>
<td>Foundations of School Administration</td>
</tr>
<tr>
<td>27:201</td>
<td>Research: Administration and Supervision</td>
</tr>
<tr>
<td>27:203</td>
<td>Psychology of Sport</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>27:160</td>
<td>Behavior Management in Physical Education Athletics</td>
</tr>
<tr>
<td>27:207</td>
<td>Advanced Administration of Physical Education</td>
</tr>
<tr>
<td>27:227</td>
<td>Advanced Administration of Athletics</td>
</tr>
<tr>
<td>27:240</td>
<td>Professional Preparation in Physical Education</td>
</tr>
</tbody>
</table>

Anatomy

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>37:102</td>
<td>Principles of Modern Embryology</td>
</tr>
<tr>
<td>27:153</td>
<td>Advanced Anatomy and Embryology</td>
</tr>
<tr>
<td>60:103</td>
<td>Gross Human Anatomy for Medical Students</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>60:109</td>
<td>Human Anatomy</td>
</tr>
<tr>
<td>and</td>
<td></td>
</tr>
<tr>
<td>60:110</td>
<td>Human Anatomy and Neuramnatomy</td>
</tr>
</tbody>
</table>

One of these:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>60:105</td>
<td>Microscopic Anatomy for Medical Students</td>
</tr>
<tr>
<td>37:112</td>
<td>Cell, Tissue and Organ Biology</td>
</tr>
<tr>
<td>60:221</td>
<td>Microscopic Anatomy for Graduate Students</td>
</tr>
</tbody>
</table>

Biomechanics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>527:190</td>
<td>Readings in Energy Engineering (include statics; dynamics; mechanics of fluids, transfer processes and deformable bodies)</td>
</tr>
<tr>
<td>3:120</td>
<td>Fundamentals of Laboratory Instrumentation</td>
</tr>
<tr>
<td>60:109</td>
<td>Human Anatomy and Neuramnatomy</td>
</tr>
<tr>
<td>27:201</td>
<td>Research-Biomechanics</td>
</tr>
<tr>
<td>27:357</td>
<td>Research Techniques in Biomechanics</td>
</tr>
</tbody>
</table>

Curriculum in Physical Education

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>7E:300</td>
<td>Elementary Education</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>7E:291</td>
<td>Secondary School Curriculum</td>
</tr>
<tr>
<td>7P:332</td>
<td>Seminar: Educational Psychology II: Psychology of Learning</td>
</tr>
</tbody>
</table>

7X:301 Current issues in Education
| 27:160      | Perceptual Motor Skill Development in Children |
| 27:201      | Research-Curriculum (may be repeated) |
| 27:240      | Professional Preparation in Physical Education |
| 27:338      | Seminar: Models and Theory in Curriculum |
| 28:243      | Philosophical Basis of Curriculum Construction |

Exercise Physiology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>72:202</td>
<td>Advanced Exercise Physiology</td>
</tr>
<tr>
<td>72:131</td>
<td>Interim Physiologie</td>
</tr>
<tr>
<td>99:130</td>
<td>Metabolism</td>
</tr>
</tbody>
</table>

Measurement and Evaluation

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>25C:100</td>
<td>Introduction to Computing with FORTRAN</td>
</tr>
<tr>
<td>7P:243</td>
<td>Statistical Methods, and Correlation Methods</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>225:153</td>
<td>Introduction to Mathematical Statistics I and II</td>
</tr>
<tr>
<td>7P:246</td>
<td>Design of Experiments</td>
</tr>
<tr>
<td>7P:253</td>
<td>Construction and Use of Classroom Tests as Evaluation Instruments</td>
</tr>
<tr>
<td>7P:257</td>
<td>Educational Measurement and Evaluation</td>
</tr>
<tr>
<td>27:367</td>
<td>Seminar: Research in Measurement and Evaluation in Physical Education (may be repeated)</td>
</tr>
</tbody>
</table>

Motor Performance and Learning

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>27:201</td>
<td>Research-Motor Learning (may be repeated)</td>
</tr>
<tr>
<td>27:312</td>
<td>Selected Issues in Information Processing and in Motor Control</td>
</tr>
<tr>
<td>27:314</td>
<td>Seminar in Motor Behavior Research</td>
</tr>
<tr>
<td>31:119</td>
<td>Human Memory, Learning and Conceptual Processes</td>
</tr>
<tr>
<td>31:155</td>
<td>Human Engineering</td>
</tr>
<tr>
<td>31:223</td>
<td>Information Processing in Psychology</td>
</tr>
</tbody>
</table>

Therapeutics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>101:327</td>
<td>Research in Therapeutics</td>
</tr>
<tr>
<td>101:214</td>
<td>Principles of Human Motion II</td>
</tr>
</tbody>
</table>

One of these:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>72:110</td>
<td>Neurobiology and Behavior</td>
</tr>
<tr>
<td>72:271</td>
<td>Advanced Cardiovascular Physiology</td>
</tr>
<tr>
<td>72:247</td>
<td>Advanced Respiratory Physiology</td>
</tr>
</tbody>
</table>

One of these:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>60:105</td>
<td>Microscopic Anatomy for Medical Students</td>
</tr>
<tr>
<td>59:202</td>
<td>Readings in Mechanics</td>
</tr>
<tr>
<td>72:202</td>
<td>Advanced Physiology and Exercise</td>
</tr>
<tr>
<td>72:281-4</td>
<td>Advanced Neurophysiology</td>
</tr>
</tbody>
</table>

Admission Requirements

M.A. with and without Thesis

For admission to the program leading to the M.A. degree with or without thesis, see the admissions requirements prescribed by the Graduate College.

Ph.D. Program

The student is admitted to the study program leading to the Ph.D. degree on the basis of his or her grade-point average on the work completed for the M.A. or M.S. degree, and his or her score on the Graduate Record Examination (Scholastic Aptitude Test). To be consid-
ered for admission, the student must have earned a grade-point average of 3.0 or higher on all graduate work undertaken.

Facilities
The construction of the mammoth new Recreation Building, along with the recent refurbishing of the Field House, provides excellent facilities for use in the physical education skills program, in the undergraduate and graduate instructional programs, and for student participation in intramural sports, recreational activities and athletics.

Research laboratories for physiology of exercise, stress, motor performance and biomechanics are located in the Field House and provide excellent facilities for instruction and research at both the undergraduate and graduate levels.

Because of our cooperative efforts with other departments to facilitate specialization, physical education students use additional special facilities in other departments on the campus.

Courses

<table>
<thead>
<tr>
<th>Primarily for Undergraduates</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>27:61 Freshman Physical Education 1 a.h.</td>
<td></td>
</tr>
<tr>
<td>Elective for students who have satisfied requirements for physical education skills (see &quot;Basic Skills&quot;)</td>
<td></td>
</tr>
<tr>
<td>27:62 Freshman Physical Education 1 a.h.</td>
<td></td>
</tr>
<tr>
<td>Continuation of 27:61</td>
<td></td>
</tr>
<tr>
<td>27:63 Freshman Physical Education 1 a.h.</td>
<td></td>
</tr>
<tr>
<td>Continuation of 27:62</td>
<td></td>
</tr>
<tr>
<td>27:64 Freshman Physical Education 1 a.h.</td>
<td></td>
</tr>
<tr>
<td>Continuation of 27:63</td>
<td></td>
</tr>
<tr>
<td>27:65 Freshman Physical Education 1 a.h.</td>
<td></td>
</tr>
<tr>
<td>Continuation of 27:64</td>
<td></td>
</tr>
<tr>
<td>27:66 Freshman Physical Education 1 a.h.</td>
<td></td>
</tr>
<tr>
<td>Continuation of 27:65</td>
<td></td>
</tr>
<tr>
<td>27:67 Freshman Physical Education 1 a.h.</td>
<td></td>
</tr>
<tr>
<td>Continuation of 27:66</td>
<td></td>
</tr>
<tr>
<td>27:68 Freshman Physical Education 1 a.h.</td>
<td></td>
</tr>
<tr>
<td>Continuation of 27:67</td>
<td></td>
</tr>
</tbody>
</table>

Note: Freshmen are required to attend freshman physical education classes except for those who have transferred and have met the freshman requirements.

| 27:71 Introduction to Physical Education 0 a.h. |  |
| Optional lecture on historical and educational aspects of physical education. First semester. |  |
| 27:72 Social Forms of Leisure 1-2 a.h. |  |
| Same as 28:72. First semester. |  |
| 27:73 Teaching of Recreational Sports I 3 a.h. |  |
| Consent of instructor, teaching group or prepares for participation. First semester. |  |
| 27:74 Teaching of Recreational Sports II 6 a.h. |  |
| Continuation of 27:73. Second semester. |  |
| 27:75 Teaching of Gymnastics 2 a.h. |  |
| Teaching techniques of conditioning exercises, elementary apparatus and swimming exercises. |  |
| 27:76 Coaching of Gymnastics 2 a.h. |  |
| Prerequisite: High school physical education or equivalent. Second semester. |  |
| 27:77 Coaching of Physical Education 1 a.h. |  |
| Prerequisite: High school physical education or equivalent. Second semester. |  |
| 27:78 Coaching of Baseball 2 a.h. |  |
| Prerequisite: high school physical education or equivalent. Second semester. |  |
| 27:79 Coaching of Track and Field Athletics 2 a.h. |  |
| Prerequisite: high school physical education or equivalent. First semester. |  |
| 27:80 Coaching of Basketball 2 a.h. |  |
| Prerequisite: high school physical education or equivalent. First semester. |  |
| 27:81 Teaching of Swimming 2 a.h. |  |
| 27:82 Coaching of Competitive Swimming 2 a.h. |  |
| Prerequisite: high school physical education or equivalent. Second semester. |  |

For Undergraduates and Graduates

| First semester. |  |
| 27:84 Administration of Physical Educational and Athletics 2 a.h. |  |
| Second semester. |  |
| 27:85 Applied Physical Education 4 a.h. |  |
| Prerequisite: 27:81. Second semester. |  |
| 27:86 Scientific Aspects of Sports Skills 3 a.h. |  |
| Saturday and Evening Summer Session. |  |
| 27:87 Biomechanics of Physical Education 2 a.h. |  |
| First semester. |  |
| Second semester. |  |
| 27:89 Workshop in Growth and Development 1 a.h. |  |
| Correspondence course. |  |
| 27:111 History of Physical Education 2 a.h. |  |
| 27:120 Track and Field Athletics 2 a.h. |  |
| 27:130 Workshop in Advanced Athletic Coaching 1 a.h. |  |
| Second semester. |  |
| 27:151 Advanced Theory and Techniques of Swimming and Diving 2 a.h. |  |
| First semester. |  |

| 27:132 School Physical Education Programs 2 a.h. |  |
| Same as Education 27:18. First semester. |  |
| 27:140 Workshop: Physiological Effects of Activity 1 a.h. |  |
| Correspondence course. |  |
| 27:141 Elementary Exercise Physiology 2 a.h. |  |
| Prerequisite: 27:12. First semester. |  |
| 27:147 Knowledge and Performance Tests in Physical Education 2 a.h. |  |
| First semester. |  |
| 27:150 Advanced Anatomy and Physiology 3 a.h. |  |
| Emphasis on preparation for teaching anatomy and physiology at the undergraduate level. Second semester. |  |
| 27:154 Instructional Units in Physical Education 3 a.h. |  |
| Same as Education 27:19. Summer session. |  |
| 27:155 Advanced Instruction in Selected Activities 2 a.h. |  |
| Division of Coaching Education. |  |
| 27:156 Sports and Movement for Drama 1 a.h. |  |
| May be taken for credit. |  |
| 27:157 Biomechanics of Athletics 3 a.h. |  |
| 27:169 Physical Education for Elementary School 2 a.h. |  |
| Same as Education 27:20. First semester. |  |
| 27:182 Physical Education for Elementary School 2 a.h. |  |
| 27:183 Physical Education for Elementary School 2 a.h. |  |
| 27:184 Physical Education for Elementary School 2 a.h. |  |
| 27:185 Physical Education for Elementary School 2 a.h. |  |
| 27:186 Physical Education for Elementary School 2 a.h. |  |
| 27:187 Physical Education for Elementary School 2 a.h. |  |
| 27:188 Physical Education for Elementary School 2 a.h. |  |
| 27:189 Physical Education for Elementary School 2 a.h. |  |
| 27:190 Physical Education for Elementary School 2 a.h. |  |
| 27:191 Physical Education for Elementary School 2 a.h. |  |
| 27:192 Physical Education for Elementary School 2 a.h. |  |
Primary for Graduates

27-201 Research 3 a.h.
Consult department head before registering.
27-202 Practicum in College Teaching 3 a.h.
27-203 Psychology of Sport 1 a.h.
First semester.
27-205 Adapted Physical Education: Special Topics and Research 4 a.h.
Prerequisites: 27-53 and 27-55. First semester.
27-207 Advanced Administration of Physical Education 2 a.h.
Second semester.
27-221 Advanced Administration of Athletics 2 a.h.
Second semester.
27-227 Public School Curriculum in Physical Education 2 a.h.
Same as Education 70-343. Second semester.
27-260 Professional Preparation in Physical Education 2 a.h.
Critical analysis of current undergraduate and graduate programs in physical education. Senior by invitation.
27-541 Scientific Principles of Physical Conditioning 1.5 a.h.
Prerequisite: 27-143 or 27-144. Seniors & Fall, First semester.
27-557 Biomechanics of Human Motion 4 a.h.
Prerequisite: 27-125. Second semester.
27-298 Seminar: Current Developments in Biomechanics 0 a.h.
27-297 Advanced Measurement and Evaluation in Physical Education 3 a.h.
Second semester.
27-296 Electromyography in Kinesiology and Biomechanics 3 a.h.
Same as 101-395. Second semester.
27-296 Human Kinesiology Seminar 3 a.h.
Required for students by M.A. without thesis. Second semester.
27-296 Seminar: Physical Education for the Mentally Retarded 2 a.h.
First semester.
27-296 Human Perceptual-Motor Performance 3 a.h.
Motor learning principles and practical implications for teaching. First semester.
27-310 Collegium 6 a.h.
Special topics. Summer session.
27-311 Orientation to Graduate Study 5 a.h.
First semester.
27-312 Selected Issues in Information Processing and in Motor Control 3 a.h.
27-314 Seminar in Motor Behavior Research 3 a.h.
Second semester.
27-317 Seminar: Research in Physical Education Curriculum 3 a.h.
Students who have not completed 27-231 or equivalent must elect 27-237. Second semester.
27-239 Seminar: Models and Theory in Curriculum 3 a.h.
Second semester.
27-267 Research Techniques in Biomechanics 4 a.h.
First semester.
27-367 Seminar: Research in Measurement and Evaluation in Physical Education 3 a.h.
First semester.
27-426 Seminar in Scientific Writing 1 a.h.
Second semester.
27-426 Research Methods in Physical Education 3 a.h.
First semester.
27-430 Seminar: M.A. 0 a.h.
First semester.
27-434 Thesis: M.A. 0-3 a.h.
27-434 Thesis: Ph.D. 0-3 a.h.
Not to exceed 15 semester hours.

Physical Therapy
See "College of Medicine."

Physician's Assistant Program
See "College of Medicine."

Director and Administration:
James A. Van Allen
Assistant Director: Edward B. Nelson
Assistant Director and Undergraduate Advisor: Edward B. Nelson
Degree: B.S. and M.S. in Anatomy and Physiology, Ph.D. in Physical Therapy.

The Department of Physics and Astronomy provides comprehensive and rigorous instruction in all basic aspects of these subjects. In addition it provides research facilities and guidance for individual scholarly work at an advanced level in selected specialties. Total departmental enrollments are typically 1,200 student registrations during each semester of the academic year and 130 during the summer session. All courses and advanced laboratories are taught by full-time members of the faculty. Senior members of the faculty teach the elementary courses and supervise graduate student assistants who conduct the associated laboratories. Beyond the elementary level, typical course enrollments are 20, and there is ample opportunity for individual work. Special introductory courses having similar enrollments are offered for majors in physics and for others with special interest in the subject. There are about 55 undergraduate majors, 15 of whom are Honors students, and 45 graduate students in physics or astronomy.

About 40 percent of the graduates with Bachelor of Arts degrees pursue advanced study, 25 percent find secondary school teaching posts and 35 percent find employment in government laboratories or in industry. Graduates of The University of Iowa with M.S. or Ph.D. degrees in physics or astronomy continue to find satisfactory employment in universities, colleges and research laboratories in government and industry, despite a recent national tightening in such opportunities.

Undergraduate Major in Physics

The following courses or their equivalents are required for the Bachelor of Arts degree with a major in physics:

246:32:52 Calculus I, II, III and Introduction to Linear Algebra
or
23:3:58 Engineering Calculus I-IV

16 a.h.
29:1-19 Introductory Physics I-III 12 s.h.
29:115 Intermediate Mechanics 3 s.h.
29:116 Introductory Quantum Mechanics 3 s.h.
29:118 Statistical Physics 3 s.h.
29:129-130 Electricity and Magnetism 6 s.h.
29:132 Intermediate Laboratory 4 s.h.
29:191 Atomic Physics 3 s.h.

4:4, 4:6 Principles of Chemistry II and Elementary Chemistry Laboratory 5 s.h.
or 4:8, 9 General Chemistry II and General Chemistry Laboratory 3 s.h.

Undergraduate majors who plan to pursue graduate study in physics are advised to take 29:171-172 Mathematical Methods of Physics, and to go beyond the minimum requirements listed above to the greatest feasible extent, including further work in mathematics.

For general requirements of the College of Liberal Arts, see "College of Liberal Arts."

Undergraduate Major in Astronomy

Astronomy includes the subdisciplines of astrophysics, classical astrometry, radio astronomy and space astronomy. A balanced and integrated program of astronomy, physics and mathematics courses is required for the Bachelor of Arts degree in astronomy.

The purpose of this program is to prepare the student for a career or advanced study in astrophysics, radio astronomy or space astronomy.

The following courses or their equivalents are required for the Bachelor of Arts degree in astronomy:

22M:25-28 Calculus I, II, III and Introduction to Linear Algebra 16 s.h.
or 22M:35-38 Engineering Calculus I-IV 16 s.h.

29:17-19 Introductory Physics I-III 12 s.h.
29:61-62 General Astronomy 8 s.h.
29:115 Intermediate Mechanics 3 s.h.
29:116 Introductory Quantum Mechanics 3 s.h.
29:119-120 Introduction to Stellar Astrophysics I-II 6 s.h.
29:129, 130 Electricity and Magnetism 6 s.h.
29:132 Intermediate Laboratory 4 s.h.
29:137 Astronomical Laboratory 2 s.h.
29:191 Atomic Physics 3 s.h.

Undergraduate majors in astronomy who plan to pursue graduate study in astrophysics are advised to go beyond the minimum requirements listed above to the greatest feasible extent, and take:

29:117 Optics 3 s.h.
29:118 Statistical Physics 3 s.h.
29:171-172 Mathematical Methods of Physics 6 s.h.

For general requirements of the College of Liberal Arts, see "College of Liberal Arts."

Honors

Selected junior and senior majors may take six to eight semester hours of 20:99 Honors Seminar and conduct an investigation with the guidance of a faculty member as part of their program for the degree Bachelor of Arts with Honors in Physics or Astronomy.

Graduate Program

Two advanced degrees are offered in physics, the Master of Science degree with or without thesis, and the Doctor of Philosophy degree. One in astrophysics, the Master of Science (with or without thesis). A student who wishes to pursue a program in astronomy beyond the M.S. level may qualify for a Doctor of Philosophy degree in physics with specialization and a dissertation in astronomy or astrophysics.

As M.S. degree is not prerequisite to the Ph.D.

The Department of Physics and Astronomy cooperates in interdisciplinary doctoral programs with the Program in Applied Mathematical Sciences (see "Graduate College").

An interdisciplinary program leading to the M.S. and Ph.D. degrees in chemical physics is also available.

Each entering graduate student is assigned to a faculty adviser who will assist in preparing a plan of study and in guiding the student's progress. A graduate student becomes a candidate for an advanced degree in physics or astronomy only after passing a qualifying examination in all principal areas of the subject at the level of advanced undergraduate work. The examination is given during the first week of the second semester each year and must be taken by all first-year graduate students. After a student has selected a research specialty, the appropriate thesis or essay adviser then becomes the candidate's general adviser and the chairman of the final examination committee.

For general admission and degree requirements, see "Graduate College."

Master of Science Degree in Physics

The M.S. degree is offered with thesis or without thesis. Either degree may be an intermediate step toward a Ph.D. degree, or it may be a terminal degree. The final examination in either case is an oral one conducted by a committee of three members of the graduate faculty appointed by the dean of the Graduate College.

The program for the M.S. degree with thesis requires 30 semester hours of graduate work and a thesis based on an original experimental or theoretical investigation by the candidate. No more than six of the minimal 30 semester hours may be for research (29:281 Research in Physics).

The program for the M.S. degree without thesis requires 30 semester hours of graduate work, an independent study of the literature on a chosen topic and the preparation of a critical essay on that topic. No more than four of the minimal 30 semester hours may be for the essay course (29:230 Individual Critical Study).

Up to one-third of the graduate program may be in related scientific fields other than physics and mathematics, e.g., chemistry, astronomy, engineering, etc.

The candidate for either of the M.S. degrees must have satisfactorily completed the following courses or their equivalents as an undergraduate or a graduate:

29:115 Intermediate Mechanics 3 s.h.
29:116 Introductory Quantum Mechanics 3 s.h.
29:117 Optics 3 s.h.
29:118 Statistical Physics 3 s.h.
29:129-130 Electricity and Magnetism 6 s.h.
29:132 Advanced Laboratory 4 s.h.
29:171-172 Mathematical Methods of Physics 6 s.h.
29:191 Atomic Physics 3 s.h.
29:192 Nuclear Physics 3 s.h.
29:193 Introductory Solid State Physics 3 s.h.

The student’s plan of study should provide for as much advanced work as possible and appropriate preparation permit.

Master of Science Degree in Astronomy

The M.S. degree is offered with thesis or without thesis. The general requirements are the same as for the M.S. in Physics (see above). The course requirements are as follows:

29:115 Intermediate Mechanics 3 s.h.
29:116 Introductory Quantum Mechanics 3 s.h.
29:117 Optics 3 s.h.
29:118 Statistical Physics 3 s.h.
29:119-120 Introduction to Stellar Astrophysics I-II 6 s.h.
29:121 Solar System Astrophysics 3 s.h.
29:129-130 Electricity and Magnetism 6 s.h.
29:133 Advanced Laboratory 2 s.h.
29:137 Astronomical Optics 2 s.h.
29:171-172 Mathematical Method of Physics 6 s.h.
29:191 Atomic Physics 3 s.h.

A student who intends to continue for a Ph.D. in physics with an astrophysics specialization should take the following courses as soon as possible:

29:131 Radio Astronomy 3 s.h.
29:232-233 Theoretical Astrophysics I-II 6 s.h.
29:234 Stellar Structure and Evolution 4 s.h.
29:235 Special Topics in Astrophysics 2 s.h.

Doctor of Philosophy Degree in Physics

The program of study for the Ph.D. degree with major in physics includes: Thorough coursework in both classical and modern theoretical physics for all candidates, whether their specialized research is to be in an experimental or a theoretical area; Comprehensive examinations; Participation in advanced seminars; Original research in experimental physics, theoretical physics or astrophysics; and the preparation and defense of a written dissertation based on this work.

All candidates for the Ph.D. must take at least 27 semester hours of graduate courses in the Department, excluding 29:225, 29:226 and seminars. The following minimum program is recommended as preparation for the comprehensive examinations:

29:191-193 Atomic Physics, Nuclear Physics and Introductory Solid State Physics 9 s.h.
29:205 Classical Mechanics 3 s.h.
29:212 Statistical Mechanics I 3 s.h.
29:212-214 Classical Electrodynamics 6 s.h.
29:245-246 Quantum Mechanics I-II 6 s.h.

Advanced mathematics, such as the theory of functions of a complex variable and vector and tensor analysis, is used freely in these courses. An introduction to these fields is given in 29:171-172 Mathematical Methods of Physics. The selection of less advanced courses will depend on the adequacy of the student’s preparation for graduate work; the student’s choice of more advanced and specialized courses will depend on the direction in which his or her interests develop. No more than 30 of the minimal 72 semester hours may be in research and seminars.

A candidate for the Ph.D. degree will not be recommended for the degree until he or she has written the dissertation is proper form for formal publication and has submitted it, with the approval of the research adviser, for publication to a standard scientific journal of wide distribution.

Research

The Department has an excellent library and a number of well-equipped laboratories and observatories. An IBM 360/65 digital computer and the associated facilities of the University Computer Center are available for research by students and staff of the Department. Several other smaller computers are available within the Department. The central machine shop is fully equipped and staffed with skilled instrument makers and machinists, and there are several electronics and machine shops for the use of advanced students and the research staff.

Experimental research is conducted in the fields of nuclear structure physics, isoscalar and space physics, astrophysics, solar and planetary physics, chemical physics, solid state physics and plasma physics.

Theoretical research is devoted to nuclear theory, statistical mechanics, plasma physics, theory of solids, theory of elementary particles, solar terrestrial physics and astrophysics.

Exceptional opportunities are available for experimental research in space physics.

Persons qualified for graduate study are invited to apply for fellowships and assistantships. Inquiries should be directed to the head of the Department.

Courses

Physics

Prerequisites and corequisites are specified as guides and may be waived by the instructor.

An elementary course may not be repeated for credit or for quality points if the student has already completed a higher level course for which the elementary course, or its equivalent, is a prerequisite.

Courses 29:1-2, 29:3, 29:17-18, 29:26, 29:30, and 29:61-62 are accepted toward the College of Liberal Arts core requirements in the Natural sciences.

Primarily for Undergraduates

29:1 College Physics 4 s.h.

Core in preparation for premedical, preprofessional and pharmacy students and others interested in elementary physics: descriptive lectures, laboratory and problem work in mechanics, heat and sound. Prerequisite: Or corequisite: Mathematics 2201:2 or equivalent. Offered both semesters and summer session.

29:2 College Physics 4 s.h.

Electricity, magnetism, light and modern physics. Continuation of 29:1, which is prerequisite. Offered both semesters and summer session.

29:3 Basic Physics 4 s.h.

Quantitative treatment of mechanics, electricity, heat, fluids and gases with emphasis on useful applications. Meets one-semester physics requirements.

29:444 Experiential Physics 3 s.h.

Three hours per week, no laboratory. Intended primarily for students interested in related fields. This is a one-semester course in physics covering mechanics, properties of fluids, heat, electricity and magnetism, chemical instruments, sound, X-rays and modern physics. Prerequisite: High school algebra.

29:5 Practical Electricity and Magnetism 2 s.h.

This course covers some of the basic principles and practical experience necessary to
 cope with our environment which is filled with electrical and electronic devices. Topics include the nature of electricity, current and charge, electric force, electric potential, electrostatics, capacitance, and magnetism. The principles of electricity and magnetism allow us to understand the behavior of electric circuits and magnetic fields. We will study Ohm's law, Kirchhoff's laws, and the concept of magnetic fields.

For Undergraduates and Graduates

193:102 Reading in Practice

193:103 Cell and Tissue Biology

193:105 Physics of Sound and Waves

193:115 Introductory Quantum Mechanics

193:116 Introductory Quantum Mechanics

193:117 QCD

193:118 Statistical Physics

193:119 Statistical Physics

193:120 Electrons

193:123 Electricity and Magnetism

Electricity, magnetic fields and introduction to Maxwell's equations. See 20-12 for two-hour work. Prerequisites: Mathematics 3220-38 or equivalent.

Magnetism, electrostatics, A.C. circuits and applications of Maxwell's equations to wave guides, antennas, optics, plasma and other related topics. Preparatory to 20-120, which is prerequisite. See 20-12 for one-hour work.

Laboratory work in electricity, magnetism and electronics; atomic, nuclear and solid state physics; optics, spectroscopy. May be repeated.

Advanced Laboratory 2

Research in optical spectroscopy, solid state, nuclear physics and related areas. May be repeated.

Digital Electronics, Microcomputer Programming and Microcomputer 3

Introduction to micro-processor based control. Numerical systems, integrated circuit logic design, microprocessor architecture, memories, interfacing, microcontrollers, peripheral devices, interface design and programming for the real world. Prerequisite: Programming experience in digital circuits and basic Algebra. Assembly programming skill helpful.

Physics for Artists

3

Dynamics and kinematics course for non-science students; study of properties of many different kinds of waves leading to understanding of telescopes. No prerequisites.

Physics for Artists

3

Study of statics-kinetics of structures and determination of forces. Continuation of 20-13-5 which, however, is not prerequisite. See 20-13 for one-hour work.

Asteroid Physics

3

Atmospheric and astrophysical structures; optical spectra and extinction rules; one- and two-temperature atmospheres, stability, flux, pressure, temperature, temperature structure, molecular vibration and rotation spectra. Prerequisite: 20-116 or equivalent. See 20-12 for one-hour work.

Astrophysics

3

Nuclear models, relativistic, alpha-, beta- and gamma-ray spectra, nuclear energy levels and nuclear structure, nucleosynthesis, the nucleus, fission and fuses machines, passage of radiation, nuclear radiation, and interior structure of particles. Prerequisite: 20-116 or equivalent. See 20-13 for one-hour work.

Interstellar Solid State Physics

3


Physics for Physicists

3

Physics of trapped ions including orbit theory, guiding core profiles, relativistic quantum mechanics and the finite field effects. See 20-13 for one-hour work.

Telescope Physics

3

Introduction to the principles of optical and radio telescopes. The design and use of telescopes. Introduction to interferometry and multi-element telescopes. Prerequisites: 20-121 and knowledge of vector analysis.

Telescope Physics

3

Primarily for Graduates

3

Principles of Statistical Mechanics

3

Dynamic of mass points, Lagrange's and Hamilton's equations; classical thermostatistics and Hamiltonian systems. Prerequisite: 20-115.

Mechanics of Continuous Systems 3

Hydrodynamics, dynamics of ideal fluids, both incompressible and compressible flows; classical theory of electricity and magnetism. Prerequisites: 20-200 and 20-17, 20-72 or the equivalent.

Basic Quantum Mechanics I

1

Principles of quantum mechanics: formulation of the position and momentum wave equations and solutions; magnetic and nuclear quantum mechanics; most probable values of the wave functions of particles. Prerequisites: 20-115 and 20-110 or the equivalent.

Advanced Electromagnetism

3

Advanced electromagnetism, boundary value problems. Green's functions, Maxwell's equations, relativity theory, physical optics and multiple expansions of
Political Science

Department chairman: Paul C. Stowe

Undergraduate Programs

At the undergraduate level the study of political science is general and not vocational. Undergraduate political science majors often enter careers in law, public service, or teaching; others enter business, journalism, or medicine. The department offers a standard undergraduate major and a special teaching major.

Teaching Major

Undergraduates planning to teach in the social sciences with an emphasis on political science must meet these requirements:

1. At least 20 semester hours of study in political science, including 30.1 Introduction to American Politics or 30.100 The American Political System; and two of these introductory courses:
   30.10 Introduction to Political Behavior.
   30.11 Introduction to Political Theory.
   30.12 Introduction to Comparative Politics.
   30.13 Introduction to World Politics, and
   At least 15 semester hours in political science courses numbered 100 or above.

2. At least 12 semester hours of work in one of the open departments: Economics, Geography, History, Journalism, Philosophy, Psychology, Sociology, Anthropology, or European Literature and Thought. Completion of this requirement satisfies the College of Liberal Arts social science core requirement.

3. A grade-point average of at least 2.0 in all political science courses taken at The University of Iowa, and in all courses in the related departmental area of concentration (2). Political science courses and courses in the related field may not be taken on a pass-fail basis.

Honor in Political Science

Honors also has a program leading to a B.A. degree with Honors. It is open to a limited number of students with a minimum general grade-point average of 3.0 on at least 12 semester hours of work in political science. To graduate with Honors, the student must maintain a grade-point average in political science of at least 3.2 and a general grade-point average of at least 3.0. Honor students must take Honors Introduction to Political Inquiry (30.183), and must complete at least two semesters of work in the advanced Honors Seminar (30.47-488) with a grade of B or better each semester. In some cases, the Honors advisor may require a comprehensive political science examination at the end of the senior year. Students interested in seeking a B.A. degree with Honors should contact the departmental Honors advisor prior to the beginning of the junior year.

Graduate Programs

At the graduate level, the department emphasizes the program leading to the degree of Doctor of Philosophy in political science, which is particularly appropriate for students planning a scholarly academic career; and the Master of Arts in public affairs program, which is designed for students who wish to prepare for careers in government service, public affairs, or civic education teaching in secondary schools or justice and community colleges. The general Master of Arts degree is normally pursued by persons whose ultimate degree objective is the Ph.D.

Master of Arts in Public Affairs

Although all students in the public affairs program must take the core courses indicated in the schedule below, elective opportunities make possible several areas of specialization. Students interested in public administration may take elective credits to take further courses in municipal, state, or financial administration; administrative theory and behavior; or quantitative analysis. Students interested in public policy analysis may use their elective credits to take courses in quantitative research methods, and courses dealing with substantive policy fields such as economic policy, health policy, natural resources policy, or social policy. This is a non-thesis program. The student must complete at least 36 hours of coursework with at least a 3.0 grade-point average, and must pass a written final examination. Although the
schedule suggests below implies completion within a year, the program is self-paced to accommodate students who may require additional time to meet all degree requirements.

Fall Semester
30:210 American Public Policies 3 s.h.
30:220 Administrative Theory and Public Policy 3 s.h.
Electives 9 s.h.

Spring Semester
30:121 Urban Administration 3 s.h.
30:223 Comparative Public Policy Analysis 4 s.h.
5E:119 Economics of the Government Sector 3 s.h.
Electives 5 s.h.

Summer Semester
30:383 Internships in Public Policy and Administration 3 s.h.
30:384 Practicum in Public Policy and Administration 3 s.h.
Elective 3 s.h.

Total 36 s.h.

Students choose electives on the basis of their own interests and career objectives, in consultation with the director of the program. Students are expected to choose at least one elective numbered 200 or above.

In addition to a wide range of elective options in political science, the student may choose electives including economics, business administration, urban and regional planning, sociology, geography, higher education, social studies education, civil engineering, and law.

Master of Arts with Thesis
Except for the M.A. in public affairs and the M.A. offered under a joint program with the College of Law (see "College of Law"), the department normally offers the M.A. only as a preliminary step toward the Ph.D. It does not recommend a general M.A. program for students who do not intend to continue the Ph.D.

The M.A. degree is normally obtained by completing at least 30 semester hours with a grade-point average of at least 3.0, submitting a thesis, and passing a final oral examination. No more than eight semester hours of credits for thesis preparation will be counted toward the 36-semester-hour minimum requirement for the general M.A.

The final oral examination covers both thesis and coursework.

M.A. Without Thesis
If a student's first-year evaluation committee finds that his or her coursework and research papers provide sufficient evidence of the research and writing skills ordinarily demonstrated in a master's thesis, it may recommend that he or she be allowed to proceed with a thesis program without writing a thesis. The requirements for the M.A. without thesis include completion of at least 36 semester hours with a grade-point average of at least 3.0 and review of the student's record by a final examination committee, which may waive the final oral examination.

The same requirements apply where a student's doctoral committee finds that the student's work is adequate for recommending continuation toward the Ph.D. but inadequate for proceeding with the master's program, and recommends that the student be permitted to seek the non-thesis M.A. as a terminal degree.

Doctor of Philosophy Program
Students are encouraged to seek the Ph.D. only after they have demonstrated their scholarly competences over at least two semesters of graduate study. Requirements for the Ph.D. include completion of at least three academic years in residence and 72 semester hours of graduate-level credit, including work for the M.A. and transfer credits; 60 of the M.A. degree; at least one semester each of special supervised training in teaching and in research; demonstration of competence in appropriate research skills; passage of a comprehensive examination; preparation of a dissertation; and the final examination.

The Tool Requirement
The student seeking a Ph.D. degree must demonstrate command of one foreign language or another tool of research, selected with the approval of the doctoral committee. If the tool is other than a foreign language, the student's doctoral committee will specify the criteria to determine whether the requirement has been met. The tool requirement must be met before the student takes the comprehensive examination.

Comprehensive Examinations
Students are expected to take the comprehensive examination after completing the third fall of graduate study. Candidates for the Ph.D. take written examinations in three of these areas:

- American Politics
- Comparative Politics
- International Politics
- Political Theory
- Public Policy and Administration
- Philosophy and Methods of Political Research

Before taking the written examinations, candidates must present to each member of the examining committee a written dissertation proposal. The dissertation proposal covers the whole general area of the comprehensive examination. It must be approved and defended in the oral examination, which deals also with all matters relevant to the written examinations.

Teaching and Research Training
Each Ph.D. candidate in political science must take at least one semester of special supervised training in teaching and in research. This instruction is normally given in association with the student's service as a teaching or research assistant.

Dissertation
Not more than 30 semester hours of credit are granted for the preparation of dissertations, and students may not register for credit for reading or research solely for work on their dissertations.
Further Information
A comprehensive statement of departmental requirements is set forth in the Guide to Graduate Study in Political Science. For general graduate admission and degree requirements, see "Graduate College." Special Facilities
The Laboratory for Political Research provides logistical and technical support for undergraduate and graduate teaching and research programs undertaken by the Department of Political Science. The laboratory assists faculty members in utilizing quantitative data and the computer for their undergraduate instruction. This assistance is provided to social scientists at The University of Iowa and at 12 other institutions which make up the Iowa Regional Computer Network. The laboratory is an integral part of graduate education in the department, and is involved at every level of advanced study. The Social Science Data Archive holds more than 450 data collections, and the laboratory is a user contact site for data from the 1970 United States Census. The facilities of the laboratory include a card-reader/file-printer, two communications terminals, three card punchers, and a counter-sorter. The laboratory also supervises the College of Liberal Arts Mini-Computer Terminal Center for the social sciences, which houses terminals for access to one of the University's Hewlett-Packard 2000DF educational computers. The Comparative Legislative Research Center of the Department of Political Science was established to promote comparative studies of legislative institutions and behaviors in a wide variety of political systems. The main activities of the center include bibliographic and archival work, data collection, collaborative research with foreign scholars, training of students in legislative research, conferences, and seminars, and publication of research. The center also publishes the Legislative Studies Quarterly.

Courses

**Introductory Undergraduates**

30-1 Introduction to American Politics 4 s.h.

30-2 Introduction to Political Behavior 4 s.h.

30-3 Introduction to Political Theory 4 s.h.

30-4 Introduction to Public Administration 4 s.h.

30-5 Introduction to Political Economy 4 s.h.

30-6 Introduction to Comparative Politics 4 s.h.

30-7 Introduction to International Relations 4 s.h.

30-8 Introduction to Public Policy 4 s.h.

30-9 Introduction to Public Opinion 4 s.h.

30-10 Introduction to Public Administration 4 s.h.

30-11 Introduction to Public Finance 4 s.h.

30-12 Introduction to Public Law 4 s.h.

30-13 Introduction to Public Administration 4 s.h.

30-14 Introduction to Public Policy 4 s.h.

30-15 Introduction to Public Finance 4 s.h.

30-16 Introduction to Public Administration 4 s.h.

30-17 Introduction to Public Law 4 s.h.

30-18 Introduction to Public Finance 4 s.h.

30-19 Introduction to Public Administration 4 s.h.

30-20 Introduction to Public Policy 4 s.h.

30-21 Introduction to Public Finance 4 s.h.

30-22 Introduction to Public Administration 4 s.h.

30-23 Introduction to Public Policy 4 s.h.

30-24 Introduction to Public Finance 4 s.h.

30-25 Introduction to Public Administration 4 s.h.

30-26 Introduction to Public Policy 4 s.h.

30-27 Introduction to Public Finance 4 s.h.

30-28 Introduction to Public Administration 4 s.h.

30-29 Introduction to Public Policy 4 s.h.

30-30 Introduction to Public Finance 4 s.h.

30-31 Introduction to Public Administration 4 s.h.

30-32 Introduction to Public Policy 4 s.h.

30-33 Introduction to Public Finance 4 s.h.

30-34 Introduction to Public Administration 4 s.h.

30-35 Introduction to Public Policy 4 s.h.

30-36 Introduction to Public Finance 4 s.h.

30-37 Introduction to Public Administration 4 s.h.

30-38 Introduction to Public Policy 4 s.h.

30-39 Introduction to Public Finance 4 s.h.

30-40 Introduction to Public Administration 4 s.h.

30-41 Introduction to Public Policy 4 s.h.

30-42 Introduction to Public Finance 4 s.h.

30-43 Introduction to Public Administration 4 s.h.

30-44 Introduction to Public Policy 4 s.h.

30-45 Introduction to Public Finance 4 s.h.

30-46 Introduction to Public Administration 4 s.h.

30-47 Introduction to Public Policy 4 s.h.

30-48 Introduction to Public Finance 4 s.h.

30-49 Introduction to Public Administration 4 s.h.

30-50 Introduction to Public Policy 4 s.h.

30-51 Introduction to Public Finance 4 s.h.

30-52 Introduction to Public Administration 4 s.h.

30-53 Introduction to Public Policy 4 s.h.

30-54 Introduction to Public Finance 4 s.h.

30-55 Introduction to Public Administration 4 s.h.

30-56 Introduction to Public Policy 4 s.h.

30-57 Introduction to Public Finance 4 s.h.

30-58 Introduction to Public Administration 4 s.h.

30-59 Introduction to Public Policy 4 s.h.

30-60 Introduction to Public Finance 4 s.h.

30-61 Introduction to Public Administration 4 s.h.

30-62 Introduction to Public Policy 4 s.h.

30-63 Introduction to Public Finance 4 s.h.

30-64 Introduction to Public Administration 4 s.h.

30-65 Introduction to Public Policy 4 s.h.
Psychology

30:262 Advanced Research Methods 4 a.h.
Survey sampling: analytical techniques; statistical models, and relationship models to be used.

30:263 Quantitative Methods in Public Policy Analytics 4 a.h.
Survey of quantitative techniques useful in analyzing public policy, including the comparison of various econometric surveys, sampling, and statistical testing.

30:265 Problems in Public Administration 4 a.h.
Solved issues in public administration; over 30 weeks with consent of instructor.
Same as 70:263.

30:267 Administrative Theory and Policy 4 a.h.
Literature of public theory, political and organizational behavior, and complex organizations. The focus of the course is to study the administrative agencies of government.

30:268 Financial Administration 4 a.h.
Budgetary and accounting aspects of governmental financial operations at national, state, and local levels; financial management, and the execution of governmental budgets; an introduction to non-governmental financial relations.

30:269 Cooperative Public Policy Analysis 4 a.h.
Empirical study of theories of public policy formation (decision theory, systems theory, theories of political economy), research methods for analyzing public policy development, and research applications in North American and Western European societies.

30:269 Seminar Urbanization 4 cr.
Problems and consequences of urbanization: political, economic, and social effects of metropolitan areas. May be repeated with consent of instructor, same as 70:269, 70:369, and 70:221.

30:270 Problems in Political Theory 4 a.h.
Selected problems of prescriptive and explanatory political theory; may be repeated with consent of instructor.

30:272 Psycho-Biological Bases of Political Behavior 4 a.h.
Survey of principles of human behavior established in the-behavioral sciences and their conceptual and methodological implications for political science. Application to selected problems in political behavior research.

30:274 Problems of Comparative Politics 4 a.h.
Selected problems in comparative analysis of politics; may be repeated with consent of instructor.

30:275 Political Systems of Western Europe 4 cr.
Selected Western European political systems or political phenomena common to several such systems.

30:275 Western European Political Systems 4 cr.
Research seminar on selected topics of Soviet and East European politics; permission of instructor required.

30:275 Asian Political Systems 4 cr.
Comparative analysis in economic, social, and cultural systems of government in Asia; special emphasis on leadership recruitment, social control, political participation.

30:276 Latin American Political Systems 4 cr.
Selected political systems in Latin America (political parties, church, students, military); intended primarily for graduate students with little or no previous knowledge of Latin America.

30:277 Social and Political Change 4 cr.
An analysis of the patterns and processes which transform political, economic, and social behavior; including expectation, accomplishment, and social movement patterns across time.

30:278 Social and Political Change 4 cr.
Development of political roles, attitudinal, ethno-cultural, political, and behavioral attitudes and processes.

30:279 Public Opinion and Political Behavior 4 cr.
Analysis of political attitudes and beliefs in mass publics; voting behavior; functioning of electoral systems.

30:281 Political Parties 4 cr.
Systematic investigation of roles, organization, competition, leadership, and functions of political parties or other political systems; may be repeated with consent of instructor.

30:282 Politics and the Leadership 4 cr.
Study of backgrounds, events, attitudes, and behavior of political leaders, geographic regions may vary with instructor; may be repeated with consent of instructor.

30:283 The Propaganda 4 cr.
American and European elites of the 20th century: history, recruitment, behavior, role, responsibility, power, and status relations with other institutions.

30:284 Legislative Process 4 cr.
Analytical study of legislative institutions, processes, and behavior, which may focus on the United States, Europe, or developing countries. May be repeated with consent of instructor.

30:285 Constitutional Law and Judicial Behavior 4 a.h.
Major issues of constitutional law, analysis of governmental processes and behavior.

30:286 Problems in International Politics 4 a.h.
Intensive examination of selected issues in international politics, emphasizing problems of theoretical analysis, may be repeated with consent of instructor.

30:288 Human Rights and World Citizenship 4 cr.

30:289 Readings and Research Tutorial 4 cr.
Independent individual study; consent of supervising faculty member required.

30:291 Master's Thesis 4 cr.
Consent of supervising faculty member required.

30:292 Internship in Public Policy and Administration 4 cr.
Consent of supervising faculty member required.

30:293 Practicum in Public Policy and Administration 4 cr.
Consent of supervising faculty member required.

30:294 Ph.D. Dissertation 4 cr.
Consent of supervising faculty member required.

Portuguese

See "Spanish and Portuguese."

Psychology

Department chairman: Dan W. Noron


Degrees offered: B.A., B.S., M.A., Ph.D.

Undergraduate Programs

The B.A. and B.S. degree programs both are designed to contribute to a student's general liberal education and to provide a foundation for post-baccalaureate training in any of a wide variety of areas of specialization. Students interested in psychology should clearly understand that almost all vocational opportunities in psychology require substantial advanced preparation; the number of jobs for those with only an undergraduate degree is extremely limited.

The B.S. program is specifically designed for students planning to pursue advanced work in psychology or in a closely related discipline. The B.S. program includes fewer specific requirements and thus afford the student an opportunity to develop an emphasis in psychology within a broad undergraduate program. Students in either program begin with a general introductory course, followed by one or more courses in methodology and electives in several broad areas of psychology: clinical, developmental, social, physiological and general experimental. The Department enjoys excellent facilities to support teaching and research about human and animal behavior. All faculty members are actively engaged in research and they bring to their under-graduate teaching the excitement that each activity engenders. Many opportunities exist for interested and capable students to participate in some of the research projects being carried on in the Department.
The Bachelor of Arts Degree

The student must satisfy the general College of Liberal Arts requirements for the B.A. degree and must complete at least 25 semester hours in psychology. At least the last nine semester hours of the major must be completed in residence.

The B.A. program must include 31:1 Elementary Psychology, or 31:3 General Psychology, or equivalent; 31:43 Evaluating Psychological Research, or equivalent; and one area elective course from each of four of the five area groupings given below, or equivalents.

Alternatively, the 31:43 requirement may be satisfied by a combination of 31:43 Introduction to Statistical Methods and 31:120 Experimental Psychology I. This alternative is strongly recommended in students in the B.A. program who plan to pursue graduate work in psychology or related areas.

The Bachelor of Science Degree

The student must satisfy the general College of Liberal Arts requirements for the B.S. degree and must complete at least 26 semester hours of course credit in psychology. At least the last nine semester hours of the major must be completed in residence.

The B.S. program must include the following courses, or equivalent: 31:1 Elementary Psychology or 31:3 General Psychology, 31:43 Introduction to Statistical Methods, 31:120 Experimental Psychology I, 31:121 Experimental Psychology II, and one elective course from each of four of the five area groupings given below, with at least three of these four areas electives being 100-level courses.

Candidates for the B.S. degree in psychology must satisfy the College of Liberal Arts eight semester hour natural science core requirement with one semester of chemistry followed by one semester of zoology; or with eight semester hours of chemistry; or with eight semester hours of physics. B.S. majors also must complete either one semester of calculus and two semesters of one foreign language, or two semesters of mathematics through analytic geometry and four semesters of one foreign language. The courses in natural science and mathematics required for the B.S. degree cannot be taken pass-fail.

Area Electives

Area A (Clinical Psychology)
31:13 Psychology of Adjustment
31:105 Personality
31:161 Current Theories of Schizophrenia
31:163 Abnormal Psychology
31:166 Abnormal Child Psychology
31:170 Behavior Modification

Area B (Social Psychology)
31:15 Introduction to Social Psychology
31:03 Development of Social Behavior
31:104 Experimental Social Psychology
31:106 Attitude Change
31:108 Small Group Processes

Area C (General Experimental Psychology)
31:50 Introduction to Cognitive Psychology
31:102 Psychology as a Science
31:110 Learning and Motivation in Children

Area D (Biopsychology and Physiological Psychology)
31:50 Comparative Psychology and Ethology
31:123 Psychology of Learning
31:125 Brain Function and Learning
31:126 Physiological Psychology and Psychobiology
31:128 Introduction to Behavioral Pharmacology
31:129 Biological Aspects of Behavior
31:135 Operant Behavior Analysis

Area E (Developmental Psychology)
31:14 Introduction to Child Psychology
31:107 Language Development
31:114 Cognitive Development of Children
31:116 Singer of Development
31:148 Individual Differences in Developmental Psychology

The Honors Program

The Department has an active Honors Program open to majors with at least a 3.3 grade-point average in psychology courses and 3.0 overall. The program includes research seminars and individual research collaboration with faculty members. Interested majors should contact the Department Honors Advisor before the start of the junior year.

Undergraduate Research Participation Program

With support from the National Science Foundation, the Department has for many years conducted an Undergraduate Research Participation Program for exceptionally qualified junior and senior psychology students from The University of Iowa and nearby institutions. During the academic year, faculty members assist participants in planning individual research projects, which the students then carry out in department laboratories during the summer months.

Continuation of this program is contingent on the availability of federal support.

Graduate Program

The graduate program in psychology is designed to provide comprehensive training leading to the Ph.D. degree with emphasis in one of the following broad training areas: general experimental psychology, biopsychology, physiological psychology, social psychology, clinical psychology, and development psychology. The program is planned to provide both general training and specialty training with sufficient flexibility to encompass a wide spectrum of student interests.

The primary purpose of the program is to produce graduates who are deeply committed to the study of behavior, familiar with fundamental knowledge about behavioral processes, thoroughly trained in the methods and techniques for careful investigation of basic and applied problems, and determined to make significant
contributions to the discipline of psychology and to society generally.

The most appropriate jobs for graduates of this program are in academic programs in business or private institutions which provide opportunities for continuing analysis and investigation of fundamental questions about behavior, for teaching about research result and methodology, and for application of psychological knowledge and techniques to the solution of important practical concerns. Prospective applicants should understand that the number of such positions is sharply limited and the competition for available openings is intense.

Program Requirements

The graduate program in psychology is designed as a four-year program leading to the Ph.D. degree; students in the clinical area ordinarily have an additional off-campus internship year. A student entering with a master's degree from another institution will require at least an additional two years in the department depending on the nature and extent of previous research activity.

The M.A. with Thesis

The Master of Arts degree with thesis is required for all students who intend to earn the Ph.D. on this department, and may be the primary degree objective for a very few students, particularly those in special joint programs. This degree is gained after satisfactory completion of at least 30 semester hours of coursework including requirements appropriate to the training area with a cumulative grade-point average of at least 2.7, preparation of an acceptable scholarly thesis and successful oral defense of the thesis. Typically work for this degree should be completed after four semesters in the Department.

The M.A. without Thesis

The Master of Arts degree without thesis also is available and may be the appropriate objective for certain special students. It ordinarily will be the degree taken by those students who for various reasons decide to terminate their work in this department after two years of graduate work. A student successfully completing a total of 38 semester hours of coursework including courses required by the training area and successful performance on a written and/or oral examination covering the student's area of specialization.

During the first three semesters each beginning graduate student follows a curriculum involving both required and elective courses designed to develop understanding of the central theories, research methods and investigational techniques appropriate to the specialty area. All students also engage in supervised research practice during each of these semesters. By the end of the third semester each beginning student is expected to have demonstrated competence in coursework, in research practice, and in participation in the teaching, research and service functions of the Department. In addition each student intending to proceed toward the Ph.D. is expected to have made substantial progress in planning for the master's research project. A faculty-wide review of each student's program is conducted at this point in the student's program.

The Ph.D.

Formal advancement of a student to Ph.D. candidacy follows a review conducted at the middle of the third year, i.e., after the fifth semester. By this time the student must have successfully completed and defended the master's thesis and passed a comprehensive Examination, set by the training area, covering a range of material related to the student's area of concentration.

The Ph.D. degree in this department requires completion of at least 72 semester hours with a cumulative grade-point average of at least 3.0. Each student also is expected to take sufficient work outside the specialty area to develop a reasonably broad background in the discipline of psychology as a whole, and familiarity with the history and philosophy of psychology. The extent of this additional general training, and its time placement within the graduate program, varies somewhat among the training areas and depends also on the individual student's background and interests. Work toward the Ph.D. concludes with preparation and satisfactory oral defense of the dissertation.

More specific information about training area programs, degree requirements, policies and procedures for evaluation of student progress and performance, and other matters of concern to graduate students is set forth in the Department's Graduate Student Handbook, which is provided to each student at the time of initial registration.

Major Specialty Areas for Graduate Training

The general experimental program focuses primarily on the study of human behavior. Three major sub-areas are represented: cognitive processes, sensation and perception, and experimental child psychology.

Students specializing in cognitive processes acquire expertise in areas such as information processing and decision-making, learning and memory, and concept formation and language behavior. Students specializing in sensation and perception may focus on visual perception, auditory processes or mathematical models in perception and psychophysics.

Students in experimental child psychology specialize in areas such as discrimination learning, problem solving and transfer of training. All students in the general experimental program develop sophistication about laboratory techniques, computer-controlled data acquisition and reduction systems, and electronic instrumentation. In addition, they acquire a solid background in statistical procedures and in the historical and contemporary theoretical frameworks of psychology.

Students are expected to broaden their training by taking courses in other specialty areas within the Department and often also elect courses in other departments of the University.

The central focus of the biopsychology program is on the analysis of learning and motivation, primarily in non-human subjects, through the application of behavioral, biological and mathematical principles. Current approaches include the techniques of classical and operant conditioning, physiology, neuropharmacology, neurochemistry, neuroendocrinology, neuroanatomy and comparative psychology. Students in this program will have abundant opportunities to develop relevant skills including computer-assisted experimentation, electronic instrumentation, neurosurgical and histological techniques and biochemical assay procedures. Fundamental facts and theories about the biological basis of behavior will be stressed in coursework to be taken within the Department of Psychology as well as in extra-departmental life science courses.

Students in the physiological program specialize in some aspect of central nervous system physiology and its relation to behavior. Areas of emphasis include electrophysiological aspects of brain functioning, physiological basis of learning, biological rhythms and human psychophysiology. In addition to broad training in
psychological theory and research methods, students in the psy-
chology program are trained to be leaders in some number of related
scientific disciplines. They also have extensive laboratory expe-
rience to develop skills in neuroscientific techniques, electronic
instrumentation and recording methods, laboratory computer
usage, etc.

The special psychology program offers specialized training in
two sub-areas: social influences on behavior, attitude formation
and change, and the psychology of groups. The first of these
includes such phenomena as social learning, imitation, conform-
ity, social facilitation, behavioral contagion and social rein-
forcement. The second includes attitude acquisition, cognitive
consistency and the notions of commitment, persuasion and at-
tribution. Under the third sub-area, one might focus on group
versus individual performance, on interdependence or on topics in
the area of social interaction. In addition to increasing training in
discipline of experimental psychology, statistical analy-
sis, computer processing, etc., the student in the social area has
ample opportunities to handle instrumental observation labora-
tories and to develop skill in the conduct of field investigations.

The clinical program strongly emphasizes an empirical ap-
proach to the study of psychopathology. It is designed for students
who are primarily interested in developing scholarly understanding
of clinical phenomena and acquiring research skills necessary to the
systematic investigation of such phenomena. Recognizing that
students must become familiar with clinical material and compe-
tent in clinical skills, practical experience in the Department's
Research and Training Clinic is closely integrated with cour-
sework in the content, theory and research methods of psychology
and with supervised research experience. Students may develop
special competence in such areas as psychophysiology, aggress-
vion, psychotherapy, behavior therapy, schizophrenia, psycho-
diagnosis, childhood behavior disorders and clinical neuropsy-
chology. Additional opportunities for clinical experience in placement with local agencies such as the
Veterans Administration Hospital, the Iowa Psychiatric Hospi-
tal, the Central School for Handicapped Children and the Oto-
hiopathic Rehabilitation unit. Students ordinarily complete a one-year
involves an accredited clinical facility either before or after comple-
tion of the four-year academic program. The clinical training
program is fully approved by the American Psychological
Association.

The developmental psychology program provides opportunities
for students to investigate the processes and mechanisms of age-
related changes in various aspects of behavior, e.g., sensory and percep-
tional processes, verbal processes and memory, learning and cogni-
tive processes. Students also may focus on social or personality develop-
ment, developmental psychology or factors in growth and development related to clinical problems. Focus on the mecha-
nisms of change is developed against a background of broad training in the theo-
ries and techniques of general experimental psychology.

Special Facilities

The Department's facilities for graduate training and research are
among the finest in the country. The Research and Spence
Laboratories of Psychology, and adjoining space in East Hall, include
three separate animal facilities, several surgeries, a hist-
ology laboratory, a number of small laboratory computers, au-
tomated data acquisition and reduction systems, observation stalls
with remote audio-video control and recording equipment,
soundproof chambers, closed-circuit TV systems, electrophy-
逻辑al recording rooms, conditioning laboratories, the Research
and Training Clinic and well-equipped electronic, mechanical and
woodworking shops. Specially-equipped research trailers are
available for use in studies conducted a schools and other loca-
tions.

Students and faculty have ready access to the IBM 360/65 in
the University Computer Center through an ATS terminal and a
remote input-output station in East Hall. Office space for graduate
students and faculty is provided in East Hall and the Psychology-
Education Branch of the main University Library is conveniently
located in the west wing of East Hall.

The research and teaching activities of the Department are
greatly benefited by the facilities and staff of other University
and local agencies including the University's Early Childhood Education
Center, the University's General, Children's and Psychiatric
Hospitals, the Veterans Administration Hospital, the University
Council of the Child Development Clinic and the Speech
and Hearing Clinic.

Financial Assistance for Graduate Students

All students admitted to the graduate training program in psy-
chology are automatically considered on the basis of merit for such
financial support as may be available in the form of teaching and
research assistantships, men's athletic scholarships, etc. No separate application for financial aid is required.

Graduate Assistantship

As is evident from the preceding paragraphs, the graduate program in psychology is greatly prorated for students seeking the Ph.D.
degree; all applicants are considered on this basis. A very small
number of qualified applicants interested in advanced work only
through the M.A. level may be admitted, primarily those who
intend to pursue a joint graduate program involving psychology
and another discipline or profession. Joint programs must be
specially designed and the individual must apply to and be ac-
cepted by each program.

Applications may be submitted at any time but are considered
only once each year—between February 15 and March 15—for
admission the following fall. Admission decisions are based on a
composite consideration of prior academic performance, letters of
reference, scores on the verbal and quantitative sections of the
Graduate Record Examination (GRE), and other factors deemed
reasons for pursuing advanced work in psychology. An under-
graduate major in psychology, including a laboratory course in
experimental psychology, a course in statistics and additional
work in the natural sciences and in mathematics, is certainly
desirable though not required. Students who have not had such
a background but who are strongly qualified on other grounds may
be admitted but will be expected to remedy deficiencies through special coursework or independent study prior to embarking on
the regular graduate program.

A student who has completed substantial graduate work at
another institution at the time of admission to this program will be
expected to present documents such as the master's thesis or
equivalent which reflect significant engagement in research and
scholarly writing. This material and the record of previous
coursework will be reviewed by the faculty members of the
appropriate training area as a basis for placement in the
graduate program. In no instance will a student be permitted to
complete substantial research or writing for a master's degree at
another institution while a regular full-time student in the graduate
program at Iowa.
A foreign language is not required for admission, and there are no foreign language requirements for either the M.A. or the Ph.D. degree in psychology.

Special Faculty Strengths
National rankings of graduate psychology programs consistently have shown this department to be among the top 20 in the nation. The widely recognized commitment of the faculty to research and scholarship is manifest in the publication of some 75 articles, books, reviews and book chapters each year, and in the fact that many of the faculty members are, or have been, active as editors, associate editors and regular consulting editors for major psychological journals.

Courses

For Undergraduates

101:301 or 101:310: Prerequisites to all other courses in psychology except 311:17 and 311:43.

101:311 Elementary Psychology 3 a.h.

101:312 General Psychology 4 a.h.

101:313 Personality 4 a.h.

101:314 Introduction to Child Psychology 3 a.h.

101:315 Development of Social Behavior 3 a.h.

101:316 Group Dynamics 3 a.h.

101:317 Educational Psychology and Measurement 3 a.h.

101:318 Psychopathology in Business and Industry 3 a.h.

101:319 Learning and Motivation in Children 3 a.h.

101:320 Cognitive Development in Children 3 a.h.

101:321 Language Development 3 a.h.

101:322 Theories of Psychological Development 3 a.h.

101:323 Developmental Psychology 3 a.h.

101:324 Language and Thought 3 a.h.

101:325 Social Psychology 3 a.h.

101:326 Research Methodology in Psychology 3 a.h.

101:327 Research Practicum in Psychology 3 a.h.

101:328 Research in Social Psychology 3 a.h.

101:329 Research in Cognitive Psychology 3 a.h.

101:330 Research in Developmental Psychology 3 a.h.

101:331 Research in Educational Psychology 3 a.h.

101:332 Research in Personality and Individual Differences 3 a.h.

101:333 Research in Social Psychology 3 a.h.

101:334 Research in Cognition and Perception 3 a.h.

101:335 Research in Developmental Psychology 3 a.h.

101:336 Research in Educational Psychology 3 a.h.

101:337 Research in Personality and Individual Differences 3 a.h.

101:338 Research in Social Psychology 3 a.h.

101:339 Research in Cognition and Perception 3 a.h.
Psychology

31:119 Human Memory, Learning and Conceptual Processes 3 a.h.
An introduction to contemporary psychological theory and research.

31:120 Experimental Psychology I 3 a.h.
Legends and application of quantitative methods to analysis of behavioral phenomena; includes overview of some major problem areas of experimental psychology. Prerequisites: 31:118.

31:121 Experimental Psychology II 3 a.h.
Theoretical and experimental bases of learning in animals and human behavior. Prerequisite: 31:120 or consent of instructor.

31:124 Introduction to Biobehavioral Models in Psychology 3 a.h.
Introduction to neurobiological models in the interpretation of biological data; applications to learning, decision-making, information processing and social processes. Prerequisite: one course in statistics or experimental design.

31:125 Brain Function and Learning 3 a.h.
Survey of physiological psychology, with emphasis on sensory and motor systems and integrative processes of nervous system.

31:126 Physiological Psychology and Psychophysiology 3 a.h.
Introduction to basic concepts and techniques in the measurement and their application to the analysis of nervous processes, arousal mechanisms, motivation and learning.

31:127 Drugs and Behavior 3 a.h.
Review of methodological and theoretical problems involved in psychotherapeutic research, consideration of social, psychological, sociological, anthropological and legal factors.

31:128 Introduction to Behavioral Pharmacology 3 a.h.
Analysis of behavioral consequences of drugs derived from experimental study of animals, including man.

31:129 Biological Aspects of Behavior 3 a.h.
Introduction to physiological bases of behavior; consideration of alternative perspectives in physiological psychology.

31:130 Psychology of Thinking 3 a.h.
Problem solving, reasoning, judgment and decision making, language and thought. Recommended: 31:120.

31:135 Perception 3 a.h.
Recent developments in experimental approaches to perception.

31:150 Operant Behavior Analysis 3 a.h.
Laboratory study of operant behavior of experimental animals and results of operant approaches to experimental analysis of behavior in laboratory and applied settings. Prerequisites: 31:120 or 31:124.

31:143 Reproduction of Statistical Methods 3 a.h.
Same as Sociology 79:143 and Statistics 228:143.

31:148 Individual Differences in Developmental Psychology 3 a.h.
Recent research on individual differences in psychological structure of children.

31:165 Human Engineering 3 a.h.
Design of man-machine systems to develop optimum work environment by application of physiological, psychological and sociological factors in work planning, work measurement, work analysis, and performance evaluation.

31:158 Psychology in Management 3 a.h.
Applications of psychological principles to human resources and supervision, selection of leadership, motivation, communication, group processes, etc. Same as Industrial Management 41:158.

31:161 Current Theories ofSubliminal Phenomena 3 a.h.
The examination of causes of subliminal perception via classical and modern research in subliminal perception, such topics as classical theory, preconscious perception, awareness, influence, cognitive disturbances, and physiological and psychological treatment.

31:155 Abnormal Psychology 3 a.h.
Review of the major adult psychiatric disorders (e.g., neurosis, psychosis, schizophrenia, depression) with special emphasis on the applications of basic concepts to theories of etiology.

31:156 Personality 3 a.h.
Introduction to field of clinical psychology with consideration of basic issues and selected research topics. Prerequisites: 31:124 or consent of instructor.

31:166 Stuttering 3 a.h.
Same as Speech Pathology and Audiology 31:167. Prerequisites: 31:167 or consent of instructor.

31:160 Abnormal Child Psychology 3 a.h.
Survey of major types of psychopathology in childhood.

31:170 Introduction to Speech and Hearing Processes and Disorders 3 a.h.
Same as Speech Pathology and Audiology 31:170.

31:170 Behavior Modification 3 a.h.
Basic approaches to the modification of clinically disturbing behavior; focus on learning theory principles underlying the techniques, translations into procedures, and behavioral evaluation of effectiveness.

31:160 Current Topics in Psychology 3 a.h.
Critical review of the literature pertaining to a specific topic of current interest; various sections deal with different problem areas. May be repeated for credit when topics vary.

For Graduates

31:200 Attitude Development and Change 3 a.h.
Review of research involving attitude measurement: experimental analysis of variables influencing formation and modification of attitudes.

31:203 Social Perception and Attribution 3 a.h.
Theory and empirical analysis of perception of persons and attributes concerning personal processes. Consideration of determinants of impression formation, attraction, and behavioral predictions.

31:205 Group Dynamics 3 a.h.
Theoretical and empirical analysis of social power, social norms, social roles, intergroup conflict, etc.

31:206 Social Influences on Behavior 3 a.h.
Motivational, social and psychosocial studies of influence of social variables on learning, judgments, attitude development and modification, group processes, and attitudes.

31:207 Social Learning Processes 3 a.h.
Theory and research on learning in social context; topics considered include observational learning, development of social attitudes, dependency, aggression and affiliation.

31:206 Psychology of Group Behavior 3 a.h.
Methodology, research and interpretations of studies of structured properties of groups, leadership, group problem-solving and communication, public opinion, interpersonal relations.

31:206 Advanced General Psychology 3 a.h.
Same as 31:12, but includes additional assignments for graduate students who have not had an elementary course in psychology.

31:210 Personality in Social Development 3 a.h.
Clinical and experimental studies of social behavior in social development of the 60's.

31:217 Current Problems in Psychology 3 a.h.
Review of research procedures and results bearing on development of society and potential needs of children.

31:214 Learning in Children 3 a.h.
Review and analysis of research with children on conditioning, generalization, discrimination learning, verbal learning and memory, and transfer of training. Open to upper-level undergraduates with permission of instructor.

31:216 Philosophy of Modern Psychology 3 a.h.
Analysis and discussion of scientific method in its application to modern psychology; laboratory exercises in analyzing psychological research.

31:216 Behavior Processes in Children 3 a.h.
Age trends in verbal learning and memory processing.

31:217 Advanced Developmental Psychology 3 a.h.
Analysis of theoretical theory and contributing field of developmental psychology.

31:218 Thinking and Problem Solving in Children 3 a.h.
Reasoning and logical thinking, concept building, problem solving; effects of perceptions, memory and language in children's thinking.

31:216 Experimental Psychopathology 3 a.h.
Same as Speech Pathology and Audiology 31:213 and Linguistics 313:21.

31:220 Dissertation Research in Children 3 a.h.
Theory and methodology of differential psychology in clinical and experimental conditioning and in situational, social, emotional and cognitive discrimination,
Recreation Education

Selected topics concerning children's verbal behavior. Prerequisites: consent of instructor.

31:214 Seminar: Language Development 2 a.h.

31:241 Behavioral Pharmacology 3 a.h.
Behavioral analysis of drug action in experimental animals including man; special emphasis on physiological and biochemical mechanisms. Prerequisite: consent of instructor.

31:281 Seminar: Chemical Influences on Behavior 2 a.h.
Selected topics on relation between brain chemistry and behavior. Prerequisite: consent of instructor.

31:282 Seminar: Psychobiology of Motivation 2 a.h.
Current topics on the biological basis of motivated behavior.

31:289 Seminar: Discrimination Learning 2 a.h.
Theoretical analysis of learning and testing in complex discrimination tasks, including comparison of theoretical expectations and empirical results. Prerequisite: consent of instructor.

31:320 Seminar: Motivation 2 a.h.
Theoretical and experimental treatment of selected topics in areas of motivation, punishment, conflict, creation, and frustration.

Selected theory and data assessing systematic problems in intra-human behavioral analysis. Prerequisite: 31:217 and consent of instructor.

31:326 Seminar: Verbal Processes and Problem Solving 2 a.h.
Experimental findings and theoretical interpretations in fields of verbal learning, language behavior, concept formation and problem-solving. Prerequisite: consent of instructor.

31:328 Seminar: Neurochemical Mechanisms and Behavior 2 a.h.
Selected topics in nervous system control of behavior.

31:368 Seminar: Physiological Psychology 2 a.h.
Selected topics on neuroanatomical and neurophysiological bases of behavior. Prerequisites: consent of instructor.

31:381 Seminar: Mathematical Psychology 3 a.h.
Selected topics in applications of mathematical models to animal and human behavior.

Various mathematical models in perception and psychophysics; advanced study of theories and methods in signal detection theory.

31:383 Seminar: Statistical Analysis 3 a.h.
Prerequisites: Consent of instructor.

31:381 Seminar: Real-Time Computing 3 a.h.
Consideration of microprocessors and microcomputer systems for on-line control of experiments and data collection.

31:385 Seminar: Psychobiology 3 a.h.
Same as Speech Pathology and Audiology 3:385 and Linguistics 323:385.

31:385 Seminar: Sensory Psychology 3 a.h.
Systematic consideration of selected issues in sensory psychology.

31:381 Seminar: Clinical Psychology I 3 a.h.
Systematic review of selected topics. Prerequisites: consent of instructor. May be repeated.

31:383 Seminar: Clinical Psychology II 3 a.h.
Systematic treatment of selected topics. Prerequisites: 31:381 and consent of instructor. May be repeated.

31:386 Seminar: Psychopharmacology 3 a.h.
Systematic consideration of selected issues in psychopharmacology.

31:386 Seminar: Behavior Therapy 3 a.h.
Systematic treatment of selected issues in behavior therapy.

31:387 Seminar: Psychobiological Approaches to Any Selected Topics in Psychological Testing and Assessment 3 a.h.
Systematic treatment of selected issues in psychological testing and assessment.

31:380 Seminar: College Teaching of Psychology 3 a.h.
Consideration of purposes, organization and materials for undergraduate college courses in psychology.

31:385 Seminar: Research Principles and Methods 3 a.h.
Specialized, advanced research methods and techniques uniquely characteristic of diverse subject matter areas of different disciplines. Prerequisite: consent of instructor.

31:481 Psychophysiological Procedures 3 a.h.
Psychophysiological work in Psychology Clinic for training and research under supervision of clinical psychology faculty members. Prerequisites: permission of Clinical Training Committee.

31:482 Practicum in Psychotherapy I 3 a.h.
Supervised practice in psychological techniques of behavior change. Prerequisites: permission of Clinical Training Committee.

31:483 Practicum in Psychotherapy II 3 a.h.
Supervised practice and clinical experience in the application and evaluation of behavior therapies.

Related Courses in Other Departments

Anatomy:
60:110 Neuroanatomy and Behavior

Biology:
99:120 The-Chemistry of Biological Materials
99:120 Advanced
99:120 Experimental Biochemistry

Computer Science:
320:100 Introduction to Computing with Pears

Education:
79:120 Psychology of Reading
79:238 Theory and Techniques in Educational Measurement
79:446, 340, 344 Beginnings Bulletin 3:211

Philosophy:
24:203 Philosophical Problems of the Social Sciences
24:203 Philosophy of Science

Physics:
29:128 Electronics

Psychology and Biophysics:
72:251 Intermediate Psychology
72:252 Medical Psychology

Speech Pathology and Audiology:
3:296 Fundamentals of Lab Instrumentation
3:296 Advanced Laboratory Instrumentation
3:396 General Experimental Psychophysics
3:396 General Experimental Psychophysics Lab
3:396 Physiology of Hearing

Zoology:
37:91 Principles of Human Genetics
37:106 Fundamental Genetics

Recreation Education


Degrees offered: A professional career in recreation and parks involves service to and with people, meeting human needs for personal, social and creative fulfillment in recreation and leisure activity. The field is characterized by growth and diversity. In the past 30 years, the number of people employed in it has doubled, to 200,000.

There are opportunities for professional placement throughout the United States and abroad, in a wide range of public park and recreation settings; voluntary and social agency recreation programs; therapeutic recreation programs; school, military service, commercial and industrial recreation programs; and teaching and research.
In its recreation aspect, the profession deals with the provision of worthwhile recreational opportunities in activities ranging from music and drama to sports and tourism. The park aspect deals with the planning, design, maintenance and management of recreational land and facilities.

The Bachelor of Science Degree

For general requirements, see the College of Liberal Arts section of the Catalog.

Course requirements for the major are:

**Professional Core (36 s.h.)**
- 104:60 Foundations of Recreation
- 104:61 Recreation Leadership
- 104:110-111 Internship in Recreation
- 104:120 Introduction to Therapeutic Recreation
- 104:129 Administration of Recreation I
- 104:134 Recreational Program
- 104:135 Park and Recreation Facility Management
- 104:140 Principles of Outdoor Recreation

**Related Courses and Proficiencies (4 s.h.)**
- 27:21-22 Teaching of Recreational Sports I-D
- First aid proficiency
- Swimming proficiency

**Program Requirements**

- 30 s.h. of 400-level Recreation courses
- 27:21-22 Teaching of Recreational Sports I-D
- First aid proficiency
- Swimming proficiency

**Area of Concentration (5 s.h.)**

One of the following:

- Recreation and Park Administration

For students preparing for positions in which they will be responsible for organizing and administering recreation programs, facilities and departments. This concentration is oriented primarily to municipal, district and county-level recreation and park departments.

- Recreation Program Leadership and Supervision

For students preparing for leadership and program supervision positions with youth-serving agencies, settlement houses, armed forces and city park and recreation departments.

- Therapeutic Recreation

Therapeutic recreation focuses on preparing students to organize, plan and lead recreation programs in treatment and non-treatment settings for people who are ill, handicapped, aged, disabled and disadvantaged.

- Outdoor Recreation

Focuses on preparing students to organize, plan and administer programs of outdoor recreation on the city, county and state levels, and particularly on developing cooperative interpretive programs with schools, youth agencies and conservation districts.

**Electives (28 s.h.)**

**Internship Opportunities**

The recreation education program places special emphasis on practical experience and student involvement with the profession and practitioners. Students are encouraged to attend state and national professional conferences, and every class in the professional core includes lectures by working professionals, as well as opportunities for field experience related to course content.

The practical emphasis is climaxed by a professional internship for a full semester in an agency and setting of the student's selection. The internship is designed to lead to professional placement. More than 50 departments, agencies and services throughout the state provide field work and internship opportunities for students in the program.

**Recreation Minor**

Recreation education is an excellent minor for students majoring in elementary or special education.

**Honors**

Admission to the Honors Program in recreation education requires a formal application, completion of at least 30 semester hours of course work at the University, completion of at least 9 of the 32 semester hours of required major coursework and at least a 3.0 grade point average on all college work attempted and on all work completed in recreation education.

To graduate with Honors in recreation education, the student must successfully complete six semester hours of Honors work and must pass an Honors examination. The Department offers two Honors courses—104:190 Problems in Honors and 104:192 Seminar: Recreation Education Research. With the permission of the chairman of his or her Honors committee, the student may take three semester hours of Honors work in another department.

**Master of Arts Degree Programs**

The degree is offered with or without thesis. In both programs, the option is recreation administration, therapeutic or therapeutic recreation. Both require this undergraduate background:

- Foundations of Recreation 3 s.h.
- Recreation Leadership 3 s.h.
- Recreation Program 3 s.h.
- Park and Recreation Facility Management 3 s.h.
- Introduction to Therapeutic Recreation 3 s.h.
- Administration of Recreation 3 s.h.
- Principles of Outdoor Recreation 3 s.h.

Total 21 s.h.
Depending on his or her background in the field, the student may be required to take up to 12 hours of graduate coursework beyond the total option program minimum. Remaining prerequisite deficiencies may then be satisfied through option program electives. Credit may be given for experience when competence is demonstrated by examination.

Master of Arts with Thesis

Designed to provide a foundation for further study, the thesis program emphasizes techniques and research. It requires a minimum of 30 semester hours of graduate-level study in recreation and related areas.

Master of Arts without Thesis

The non-thesis program is designed as a terminal unit in preparation for recreation administration. It requires a minimum of 38 semester hours of graduate-level study in recreation and related areas.

Department Financial Aid

Assistance is available in the form of Graduate Assistantships, Research Assistantships, Teaching Assistantships and Post-Masters Assistantships for Doctoral Candidates. This assistance is made available through the Department as well as through a special program in Therapeutic Recreation Service for Handicapped Children.

Courses

Primary for Undergraduates

104/105 Foundations of Recreation 1-2 s.h.
Basic humanistic, historical, scientific foundations and development in leisure and recreation; function and setting of organized recreation and survey of organizations and agencies concerned with recreation.
104/106 Recreation Leadership 2 s.h.
Leadership principles and techniques, program activities.
104/107 Social Recreation 2 s.h.
104/108 Recreational Crafts 2 s.h.
104/109 Advanced Recreational Crafts 2 s.h.
104/108 Camp Leadership 2 s.h.
Counselor skills and techniques for camp counselors: ACA certification required.
104/108 Orientation to Rehabilitation Settings 1 s.h.
104/107 Park and Recreation Agency Orientation 1 s.h.

For Undergraduates and Graduates

104/100 Contemporary Issues in Leisure 2 s.h.
Survey of contemporary and future leisure in a modern society: human and technological values as they relate to leisure. Primarily for seniors.
104/102 Recreation in Leisure 2 s.h.
Experiential settings, conferences and written reports related to specific areas of interest.
104/110 Internship in Recreation 2 s.h.
Practical field experience arranged to include leisure leadership, program planning and administrative procedures. Prerequisites: 104/109 and permission of instructor.
104/111 Internship in Recreation 2 s.h.
Contemporary issues 2 s.h.
104/112 Internship 2 s.h.
Current issues, respect of all student and graduate students enrolling in recreation.
104/113 Introduction to Therapeutic Recreation 2 s.h.
Basic concepts of recreation's role in rehabilitation; organization and development of programs, agencies and understanding behavior of patients and adaptation of activities to basic disability areas.

104/112 Role of Therapeutic Recreation in Rehabilitation 2 s.h.
Role of therapeutic recreation in total institution and community rehabilitative effort; specific attention given to cooperative role of therapeutic recreation to relate to total therapy program.
104/126 Recreation Service for the Deaf-Blind 2 s.h.
Program planning, personnel, finance and leadership, liability, areas and facilities, other administrative aspects of recreation. Prerequisites: 104/114.
104/127 Administration of Recreation 2 s.h.
Continuation of 104/126 for students specializing in park and recreation administration.
104/131 Rural and Community Recreation 2 s.h.
Role of recreation in assisting for survey of total community involvement in recreation through school, church, voluntary agency, commercial, private, industrial, institutional, military and technical programs.
104/132 Community Recreation 2 s.h.
104/134 Recreation Program 2 s.h.
Planning and evaluation of recreation program; organization, promotion, utilization of resources, use of facilities and leadership.
104/138 Parks and Recreation Facilities Management 3 s.h.
Introduction to parks and facilities management: program, planning, financing, design and standards.
104/138 Recreation Program Planning 3 s.h.
104/140 Principles of Outdoor Recreation 2 s.h.
Administration of natural resources and public land on national, state, local and private levels; responsibilities of recreation profession to various phases of natural resource recreation and multiple use of public lands.
104/141 Camp Administration 2 s.h.
Public relations, personnel, finance and budgets, areas and facilities, ACA standards, administrative structure, legal aspects, evaluation and other administrative aspects of organized outdoor camping.
104/142 Principles of Outdoor Education 2 s.h.
Development and scope of outdoor education, educational significance, philosophy, organization, administration, methodology and cost; practical consideration of interpretive programs in ecology for recreation and educational majors.
104/143 Environmental Education 2 s.h.
Organization, administration, leadership and engineering for school camp; integration of camp and school curriculum. Prerequisites: 104/113.
104/120 The Role of the College Union 2 s.h.
104/125 Workshop Program 2 s.h.
Investigations of problem related to specific area of interest.
104/126 Recreation in Home and Family 2 s.h.
Open to majors and non-majors. May be repeated.
104/127 School-River Education Research 2 s.h.
Design, execution and analysis of research project.

Primary for Graduates

154/301 Problems

154/19 Graduate Practicum

154/200 Concepts of Recreation and Leisure 2 s.h.
Advanced preparation, historical, scientific foundations and development of leisure and recreation; leadership principles; and advanced case and field studies. Designed only for graduate degree candidates with undergraduate degree in recreation and/or park management.
154/200 Research Techniques in Therapeutic Recreation 3 s.h.
Designed to prepare therapeutic recreation specialists to counsel clients, particularly handicapped children's, assess disabilities and handicaps, to determine particular consequences and to direct therapeutic recreation activities which contribute to effective facilitation of personal functioning. Prerequisites: graduate status and consent of instructor.
154/200 Recreation Service and Recreation Planning 3 s.h.
Client services, program planning and development, community recreation and recreation planning.
154/200 Admin. Aspects of Recreation Services 3 s.h.
Problems of administration, supervision and administration in recreation programs.
154/200 Therapeutic Recreation in Action 3 s.h.
Historical and philosophical development of attitude toward leisure and recreation, emerging program patterns, current issues and education for leisure living.
Religion

104:232 Seminar: Therapeutic Recreation 3 s.h.
Sensory and special play approach to therapeutic recreation is specific setting such as psychiatric, physically handicapped, mentally retarded, correctional, etc. Administration techniques and procedures unique to activity therapy program.

104:233 Seminar: Camping 3 arr.

104:234 Planning and Design of Recreation and Parks Areas and Facilities 3 s.h.
eas. Principles: methodology; standards of design, planning, construction, etc., maintenance of areas not facilities for recreation and physical education.

104:236 Seminar: College Union Management 3 s.h.

104:238 Workshop: College Union Program 2 s.h.

104:501 Research in Recreation 3 arr.
Research project development, selection, method and design.

104:310 Recreation College Teaching Internship 3 arr.


104:422 Advanced Professional Practicum Recreation Parks: Leisure arr.

Religion

Director of school: James C. Spalding.


Degrees offered: B.A., M.A., Ph.D.

A central goal of the School of Religion has always been to help as many students as possible—whether or not they are majoring in religion—to gain an understanding of the history and literature of the religions of mankind, and insight into the nature and meaning of religion to all people in human culture. Such understanding is not only valuable for its own sake; it is essential for responsible participation in a religiously pluralistic American society and in a pluralistic world community. Many students at the University major in other areas elect courses in religion as a part of their general education program; some elect religion as a major subject. An undergraduate major in religion provides a foundation for graduate and professional study in the field of religion, but it is oriented more toward understanding than toward vocation. The School of Religion is not a theological seminary. It does not prepare students for ordination, although a number of its undergraduate majors later attend theological seminaries well prepared for study in those schools leading toward professional careers in churches and synagogues. Other majors continue their academic study of religion toward the M.A. and Ph.D. degrees to become specialists in the study and teaching of religion as a basic dimension of human culture.

Bachelor of Arts Program

For a major in religion, undergraduate students elect at least 24 semester hours of coursework in religion according to their own interests, provided they take a minimum of four (100-level) courses in Religion, one of which is ordinarily the major's seminar (32:166 Seminar, Senior Seminar). Students majoring in religion also elect 12 hours in related courses such as anthropology, art, classics, history, philosophy, psychology, or sociology. The student must also fulfill the requirements of the College of Liberal Arts. The selection of the foreign language must be approved by the advisor.

Honors Program

Religion majors eligible for the Liberal Arts Honors Program may obtain a degree with Honors through satisfactory completion of an Honors essay during the senior year.

Graduate Programs

The School of Religion seeks to prepare a select and limited number of graduate students to become specialists in the study and teaching of study, is offered in five areas, including 13 fields: Jewish and Christian Scriptures Old Testament New Testament Post-Biblical Judaism History of Christianity Studies (to 1500) Modern (since 1500) American Theology and Ethics Jewish Roman Catholic Protestant World Religions History of Religions Intensive Study of Religion in India, China, or Japan Religion and Personality Religion and Personality Development Religion and Health

Master of Arts

A score of 1000 on the GRE Aptitude Test and a GPA of 3.0 are ordinarily required for admission to the Master of Arts program. The Master of Arts degree in religion requires four courses or seminars at the 100-level or above, in each of three areas, for not less than ten semester hours of credit in each area nor less than 30 altogether. Toward the end of the fourth semester, the student writes a master's examination on the courses and/or seminars he or she has taken. The student must demonstrate a reading knowledge of French or German, or another foreign language which is relevant to his or her field of study and is approved by his or her advisor. A thesis is also required. It must be formally defended except when the student's advisory committee considers it desirable. Four hours of credit for thesis research may be applied toward the 30-hour requirement.

Master of Arts in Religion and Health

The contemporary study of the function and dynamics of religion in illness and health necessitates a combination of theoretical and clinical investigations of human experience. The University Hospitals provide the clinical setting for research and training in this program.

The program requires 30 semester hours of coursework. Four may be earned in thesis research. Six may be from another accredited graduate or professional school.

The program includes required courses in religion and personality, and in related fields of ethics and religion in America, together with other relevant courses. Knowledge of a foreign language, statistics, or another research tool may be required, at
the discretion of the student's advisory committee. In addition to the general requirements for admission to the Graduate College, the school generally requires an on-campus interview of applicants to this program; however, the interview may be conducted off campus by an accredited member of the Association for Clinical Pastoral Education.

**Doctor of Philosophy**

A score of 1100 on the GRE Aptitude Test and a GPA of 3.2 are ordinarily required for admittance to the Ph.D. program. The student may elect one of two options for doctoral study. In the first option, in consultation with the School of Religion faculty, the student develops a broad program which will give him or her a knowledge of three of the five areas in which the school offers graduate study. Major written qualifying examinations, covering coursework and readings in each of the three selected areas, provide an initial determination of the student's progress toward the ultimate objectives of the doctoral program. Students who hold the Master of Arts degree in religion, or the Bachelor of Divinity or an equivalent degree, must take the qualifying examinations within two years after beginning the doctoral program. Other students must take them within three years after beginning the program. Generally, students must pass the Graduate School Foreign Language Tests in French or German before taking the qualifying examinations. In all cases, both tests must be passed at least 12 months prior to the comprehensive examinations.

If the student's program warrants it, and the faculty permits it, another language may be substituted for either French or German. There are also special language requirements in some areas. Students in the New Testament area, for example, must satisfy a requirement in Greek.

Not less than three months after passing all three qualifying examinations, the student and advisor must establish a three-member committee for comprehensive examinations. The committee will determine three subjects for the comprehensive examinations, including one subject closely related to the student's dissertation topic.

The plan of study for the comprehensive examinations must include the semester hours of coursework at the 100-level or above outside the School of Religion with grades of "A" or "B", a set semester hours of coursework in a field of religion outside the student's field of major interest, with grades of "A" or "B"; and a maximum of three papers indicating that the student possesses the skills required for doctoral-level work in his or her field of major interest.

The student must pass an oral examination on the dissertation. Not less than 6 semester hours of credit must be allowed for the dissertation.

A student whose grade-point average in graduate study at the University falls below 3.0 will be placed on probation. A student who does not bring the average up to 3.0 within one semester ordinarily will be disqualified from further graduate study in the School of Religion.

A student choosing the second option pursues one of four separate programs: Judaism and Christianity in the Hellenistic World, History of Theology and Religious Thought in the West, Contemporary Theology and Religious Thought, Studies Relating Theology and Other Academic Disciplines. The student may apply for admittance to this program before or after enrolling for graduate study. The student is expected to have passed the language requirements by the end of the second year of graduate study, and to at least 12 months before taking the comprehensive examinations.

Beginning with the third semester and continuing each semester up to the semester of the comprehensive examinations, the student must submit to the faculty in his or her program area a copy of the paper he or she is writing or work that semester.

Depositing on the student's program, the comprehensive examination will cover three or four fields. One field will be directly pertinent to the student's dissertation subject. Within three months after passing the comprehensive examinations, the student must submit a dissertation prospectus to his or her advisor. The advisor will then assemble a dissertation committee to discuss the prospectus and guide the dissertation work. A student who fails all of the comprehensive examinations may, with faculty approval, complete a thesis for a terminal Master of Arts degree.

Detailed information about any of the programs may be obtained from the director of the school.

**Special Facilities**

The University Hospitals and Clinics provide clinical opportunities for students in religion and personality, particularly in clinical pastoral education and the M.A. program in religion and health. Individual courses on such topics as death and dying and medical ethics also utilize hospital personnel and facilities.

**Graduate Financial Aids**

The School of Religion has available three types of departmental financial aid: teaching research fellowships (TRF); teaching assistantships (TA), and research assistantships (RA).

TRF is awarded on the basis of proven academic excellence to an enrolling student who has not previously attended The University of Iowa. It provides support, including summers, for four years for a student holding a B.A., and for three years for a student holding an M.A. or M.Div.

TAs, either 1/4- or 1/2-time, are awarded to students on the basis of superior academic performance; ordinarily, first-year students are not eligible. They are limited to the academic year and are evaluated and renewed annually. Students holding TAs work primarily in the undergraduate core courses.

Students holding RAs are assigned to a particular professor to assist him or her with research projects. RAs are also awarded on a yearly basis, to enrolling and to current students, 1/4- or 1/2-time, and reviewed annually.

**Courses**

**Primarily for Undergraduates**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>251 Old Testament Survey</td>
<td>3 h.</td>
<td>Offered fall semesters.</td>
</tr>
<tr>
<td>252 Old Testament Survey</td>
<td>3 h.</td>
<td>Offered spring semesters.</td>
</tr>
<tr>
<td>255 Introduction to Old Testament in Historical Setting: Offered fall semesters.</td>
<td>3 h.</td>
<td></td>
</tr>
<tr>
<td>261 Introduction to Catholicism</td>
<td>6 h.</td>
<td>Jesuit weeklong of the Catholic faith, interpreted and medicinal doctrines and practices</td>
</tr>
</tbody>
</table>
Air force classroom instruction is regularly supplemented by one- and two-day visits to air force bases; most cadets have the opportunity to make at least one such visit each semester.

Financial Aid
ROTTC scholarships, providing tuition, books, laboratory fees and a $100/month tax-free subsistence allowance, are available to high school seniors. ROTTC cadets and qualified two-year program applicants. All cadets in the Advanced Course receive a $1500/month tax-free subsistence allowance. Cadets are supplied with books for University classes taught by military faculty and uniform forms for training exercises. A $1000 uniform allowance is provided to students who become commissioned. Students attending summer camps are paid while on duty, and receive travel allowances.

Courses

**Aerospace Military Studies**

2DA11 Aerospace Military 100 1 s.h.

Introduction to the study of air laws, forces, organization, operation and growth of the air force, study of offensive and defensive forces, employment of special-purpose forces.

2DA12 Aerospace Military 100 1 s.h.

Continuation of 2DA11.

2DA31 Aerospace Military 200 1 s.h.

Cultural analysis of air power from prehistoric to vassall, including development of air power doctrine, influence of technology on air power, use of air power in military and non-military operations.

2DA32 Aerospace Military 200 1 s.h.

Continuation of 2DA31.

2DA39 Aerospace Military Studies: Flight Instruction 3 s.h.

FAA regulations, flight computer, navigation, meteorology. Required for qualified APR/ROTTC cadets; great school open to other students with consent of instructor.

Spring

2DA40 Leadership Laboratory 0 s.h.

Opportunity for cadets to improve avionics, skills, techniques and attitudes to leadership and management; grading and teaching is in the form of assignments in a military environment; cadets plan, develop and manage the cadet corps program under faculty supervision and guidance; provides cadets with meaningful experience in leadership and responsibility.

2DA47 Leadership Laboratory 0 s.h.

Continuation of 2DA40.

2DA112 Aerospace Military 300 3 s.h.

Examinex civil-military relations, nature of international environment, strategic requirements and related problems of defense policy.

2DA113 Aerospace Military 300 3 s.h.

Continuation of 2DA112.

2DA114 Aerospace Military 400 3 s.h.

Theory and application of basic management concepts, with emphasis on relationship to air force leadership, includes knowledge base of leadership and management principles.

2DA115 Aerospace Military 400 3 s.h.

Manager's world of power, politics, strategy basics, voice of leadership, managing forces in change. Includes leadership studies and the operational military law within the air force.

**Military Science**

2DS9 The Military Team 1 s.h.

Introduction to structure of our army and to Army specialty concepts, military organizations, present job and structure of the army.

2DS9 Introduction to Leadership 1 s.h.

Basic group leadership, tactical concepts, use of maps for map reading, and navigation and military operations.

2DS9 American Military History 1 s.h.

Curriculum study of military history and evaluation of warfare, with emphasis on origins, role and development of the army.

2DS9 American Military History 1 s.h.

2DS9 American Military History 1 s.h., which is a prerequisite or corequisite.
Russian

Bachelor of Arts Program
Students who major in Russian must meet the general requirements for a degree in Liberal Arts and earn at least 26 semester hours of credit in advanced Russian courses:

- 41:111-112 Intermediate Composition and Conversation 8 s.h.
- 41:113 Advanced Composition and Conversation 3 s.h.
- 41:171-172 Readings in Representative Russian Literature 6 s.h.
- 41:191 Russian Civilization 3 s.h.
- 41:151 Russian Literature in Translation (1800-1860) 3 s.h.
- 41:152 Russian Literature in Translation (1860-1917) 3 s.h.
- 41:158 Solzhenitsyn 2 s.h.
- 41:181 Soviet Literature in Translation 3 s.h.

For a more complete area background, Russian majors are urged to include related courses in economics, geography, history or political science among their elective courses.

All Russian majors are strongly encouraged to enroll in the one-semester course 41:127 Phonetics and Pronunciation. In addition, all majors should consult with the instructor by enrolling in 41:108 Special Reading. The requirements for a minor in Russian can be fulfilled by eight semester hours of third-year Russian.

The Honors Program
Russian majors of junior or senior standing with a grade-point average of at least 3.0 both in Russian and overall may enroll in the Honors Program in Russian. An extensive reading program with discussions, regular reports and a semester paper constitutes each work unit of two semester hours. Students may take up to eight semester hours of Honors in Russian. A comprehensive examination is given in the senior year.

Summer and Study Abroad Programs
The Department regularly encourages undergraduate and graduate students to participate in intensive programs of language study both in the United States and in the Soviet Union. In recent years an increasing number of students have studied in summer and semester programs at Lingard State University under the auspices of the Council on International Educational Exchange. Other students have accelerated and refined their Russian language skills in various intensive summer programs at major American universities. Inquiries should be directed to the Russian department office.

Master of Arts Program
The major emphasis of the graduate program at Iowa is literary improvement and refinement of the students' Russian is not neglected. Graduate students therefore study the development of Russian literature, both as a national phenomenon and as a part of

Russian

22:66 Introduction to Basic Military Skills 0 s.h.
22:67 Introduction to Basic Military Skills 0 s.h.
22:68 Advanced Military Skills 0 s.h.
22:69 Advanced Military Skills 0 s.h.
22:86 Army Flight Instruction 0 s.h.
22:87 Preclinical Leadership and Instruction 0 s.h.
22:88 Preclinical Leadership and Instruction 0 s.h.
22:89 Preclinical Leadership and Management 0 s.h.
22:90 Leadership Development and Methods of Instruction 0 s.h.
22:91 Leadership Small Unit Operations 0 s.h.
22:92 Principles of war and fundamentals of offensive and defensive operations; resupply procedures, combat orders, problem-solving. 0 s.h.
22:93 Theory and Dynamics of the Military Team IV 0 s.h.
22:94 Development of self-regulatory concepts; command and control relationship and leadership; military law; force lethality of units; command. 0 s.h.
22:95 Seminar in Leadership and Management IV 0 s.h.
22:96 Preclinical Leadership and Instruction 0 s.h.
22:97 Preclinical Leadership and Management 0 s.h.
22:98 Preclinical Leadership and Management 0 s.h.
22:99 Leadership Development and Methods of Instruction 0 s.h.
22:100 Leadership Small Unit Operations 0 s.h.
22:101 Principles of war and fundamentals of offensive and defensive operations; resupply procedures, combat orders, problem-solving. 0 s.h.
22:102 Theory and Dynamics of the Military Team IV 0 s.h.
22:103 Development of self-regulatory concepts; command and control relationship and leadership; military law; force lethality of units; command. 0 s.h.
22:104 Seminar in Leadership and Management IV 0 s.h.
22:105 Preclinical Leadership and Instruction 0 s.h.
22:106 Preclinical Leadership and Management 0 s.h.
22:107 Preclinical Leadership and Management 0 s.h.
22:108 Leadership Development and Methods of Instruction 0 s.h.
22:109 Leadership Small Unit Operations 0 s.h.
22:110 Principles of war and fundamentals of offensive and defensive operations; resupply procedures, combat orders, problem-solving. 0 s.h.
22:111 Theory and Dynamics of the Military Team IV 0 s.h.
22:112 Development of self-regulatory concepts; command and control relationship and leadership; military law; force lethality of units; command. 0 s.h.
22:113 Seminar in Leadership and Management IV 0 s.h.
European literature, and are expected to analyze writers’ styles, perceive literary devices, recognize literary influences and develop the ability for sound criticism of form, content and language of works in all genres. All Masters of Arts degree candidates are responsible for reading the works on the Department’s reading list of Russian literature.

Candidates for the master’s degree must complete the equivalent of the undergraduate major in Russian. Deficiencies in previous training may be remedied by taking appropriate courses. Candidates for the master’s degree are required to complete a minimum of 30 semester hours of graduate work, with or without thesis. This program consists of courses over and above those which constitute an undergraduate major in Russian and should include courses in related fields such as comparative literature, history, philosophy and other languages. Four to eight semester hours may be received for thesis preparation. The candidates must pass a written and an oral examination; they must also demonstrate a reading knowledge of either French or German.

The program for the M.A. must include the following courses or their equivalents:
41:113-114 Advanced Composition and Conversation 6 s.h.
41:211-212 19th-Century Russian Literature 6 s.h.
41:233 Soviet Literature 3 s.h.
41:249 Prosemenar, Research Methods 2 s.h.
41:261 or 263 History of the Russian Language or Old Church Slavonic 3 s.h.

Two seminars and one course in pre-19th-century Russian Literature.

Financial Aid
Aid is available to graduate students in the form of scholarships, University fellowships, and teaching and research assistantships. It is awarded annually on a competitive basis to the best qualified applicants. Ordinarily teaching assistantships are not awarded to first-year students, but in special exceptions are sometimes made on the basis of advanced language skills. Applications are considered only for students who have been admitted to the Graduate College. Inquiries should be addressed to the departmental office.

Coursework for Nonmajors
The Department offers introductory courses in the Russian lan-
guage for students who have specific language requirements. There are special reading courses designed to give students from other fields an opportunity to acquire a reading proficiency in Russian in either the social or natural sciences. A scientific Russian course is offered for students in sciences who need to develop reading ability for research purposes. Some classes are open to University students from all departments and are offered in English. These include survey courses in Russian literature and civilization, readings in Soviet literature and monographs courses on Tolstoy and Dostoevsky.

Special Activities
Each year the Department presents several guest lectures and sponsored films. Students sometimes put on Russian plays. Russian Circle is an organization open to graduates and undergraduates for social activities. Participation in Russian Circle also provides students with the opportunity to practice speaking and to improve their Russian with other members of the Department.

The Language Laboratory
The University's Language Laboratory provides facilities for lan-
guage learning, teaching and research. Equipment in the lab includes standard and short wave radios, tape recorders, record players, soundproof recording rooms and drill rooms. An elec-
tronic classroom, a soundproof workroom and a library of tape and disc recordings are also available.

Courses
For Undergraduates and Graduates
41:193 Elementary Russian 4 s.h.
41:203 Elementary Russian Personnel: 41:193 or equivalent.
41:503 Russian for Reading 3 s.h.
Note: Emphasis on reading scientific and technical Russian material, for students, espes-
cially those majoring in sciences, who need primarily to develop reading ability for research purposes.
41:554 Russian for Reading Personnel: 41:503 or equivalent.
41:603 Second-Year Russian 6 s.h.
Recommended second-year course recommended for students satisfying their foreign language requirement and desiring further training in active use of the language. Personnel: 41:503 or equivalent.
41:604 Second-Year Russian Personnel: 41:603 or equivalent.
41:612 Special Readings Personnel: 56 weeks hours of language instruction.
41:620 Intensive Conversation Personnel: 41:612 or equivalent.
41:631 Intermediac Composition and Conversation Personnel: 41:612 or equivalent.
41:632 Intermediate Composition and Conversation Personnel: 41:612 or equivalent.
41:633 Advanced Composition and Conversation Personnel: 41:612 or equivalent.
41:644 Advanced Composition and Conversation Personnel: 41:633 or equivalent.
41:652 Methods of Reading 3 s.h.
41:657 Phonetics and Pronunciation 2 s.h.
41:661 Russian Literature in Translation (1800-1899) 3 s.h.
Conducted in English, Same as School of Letters 108:161.
41:662 Russian Literature in Translation (1890-1917) 3 s.h.
Conducted in English, Same as School of Letters 108:162.
41:668 Tolstoy and Dostoevsky 3-4 s.h.
Conducted in English, Same as School of Letters 108:125.
41:668 Short Stories 2-3 s.h.
Conducted in English.
41:669 Russian Poetry in Translation Conducted in English, Same as School of Letters 108:139.
41:675 Russian Literature in Translation Personnel: 41:612 or equivalent.
41:677 Readings in Russian Literature Personnel: 41:675 or equivalent.
41:680 Russian Literature in Translation Conducted in Russian. Credit not given to students who have taken 41:677, Personnel: 41:677 or equivalent.
41:695 Russian Civilization Personnel: 41:680 or equivalent.
41:698 Honors May be repeated to a maximum of eight semester hours. Personnel: candidate of Department.
Science Education

Primarily for Graduates
41:201 19th-Century Russian Literature 2 c.h.
41:202 Old Russian Literature 2 c.h.
41:211 19th-Century Russian Literature 3 c.h.
41:212 20th-Century Russian Literature 3 c.h.
Continuation of 41:211 but may be taken as independent unit
41:215 Russian Poetry
41:217 Soviet Literature
41:350 Program: Research Methods 18 c.h.
41:382 Bibliographies: Tolstoy and Dostoevsky 3 c.h.
41:383 Bibliographies: Pushkin 3-5 c.h.
41:384 Bibliographies: 20th-Century Literature 3 c.h.
41:381 History of the Russian Language 3 c.h.
41:380 Old Church Slavonic
41:379 Special Work
41:510 Master's Thesis

Science Education

Heidi: Robert E. Yager

Undergraduate Program
The Science Education program cooperates with the College of Liberal Arts in administering the General Science Program. Prospective secondary school teachers may select one of five science teaching emphases in General Science. The program in elementary education for a concentration in science is recommended for elementary majors with interests in science as a primary field. Special programs for high school students are administered by the Department, including environmental studies, Secondary Student Training Program, Florida and Western Ecology Program, High School Research Participation Program, and various programs of Iowa State Academy of Science.

Graduate Programs
Certification Only
This is a special classification for graduate students who have earned a bachelor's degree without fulfilling requirements for a teaching certificate. The requirements include fulfilling all requirements in science, American government, history and philosophy of science that are necessary for students graduating from the teacher education program in science at the University of Iowa. In addition, the normal sequence of education courses totaling 20 to 28 additional hours of credit. No degree objective is implied, although it is possible to complete a degree or graduate status. In such instances, the normal processing and faculty review would occur before any changes could be made.

The M.A.T. in Science Teaching
This degree is designed primarily for persons who decide they would like to become teachers after they have completed a bachelor's degree. It features advanced work in science along with the courses required for certification. It is a master's by which students can attain a master's degree and certification at the same time. (Other Science Education degree programs assume that the candidate has already completed a certification program.)

The M.S. without Thesis
This degree is the one most appropriate for teachers who plan to remain in the classroom. It is a research degree and is not designed for persons who plan to continue their education beyond the master's level. It is a 38-hour program requiring 26 hours in the sciences further preparation in the content fields where the teacher is assigned and 12 semester hours of advanced work in science education.

The M.S. without Thesis, for Elementary Teachers
This degree is similar to the one above and has the same general requirements, but is designed for persons with general preparation as elementary teachers who have not emphasized science as undergraduates. The primary difference exists in the fact that courses in general science typically are used as one of the areas of science. The other area of science is also broadly defined, i.e., biological, physical or earth science.

The M.S. with Thesis
This degree is appropriate for candidates who plan to continue for the special degree or the Ph.D. It features a thesis which can emphasize a problem in science education. If it is a scientific research, the candidate must locate an appropriate professor in the science field to direct the thesis work. The program includes 30 semester hours, of which 10 hours must be completed in science education and 20 hours in two fields of science.

The M.S. for Science Supervisors
Since the need for supervision of science is often unique, a special program of required courses is outlined. Although this degree could be with thesis, most candidates find it desirable to complete additional coursework in lieu of the formal thesis. Nonetheless, research and work with program evaluation are required. Such pilot studies and publishable results usually center upon very practical curriculum problems. The special M.S. degree meets all the qualifications of the regular M.S. degrees. However, these are general objectives required for this program, since special supervisory courses and experiences are required. (Problems remain in Iowa for special endorsement and certifica-
tion as a supervisor without meeting all requirements for certifica-
tion as a principal. However, other states have offered such certification upon completion of the program as outlined.)

Professional improvement
This is a special status for graduate students who wish to complete additional coursework without further degree objective. Students so classified must be formally accepted as P.T. students and must meet regularly with an advisor. At the same time, there is great latitude in the types of courses and individual instruction se-
quencies that are possible. Many students interested in special workshops, seminars, conferences and institutes are admitted as students in this category. If such students wish to apply for a degree at a later time, all credit completed while admitted for P.T. must be evaluated and the application is reviewed as if it is a new one for admission purposes.
Social Work

Director: Thomas H. Waltz

Undergraduate Program

The undergraduate program in social work is intended to provide basic preparation for direct entry into social work practice. In the context of a broad liberal arts education, the program focuses on general practice in social work, rather than specialization. It encompasses several aspects of social work practice with the B.A. degree (e.g., aspects of social work practice, family and children’s services, health, corrections and certain group-serving organizations); establishment of a base for graduate study, especially in social work; provision of knowledge for use in allied professions; and broad preparation for informed community participation.

Requirements

Undergraduate students majoring in social work must satisfy the general College of Liberal Arts requirements, excluding the social science core. The following courses are required for the major:

30:1
Introduction to American Politics 4 s.h.

or

30:100 The American Political System 4 s.h.

31:1 or 31:3
Elementary Psychology 4 s.h.

or

General Psychology 4 s.h.

34:1
Introduction to Sociology: Principles of Economics (68:1, 68:2, 68:7, or 68:100) 4 s.h.

42:102
The Field of Social Work 4 s.h.

42:131
Human Behavior in the Social Environment 3 s.h.

42:141
Social Work Practice I 3 s.h.

42:162
Social Work Research 3 s.h.

42:171
Social Welfare Program and Policy I 3 s.h.

42:197
Social Work Processes 2 s.h.

42:193
Field Experience 7.5 s.h.

A minimum of 12 semester hours of coursework is required in one department listed below in group A or B and nine hours in the other two groups. Most students select either sociology or psychology for the 12-hour requirement. One of the social science courses listed above can be applied toward this requirement, if the choice for the 12 hours is in that social science.

A. Social Sciences

Anthropology

Economics

Geography

Political Science

Psychology

Sociology

B. Humanities

American Civilization

English

History

Literature, Science and Arts

Philosophy

Religion

C. Related Disciplines

Education

Home Economics

Journalism

Nursing

Recreation Education

Urban and Regional Planning

Most students majoring in social work have ample opportunity for electives in social work as well as in other departments. Students may contact the School for a list of recommended electives.

Honors in Social Work

The School of Social Work has an Honors Program leading to a Bachelor of Arts with Honors in Social Work. Students interested in such a program should contact the School of Social Work.

Graduate Program

After satisfying first semester foundation requirements or their equivalents, students may choose one of the three concentrations described below. Students elect one concentration and a minimum number of hours in each of the other concentrations. Courses in other departments may also be included in concentrations. Concentrations will be modified periodically; applicants should secure a current description of the program.

Personal and Family Services prepares practitioners for direct service to persons, families and small groups. Content includes: study of functional and dysfunctional behavior, theory and practice of intimate modalities, theory and research methodology as applicable to direct services, values and ethical questions and contemporary issues in service delivery.

Organization of Human Services enables students to prepare for roles in social service organizations. Content includes administration, planning, supervision, consultation and organizational development. Students examine operational processes, the interrelation of organizations in the community, evaluative
Graduate Admission

Applications for graduate admission are accepted after October 1
for entrance the following August, which is the usual starting time for
full-time students in the M.S.W. program. Early application
(by January 1) is advised.

The School offers a special part-time study program leading to
the M.S.W.; application may be made to begin this program in
any session. A part-time student is one who plans to complete
the M.S.W. program in six semesters or more. An individualized
program is developed, in cooperation with the student's advisor.
The plan must include two full-time semesters (9 s.h. or more).

To qualify for admission, the applicant must meet the general
requirements for admission to the Graduate College (see "Graduate
College"), and have the approval of the social work faculty
committee on admissions. Generally, a grade-point average of 3.0
on a 4.0 scale (based on junior/senior or at least 12 s.h. graduate
level work) is required. Up to 25% of the class may be admitted
with a grade-point average of less than 3.0. A bachelor's degree
(B.S. or B.A.) from an accredited college or university is re-
quired, with a reasonable distribution of courses in the sciences
and humanities.

The applicant's personal statement will be reviewed and eva-
luated. Experience in social work or a related field is viewed as
documentation of commitment to the field and the applicant is
encouraged to include the relevance of the work experience to
social work. At least three references are required, and if the
applicant is currently employed in social work or a related field,
one or more references should be provided from the applicant's place
of employment.

Courses

Primary for Undergraduates

411 Helping Individuals and Families 2 s.h.
Introduction to social work practice in the present and future society.
Prerequisites: 402 (10 s.h.), 432 (10 s.h.), 442 (10 s.h.); 452 (10 s.h.).

4132 The Field of Social Work 4 s.h.
Social work as a profession and as a service; history and development; ethics of social work practice; profession of social work.
Same as Sociology 34 (10 s.h.).

4139 Social Work Processes 3 s.h.
Processes of social work practice used by social workers with individuals, groups, and communities; advanced communication skills; emphasis on integration of theory and practice.
Prerequisites: 410 (10 s.h.), 431 (10 s.h.), 442 (10 s.h.), 452 (10 s.h.).

4191 Individual Study err.
A study under the supervision of a faculty member in an area not included in the regular curriculum.
Prerequisites: 415 (10 s.h.).

4192 Field Experience err.
An educational experience in a social work agency or organization; requires a minimum of 300 hours in agency experience for 3 s.h. credit.
Prerequisites: 410 (10 s.h.), 431 (10 s.h.), 442 (10 s.h.).

4194 Senior Seminar 3-5 s.h.
Selected social welfare problems, issues, innovations and trends.

For Graduates and Undergraduates

4110 Legal Foundations of Social Welfare 3-5 s.h.
An introduction to the historical development of welfare programs and legal aspects of administering modern social welfare services.
Prerequisites: 4102, graduate standing or consent of instructor.
Social Work

42110 Human Sexuality 3.0 a.h. Psychological and sociological aspects of human sexuality; parameters for understanding needs of the group. Same as Home Economics 17117, Nursing 96.112, and Consumer Education 90.112.

42116 Aging and Social Work 3 a.h. The course will be oriented around behavioral characteristics of aging, aging policies and programs, and practice with the elderly client; related course will include prevention theories of aging, mental health dimensions, geriatric conditions, traditional and innovative programs, etc. Prerequisite: 42102, graduate standing, or consent of instructor.

42119 Basic Skills for Mental Health Professionals 3 a.h. Basic skills in mental health; principles of counseling and treatment techniques; etiology and evaluation of mental health problems. Prerequisite: 42102, consent of instructor.

42120 Practical Experience in Social Work 6 a.h. Practical supervised experience in social work agencies: emphasis on criterion-referenced and criterion-related evaluation.

42121 Social Problems and Public Policy 3.0 a.h. Social problems and public policy as viewed from a perspective with emphasis on issues of distinctive approach to public policy making.

42126 Child Care Centers: Development and Administration 3.0 a.h. Development of child care centers from theoretical, biological, and the role of the administrator; management and operation from a theoretical and practical point of view.

42127 Future and Functions of Social Welfare 2 a.h. Exploration of possible social welfare provisions based on assumptions of social welfare.

42130 Alcoholism and the Social Services 3 a.h. Identification of alcoholism and the social services approach; emphasis on alcoholism in society at large.

42131 Human Behavior in the Social Environment I 3 a.h. A phenomenological approach to understanding human behavior; historical, social, cultural factors and their impact on individual, family and society; processes of personality growth, developmental tasks and modes of adaptation. Prerequisite: 42102; graduate standing, or consent of instructor.

42132 Human Behavior in the Social Environment II 3 a.h. Social and psychological aspects of dysfunctional behavior of persons, families, groups and communities; analysis of stress situations and adaptive responses; with emphasis on counseling techniques. Prerequisite: 42131; or consent of instructor.

42134 Social Work Practice I 3 a.h. An introduction to the field of social work; conceptual base for all social work practice; job experience in social service agencies. Prerequisite: 42102; graduate standing.

42135 Social Work Practice II 2 a.h. Consideration of specific problems and society's response.

42136 Community Mental Health 3 a.h. Theory and organization of comprehensive community mental health services, with special emphasis on the need for creative leadership and community involvement in the development and achievement of goals. Prerequisite: 42102, graduate standing, or consent of instructor.

42138 Probable World Futures 3 a.h. The study of probable world futures, including the background material regarding technological and social-political forecasting and to choose programmatic and policy statements which may influence action; the introduction to social methodology and their impact to future events. Special attention to topics such as climate-change-analysis, digital technology and societal implications.

42139 Intergenerational World Futures 3.0 a.h. Projected objectives for analysis of types of world futures using scenario methodology; life expectancy and world poverty with an analysis in terms of their impact on current and future world problems. Prerequisite: 42102, graduate standing, or consent of instructor.

42140 Social Work Research 3.0 a.h. Selected problems in social work research methodology; emphasis on the formulation of research questions; research design, selection of data collection instruments, and the preparation of research reports. Prerequisite: 42102, graduate standing, or consent of instructor.

42147 Social Welfare Program and Policy I 3.0 a.h. Concept of social policy examined and defined by various authors; functions of social policy making; development and implementation: emphasis on issues of social policy, social problems and social policies. Prerequisite: 42102, graduate standing, or consent of instructor.

42172 Social Welfare Program and Policy II 3.0 a.h. Analysis, design and implementation of social policy relevant to social welfare system; emphasis on alternative conceptions about social values and social structures. Prerequisite: 42110, consent of instructor.

42198 Selected Aspects of Social Work and Social Welfare 3.0 a.h. Comprehensive study of selected topics in the social work/social welfare field. May be repeated.

Primary Requisites (These courses are not available every semester.)

42120 Human Services Administration 3 a.h. Selected theories of organizational and administrative management, and organization structure and its impact on public human service organizations. Prerequisite: 42110, consent of instructor.

42132 Social Development 3 a.h. Theories, strategies and strategies of graded change of social systems. Role of values and technology in determining factors. Examining of alternative structures, international communities, education, industry, and social services. Prerequisites: 42110, 42147, 42160 and 42170, consent of instructor.

42136 Teaching and Supervision 3 a.h. Role of supervision and teaching as means of professional development in human services. Consideration of individual differences of interest. Theory of learning, teaching, and supervision, and applications to student's experiences. Prerequisites: 42110, 42147, 42160 and 42170, consent of instructor.

42168 Workshop on Social Work and Social Welfare 3 a.h. Workshops on selected topics regarding the social work profession and fields of social work practice.

42201 Seminar on the Family 3 a.h. Prospective on structure and function of family; changes in family and implications of their functions.

42202 Human Behavior in the Social Environment: Selected Aspects 3.0 a.h. Examination of selected theories of behavior, with emphasis on analysis of underlying assumptions and anticipated outcomes, application of theory to practice, in social services agency.

42203 Human Behavior in the Social Environment: Selected Aspects II 3 a.h. Human development and behavior of individuals, groups and organizations, based on theoretical concepts and interdisciplinary perspectives on social, environmental forces which influence patterns of behavior; recent changes may be selected for special study with emphasis on students' needs and interests, e.g., school socialization, contemporary views of social desensitization, terminality. May be repeated.

42204 Human Behavior in the Social Environment: Selected Aspects III 3 a.h. Human development and behavior of individuals, groups and organizations, based on theoretical concepts and interdisciplinary perspectives on social, environmental forces which influence patterns of behavior; recent changes may be selected for special study with emphasis on students' needs and interests, e.g., school socialization, contemporary views of social desensitization, terminality. May be repeated.

42205 Integrated Seminar 3 a.h. Seminar in the preparation of a thesis, which will include the preparation of an outline, and the development of the thesis, as well as the editing of the final product.

42206 Social Work Research Seminar 1-3 a.h. Opportunities for further in-depth experience as writers on selected topics or to improve writing skills, including correction of thesis. May be repeated.

42207 Community Work Seminar 1-3 a.h. Opportunities for further in-depth experience as writers on selected topics or to improve writing skills, including correction of thesis. May be repeated.

42208 Social Work Practice Seminar: Selected Aspects 3 a.h. Seminar in the preparation of a thesis, which will include the preparation of an outline, and the development of the thesis, as well as the editing of the final product. May be repeated.

42209 Social Work Practice Seminar: Selected Aspects II 3 a.h. Seminar in the preparation of a thesis, which will include the preparation of an outline, and the development of the thesis, as well as the editing of the final product. May be repeated.

42210 Social Work Practice Seminar: Selected Aspects III 3 a.h. Seminar in the preparation of a thesis, which will include the preparation of an outline, and the development of the thesis, as well as the editing of the final product. May be repeated.
Sociology

42546 Social Work Practice: Selected Aspects II

42562 Social Welfare Policy: Selected Aspects II

42582 Legal, Political, Economic, Sociological, Historical, Philosophical and Psychological Aspects of Social Policy Formulation: Knowledge of related social problems and social welfare programs developed last are used in classes of study for social and social welfare policies to understand role of social work in social policy formulation. 4.1. economic and political considerations in social policy formulation, spirituality and mental health, social policy and family. May be repeated.

42583 Social Welfare Policy: Selected Aspects III

42584 Social Welfare Policy: Selected Aspects IV

42630 Product in Social Work Research

Participation in research directed by faculty, which may extend over several semesters. May be repeated.

42634 Applied Management Seminar

2-2.5 A. Analysis of psychiatric administrative experiences by faculty, practitioners and students. Emphasis on students' identification of current theory of administrative skills.

42586 Advanced Social Work Research

Participation in one or all of the following: supervision of published reports of research projects in the collection, analysis and reporting of data research project. May be repeated.

42727 Practicum in Social Work I

Social work practice under supervision of practicum teachers; understanding and skill in social work practice; background and skill in different areas of social work intervention, emphasis on integration of theory from entire curriculum. May be repeated.

42728 Practicum in Social Work II

Same description as 42727.

42740 Practicum in Social Work III

Same description as 42727.

42741 Practicum in Developing Countries

Cooperative and interdisciplinary analysis of projects associated with urbanization and development in the developing countries. Same as Economics 69715; Political Science 37125; Sociology 34, 4710, Geography 4715; Urban and Regional Planning 160 t 23; Anthropology 113 27.

42891 Individual Study

Project related to student's interest is carried out under direction of faculty member, sometimes including group participation. May be repeated.

42911 Advanced Management Lab

3 A. Examination of applied management skills, including professional practice, clinical supervision, affiliation activity, accountability, initiative targeting, information systems, quality control and communications.

Sociology

Chairperson: Hallwood Pop.


Undergraduate Programs

An undergraduate major in sociology provides a liberal arts education and is not specifically career-directed. In terms of career preparation, however, completion of baccalaureate study in sociology will provide a desirable background for employment which does not require advanced degree work, such as social science teaching in secondary schools; for graduate study leading to employment in related fields such as social work; or for graduate study preparatory to college or university teaching and research in sociology. Undergraduate students majoring in sociology should plan their programs in joint consultation with a sociology advisor and an advisor from the intended career field. In addition to its major programs, the department provides supportive coursework of value to undergraduate students in a number of fields, particularly other social sciences, business administration, elementary education and nursing.

An undergraduate student majoring in sociology may elect either a Bachelor of Arts or a Bachelor of Science degree program. Students interested in careers in the physical, biological, social sciences are advised to seek the Bachelor of Science degree. Both programs require 60 semester hours of coursework in sociology, including 34:1 Introduction to Sociology: Principles, 34:2 Introduction to Sociology: Problems, 34:10 Analysis Theory, Research, and Statistics, and 12 hours of electives. The two-semester sequence, research, and statistics sequence should be taken early, to maximize the student's capacity to benefit from the other sociology courses.

The Bachelor of Science program also requires either 34:12 Log of Social Sciences, 36:102 in introduction to Logic, or 26:104 Introduction to the Philosophy of Science: a year's work in mathematics; and 225:25 Elementary Probability and Statistics. To satisfy the mathematics requirement, the student may either select two of these three courses: 224:4 Matrix Algebra, 24:4:7 Quantitative Methods I, and/or 24:20 Elementary Functions: or complete both 226:16 Introduction to Programming with PL/1 and 25:17:1 Computing with PL/1. Students with exceptionally strong high school mathematics backgrounds may substitute the more advanced 225:25-26 Calculus I-II sequence for the first option. All majors are advised to take six semester hours of coursework in at least two of the following departments: anthropology, economics, geography, political science and psychology, and at least two basic courses in history or philosophy.

Sociology Teaching Major

The sociology teaching major in secondary education requires completion of either the B.A. or B.S. requirements for a sociology major in the College of Liberal Arts; eight semester hours in each of three of the following areas: American history, audiology, economics, geography, political science; and the professional courses in addition to required for teaching certification (22-25 s.h.). Consult the College of Education for complete information.

Honors in Sociology

Students who wish to graduate with honors in sociology must be admitted to the Honors Program, have a departmental honors advisor, include 34:190 The Development of Modern Social Theory and 34:97 Honors Research in their programs, and take an oral examination upon completion of their honors research.

Graduate Programs

The graduate program trains sociologists for professional careers. It has a research emphasis and primarily prepares sociologists for teaching and research positions in colleges and universities. All graduate students are required to become competent in general theory and quantitative methods, in addition to specializing in substantive areas. Opportunities for research, using survey, experimental and observational methods, are available in the Department. The Department also provides professional training in deviance control. Students interested in this type of training enroll in the Master of Arts in Criminal Justice and Corrections program.
Master of Arts

The Master of Arts degree in sociology requires 30 semester hours with thesis or 33 semester hours without thesis. The program without thesis is intended for persons who desire a terminal degree and for whom a wider range of course content in sociology is appropriate.

All candidates for the Master of Arts degree must complete 34.201 History of Sociological Theory, 34.202 Contemporary Sociological Theory, 34.274 Elementary Statistics and Data Analysis and 34.213 Sampling, Measurement and Observational Techniques, with grades of B or higher.

M.A. in Criminal Justice and Corrections

This program is designed for individuals desiring to prepare for careers in the criminal justice system. It provides the student with training in the social and behavioral sciences, the administration of justice, counseling techniques and administrative procedures. The program is administered by the Department of Sociology and has a strong sociological emphasis. A limited number of students are admitted to the program each year, so a low faculty-student ratio is maintained. Arrangements have been made with local criminal justice agencies so that internship placements are available. This program requires a minimum of 45 s.h. and a research paper for a Master of Arts in Criminal Justice and Corrections.

Joint Program in Sociology and Law

A student may obtain a Master of Arts in sociology and a J.D. by fulfilling the basic requirements of both programs. The College of Law will credit up to 12 hours of graduate work taken while entering the joint program toward the 90 hours required for the J.D., even though these hours are also credited toward an M.A. in sociology. The Department of Sociology may grant, upon the discretion of a student's M.A. committee, up to 12 hours of law toward the M.A. degree. This cross-creditting allows a student to receive the J.D. and the M.A. by taking less work than would be necessary if the two degrees were pursued independently. This program is highly individualized and allows the student to explore various aspects of the relationship between law and society.

Doctor of Philosophy

The Doctor of Philosophy degree in sociology requires a minimum of 72 semester hours of graduate-level coursework, including the post-M.A. courses 34.216 Intermediate Statistics and Data Analysis and 34.217 Theory and Research Design; comprehensive examinations; and dissertation.

All doctoral candidates are examined in the basic tool areas of sociology—theory, history of theory, methodology and statistics. In addition, each is examined over two major and one minor area chosen from among the areas currently represented on the faculty, such as social psychology, deviance, criminology, family, stratification, organizations, theory, methods and statistics.

A detailed statement of regulations for graduate study is available upon request. Prospective doctoral candidates should carefully plan their course of study.

Graduate Admission

Admission to graduate study in sociology normally requires a minimum undergraduate grade-point average of 3.0 and a total score of 1100 from the quantitative plus verbal sections of the Graduate Record Examination. In addition to the Graduate College procedures, the applicant completes a departmental application and uses its personal reference forms in obtaining three letters of recommendation. Applications can be submitted at any time, but should be completed two months before the start of the academic session for which admission is requested.

The deadline for applying for departmental financial support is March 1.

Admission decisions are based on a composite consideration of prior academic performance, personal reference letters, scores on the Graduate Record Examination and the applicant's statement of reasons for pursuing advanced work in sociology. For admission there is no specific coursework expected as an undergraduate, but a background in the social sciences with some mathematical training is useful. A foreign language is not required for admission and there are no foreign language requirements for either the M.A. or Ph.D. degrees in sociology. Inquiries concerning admission should be directed to Chairperson, Admissions Committee, Department of Sociology.

Admission to the M.A. program in Criminal Justice and Corrections requires a B.S. or a B.A. degree, a grade-point average of 2.75 and a total score of 1000 from the quantitative plus verbal sections of the Graduate Record Examination. Enrollment in this program is currently limited to five admissions per year.

Graduate Financial Aid

The Department of Sociology offers three types of awards to graduate students: teaching assistantships, research assistantships and teaching-research fellowships. Resident tuition is charged out-of-state students who receive awards. Students who receive assistantships are obligated to work twenty hours each week for faculty members on either teaching or research assignments. The department may also offer fellowship scholarships to some students.

Special Facilities

The department maintains a card punch, two terminals for communicating with the University's main computer and a terminal for access to one of the University's minicomputers and the University's main computer. Also available for faculty and students are the facilities of the Center for Research in Interpersonal Behavior (CRIB), a data archives unit and the Iowa Urban Community Research Center (IUCRC). The basic facility in CRIB is a small, groups laboratory complex with audio and video-tape and interactive process recording equipment. The data archives house the results of numerous surveys which are available to faculty and students for teaching and research purposes. IUCRC maintains a research library, data bank and laboratory. (See the Research Activities section of this catalog.)

Courses

For Undergraduates Only

Note: All courses are open to qualified undergraduates. Students must be registered for a minimum of three semester hours in sociology and in no other discipline unless a departmental exception is obtained. Science courses, when substituted for sociology courses, must be courses specifically dealing with social science topics.

34.14 Introduction to Sociology: Methodology

3 s.h.

34.15 Introduction to Sociology: Problems

3 s.h.

34.16 Theory, Research and Statistics

3 s.h.

34.17 Community Action

3 s.h.

34.18 Urban Politics

3 s.h.

34.19 Family of Sociology

3 s.h.

34.20 What Is Sociology?: An Introduction

3 s.h.

34.21 Elementary Sociology

3 s.h.
the research process; general issues associated with evaluating and interpreting social research. Emphasis on research design and on writing research reports. Prerequisites: 34-3, 34-4 and a declared major in sociology.

34-3 Theory, Research and Methods

34-3 Contributions to 34-3. Prerequisite: 34-4. Schedule varies. Prerequisites: 34-4, 34-5.

34-12 Logic of Social Science

34-12 Explorations of selected topics in contemporary philosophy of social science. Prerequisites: 34-4, 34-11.

34-75 Individual Study

34-75 Supervised reading to study special areas or advanced sociology in which the student has had a basic course. Prerequisite: 34-5.

34-70 Research Paper

34-70 The honors course includes a special research project under the guidance of the honors chairman, who after consultation with the honors committee, may be repeated.

Advanced Courses

Social Theory

34-190 The Development of Modern Social Theory

34-190 Coursework on selected works of modern or contemporary authors on social theory. Prerequisites: 34-1 and junior or senior standing.

34-201 History of Sociological Theory

34-201 Examination of ideas of major 19th and 20th-century social thinkers. Prerequisites: 34-1, 34-2, 34-3, 34-4, 34-5.

34-301 Contemporary Sociological Theory

34-301 Contemporary social theory and major theories of change, plus of theory in research strategy of theory construction. Prerequisites: graduate standing or consent of instructor.

34-302 Seminar: Sociological Theory

34-302 Problems in sociological theory. Prerequisites: 34-201 and 34-301 or consent of instructor. May be repeated.

34-204 Socio-Lg Theory

34-204 Study of ideas, beliefs, systems and structures in social life, focusing specifically, the relationship between ideas and the social context of the organizational and institutional levels. Prerequisites: graduate standing and consent of instructor. Prerequisite: 34-301.

34-305 Seminar; Contemporary Social Theory

34-305 Comparative examination of contemporary theoretical approaches and systems in light of empirical studies. Prerequisites: graduate standing and consent of instructor.

34-306 Seminar; General Systems Theory

34-306 Survey of issues in general systems theory, stressing applicability to theory and research in behavioral and social sciences. Concepts and applications are emphasized. Prerequisites: graduate standing and consent of instructor.

Sociology and Methods of Research

34-111 Social Statistics and Educational Computing

34-111 Review of sociological research and analytic methods of social processes. Students develop computer simulations and related models for use in educational settings. Prerequisites: consent of instructor. May be repeated.

34-211 Nonparametric Statistics in Social Research

34-211 Techniques for collecting appropriate data about the subjects of the population from which data were chosen, emphasis on application to social studies and description of data in sample. Prerequisites: 34-214 or equivalents.

34-212 Mathematical Sociology

34-212 Solutions of social problems in analysis of social contexts and survey of structural, functionalist, and interactionist models. Prerequisites: graduate standing and consent of instructor. Prerequisites: 34-210.

34-214 Biostatistics and Data Analysis

34-214 Coursework in biostatistics and data analysis. Emphasis on statistical inference and hypothesis testing, contingency tables and linear regression. Prerequisites: 34-210. Prerequisite: 34-210.

34-215 Sampling, Measurement and Observation Techniques

34-215 Concerns the measurement and techniques for designing surveys, interviewing techniques, participant and nonparticipant observation, coding and reporting of data for analysis; measurement accuracy, reliability and validity. Prerequisites: 34-212 and 34-214.

34-216 Intermediate Biostatistics and Data Analysis

34-216 Advanced techniques of multivariate analysis and the use of statistical techniques to the solution of the problems of data analysis. Prerequisites: 34-212 and 34-214.

34-217 Theory and Research Design

34-217 Development and logic of research; correlation and causality, methods of factorial analysis, choice of research methods; experimental, correlational and survey research; interpretive and case study research. Prerequisite: 34-216.

34-218 Advanced Statistics and Data Analysis

34-218 Advanced techniques of multivariate analysis and the use of statistical techniques to the solution of the problems of data analysis. May be repeated.

34-219 Qualitative Research Methods and Data Analysis

34-219 For graduate students in qualitative research methods. Prerequisites: 34-217 or 34-218 or consent of instructor.

Social Psychology

34-220 Principles of Social Psychology

34-220 Basic concepts and principles of social psychology; personality, interpersonal and group processes. Prerequisites: 34-1 and 34-2.

34-221 Sociology of Consumer Behavior

34-221 Social psychological aspects of consumer behavior. Prerequisites: 34-1, 34-2, 34-3, 34-4, 34-5.

34-222 Sociology of Mental Illness

34-222 Behavioral, medical and psychological implications of the social psychology of mental illness and mental suffering. Prerequisites: 34-1 or consent of instructor.

34-223 Mass Communication

34-223 A study of communication (oral, written and electronic) and how these forms are integrated with social structures and processes. Prerequisites: 34-1, 34-2.

34-225 Small Group Analysis

34-225 Small group as a fundamental unit in the fabric of larger social organizations; as a unique analogue of research interest. Prerequisites: 34-1, 34-2 or graduate standing and consent of instructor.

34-226 Collective Behavior

34-226 Social movement, social movements as a form of social change. Prerequisites: 34-1, 34-2.

34-227 Social Fora and Interaction

34-227 Social fora as a form of social interaction. Prerequisites: consent of instructor.

34-228 Interactional Perception

34-228 Perception in the exchange of social intentions; terms in social interaction; the search for meaning and roles of speakers, listeners and of speakers and listeners in the interaction. Prerequisites: 34-227.

34-229 Social Fora and Interaction

34-229 Social fora as a form of social interaction. Prerequisites: consent of instructor.

34-230 Communications and Control of Aggression

34-230 Study of the social factors contributing to the development of interpersonal aggression, the circumstances underlying aggression and the social requirements for reducing aggression. Prerequisites: 34-1 or 34-2.

34-231 Interracial Conflict

34-231 Use of social psychological theory and research to analyze leading causes and development of conflict. Prerequisites: 34-1, 34-2.

34-232 Social Psychology of Alcohol Use and Community Problems

34-232 Alcohol use and abuse and community reaction analyzed in terms of the social and psychological processes. Prerequisites: 34-1, 34-2.

34-233 Field Experiences in Social Psychology

34-233 Field experiences in social psychology. Prerequisites: 34-1, 34-2, 34-3, 34-4, 34-5.

34-234 Contemporary Approaches to Social Psychology

34-234 Contemporary approaches to social psychology. Prerequisites: 34-1, 34-2, 34-3, 34-4, 34-5.

34-235 Social Psychology of Change

34-235 Changing concept of change and the social psychology of change. Prerequisites: 34-1, 34-2, 34-3, 34-4, 34-5.
34190 American Society
3 a.h.
American society comprises perspectives on structure and processes of society. Applications: study of large, complex, modern societies; institutional interpretation; analysis of agency of social control; institutional decision-making as an effect of social change. Prerequisite: 341. Same as American Civilization 45190.

34194 Organizations
3 a.h.
Approaches to the study of occupational, social, religious, and educational organizations; interaction of occupational components with each other, the participants and the environment. Prerequisite: 341; consent of instructor.

34196 Sociological Research
3 a.h.
Work cooperatively preparatory to research; occupational and professional research; research groups and organization: modern and complex organizations: methodology and social organization; work, leisure and alienation. Prerequisite: 341.

34198 Social Inequality
3 a.h.
Approaches to the study of social inequality; inequality in the United States; results in social inequality; relationships between social class and other social phenomena. Prerequisite: 341.

34199 Sociology of Religion
3 a.h.
Critical study of societies, beliefs and practices; basis in social organization; social consequences in larger societies. Prerequisite: 341; Same as Religious Studies 32116.

34200 Sociology of Power
3 a.h.
Principles and theoretical and empirical approaches to social class and other forms of social inequality. Prerequisite: 342.

34201 Sociology of Popular Culture
3 a.h.
Analysis of the sociological bases, impact and interpretation of popular culture; interactions of popular culture and major social institutions; popular culture and society; role of major social institutions in the culture and politics. Prerequisite: 341; Same as American Civilization 45318.

34203 Sociology of Art
3 a.h.
Form and innovation; the social role of the artist; organization of the arts in industrial society; art as an industry. No prerequisites.

34202 Seminar: Sociology of Religion
3 a.h.
Background of current sociological theories of religion; critical examination of contemporary conceptual and methodological innovations for the study of religious phenomena. Prerequisite: graduate standing.

34204 Seminar: Social Stratification Research
3 a.h.
Methodological techniques and issues in the study of social stratification. Prerequisite: 342 or consent of instructor.

34206 Seminar: Social Stratification
3 a.h.
Inequality, social change, and the sub-issues in social stratification. Prerequisites: 34204 or consent of instructor.

34208 Seminar: Medical Sociology
3 a.h.
Theory and research on health institutions in modern society; social change; class and social mobility; sociology of health, illness, hospital organization and medical practice, sociology of medical education. Prerequisites: graduate standing and consent of instructor.

34209 Seminar: Prejudice and Intergroup Relations
3 a.h.
Research and theory on prejudice and intergroup behavior. Prerequisite: 34208 or consent of instructor. May be repeated.

34217 Organizations
3 a.h.
Evolution of social problems in organizational theory. Prerequisite: graduate standing or consent of instructor.

34218 Seminar: Occupational Structure and Social Mobility
3 a.h.
Evolution of behavioral, institutional and structural antagonism, society, sociology of development, and occupational theory. Prerequisites: graduate standing. Consent of instructor.

34220 Complex Organizations
3 a.h.
An introduction to the study of organizations for graduate students. Major topics: productivity, efficiency, innovation, coordination, conformity and satisfactions. Prerequisite: graduate standing or consent of instructor.

34222 Methods of Organizational Research
3 a.h.
Selected topics in applied organizational research. Prerequisite: graduate standing or consent of instructor.

34228 Seminar: Communication and Change
3 a.h.
Theory, research and methodological problems of analyzing change; major coverage includes: ideas, information, organizational change, feedback, organizational climates, communication processes, international organizations and evolutionary organizations. Same as Journalism 71390.

Community and Population

34170 Population and Society
3 a.h.
Factors and processes determining population size, composition and distribution; origins of population in social organization and human welfare; recent trends in population; role of population studies in preventive medicine and public health. Prerequisite: 341.

34172 The Urban Community
3 a.h.
Processes of urbanization and changes in urban life; nature of urban social relations; urbanization and the changing urban environment. Prerequisite: 341.

34174 World Population Problems
3 a.h.
Population trends and problems; world crises and consequences by country and world areas; cultural changes in migration patterns and family planning. Prerequisite: 341.

34179 Introduction to Demography
3 a.h.
Principles of techniques for understanding the demographic characteristics of recently emerging human populations; emphasis on both national and spatial demographics.

34179 Problems of Community Organization
3 a.h.
Formal organizations, informal groups, voluntary associations and their role in local and general community life. Prerequisite: 341.

34275 Seminar: Human Ecology
3 a.h.
Principles of human and ecological systems; models of human and ecological systems; their role in local and general community life. Prerequisite: graduate standing.

34277 Seminar: Community Research
3 a.h.
Development of forms of research and design for a community study relevant to the project plans of the Iowa Urban Community Research Center. Prerequisite: consent of instructor.

34279 Urban Growth in Developing Countries
3 a.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Prerequisite: graduate standing in social science. Same as Anthropology 117325, Sociology 62275, Geography 44275, Political Science 30275, Social Work 42275, Urban and Regional Planning 10275.

34280 Seminar: Urbanization
3 a.h.
Problems growing out of the increase in urban population and the relative decline in rural population; emphasis on Iowa and the Midwest generally. Prerequisites: graduate standing and consent of instructor. Same as Economics 102320, Political Science 30320, Urban and Regional Planning 102321.

Independent Reading and Research Projects

34283 Independent Study
3 a.h.
Prerequisite: research project consent of instructor.

34285 Internship
3 a.h.
Prerequisite: research project consent of instructor.

Spanish and Portuguese

Department chairperson: George W. Mee.
Faculty: professors Mary Luis Daniel and Dolor Oxer, James Baker, Felix Hortiguela (Portuguese), Robert Joseph Estrella, professors Alberto de Luna, R. W. Kings, assistant professors Pedro de la Torre, Sophie Peltier, Carolina Dumas, graduate assistants Patricia Price, Maris Samin, John F. Webb, Graduate Assistant Patricia Williams.

Degree offered: B.A., (Spanish or Portuguese), M.A. (Spanish or Portuguese), Ph.D. (Spanish).

The department provides coursework for undergraduate and graduate majors in Spanish or Portuguese, for the satisfaction of foreign language requirements for baccalaureate and advanced degrees in other fields, and for the satisfaction of the second literature requirement for undergraduate majors in English and in letters.

Knowledge of foreign language and culture is indispensable in many career areas. Study majoring in Spanish or Portuguese, may find opportunities in such fields as business, transportation, industry, journalism, international broadcasting, and publishing, as well as teaching, research, library work, and translating.

department. 2) An oral examination as specified below and site.
Latin American Literature
35:230 Modernism 3 s.h.

Plus three fields (nine hours) taken from two or three of the following areas:

Area A
35:230 Contemporary Spanish American Novels 3 s.h.
35:236 New Trends in Spanish American Fiction 3 s.h.
35:246 Novel of the Mexican Revolution 3 s.h.
35:263 Contemporary Cuban Narrative 3 s.h.

Area B
35:243 Spanish American Colonial Literature 3 s.h.
35:232 Spanish American Essays and Thinkers 3 s.h.
35:242 Spanish American Literature of the 19th Century 3 s.h.

Area C
35:257 Modernism 3 s.h.
35:244 Spanish American Poetry of the 20th Century 3 s.h.

Area D
35:531 Spanish American Drama 3 s.h.
35:245 Spanish American Short Story 3 s.h.
35:237 Chilean Short Story 3 s.h.

Area E
A course in Brazilian Literature 3 s.h.

Contemporary Language and Stylistics
35:208-209 Graduate Spanish Language I-II 8 s.h.
35:210 Studies in Style 3 s.h.
35:217 Literary Theory and Explication of Texts 2 s.h.

Professional Training
35:211 Research Methods and Bibliography 2 s.h.
35:233 Seminar in College Teaching 1 s.h.

Seminars
Two seminars at The University of Iowa (300 level) 4 s.h.

Specialization
Students in the Hispanic Literature program (Program 3) desiring to specialize in an area (Medieval literature, Golden Age Literature, Modern Spanish literature, Latin American literature, or another approved area) may be allowed to substitute courses in that area for one non-required course in each of the other areas. However, it is strongly recommended that wherever possible these courses be taken in addition to those in the basic minimal program, as initial employment opportunities are enhanced by having a wide spread in areas of preparation.

Program II: Emphasis on Language

History of the Spanish Language and Medieval Literature
35:251 Medieval Spanish Literature I 5 s.h.
35:253-254 Historical Spanish Grammar I-II 4 s.h.

Comparative Linguistics
35:250 Romance Linguistics 3 s.h.

Golden Age Literature
35:225 Don Quixote 3 s.h.
35:226 Cervantes—Don Quixote 3 s.h.

Modern Peninsular Literature
One of the following:
35:220 19th Century Spanish Novel 3 s.h.
35:221 19th Century Spanish Poetry and Drama 3 s.h.
35:223 20th Century Spanish Poetry 3 s.h.
35:224 20th Century Spanish Novel 3 s.h.
35:228 20th Century Spanish Essay 3 s.h.
35:241 20th Century Spanish Drama 3 s.h.

Latin American Literature
35:257 Modernism 3 s.h.
Two other courses taken from two of the fields listed in Program I

Contemporary Language and Stylistics
35:208-209 Graduate Spanish Language I-II 8 s.h.
35:210 Studies in Style 3 s.h.
35:217 Literary Theory and Explication of Texts 2 s.h.

Professional Training
35:211 Research Methods and Bibliography 2 s.h.
35:233 Seminar in College Teaching 1 s.h.

Seminars
Two seminars at The University of Iowa (300 level) 4 s.h.
Ph.D. Comprehensive Examinations
The doctoral comprehensive examinations require a general knowledge of Spanish peninsular and Spanish American literatures and period three broad fields, such as a literary genre or a historical literary period, chosen by the candidate and the representing both of the following groups:

- Spanish Language and Stylistics
- Medieval Literature
- Golden Age Literature
- Modern Literature of Spain
- Spanish-American Literature
- Luso-Brazilian Literature

Candidates following the program with emphasis on language will take comprehensive examinations in two language fields and one literature field, or, with permission of the Department, in three language fields. The group distinction outlined above does not apply; the literary field if one is chosen, may be from either group.

The length of time during which both the educational examinations are taken is determined by the candidate. They may be taken during the course of a semester or limited to a shorter period. Three written four-hour examinations are administered, followed by an oral examination.

Financial Aid
Teaching and research assistantships are available to qualified graduate students. Normally, two years of such support are available for the completion of a master's degree, and four years for the Ph.D. As long as a graduate student's studies and performance meet departmental standards, he or she will continue to receive support over a reasonable period of time, but usually not over four years. A student wishing financial support should apply directly to the departmental office.

Special Facilities
The Language Laboratory provides facilities for language learning, teaching, and research. These include standard and shortwave radios, tape recorders, record players, soundproof recording rooms, two drill rooms with 60 dual-channel tape recorders providing a simultaneous master duplicator and student record, an electronic classroom, a soundproof work room, 10mm and 8mm projection equipment and facilities, and a library of tape and disc recordings. The department offers to its majors a specific course in language laboratory procedures.

A 30-minute Spanish-language program, "Success en Español" ("Hablenes en Español"), sponsored by the department, is broadcast weekly over University radio station KUSU. The Spanish-Portuguese Players, a group of volunteer student actors, provide dramatic programs in Spanish for students and others in the local area, and on request perform at other campuses in the state.

Spanish Courses
Primarily for Undergraduates
As undergraduate majors who have had less than two years of high school study in Spanish will be placed in a first or second semester class. It is to be understood that in two to three years of high school Spanish students may be placed in a fourth-semester class. Prospective and entering students should consult a departmental advisor. Students planning to take the language test in transfer students who have taken college Spanish or other institutions will be placed according to courses previously completed.

A student may not, except with the approval of the chairman, take for credit an elementary course if he or she has already completed a higher-level course for which the elementary course or its equivalent is a prerequisite.

3-4 a.h.
3625 Elementary Spanish I
Prerequisite: 3624 and satisfactory placement
4 a.h.
3626 Contemporary Latin American Narrative
Coreq: 3626. Teaching in English; for fulfillment of second-semester core literature requirement only. Same as Core 1118.
4 a.h.
3630 Spanish for Health Professionals
May not be taken in tandem with foreign language requirements.
3 a.h.
3631 Intermediate Spanish
Prerequisite: 3625 or equivalent.
3 a.h.
3632 Intermediate Spanish
Prerequisite: 3631 or equivalent.
5-6 a.h.
3635 Spanish Conversation: Sophomore Level
May be repeated for credit.
3 a.h.
3635 Spanish Pronunciation
May be taken concurrently with 3612, 35117-118; 35118. Cannot be taken to complete foreign language requirements.
3 a.h.
3636 Reading Spanish
Prerequisite: 3632 or equivalent.
1-3 a.h.
3637 Special Work
Written approval of chairman required.
4 a.h.
3639 Introductory Elementary Spanish
A course in the first year level.

For Undergraduates and Graduates
36101 Remedial and Golden Age Literature
Prerequisite: 3612 or equivalent.
3 a.h.
36102 Modern Spanish Literature
Prerequisite: 3612 or equivalent.
3 a.h.
36103 Contemporary Spanish American Fiction
Prerequisite: 3612 or equivalent.
3 a.h.
36104 Spanish American Poetry and Drama
Prerequisite: 3612 or equivalent.
3 a.h.
36108 Spanish Conversation: Junior Level
May be repeated for credit.
1-2 a.h.
36109 The Concept of Revolution in 20th Century Spanish American Writings
8 a.h.
Conducted in English; readings in English. Same as School of Letters 100-109.
3 a.h.
36112 Contemporary Latin American Novel and Short Story
Conducted in English; readings in English. Same as School of Letters 100-12.
3 a.h.
36113 Elementary Spanish I
Coreq: 36102. Class meeting days: 1, 3, 5-6 a.m. Also 1-2 p.m. Also 5-6 p.m.
5 a.h.
36114 Elementary Spanish II
Prerequisite: 36113.
5 a.h.
36115 Spanish American Civilization
Prerequisite: 36114.
3 a.h.
36116 Spanish American Literature and Painting
Prerequisite: 36114.
3 a.h.
36117 Third-Year Language I
Prerequisite: 36116.
3 a.h.
36118 Third-Year Language II
Prerequisite: 36117.
4 a.h.
36119 Ymas, Lexicology, and Composition
Prerequisite: 36118.
3 a.h.
36120 Ymas, Lexicology, and Composition
Prerequisite: 36118.
3 a.h.
36121 Honor's Literature
Prerequisite: 36119.
3 a.h.
36122 Honor's Literature
Prerequisite: 36121.
3 a.h.
36123 Introduction to Bilingualism
Prerequisite: 36122.
3 a.h.
36123 Honor's Spanish Language
Prerequisite: 36122.
3 a.h.
36124 Honor's Spanish Language
Prerequisite: 36123.
3 a.h.
36125 Introduction to Bilingualism
Prerequisite: 36124.
3 a.h.
36126 Commercial Spanish
Prerequisite: 36123.
2 a.h.
36127 Chilean Literature
Prerequisite: 36124.
2 a.h.
36128 Inflation to Don Quijote
Prerequisite: 36123.
3 a.h.
36129 Romance Linguistics
Prerequisite: 36124.
3 a.h.
Speech and Dramatic Art, Broadcasting and Film

Department Chair: Samuel L. Becker


Requirements for the Master of Arts
A minimum of 36 semester hours, including 36:300 Introduction to Research or its equivalent.

A research thesis or, for the nonthesis degree, a graduate seminar in which significant original research is done. Successful completion of a six-hour written examination, the scope of which is determined by the candidate's dissertation and his or her graduate committee.

Cumulative GPA for courses on plan of study, 3.0. Application deadline for fall or summer term, February 30 for student wishing to maximize probability of admission. Minimum cumulative undergraduate GPA required for admission in good standing, 2.75.

Master of Fine Arts in Dramatic Art

See Dramatic Art section.

Requirements for the Educational Specialist (for Junior College Training)
A minimum of 60 semester hours, including 36:300 Introduction to Research, a course in the teaching of speech, an approved seminar at and at least 15 semester hours completed in the College of Education's graduate program in higher education.

Successful completion of a research report. Successful completion of such additional requirements as are specified by the Division of Speech and Dramatic Art, in which the student's work is concentrated.

Requirements for the Doctor of Philosophy
A minimum of 72 hours of graduate credit, exclusive of research tools and dissertation.

A course in introduction to research or its equivalent, at least two courses in theory taken within the Department, and others as determined by the student's adviser and graduate committee, in consultation with the student.

Successful completion of a qualifying examination and demonstrated competence in one's research area.

Substantial scholarly dissertation. Minimum cumulative GPA of 3.0 for courses on plan of study. Application deadline for fall or summer term, February 30 for student wishing to maximize probability of admission. Admission decisions are based upon a composite consideration of the applicant's undergraduate achievement, letters of reference and other evidence of scholarly potential or achievement. Graduate Record Examination results and samples of one's scholarly work are desirable for this latter purpose.

Speech and Dramatic Art, Broadcasting and Film

Department Chair: Samuel L. Becker


Requirements for the Master of Arts
A minimum of 36 semester hours, including 36:300 Introduction to Research or its equivalent.

A research thesis or, for the nonthesis degree, a graduate seminar in which significant original research is done. Successful completion of a six-hour written examination, the scope of which is determined by the candidate's dissertation and his or her graduate committee.

Cumulative GPA for courses on plan of study, 3.0. Application deadline for fall or summer term, February 30 for student wishing to maximize probability of admission. Minimum cumulative undergraduate GPA required for admission in good standing, 2.75.

Master of Fine Arts in Dramatic Art

See Dramatic Art section.

Requirements for the Educational Specialist (for Junior College Training)
A minimum of 60 semester hours, including 36:300 Introduction to Research, a course in the teaching of speech, an approved seminar at and at least 15 semester hours completed in the College of Education's graduate program in higher education.

Successful completion of a research report. Successful completion of such additional requirements as are specified by the Division of Speech and Dramatic Art, in which the student's work is concentrated.

Requirements for the Doctor of Philosophy
A minimum of 72 hours of graduate credit, exclusive of research tools and dissertation.

A course in introduction to research or its equivalent, at least two courses in theory taken within the Department, and others as determined by the student's adviser and graduate committee, in consultation with the student.

Successful completion of a qualifying examination and demonstrated competence in one's research area.

Substantial scholarly dissertation. Minimum cumulative GPA of 3.0 for courses on plan of study. Application deadline for fall or summer term, February 30 for student wishing to maximize probability of admission. Admission decisions are based upon a composite consideration of the applicant's undergraduate achievement, letters of reference and other evidence of scholarly potential or achievement. Graduate Record Examination results and samples of one's scholarly work are desirable for this latter purpose.
Interdivisional Courses

35:10 Workshop in Speech and Dramatic Art 3.5 s.h.
Methods of analysis, literary research, communication theory, and related fine arts; practice in music literature, drama, parliamentary procedure, and original writing. Student must be a high school senior to receive credit.

36:03 Voice Improvement for Spellers and Actors 3 s.h.
Practical introduction to voice and speech for public speakers, teachers, lecturers, broadcasters, and actors; includes study of principles of educational voice control, performance and presentation, and introduction to the phonetics, prosody, and pronunciation of standard American English.

36:07 Oral Interpretation of Literature 3 s.h.
Introduction to principles and practice of reading fiction prose and poetry in auditions; analysis, interpretation, evaluation; recommended for students in elementary education and English.

36:09 Honors in Speech and Dramatic Art arr.
Open to seniors and graduate students by permission.

36:18 Readers’ Theatre 2 s.h.
Critical analysis and oral presentation of even complex works of fiction, realism, poetry and drama; periods and genres of literature studied vary by semester.

36:00 Introduction to Research 1 s.h.
Review of all new graduate students in speech and dramatic arts except those enrolled for degree in Master of Fine Arts; problems of selecting and developing research problems; study and application of research methods and techniques of research; literature, discussions, readings, papers and reports; guidance in research.

36:36 Master’s Thesis 1 arr.

36:36 Ph.D. Dissertation arr.

Electives in speech and dramatic arts:
Nonproduction or nonperformance courses 6 s.h.

In addition to the secondary education T.E.P. foundations courses, students seeking teacher certification in speech and dramatic arts must also register for:

75:160 Methods: Speech (or 36:160) (fall semester) 3 s.h.

75:191-192 Observation and Practice in the Secondary School 12 s.h.

75:187 Seminar: Curriculum and Student Teaching 1-3 s.h.

Majors and minors are advised to complete the historical-cultural core requirement with 11:51-52 Drama in Western Culture and their social science core requirement with 12:3-0:1 Language and Society and 30:001 Introduction to American Politics. Majors are strongly advised to complete a minor certification in English or other tangential field to strengthen both their major and employment opportunities, and to accumulate a record of achievement in University forums, broadcasting and film, readers’ theatre and theatre activities.

Speech Education

Professor in charge: Douglas Toutk
Degree offered: B.A., M.A., M.A.T.

Students may proceed to the B.A. with emphasis in speech and dramatic art education by electing a minimum of 35 semester hours in the Department of Speech and Dramatic Art. The following should be included in one’s plan of study:

36:53 Voice Improvement for Speakers and Actors 3 s.h.

36:57 Oral Interpretation of Literature 3 s.h.

36:107 Directed Speech Activities (spring semester) 3 s.h.

At least two courses from the Division of Dramatic Art:

36:103 Stagecraft I 3 s.h.

36:110 Introduction to Theatrical Design 3 s.h.

One of the following is recommended:

36:118 Stagecraft II 3 s.h.

or 36:140 Directing I 3 s.h.

A minimum of two courses in the Division of Broadcasting and Film. These are recommended:

36:83 Introduction to Broadcasting and Film Production 3 s.h.

and 36:25 Mass Media and Mass Society or 36:29 American Broadcasting 3 s.h.

or 36:51 Survey of Film 3 s.h.

A minimum of two courses in the Division of Rhetorical Studies. These are recommended:

36:30 Interpersonal Communication 3 s.h.

Minor Certification in Speech and Dramatic Art
Completion of twenty semester hours in speech and dramatic arts is required. These hours must include speech methods and a distribution of at least two courses in any two of the following three areas: 1) Public communication (communication theory, interpersonal communication, argumentation, discussion and public speaking courses); 2) Dramatic art (acting, stagecraft, technical theatre and oral interpretation); 3) Broadcast and film.

Courses

36:178 Workshop in Group Oral Interpretation arr.
Students will study examples of multi-media theatre. Practice and present a master’s thesis program. One work. Same as 75:179.

Students will engage themselves in an extensive study of the sociopolitical media with emphasis on film criticism. Students will produce both radio and film programs. Two weeks. Same as 75:180.

36:181 Workshop in Interpersonal Communication arr.
Prepared especially for the public school teacher who is interested in incorporating new concepts of socialized communication, interpersonal communication and human relationship study into classroom situations. Two weeks. Same as 75:181.

Students will develop themselves with a variety of children’s stories, learn various techniques of creative children’s theatre, and teach this in the use of oral and/or written text. One work. Same as 75:182.

36:107 Directed Speech Activities 3 s.h.
Planning, organizing and evaluating curricular and cocurricular theatre and drama programs at the secondary level. Course will cover the establishment of curricular and cocurricular programmes; the development of techniques for positive speech and drama activities, and justifying curricular program in the secondary schools. Spring semester.

36:106 Methods: Speech 3 s.h.
Teaching methods, theoretical and practical, consideration of various aspects in teaching, curricular programs, objectives, instructional methods and materials, affords of oral and written criticism and evaluation, testing and grading, techniques and references, periodicals and sources of publication, practices and values of various speech and dramatic activities, audiovisual aids, techniques and equipment, and other means of signaling teaching of speech in schools. Same as Education 75:106. Fall.
Method, materials, ethical values, philosophy of evaluation and teaching, and supervising students in creative and extracurricular activities; opportunities for observation, demonstration, and practice in teaching and speech development. Emphasis on criticism, discussion and debate, radio and television, and individual speech, dramatic and film courses. Exam. in August 7-17.
36:280 Jacqueline Teaching Freshmen (Rhetoric)
Lectures and seminars covering the techniques involved in writing, reading, composition, public speaking and reading. Essay in English 1B-100.
36:281 Current Issues: Drama and Literature in the Speech and Dramatic Art Education 2-4 a.h.
Students will develop, research and present student-centered learning activities, teacher-centered learning and teaching strategies, and various classroom and teaching approaches. Students are expected to develop personal philosophies on speech education; to explore contemporary issues in secondary speech such as accessibility, behavioral objectives, competency-based education, student and teacher competencies, discipline, curriculum development and teacher evaluation.
36:282 Contemporary Communication Education 2-4 a.h.
Course is designed to increase the teaching competence of college instructors. Basic learning theories and student competencies will be explored. Students will design college level curricula including course justification, content, scope, philosophy, instructional goals and behavioral objectives, and suitable tools for teacher and student evaluation. Emphasis in the course is on the "basic course" in speech. Students will pursue a pedagogical research topic of their choice.

Communication Research
Professor in charge: John W. Rogers
Degrees offered: M.A., Ph.D.
The program in communication research leads either to the M.A. or the Ph.D. degree. Programs designed for individual students provide the background for and experience in experimental research on interpersonal communication, group communication and the mass media. Candidates are expected to take work in related social sciences in addition to the general requirements of the Department of Speech and Dramatic Art, and to select appropriate courses from those listed below. In general, Ph.D. candidates in this program must complete the statistics sequence in the Depart-
ment of Statistics in the College of Science, and take 26:203 Psychological Problems of the Social Sciences in the Department of Philosophy. Work is advanced statistics and communication research techniques required in the course of this department. Opportunities for varied research in addition to that required for thesis or dissertation projects are available in the Department's Communication Research Laboratory.
Several original studies in preparation for dissertation and later research are required of doctoral candidates.

Courses
36:180 Communication Theory in Everyday Life 3 a.h.
For undergraduates only. Introduction to several area methods in communication theory and application of those theories in the solution of day-to-day problems.
36:197 Public Speaking 3 a.h.
For undergraduates only. Examination of persuasion as manifested in everyday communication, interpersonal, small group, radio and oratorical contexts and application of methods for relevancy.
36:198 Introduction to Language and Communication 3 a.h.
Relates theory of language in the context of interpersonal communication. Informal research project appropriate for introductory course.
36:177 Directing Speech Activities 3 a.h.
Same as Speech Education 70-102.
36:182 Communication and Conflict 3 a.h.
Consideration of social implications of communication, conflict, and conflict theories. Formal and informal experience required.
36:282 Group Communication: Theory and Research 3 a.h.
Survey of small-group research and theory.
Speech and Dramatic Art, Broadcasting and Film

One of the following:
36:60 Communication Theory in Everyday Life
36:79 Resistance to Persuasion
36:80  Communication and Contemporary Culture
36:81  Anglo-American Public Communication: Early Period
36:82  Anglo-American Public Communication: Later Period
36:83  Contemporary Public Communication

Selected courses in drama and theatre, and in radio-TV-Film.

At least 15 semester hours beyond the liberal arts graduation requirements in literature, history, psychology, philosophy, foreign language and/or social science.

Forensics

Through forensics, the public address student at Iowa has the opportunity to expand research skills, develop improved listening habits, work on organizational and amplification methods, and use all public speaking skills before audiences outside the classroom. Students may choose to work in debate, forensic, interpretative reading or extemporaneous speaking. Each student will have the opportunity to work with experienced instructors at the University and to receive detailed critiques from teachers of argumentation and public address throughout the country.

The Master of Arts Program

The program is intended to build a strong foundation for teaching in high schools and junior colleges and/or for proceeding to the doctorate. The program may include the preparation of a thesis, according to the decision of the student and advisor. The program will include:

Introduction to Research (36:309):
At least 15 hours of courses in rhetoric and public address including a seminar;
At least six hours of courses in other divisions of this or related departments;
A course in the bases of speech (voice and phonetics) or evidence of adequate previous training; and
A comprehensive examination.

The Doctor of Philosophy Program

The program leading to the Ph.D. degree is designed to give the candidate a mature grasp of the field of learning and to develop the research competencies essential to a life of productive scholarship.

For basic requirements, see the sectional sections of this department's description.

Courses

36:21 Principles of Speech Communication 3 s.h.
Instructed and guided practice in fundamentals of real communication; required. University requirement is satisfied for students not offered course 90:21, 90:17 or 90:19 equivalent. Registration may be satisfied only by area administration by lettering each semester by program director and by students by petition 90:20. Not open for credit to students who have had or are taking rhetoric 90:31, 90:33, 36:30 or equivalent.

36:28 Communicating in Public 3 s.h.
Intermediate course in public speaking, presenting previous coursework 90:12, 10:3, 36:23 or equivalent or other experience in basic processes and practice of oratory; study and experiential in more complex forms of informative and persuasive speaking; analysis and criticism of speaking and listening; attention to the role of public communications in business and the professions.

36:21 Group Communication 3 s.h.
Preparation and practical applications of group problem-solving techniques; leadership and group participation; issues in social decision and action.

36:22 International Communication 3 s.h.
Readings, exercises and projects in dyadic and small-group communication; intercultural analysis, negotiation strategies, feedback, conflict, and cultural context.

36:23 Practice in Debate 1 s.h.
Studies in the theory of intersubjective speech. Lectures, discussions, research projects. May be repeated for credit.

36:24 Communication and Public Affairs 3 s.h.
Preparation in informative and persuasive speaking based on an study of current public issues.

36:75 Parliamentary Procedure 3 s.h.
Rules of order in conduct in meetings of committees, clubs and organizations; opportunity for practical work in making and debating motions from floor and preserving order in parliamentary meetings.

36:80 Communication and Contemporary Culture 3 s.h.
Exploration of the settings in which communication occurs; methods for analyzing processes of discourse, communicative habits in conversational genres, social programs, and international conferences; lectures, discussions, records, films, critical projects. Same as Communication Studies 122:80 and Letters 80:80.

36:87 Rhetoric of Agitation and Control 3 s.h.
Readings, lectures, discussions, films and case studies developing theories for analyzing agitation involving radical social change and response to force agitation; in small groups students participate in case studies of agitation and control, and prepare short papers. Same as Letters 120:87.

36:80 Rhetoric and Politics 3 s.h.
Analytical study of the rhetoric of political campaigns at the national, state and local levels, discussion with candidates and representatives of the media; readings and papers, especially for individual investigations. Offered only in spring semesters.

36:24 Theory and Practice of Argument 3 s.h.
Analysis of public argument as practiced in law, social science, politics and other public issues, and implications for the preparation of real arguing; recommended for prospective lawyers, business personnel, debate and others interested in constructive argumentation.

36:120 Theory and Practice of Persuasion 3 s.h.
Examination of the principles of persuasion with special attention to social theory; experience in building complex problems of persuasion in frequent speeches on significant social issues.

36:120 Interview and Conference Methods 3 s.h.
Techniques and principles of communication in small groups in business, industries, law, the ministry and other professions; consideration of theory and practical practice; exercises and discussion on practices of interviewing, negotiations, and interviews in humanities, philosophy, and methodologies of persuasion.

36:120 Modern Criticism 3 s.h.
Course in principles and techniques of literary criticism and analysis, technical dimensions of literary criticism; readings, discussions, papers in practical criticism. Same as Letters 120:120.

36:120 Greek and Roman Autocratic Communication 3 s.h.
Historical and critical study of public and oratory communication from the 8th century B.C. to the restoration A.D.; study of relevant social, philosophical and political issues. Same as Letters 120:120.

36:120 Anglo-American Public Communication: Early Period 3 s.h.
Historical and critical study of British and American public and oratory writing in the 18th century. Readings, sources, public gatherings, pamphlets and newspapers.

36:120 Anglo-American Public Communication: Later Period 3 s.h.
Trends the period 1860 through 1900. Completion of 36:120, with the addition of radio and television studies.

36:120 Contemporary Public Communication 3 s.h.
Critical examination of public communication, 1900 to the present.

36:120 The Rhetoric of Fair Justification 3 s.h.
Research in the relationship of law and speech with particular and public shortcomings.

Case studies range from Derricks through contemporary American politicians.

36:201 Methods of Research. 3 s.h.
Thematic and philosophical definitions of discourse in the ancient world. Same as English 2367.
Examination of ways in which cultural norms and communicative forms shape the popular arts of any given epoch.

Broadcasting and Film

Professor in charge: Dudley Adams, Robert Pepper
Degree offered: B.A., M.A., Ph.D.

Bachelor of Arts

This program is intended for the student who seeks an understanding of the broadcast and film media and their relationship to the larger field of the communication arts. The program is offered within the context of a liberal education and is not regarded solely as preparation for a professional career. Students may emphasize either broadcasting or film in their selection of elective courses, but minimum requirements lead all students to exposure to historical and evaluative courses in both broadcasting and film, and to experience in the production of materials for broadcast and film media.

The broadcasting and film major requires a minimum of 24 hours in the Department of Speech and Dramatic Art including at least nine hours of production and at least nine hours of non-production courses in the Division of Broadcasting and Film.

Graduate Programs

The Master of Arts degree emphasizes research in critical, theoretical, historical, and policy issues relating to broadcasting and film. M.A. candidates in film can emphasize production in a plan of study balancing the artistic and scholarly aspects of the field. The major emphasis of the Ph.D. programs in broadcasting and film is the development of research competence. For basic requirements, see the initial sections of this department's description.

Facilities

Production courses in broadcasting are held in the University Television Center and in the studios of University radio station WSUI. The large television studio in the center is equipped with three monochrome standard broadcast cameras, teleprompter, switcher and audio board; all associated audio and lighting equipment; 1/2 inch, 3/4 inch and 2 inch videotape recorders. There is also an audio preparation room with real-time and cartridge machines. Most of the nearby classrooms are wired for television so that classes can be shown in history and criticism classes, and an area is set aside where students may study videotapes on their own.

Though students in film production courses sometimes use the television studio as a sound stage, it is assumed that most filming will be done on location. There is a "pool" of equipment available for check-out to students in each course which includes: six Bolex Macromotors Super-8, six Bell and Howell, one Bolex H-17, one Auricon and four Arrilex 16mm cameras; five Sony cassette, two Sony reel-to-reel, and three Nagra battery-operated audio recorders; and two Lovell lighting kits. Each course has its own editing area; there are eight super-8, and fifteen 16mm stations (two are equipped for sound editing). There are four Moviola editing machines, two of which are "Flashboats," and a sync-excits interlock viewing area.

The University maintains a complete motion picture laboratory and all 16mm processing and printing is done on campus. There is a 5-sprocket program-insert three-element mini-laboratory. A Moviola "library" reader is available for students who may wish to study a particular film in detail.

Courses

SMR-205 Mass Media and Mass Society 3 hours
Introduction to the theory and theory of the mass media of communication, with emphasis on role, television, and the mass media. Discuss various sections and papers provide opportunity to explore some specialized topics in depth.

SMR-206 Introduction to Broadcasting and Film Production 3 hours
For the student with no previous experience, the course is supervised with a short video production, two class super-8 films and two audio productions; advanced students are given the opportunity to develop their skills.

SMR-207 Television Production 3 hours
For the student with no previous experience, the course is supervised with a short video production, two class super-8 films and two audio productions; advanced students are given the opportunity to develop their skills.

SMR-208 Survey of Film 3 hours
Introduction to motion picture history, theory, and criticism, including study of relationship of film to other art forms. Emphasis on philosophy, industry structure and audience consumption.

SMR-209 Survey of Broadcasting 3 hours
Introduction to the history and theory of the mass media of communication, with emphasis on role, television, and the mass media. Discuss various sections and papers provide opportunity to explore some specialized topics in depth.

SMR-210 Mass Media and Mass Society 3 hours
Special section of undergraduates course with same title for graduate students who are not majors in Speech and Dramatic Art.

SMR-211 Introduction to Broadcasting and Film 3-5 hours
Special section of graduate students course with same title for graduate students who are not majors in Speech and Dramatic Art.

SMR-212 Television Production 3 hours
Special section of graduate students course with same title for graduate students who are not majors in Speech and Dramatic Art.

SMR-213 Radio Production 3 hours
Special section of graduate students course with same title for graduate students who are not majors in Speech and Dramatic Art.

SMR-214 Radio Workshop 3 hours
Independent creative work for students who have completed and demonstrated outstanding talent in permissible 389-215.

SMR-215 Film for Television 3 hours
Operation and use of the 16mm film camera, editing, lighting and shooting of short news footage and in the daily operation of local TV stations; designed to serve the needs of broadcasting and motion picture majors.

SMR-216 Television Production I 3 hours
The mechanical and technical aspects of television production; responsibilities of writer.
producer, director and other production roles; lastly, presentation. Precipitated: 582-915.
3.260-114 Television Production II 3 a.h.
Preparation and development of television programs; emphasis on experimental formats and approaches in use of sound, music, lighting, staging and practice in television; major range of production experiences. Precipitated: 320-113.
3.260-115 Television Workshop 3 a.h.
Independent creative work for students who have completed and demonstrated interest in 3.260-114. Precipitated: 320-037 and consent of instructor.
3.260-120 Film Production II 3 a.h.
Advanced production practices; emphasis on editing, camera and recording tech-
niques, role discussion of model writers. Emphasis on theoretical and aesthetic aspects. Precipitated: 320-121 and consent of instructor.
3.260-122 Film Workshop 3 a.h.
Independent creative work for students who have shown outstanding talent in 3.260-122. Precipitated: consent of instructor.
3.260-124 New Directions in Video 3 a.h.
Examination of the theoretical underpinnings and impact of recent developments in video technology such as computer generated VHS and analogous video into computer generated animation.
3.260-132 Technology of Film Production 3 a.h.
A broad overview of the technical and legal concerns of film, including reproduction and distribution of film and video, film editing and the role of film in society. Precipitated: 320-127. Televising on Society 3 a.h.
The role of the medium affecting social, cultural and political values. A consideration of the forces which determine the form and function of programs. In-class viewing of representative television programs.
3.260-139 Broadcasting and Film Writing 3 a.h.
Examinations in visualization and scriptwriting; original and adaptation, reporting and editing; dialogue, characterization and structure in written television. Emphasis on television programs
3.260-150 The Criticism of Broadcasting 3 a.h.
A study of the broadcast media with the perspective of the critic, an examination of the aesthetic, theoretical and institutional issues and models that affect broadcast communications.
3.260-190 History of Broadcasting 3 a.h.
Historical overview of broadcast media, current trends and future trends in broadcast communications. Major developments in radio and television broadcasting.
3.260-195 Regulation of Broadcasting 3 a.h.
Study of legal and regulatory systems which regulate current and business practices of broadcasting. Emphasis on the FCC, emphasis on FCC policies and broadcast court cases.
3.260-185 Contemporary Issues in Broadcasting 3 a.h.
Study of major issues before Congress, courts and FCC which affect broadcasting; topics include: regulation of cable television.
The use of mass media in society and their effects. Discussion of major philosophical issues involved in the use and control of mass media.
3.260-187 Film and Public Policy 3 a.h.
Preparation for professional work based on historical research into the problems of film policy and cultural matters, governmental investigation of violence and other social issues, production and distribution of films, and study of current film and other media.
3.260-190 Broadcast Communications 3 a.h.
Examination of the development of the broadcast communications in the United States with emphasis on major public policy issues relating to development of broadcast media.
3.260-195 Documentary and Public Issue Broadcasting 3 a.h.
Focus on function of documentary films; role of photojournalism, independent and television; emphasis on development of documentary television form and film production and functions of society. Major concerns of independent media.
3.260-197 Broadcasting and Education 3 a.h.
A study of broad-casting systems in various countries, their history and development, with emphasis on the regulatory system and programming structures and processes. Precipitated: 320-199. Public Broadcasting 3 a.h.
Examination of the role, organization and problems of nonprofit broadcasting by television and radio, especially since its recognition by federal legislation. An attempt to develop a program service to commercial broadcasting in the United States.
3.260-205 Broadcast Management 3 a.h.
An examination of management practices in radio and television stations, including management, budgeting, broadcast research, programming, promotions, sales, labor relations, personnel regulations and community responsibility.
3.260-210 Documentary Film 3 a.h.
Historical and critical survey of documentary as a powerful, experimental and perfor-
mative form: screening emphasis work of Federico, Dovzic, Lasslo and modern cinema on the West.
3.260-212 Film and Video 3 a.h.
European films and trends throughout development. Examination of processes of production and distribution of films and television; examination of specific national and regional patterns of film and video production.
3.260-214 The American Film 3 a.h.
Films and trends which have shaped American films on critical, Chaplin, Keaton, Vare, Doolittle, Fort, Walter, Hitchcock, Clapper, the program film, narrative, production lines, the promotional environment, including audience, exhibitors, and viewers, and studio and independent systems.
3.260-215 Support Film History 3 a.h.
Movements in Europe which are significant in film history; silent cinema of Sweden, Germany and Russia; films in the 1930's; Italian neorealism.
The history of film in French culture. Litterature on French culture, analysis of film and discussion of influence of filmmakers in politics, society, etc. Same as French 114, 147.
3.260-218 National Cinema 3 a.h.
Focus changes: the history of the cinema and its relation to the culture of either England, Italy, Japan, Germany or Russia. Same as French 118-119 and Spanish 310-318.
3.260-219 Film Criticism 3 a.h.
Study of the purposes, presuppositions and goals of film criticism; major theoretical positions related to various areas of interest to film critic; theoretical decisions reflected in writings of students in the course.
3.261-100 Film History I 3 a.h.
Introduction to major historical periods; Gentile and Cinema; Khausen; cinema of the 1890's; cinema of the 1910's and 20's; anthropology and phenomenology.
3.261-125 Film Script Analysis 3 a.h.
Same as in 3.260-215.
3.261-134 Literature and the Film 3 a.h.
Same as in Romance Civilizations 45, 60, English 817, Latin 108; 73.
3.261-135 Drama and the Film 3 a.h.
Same as in 817.
3.261-205 Art and Movement Movements 3 a.h.
A survey of the growth of the "cinematic" film within the context of modernist and expressionist movements. Film viewing will concentrate on representations of the impressionist, surrealistic, fantastic, New American Cinema, lyrical, expanded cinema and experimental modes of filmmaking. Same as Romance Civilizations 45, 117 and Latin 108.
3.261-215 Narrative and Realist Art Forms 3 a.h.
Same as English 172 and French 9-108.
3.261-221 Film Theory 3 a.h.
Course examines films in terms of various critiques genres, periods, etc. (the narrative). film (e.g., the New Wave), and abstract topics, etc. (notile), topics will differ from semester to semester; may be taken for credit more than once. Same as Romance Civilizations 45, 60, and American 45, 119.
3.261-223 Research Seminar in Mass Communication 3 a.h.
Critical discussion of major issues in mass communication, with emphasis on the study of mass communication. Practical experience with current issues. Same as Romance Civilizations 45, 117.
3.261-225 Influences on Film Production 3 a.h.
Study and analysis of the development of the process of film production from the perspectives of the development of the industry, the growing technology, the patronage of government and individual success stories.
3.507 Mass Communication Processes and Effects 3 a.h.
Introduction to research and theory which help to explain the process by which information gets into our environment and into our culture of the "whole learner body" and the functions and effects of that treated world.
Dramatic Art

Director: Lewis Guff
Degree offered: B.A., M.A., M.F.A., Ph.D.

Bachelor of Arts

The requirements are:
11:51-52 Drama in Western Culture (to satisfy the historical-cultural core requirement);
A minimum of 32 semester hours of credit within the Department, or a combination of courses from this department and equivalent courses from other colleges or universities;
A minimum of 12 semester hours of credit for production/performance courses in the Department (or equivalent departments); and
A minimum of 12 semester hours of credit for nonproduction/performance courses in the Department (or equivalent departments).

Students with sufficient talent and dedication may specialize in one or more production areas. Admission to second and third years of the production sequences is limited to students of superior ability. Work in all production and content areas is desirable for professional and personal advancement. Studies in history, literature, philosophy, social studies, art, music, dance and religion are encouraged. There is particular emphasis on choosing courses which will fulfill departmental entrance requirements for those expecting to take advanced degrees. Students expecting to apply for teaching certificates should choose courses to satisfy departmental and state requirements.

Master of Arts

The program is designed for students who anticipate teaching at the high school and junior college levels and for those who want to earn an advanced degree before proceeding to the doctorate. The program consists of a combination of prescribed and elective courses covering the general areas of dramatic literature, criticism, theory, history and production. A thesis or graduate seminar in history, theory or criticism of drama or theatre is required.

Master of Fine Arts

Students demonstrate exceptional ability in playwriting, directing, design, acting, arts management or technical direction may apply for admission to the program of study and production leading to the M.F.A. Admission is dependent on recommendations and appropriate demonstrations of ability. Six semesters in residence and 48 semester hours are required, and students are admitted for admission each year. Substantial creative work of high quality is expected of all candidates.

Admission is based upon audition or portfolio of relevant artistic work, in addition to undergraduate record, other records of artistic accomplishment and letters of recommendation.

Doctor of Philosophy

The Ph.D. program in theatre is designed to emphasize research and creative scholarship rather than general education or production. The emphasis in this program is on theatre history.

Facilities

The division's commitment to an extensive and varied production program is reflected in its use of four quite different theatres. Studio III is a large, flexible space in which class projects, highly experimental productions and readers' theatre productions are performed with limited scenicity before small audiences. Studio I, with its intimate setting and lighting control, offers directness and designers an opportunity to stage its 100 seats and define the playing area, thus permitting experimentation with several possible relationships between the actors and audience. The E.C. Mahle Theatre is an excellently equipped proscenium theatre which offers seating for almost 500 patrons. The division also performs in the recently completed Flancher Auditorium. Seating, 2,600, this facility is used by the numerous professional touring shows which perform in Iowa City, and boasts the latest and most sophisticated stage machinery available.

To support its continuous production schedule and to provide its students with an appropriate range of experiences, the division maintains several shops for the building, maintenance and storage of its scenery, costumes and properties. Using the three scene shops, students can learn to work in metal and plastics as well as canvas and wood. In lighting and sound, students are exposed to a range of equipment from the manual resistance lighting control and the two-channel sound systems of Studio Theaters to the fully computerized lighting controls and the five-channel sound system used in Flancher Auditorium.

Courses

For Undergraduates
SMT 5 Shakespeare
Same as English 610
3 s.h.
SMT 10 Shakespeare
Same as English 372
3 s.h.
SMT 51 Drama in Western Culture
Same as core course 11:51
4 s.h.
SMT 52 Drama in Western Culture
Same as core course 11:52
4 s.h.
SMT 51 Modern Drama
Same as Drama 51
3 s.h.
SMT 52 Selected Plays
Same as English 853
3 s.h.
SMT 53 Southern Drama
Same as Drama 853
3 s.h.

For Undergraduates and Graduates
SMT 100 Dramatic Art Laboratory
3 s.h.
SMT 101 Acting I
3 s.h.
Readings, improvisation and some study developing actor’s psychological technique.
Courses in crime and movement as two components of a performer's skill. Includes construction exercises, imagery, rhythm, character, clown, tumbling, juggling, storytelling, mask, mask-making, etc.; emphasis on improvisation and de- velopment of personal group movement idiom.

357/358 Greek Drama in Translation
Same as Greek 146/158 and Section of 168/170.

357/358 Roman Drama in Translation
Same as Latin 156/166 and Section of 176/170.

357/358 Medieval Drama
Same as Religious and Drama of Europe from 10th century to close of medieval period.

357/358 Restoration Drama
Same as English 113/112.

357/358 English Drama of the 19th Century
Same as English 114/113.

357/358 Continental Drama, 1900-1970
Same as English 3/113/114.

357/358 Continental Drama, 1700-1800
Same as English 3/113/114.

357/358 American Theatre History
Organization and operation of the American theatre from its beginning (c. 1750), to present. Special attention to the interplay of theatre and American life.

357/358 Theatrical Production
Play analysis for lesser theatre emphasis on current trends in drama.

357/358 Shakespearean Theatre Practice
"Shakespeare's" playwriting and the theatre medium.

357/358 Shakespearean Acting
Improvisation, stage direction, and acting techniques.

357/358 Playwriting
In-P.A. Workshop
Independent work and writing.

357/358 Playwriting: Early Plays
Same as English 2/152.

357/358 Playwriting: Later Plays
Same as English 2/152.

357/358 Research in Drama and Film
Topics in the field of the drama and film.

357/358 Research in Dramatic Literature
Topics in the field of dramatic literature.

357/358 Seminar: Dramatic and Rhetorical Criticism
Developing critical and theoretical perspective in the drama.

Speech Pathology and Audiology
Department chairman: Kenneth L. Metz

357/358 Speech Pathology and Audiology I
Same as Speech 357/358.

357/358 Speech Pathology and Audiology II
Same as Speech 357/358.

357/358 Speech Pathology and Audiology III
Same as Speech 357/358.

The courses and degrees programs of the Department of Speech Pathology and Audiology are planned to meet the needs of students seeking to prepare themselves for a wide variety of career opportunities. These include clinical service, college and university teaching, and research concerned with speech, language or hearing problems and disorders. The offerings also include courses for students with vocational and professional goals in other fields, such as psychology, education, speech and dramatic arts, dentistry and medicine, whose preparation may be enriched by the study of speech and hearing processes and their disorders. Holders of advanced degrees in this field provide clinical services for people with speech, hearing or language problems in hospitals, community clinics, rehabilitation facilities and elementary and secondary schools; teach in colleges and universities; and/or conduct research in laboratories concerned with communication processes and disorders.

All professional programs of the Department leading to the M.A. degree are accredited by the Education and Training Board of the American Board of Examiners in Speech Pathology and Audiology.

Undergraduate Curricula
Since the master's degree is the minimum level of preparation for persons seeking professional careers in this field, the undergraduate curricula leading to B.S. or B.A. degrees in speech and hearing science do not qualify an individual to work professionally in this field but have as a primary purpose the preparation of students for graduate work. Hence, the undergraduate program emphasizes the normal processes of speech, hearing and language. Thus, these undergraduate programs may also be taken by persons who want a degree in the College of Liberal Arts but who do not desire a career in this field.

Students may qualify for either the B.S. degree or the B.A. degree with a major in speech and hearing science by completing, in addition to the general requirements prescribed by the College of Liberal Arts, the undergraduate departmental program given below:

Required Departmental Courses
315 Introduction to Speech and Hearing Processes and Disorders
120 Phonetics of American English
125 Articulatory and Acoustic Phonetics
130 Anatomy of the Speech and Hearing Mechanisms
140 Fundamentals of Speech Science
Advanced Degree

Master of Arts Degree

The M.A. program in speech pathology and audiology may be a professional program to prepare the students for immediate placement in clinical service positions, or it may be a general program of graduate study leading to additional skills for the Ph.D. degree. The various programs for the professional M.A. are necessarily specified to ensure that upon graduation the student will meet the requirements for immediate professional placement; the general M.A. program allows greater flexibility of individual program plans.

It is presumed that the student has a background of undergraduate courses in speech and hearing sciences, development of real communication and psychology of human behavior essentially equivalent to an undergraduate major in this field.

Earning M.A. degree candidates are required to take preliminary comprehensive examinations covering coursework in speech and hearing that is considered prerequisite to graduate study. The results of these examinations are to be considered diagnostic in nature, providing the student and faculty advisor with a basis for developing an appropriate plan of study. These examinations are ordinarily taken during the first semester of residence. Portions of the examinations may be waived if the student chooses to take appropriate courses.

Professional Program

The professional M.A. program is designed to prepare clinicians in speech pathology and audiology who will be competent to function independently in a variety of clinical settings. Persons completing a professional M.A. program meet all academic requirements for clinical certification by the American Speech and Hearing Association. Four different curricula are provided. Each includes basic studies listed below under A, the requirements listed under one of the four other sections (B, C, D, or E) and elective enrollments. The student should choose one of these four curricula in relation to career objectives and interests.

A total of 38 semester hours is the minimum required for a master's degree in this department. Candidates for the professional M.A. degree are not required to present a thesis. However, students demonstrating research aptitude and interest are encouraged to do so. All candidates for the professional M.A. degree without thesis are required to take final written comprehensive examinations. The professional M.A. programs in both speech pathology and audiology are accredited by the American Board of Examiners in Speech Pathology and Audiology.

Requirements for the professional M.A. degree:

A. All Majors

*5:116  Normal Processes of Speech and Language

*5:130  Foundations of Clinical Management

4:352  Articulation Disorders

*5:185  Hearing Loss and Audiology

3:214  Children's Language Disorders

3:244  Rehabilitation Audiology

7C:599  Counseling for Related Professions

Two advanced seminars or thesis

*Equivalent undergraduate course will be accepted as meeting requirements.
Additional semester hours of practicum registration sufficient to meet supervised, direct clinical experience requirements for Certification of Clinical Competence of the American Speech and Hearing Association and to provide broad supervised practicum experience.

### B. Speech Pathology, General Clinical Emphasis

Courses listed under A and:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>3:183</td>
<td>Slurring</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>3:212</td>
<td>Voice Disorders</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>3:235</td>
<td>Neuropathologies of Speech and Language</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>3:237</td>
<td>Cleft Palate</td>
<td>2 s.h.</td>
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</table>

Practicum, research and elective courses to bring total to at least 38 semester hours.

### C. Speech Pathology Major, Emphasis on Clinical Work in Elementary and Secondary Schools

Courses listed under A and B, and:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>7E:104</td>
<td>Remedial Methods in Speech and Hearing</td>
<td>2 s.h.</td>
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<tr>
<td>7E:192</td>
<td>Laboratory Practice in Elementary School</td>
<td>5 s.h.</td>
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</tbody>
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Practicum, research and elective courses to bring total to at least 38 semester hours.

### D. Audiology Major, General Clinical Emphasis

Courses listed under A, and:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tr>
<td>3:120</td>
<td>Fundamentals of Laboratory Instrumentation</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>3:121</td>
<td>Audiology Instrumentation Laboratory</td>
<td>1 s.h.</td>
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<td>3:140</td>
<td>Manual Communication I</td>
<td>1 s.h.</td>
</tr>
<tr>
<td>3:240</td>
<td>Introduction to Diagnostic Audiometry</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>3:261</td>
<td>Advanced Audiology</td>
<td>4 s.h.</td>
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<tr>
<td>3:345</td>
<td>Audiologic Procedures for Special Populations</td>
<td>3 s.h.</td>
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Practicum, research and elective courses to bring total to at least 38 semester hours.

### E. Audiology Major, School Hearing Clinician

Courses listed under A and D, and:

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<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tr>
<td>7E:104</td>
<td>Remedial Methods in Speech and Hearing</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>7E:192</td>
<td>Laboratory Practice in Elementary Schools</td>
<td>3-5 s.h.</td>
</tr>
</tbody>
</table>

Practicum, research and elective courses to bring total to at least 38 semester hours.

Students preparing for clinical positions in public schools must meet the certification requirements of the states in which they plan to work. Completion of the following courses, in addition to those previously listed under C or E above, will meet the requirements of Iowa and most other states.

### American Government or American History

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<th>Course Code</th>
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<tr>
<td>2-3 s.h.</td>
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### Exceptional Children

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<th>Course Code</th>
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### Remedial Methods in Speech and Hearing

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<th>Course Code</th>
<th>Hours</th>
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### Laboratory Practice in Elementary School

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<tr>
<th>Course Code</th>
<th>Hours</th>
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<td>3-5 s.h.</td>
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### Education Electives

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<th>Hours</th>
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<td>11 s.h.</td>
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</table>
Recommended Courses

A. All areas of specialization
Courses, or their equivalents, required for M.A. degree, and the following additional courses:

3:120 Fundamentals of Laboratory Instrumentation
3:220 Advanced Laboratory Instrumentation
3:250 General Experimental Phonetics
3:251 General Experimental Phonetics Laboratory
3:390 Research Speech Pathology
3:591 Research Audiology
3:592 Research Experimental Phonetics

Statistics beyond introductory course
Courses in computer science
Courses in psychology (physiological, learning, motivation, personality)

B. Speech pathology
Courses listed under A and:

Seminars in areas of interest
Clinical practica

C. Audiology
Courses listed under A and:

3:254 Psychoacoustics
3:255 Psychoacoustics Laboratory
3:256 Physiology of Hearing

Seminars in areas of interest
Clinical practica

D. Speech and language science
Courses listed under A and:

3:254 Psychoacoustics
3:255 Psychoacoustics Laboratory

Seminars in areas of interest
Courses in linguistics and psycholinguistics
Courses in biological and physical sciences and mathematics

B. Hearing science
Courses listed under A and:

3:254 Psychoacoustics
3:255 Psychoacoustics Laboratory
3:256 Physiology of Hearing

31:224 Sensory Processes
Seminars in areas of interest
Courses in biological and physical sciences and mathematics

Students following programs in speech and language science or hearing science are normally expected to register for research credit during each semester of residence.

Training Assignments
All students in advanced degree programs are required to complete part-time professional training assignments of a research, teaching or clinical nature, as follows:

Master of Arts: at least three academic terms (semester or summer session).

Doctor of Philosophy: at least five academic terms (semester or summer session). Training assignments completed to fulfill the Minors of Arts requirement will not apply toward the Ph.D. requirement.

The time required for a typical training assignment is 10-15 hours per week. No registration is required for those training assignments, and no academic credit is given. The training assignments are in no way connected with or related to financial assistance. The maximum academic load for all graduate students is 15 semester hours of registration during regular semesters and 8 during the summer session. During a training assignment, the maximum load is 12 semester hours for a semester and 6 for a summer session.

Admissions and Appointments
The Department of Speech Pathology and Audiology has requirements for admission and graduate appointment which supplement those specified by the Graduate College. Only a brief summary of these requirements is presented below. For more detailed information, contact the Department chairman.

Special Admission Requirements
Scores from the aptitude tests of the Graduate Record Examination are generally required. Applicants may be admitted without such scores only in special cases. All applicants must have a completed "Information Form" with the Department. This form can be obtained from the Department chairman.

Admission into the master's program is based on consideration of an applicant's credentials in relation to those of other applicants for that term. Thus a minimum grade-point average cannot be specified exactly. As a general guideline, however, experience indicates that few students with undergraduate averages under 3.0 (B) will be admitted into the M.A. program. This does not imply that all applicants with a G.P.A. greater than 3.0 will be admitted.
Admission Deadlines and Processing

Applicants to M.A. program:
Completed application to begin a program in summer session or fall semester must be received no later than the preceding February 1. Late applications will be considered only in special situations. Applications to begin study in the spring semester will be considered only under special circumstances and only if they are received no later than the preceding November 1. In most instances, applicants for summer session or fall semester will be notified of action on their admission between March 1 and April 1. Applicants for spring semester will be notified as soon as possible. In some cases, an applicant may be admitted only on the condition that he begins his program in a different term than the one for which he has applied.

Applicants to Ph.D. program:
Completed applications must be received at least two months prior to the beginning of the term for which application is made: approximately April 1 for summer session, July 1 for fall semester and November 1 for spring semester. However, if an applicant wishes to be considered for graduate appointment, the admission application must be filed by the deadline for appointment applications specified below. Applicants will usually be notified of action on their admission within six weeks after their applications are complete.

Applications for Graduate Appointments
The following information applies to all financial appointments (assistantships, fellowships, traineeships) administered by the Department:
Graduate appointments usually begin only in fall semester. Students beginning study in second semester or summer session are considered for appointments for the following fall semester.
Scores on the aptitude tests of the Graduate Record Examination are routinely required for consideration for financial assistance.

Appointment applications must be received by February 1 to insure consideration for an appointment beginning the following fall semester.

Initial appointment offers are generally made between March 15 and April 1; however, offers continue to be made after this time.

Clinical Facilities
The clinical training program derives great benefit from the fact that Iowa City is the health center of the state and that these health service facilities are located so that they may be fully utilized in the clinical training of students in speech pathology and auditory. The University of Iowa Affiliated Speech and Hearing Services are accredited by the Professional Services Board of the American Board of Examiners in Speech Pathology and Audiology. These affiliated services include the University of Iowa Speech and Hearing Clinic; Division of Speech and Hearing; Department of Otolaryngology and Maxillofacial Surgery; Speech and Hearing Services, University Hospital School; Speech and Hearing Services, Pediatrics—State Services for Crippled Children; Audiology and Speech Pathology, Veterans Administration Hospital.

The University of Iowa Speech and Hearing Clinic serves the University and the general public. Included in its services are audiological evaluations and rehabilitation programs for speech, hearing and language problems, and a six-week summer residential program for children. These clinical programs are planned for the training of students through supervised clinical experience with a wide variety of speech, hearing and language disorders. This training is enhanced by the use of the modern facilities of the Wendell Johnson Speech and Hearing Center, which include audiological testing suites, diagnostic and therapy suites, a closed-circuit television system and modern equipment for diagnosis and therapy.

In addition to the clinical training in the University Speech and Hearing Clinic, such training may also be acquired in supervised clinical practice with elementary school children by arrangement with the Great Wood Area Education Agency, in supervised clinical practice in speech and hearing services provided by the Department of Otolaryngology and Maxillofacial Surgery, Department of Pediatrics, Iowa State Services for Crippled Children, University Hospital School, Iowa City, Veterans Administration Hospital, and St. Luke’s Methodist Hospital, Cedar Rapids.

Public and private departments and programs in addition to those mentioned above often contribute to the cooperative professional training, research and service programs.

Research Facilities
Research facilities in the Wendell Johnson Speech and Hearing Center include a number of fully equipped laboratories for the study of the basic processes of speech, hearing, and language, and disorders of these processes. Included are laboratories and equipment for acoustic, physiological and perceptual studies of speech and for audiological, psychoacoustic and neurophysiological studies of hearing. Well-equipped mechanical and electronic shops and trained technical personnel are available for assistance in research instrumentation.

Cooperation of various departments of the University Hospitals and the College of Dentistry makes it possible to utilize additional facilities for the investigation of a wide variety of research problems. Research opportunities are materially broadened by the active participation and cooperation of specialists from various fields, including psychology, child development, education, engineering and medicine.

Courses
511 Introduction to Speech and Hearing Processes and Disorders
Speech, language and auditory behavior in field of scientific study; description of major types of speech, hearing and language disorders. 3 a.h.
320 Phonetics of American English
American speech and phonetic system; application of International Phonetic Alphabet to description and analysis of American English. 3 a.h.
297 Honors Seminar
Readings, reports, preparation of papers and discussions of research problems in speech pathology and audiology. Open only to Honors students. 3 a.h.
588 Honors Theses
Supervision of major projects leading to research problem in speech pathology and audiology. Open only to Honors students. 3 a.h.
5110 Anatomy of Speech and Hearing Mechanisms
Anatomy of peripheral and central structures of speech and hearing mechanisms; sections on general anatomic theory. 3 a.h.
5113 Functional Anatomy of Speech Science
Physiology, anatomic, perceptual characteristics of speech; principles and methods for the laboratory study of speech. Open only to those who have completed 5110 and 5115 or consent of instructor. 3 a.h.
5123 Introduction to Hearing Sciences
Normal auditory process; review of audiology, anatomy, physiology of the auditory
Speech Pathology and Audiology

system; subjective correlate of auditory stimuli. Prerequisites: 3.110 and Physiology and Anatomy 20.103.
2.114 Language Development 3 s.h.
Recent research and theory dealing with the acquisition of language (syntax, semantics and phonology) are discussed within the framework of cognitive development. Same as Psychology 30.107 and Linguistics 100.175.
2.116 Round Processes of Speech and Language 3 s.h.
Neuroanatomy and neurophysiology related to speech and language processes; theories on research concerning brain function, neuroanatomical structures and neural networks. Prerequisites: 3.117 Introduction to Psychological Science 3 s.h.
Same as Psychology 30.115.
2.120 Fundamentals of Laboratory Instrumentation 3 s.h.
Introduction to basic chemical and electronic instruments and their applications in speech and hearing science. Laboratory exercises provide facility with measurement techniques, circuit construction, instrument maintenance, data measurement, etc.
2.121 Auditory Instrumentation Laboratory 1 s.h.
Supervised laboratory experience for students in audiology although it can be taken by other students. Focus is on the measurement of environmental noise and on the evaluation and maintenance of audiometric equipment, filters, acoustic tape recorders, disc reproducers and hearing-aid equipment. Prerequisite or corequisite: 3.120.
2.140 Manual Communication 1 s.h.
History and comparison of various sign language systems such as American, Signed Standard English and Signed English, and tracing in the use of manual communication.
2.141 Manual Communication II 1 s.h.
Continuation of 3.140 which is prerequisite. Emphasis is on the further development of skills in the use of manual communication.
2.142 Communicating with the Hearing-Impaired 2 s.h.
Introduction to deafness and sign language, with emphasis on Signed Standard English, a visual representation of the English language. Course content includes orientation to deafness, deaf cultural identity, use of signs for use with deaf adults and children, students learn to read and produce signs through video tapes, demonstrations, and small group activities.
2.150 Foundations of Clinical Management 3 s.h.
Principles of clinical decision-making, introduction to patient assessment and results of therapy, interprofessional relationship. Lectures, discussions, projects and case observations. Prerequisites: 3.15 and 3.230. Corequisite: 3.152 or consent of instructor.
2.170 Introduction to Speech and Hearing Process and Disorders 3 s.h.
Same as Psychology 31.167.
2.182 Anatomy and Physiology of Auditory System 3 s.h.
Nature and causes of articulation disorders; diagnosis and management. Prerequisite: 2.182.
2.183 Blunting 2 s.h.
Research and theory of blunting behavior, causes, developmental factors, remedial procedures. Prerequisite: 3.183 or consent of instructor. Same as Psychology 31.165.
2.190 Literature and Research in Auditory Science 4 s.h.
2.192 Evaluation and Treatment of Hearing Problems in Children and Adults 3 s.h.
2.196 Problems: Speech Pathology err.
2.197 Problems: Audiology err.
2.199 Practice: Articulation Disorders 3 s.h.
Supervised practical class with emphasis on articulation disorders. Prerequisite: 2.199.
2.210 Voice Disorders 3 s.h.
Symptomatology and course of disorders of voice; diagnosis and management; relevant research; problems of voice instruction following laryngectomy.
Prerequisites: 2.199 and 2.210.
2.214 Children's Language Disorders 3 s.h.
Prerequisites: 2.199 or consent of instructor. Same as Linguistics 100.210. Language development, the nature of children's language disorders as well as the assessment and treatment of such disorders. Prerequisite: 2.114.
2.218 Experimental Psychology " 3 s.h.
Prerequisite: 2.117 or consent of instructor. Same as Linguistics 100.218. Study of psychological methods. Prerequisites: 2.199, 2.218.
2.230 Advanced Laboratory Instrumentation 3 s.h.
Continuation of 3.230 which is prerequisite. Laboratory exercises provide facility with circuit construction, "go" and "no-go" equipment, signal generation, switching and testing, magnetic tape recorders, transducers.
2.235 Neurophysiology of Speech and Language 3 s.h.
Nature and principles of interaction of speech disorders associated with disease, trauma and abnormalities of nervous system, including dysarthria, aphasia and development of hearing disorders.
2.237 Class Notes 2 s.h.
Notes, strategies, principles of treatment of speech disorders resulting from class notes. Prerequisite: 2.235 or equivalent.
2.240 Introduction to Diagnostic Audiology 4 s.h.
Introduction to techniques currently used in diagnostic audiology. Emphasis on principles and rationale of selecting clinical procedures. Supervised laboratory experience provide familiarity with test administration and evaluation. Prerequisites: 2.240 and 3.240 or consent of instructor.
2.241 Advanced Audiology 4 s.h.
Supervised laboratory experience provides an advanced level of study of diagnostic procedures. Laboratory sections focus on test administration and evaluation procedures. Corequisite: 3.241.
2.244 Rehabilitative Audiology 3 s.h.
Theorizes and principles for assessment and rehabilitation of the speech, hearing and language deficits of the hearing-impaired. Prerequisite or co-requisite: 2.244.
2.245 Audiology Procedures for Special Populations 3 s.h.
Theory and procedures for assessment and rehabilitation of pediatric, maladjusted and geriatric populations. Parent counseling and training procedures are included. Prerequisite: 2.243 or consent of instructor.
2.246 General Experimental Phonetics 3 s.h.
Fundamentals, acoustics, phonetics. General information concerning the perception of speech. Emphasis on research techniques. Prerequisites: 2.246 and 2.246 or consent of instructor. Same as Linguistics 100.246.
2.248 Speech-Language Research in Analysis of Auditory, Physiological and Phonetic Characteristics of Speech 3 s.h.
2.248 Psychopharmacology 3 s.h.
Lecture and discussion of modern topics and current research in auditory sensation and perception. Prerequisite: 2.248 or consent of instructor. Same as Psychology 230.248.
2.249 Psychoacoustics Laboratory 3 s.h.
Supervised laboratory supervision, study, analysis of auditory-perception apparatus and replication by students of classical psychophysical experiments. Corequisite: 2.249.
2.250 Hearing Aids 3 s.h.
Supervised clinical experience with individuals with hearing loss. Prerequisite: 2.249 or consent of instructor.
2.311 Practicum: Neurophysiology of Speech and Language 2 s.h.
Assessment and management of patient with lesions of the nervous system in levels of the AS, auditory pathways. Corequisite: 3.311.
2.312 Practicum: Class Notes 3 s.h.
Supervised clinical experience with individuals with visual impairments. Prerequisite: 3.312.
2.330 Practicum: Voice Disorders 2 s.h.
Supervised clinical experience in diagnosis and remedial procedures for voice disorders. Prerequisite: 3.330.
2.331 Practicum: Children's Language Disorders 2 s.h.
Supervised clinical experience in language disorders of children. Prerequisite: 3.331.
2.333 Practicum: Clinical Practice with a nervous system. Prerequisite: 2.233 or consent of instructor.
2.334 Practicum: Aural Rehabilitation 2 s.h.
Supervised experience with the rehabilitation of hearing-deaf children and adults. Prerequisite: 2.334 or consent of instructor.
2.335 Practicum: Hearing Aids 2 s.h.
Supervised experience with the rehabilitation of hearing-impaired individuals. Prerequisite: 2.335.
2.337 Practicum: Diagnostic Procedures 2 s.h.
Supervised experience with the evaluation of speech, hearing and language disorders. Prerequisite: consent of instructor.
2.339 Seminar: Articulation and Language Disorders 3 s.h.
An intensive review of critical issues in articulation and language disorders as they occur in children. Prerequisite: 3.339 or consent of instructor. May be repeated for credit.
3:21 Seminar: Seating
3:30 Seminar: International Study of Educational Issues and Research Findings. Prerequisite: 3:135 or consent of instructor. May be repeated for credit.
3:35 Seminar: Speech and Language Skills of the Mentally Handicapped
Prerequisite: consent of instructor. May be repeated for credit.
3:40 Seminar: Value
3:45 Seminar: Cultural Identity
3:50 Seminar: Neuropsychopathology of Speech and Language
Individually studied; special topics concerned with problems of speech and language associated with neurodevelopmental disorders. Prerequisite: consent of instructor. May be repeated for credit.
3:55 Seminar: Experimental Phonetics
3:00 Seminar: Psychopharmacology
Prerequisite: consent of instructor. Same as Linguistics 103:350 and Psychology 11:305.
3:05 Seminar: Language Development
Prerequisite: consent of instructor. Same as Linguistics 103:321 and Psychology 21:214.
3:10 Seminar: Personality
Prerequisite: consent of instructor. Same as Psychology 103:324.
3:15 Seminar: Experimental Audiology
3:20 Seminar: Clinical Audiology
3:25 Seminar: Experimental Audiology
3:30 Seminar: Audiology
Prerequisite: consent of instructor. May be repeated for credit.
3:35 Seminar: Research: Speech Pathology
Prerequisite: consent of instructor.
3:40 Seminar: Audiology
Prerequisite: consent of instructor.
3:45 Seminar: Experimental Phonetics
Prerequisite: consent of instructor.

Statistics
See "Mathematical Science."

Urban and Regional Planning
Program chairman: James A. Spady
Program coordinator: Charles A. Holec; associate professor Douglas Low; associate professor James Spady; instructor Denise WIES; visiting associate professor David Williams; visiting assistant professor Joanne Satter; associate David Kuhl, Paul Cluver, John Hoye
Degrees Offered
B.S., M.S.
Planning is a diverse field, requiring and allowing a broad range of talents and interests. Planning has been called one of the few fields that tap enough intellectual and personality talents to satisfy the so-called “many-talented person.” Yet within planning there are areas of specialization for those having highly focused talents.
In recent years, the urban field of policy development has received formal recognition in both government offices and in private agencies. The Iowa planning program maintains a firm policy analysis and policy development focus in its approach to planning. Graduates of the program take professional positions in both traditional planning and in policy development.
Planning and policy development find their historical focus in the study of urban and regional systems and trends, and in professional activities guiding governmental interventions for betterment of social conditions. This historic base of planning activities has now broadened to include social decisions that transcend a variety of urban or regional focus, such as health policy and planning, environmental policy and planning, or criminal justice policy and planning. In addition, within the strictly urban focus, the field now encompasses the planning of the urban managements system itself. These newer components of planning and policy development nicely supplement the more traditional concerns with urban and regional development, transportation and land use, so as to provide a wide range of opportunities for professional service to both self and society. The emphasis at Iowa is on “social planning,” as distinct from “physical planning.” The Department enjoys fully recognized professional status by the American Institute of Planners, and holds Institute standards for professional education. This recognition affords some appreciable advantage to degree holders when seeking professional planning positions and affiliations.
Additionally, the 1974 study by the Association of the Collegiate Schools of Planning, an association of the 66 schools recognized by the American Institute of Planners, placed the Iowa program in the second four Association members in social planning. This ranking resulted from a poll of both planning academics and practicing planners.
At Iowa, “social planning” is viewed in its broad context, as an approach to all planning specialties, not as a specialty itself. Our goal is to combine the rigorous concepts and training usually associated with highly technical or professional fields, with the human well-being usually associated with more service-oriented fields.
Our faculty and students are involved both in human settlements and social problems, and in applied social science methodologies adapted for professional interventions. In addition, our students and graduates both as a goal orientation emphasizing human concern and the need for continual societal change and development, and a means orientation emphasizing the acquisition of significant professional skills sufficient to help achieve that goal.
Curriculum
The curriculum in planning and policy development comprises a 3-Semester-hour, four-semester program encompassing two academic years. The general philosophy underlying the curriculum is that planning is policy officials, and must understand urban government and urban society, and must also possess a wide range of empirical and analytic skills necessary to assess urban problems and propose interventions to alleviate those problems. The curriculum consists of five coordinated areas:
The first three deals with urban structure and function. They teach the student the urban society and the natural pattern of urban growth, development and change. Recommended courses are 102:202 Urban Development I and 102:313 Urban Economic Analysis I.
The second curricular part deals with techniques of planning analysis. It teaches the student the analytic, empirical and judgmental methods employed by planners. Required courses are 102:210 Introduction to Analytic Methods, 102:220 Intermediate Analytic Methods, 102:240 Economics for Policy Analysis and

102:206 Planning Method.
The third curricular part deals with methods for intervention into natural urban systems to attain the more desirable conditions defined by the various analytic studies. Required courses are 102:207 History and Theories of Planning, 102:229 Collective Decision Making, 102:269 Urban Law and Legislation, 102:214 Organizational Resource Allocations and 102:303 Laboratory in Program Design and Evaluation.

A workshop sequence comprises the fourth part of the curriculam. The workshop sequence provides practice at professional analysis and synthesis, in the continual context of professional report writing on urban problem situations. The workshop sequence parallels and complements the academic training of the first three parts of the curriculum with heavily applied task intended to develop judgment about professional situations. Required courses are 102:200 Workshop in Information Systems and Presentation, parallelizing and applying Urban Structure and Dynamics Sequence; 102:301 Laboratory in Issue Analysis, parallelizing and applying Techniques of Planning Analysis Sequence; and 102:303 Laboratory in Program Design and Evaluation, parallelizing and applying Intervention Methods Sequence. The required core of the curriculum, consisting of the four parts just listed, total a maximum of 33 semester hours, leaving a minimum of 20 semester hours to electives. In practice, however, every course except the workshops and 102:206 Planning Methods can be waived by the program faculty upon a showing that the student has already mastered equivalent material before entering the program. Many students have up to three courses waived under this rule.

Each waived course allows an additional elective for the well-prepared student.

The program also allows substitution of more advanced courses for those listed in the core. For example, a student with an undergraduate major in economics might choose to substitute an economics department graduate course in public finance for the planning program's otherwise required 102:214 Organizational Resource Allocations course.

The fifth part of the curriculum is the sectoral "major," comprising nine semester hours chosen from courses offered in various departments and schools of the University, and including the planning program itself. The sectoral major can be selected from eight planning areas, or it can be student-designed as an ad hoc major. The currently listed eight majors are: urban development, regional development, health policy and planning, environmental policy and planning, community participation, criminal justice policy and planning, transportation policy and planning, and urban management.

A student may substitute two "minors" of six semester hours each for the major, if that better serves the student's professional objectives.

The philosophy underlying the majoring system is that while breadth of training (substance presented in the first four parts) is necessary to professional competence in any field of planning, specific subject matter of a more narrow kind is very useful for purposes of the initial professional position and the initial professional direction of personal development.

No honor is granted, but the student may choose to write one for six semester hours of credit toward a major or minor.

A comprehensive examination is administered at the close of the fourth semester.

Two semester hours of credit are offered for a summer internship under the student's direction. If the student writes an essay discussing and evaluating the internship experience.

Experimental Learning
Faculty and students in the planning and policy development program are often brought to one another a wide range of experiences, both professional and personal.

Fields represented by the training of the program's faculty include architecture, sociology, political science, law, operations research, geography, engineering and economics. Faculty professional experience includes practicing architect, community organizer and town planner, special assistant to state governor, chief regional planner, state planning director, RAND consultant, legislative assistant to the N.Y.C. Council, United Nations urban development consultant, counsel to a state senators assistant majority leader, urban renewal director, and city manager.

The student contribution to the experiential aspect of the learning community is equally diverse. For example, the 31 students entering in 1973-74 included six who had majored in economics, four in political science, three in anthropology, three in architecture, two each in sociology, geography, and general studies, and one each in urban development, criminal justice, planning, social studies, English, biology, history, classics and philosophy.

Admissions Standards
The 31 students in the 1973-74 entering class aggregated a mean undergraduate grade-point average of 3.38, and a mean (combined) set of GRE aptitude scores of 1274. A student having undergraduates GPA below 3.0 cannot expect admission unless either the undergraduate institution attended was a highly distinguished one, or the combined GRE aptitude scores are at least 1300, or there is compelling evidence of distinct leadership qualities of a kind relevant to public service.

Also, a student compiling combined GRE aptitude scores below 1200 cannot expect admission unless his or her undergraduate GPA was substantially above 3.0, or there is compelling evidence of distinct leadership qualities of a kind relevant to public service.

In all cases, whether or not the foregoing minimum standards are met, admission is competitive, so that possession of minimum qualifications does not guarantee admission.

Joint Programs
Law and Planning
The planning program and the College of Law cooperate in administering a four-year program which satisfies the degree requirements leading to an M.A. or M.S. in planning and a J.D. in law. This is a reduction of one academic year from the total requirements of the two programs taken separately. Separate admission to both academic units is required.

Preventive Medicine and Environmental Health
The planning program and the Department of Preventive Medicine and Environmental Health, in the College of Medicine, cooperate in administering a program for health policy planners leading to the M.A. or M.S. in planning and the Ph.D. in preventive medicine. The total of four years of coursework is reduced to three years of coursework by virtue of the joint agreement. A thesis and general examination is additionally required for completion of the Ph.D. Separate admission to both academic units is required.
Urban Transportation

The urban transportation research and training program is admin-
istered by the Center for Urban Transportation Studies of the
Institute of Urban and Regional Research. This Institute, and its
Transportation Center, is a separately organized unit at The
University of Iowa. Both the Director of the Institute and the
Director of the Transportation Center are members of the planning
faculty. The Center provides transportation certification to stu-
dents in academic graduate departments at Iowa and satisfy a
prescribed set of interdepartmental transportation courses. Plan-
ning students interested in transportation find this certificate pro-
gram enhances the value of their departmental major in transporta-
tion. A separate admissions process is maintained for joint
candidacy. For particulars, see the Urban Transportation section
do the Catalog.

Special Facilities

The program maintains its own teaching and periodicals library.
 Adequate minor research facilities are included, sufficient for
student research into professional materials. Each student is
provided with a desk and other devices of a professional setting.

Courses

102.07 Urban Transportation to Planning and Policy Development 3 s.h.

102.09 Urban Politics

102.12 Readings in Planning 3 s.h.

102.15 Environmental Planning and Law 3 s.h.

102.17 Introduction to Urban Transportation Systems 3 s.h.

102.18 Housing Economics 3 s.h.

102.19 Readings in Planning 3 s.h.

102.20 Urban Development 3 s.h.

102.21 Housing, Energy, and Environmental Policy 3 s.h.

102.22 Regional and Metropolitan Economics 3 s.h.

102.23 Urban Economic Analysis 3 s.h.

102.24 Health and Policy Planning 3 s.h.

102.25 Organizational Resource Allocation 3 s.h.

102.26 Employment and Environmental Policy Planning 3 s.h.

102.27 Economic Analysis 3 s.h.

102.28 Public Policy Analysis 3 s.h.

102.29 Sophomore Seminar in Transportation Planning 3 s.h.

102.30 Economic Analysis 3 s.h.

102.32 Introducing Urban Transportation Systems 3 s.h.
Urban Transportation

102.506 Special Problems in Planning 3 s.h.
Adversity problems in urban analysis, regional analysis, urban design and general plan development; research of planning problems of special interest to students with approval of Department; written report and one presentation required.

102.521 Seminar in Social Planning 3 s.h.
Analysis of social policy issues such as housing, education, employment, welfare, and health; emphasis is placed on philosophical foundations of analysis as well as on methodology.

102.523 Planning and Land-Use Controls Seminar 3 s.h.
Examination of traditional zoning controls, flexible controls and market devices in the land use planning, critical area controls, growth management, exclusionary zoning, fair housing, environmental impact assessments.

102.525 Seminar on Special Problems 2-3 s.h.
Opportunity for faculty and students to conduct seminars on topics of interest, as either experimental or resource-based.

102.526 Seminar in American Maturity 3 s.h.
Historical roots of American cultural, political and socioeconomic experiences of racial minorities in the U.S. with special focus on Native Americans, blacks and Chinese in the contemporary urban scene.

102.527 Seminar: Selected Problems in Social Policy 3 s.h.
Problems in selected areas: education, health, justice, poverty and welfare. Primary focus on comprehensive and creative approaches from public institutional and private perspectives.

102.528 Collective Decision Making 2-3 s.h.
A study of dynamics and size for collectives, for the purpose of setting the logical and institutional framework within which planning processes. National, political, and organizational processes of decision making are studied and commented.

102.548 Economics for Policy Analysis 2 s.h.
Fundamentals of microeconomics theory applied to problems of planning and policy analysis; emphasis on price theory, resource allocation, public goods, public policy, market problems in economic systems.

102.541 Problems and Processes of Development in Latin America 3 s.h.
Background studies in history, geography, political structure, population, health and welfare, followed by problems of current operating programs and planning efforts, economic integration, development plans for specific regions, varying incomes with Latin American experiences, faculty from various departments.

102.543 Organizational Policy Analysis 2-3 s.h.
A study of organizations as the principal entities through which public policy and planning are planned and achieved. Both governmental bureaucracy (supply side) and private organizations (demand side) are analyzed.

102.560 Justice Policy and Planning 1-3 s.h.
Introduction to the criminal justice system: courts, police, prisons, juvenile justice, emphasis on basic planning and policy issues.

102.561 Seminar on Justice Policy and Planning 1 s.h.
Survey of programs and techniques in criminal justice planning; evaluation of programs and policies, components; emphasis on procedures for design and evaluation of policy experiments.

102.570 Urban Policy and Planning I 3 s.h.
Evaluation of efficiency and equity impacts of investment and management policy alternatives; application of mathematical techniques, primarily on linear programming.

102.571 Urban Policy and Planning II 2 s.h.
Individual research project on topics in transportation and land use; examples: industrial development, road finance evaluation, one-way streets, traffic flow, residential development, highway congestion, expansion of island waterfront facilities. Prerequisites: 102.560 and 102.561 or consent of instructor.

102.576 Urban Growth in Developing Countries 3 s.h.
Cross-disciplinary analysis of problems associated with urbanization and development in the developing societies; same as Anthropology 115-275; Economics 402-275; Sociology 24-275, Political Science 20-275 and Geography 44-275 (interdepartmental seminar).

102.577 International and Comparative Research Project in Urban Thesis 6-9 s.h.
Research and analysis of special planning problems selected by student with approval of Department; development of research opportunity for students to apply knowledge obtained in area of specialization.

102.560 Laboratory in Information Systems and Presentation Techniques 3 s.h.
Introduction to basic information systems, graphical and display techniques, and communication. Development of test studies, seminars, written and oral reports examining practical planning and policy issues.

102.501 Laboratory in Issues Analysis 2 s.h.
Builds analytic, administrative, and communications skills through a consideration of case studies, scenarios, written and oral reports analyzing practical planning and policy issues.

102.502 Laboratory in Program Design and Evaluation 3 s.h.
Emphasizes problems and procedures in the design and evaluation of alternative planning strategies; case studies, scenario, written and oral reports.

102.511 Transportation Research and Development 3 s.h.
Students in the transportation certification program are required to enroll in this course each term for 3 hours credit.

Urban Growth in Developing Countries

Program coordinator: Michael L. McNally

A non-degree graduate program of interdisciplinary and cross-cultural seminars and courses is offered through the Center for the Study of Urban Growth in Developing Countries within the Institute of Urban and Regional Research. Intended to facilitate and coordinate interdisciplinary instruction and research, the program is available to graduate students from departments throughout the University.

In addition to a number of related courses offered in specific departments, the program includes a graduate course, Urban Growth in Developing Countries, currently cross-listed in the departments of Anthropology (115-275), Economics (402-275), Geography (44-275), Political Science (30-275), Social Work (42-275), Sociology (34-275) and Urban and Regional Planning (102-275). Taught by an interdisciplinary team, the course introduces students to the analysis of urban problems from a cross-cultural and interdisciplinary perspective.

A graduate workshop is intended to provide a forum for graduate students and faculty from a variety of departments to meet regularly to discuss problems of mutual interest. Additional information may be obtained by contacting the program coordinator.

Urban Transportation

A graduate program consisting of both education and research is offered through the University of Iowa's Center for Urban Transportation Studies. The program encompasses the interactions of an urban society with the various modes of passenger and freight transportation. Active participation of nine academic disciplines allows the student to assemble a program spanning physical, economic, social, and institutional elements. It is this multidisciplinary approach that distinguishes this program from the more traditional graduate urban transportation programs.

An effort is made to integrate issues of economic evaluation of alternative investments, environmental quality, travel demand, urban spatial structure, land use impacts and transportation capital management and planning, and distributional equity into a technically sound analytical framework. With few exceptions, graduates of the program are currently employed in a variety of functions in the transportation field.

Rather than graduating a degree, the Graduate Program in Urban Transportation draws upon courses offered by participating departments and is coordinated by the Center for Urban Transportation Studies within the Institute of Urban and Regional Research. Certification is granted upon completion of the required 18 semester hours of urban transportation coursework. This academic certification has been authorized by the Graduate College of The University of Iowa, and is documented on the student's transcripts. Students admitted into the program participate in conjunction with the established degree (M.A., M.S., M.B.A., Ph.D. or J.D.).
arrangements of their individual departments, programs and colleges. Students who are enrolled, or who expect to enroll in the following University disciplines, are invited to apply for admission to the Graduate Program in Urban Transportation. Business Administration, Economics, Geography, Law, Political Science, Psychology, Sociology, Systems Engineering, and Urban and Regional Planning.

Requirements

Two core courses and four optional seminars make up the curriculum, with the core courses and the Transportation Program Seminar required of all students. The seminar is of a continuing nature, and students register for it for the entire duration of their participation in the transportation program. This helps maintain interaction between students from the various disciplines, and assure the continuation of an interdisciplinary approach to transportation planning.

Each student must take two courses from the selected option stem and two from any of the other stems.

Required Core Courses

102:111 Introduction to Urban Transportation

581:272 Urban Transportation Planning

102:311 Transportation Program Seminar

Options and Requirements

Transportation Policy Formulation and Analysis
102:260-261 Transportation Policy and Planning I-II
102:240 Economics for Policy Analysis
102:250 Seminar: Urban Transportation Issues

Transportation Systems Design and Evaluation
581:179 Traffic Systems Analysis

Analysis of Travel Demand and Behavior
102:211 Readings in Travel Demand Models
44:236 Travel Behavior in Urban Areas

Transit Management and Operations
*Public Transportation Planning and Operations
*Logistics of Public Transportation

*To be developed during 1977-78

Research

Problems of small urban systems and low density states are emphasized in research projects. Through a combination of course work and research activities—surveys, analysis of local transit systems, design and monitoring of small demonstration projects, etc.—it is believed students will develop skills and receive a practice-oriented ethical/social experience in areas such as travel behavior, transit systems design, transit finance, and impact evaluation. Urban and regional laboratories available for this learning process (Downtown, Iowa City, Cedar Rapids, Quad Cities and Johnson County) provide an attractive range of small urban and regional systems within which to study travel behavior and transit planning.

All students financially supported in the program participate in the transportation research of the Center; it is provided for students to develop their own research activities.

Student Support

Fellowships, research assistantships, tuition scholarships and summer assistantships are awarded on a competitive basis with the level of financial support ranging from quarter-time research assistantships ($200 per month for the academic year) to half-time research assistantships ($400 per month). All out-of-state students receiving research assistantships are eligible for in-state tuition. Students receiving financial support during the academic year are eligible for half-time summer research assistantships, as funding permits; these assistantships are generally awarded for two months at $400 per month.

The financial support indicated above is not intended to span all potential sources of revenue within the University, but only to indicate the typical levels of financial support within the Center for Urban Transportation Studies.

Admission

Application for admission to the Graduate Program in Urban Transportation is made by submitting a duplicate University application form, two letters of reference, and a brief statement relating the nature and extent of the applicant's interest in urban transportation.

Women's Studies

Chairperson: Sheryl B. McDowell

The Women's Studies Program offers a variety of undergraduate and graduate courses designed to explore the nature, status, image and achievement of women in social, historical, anthropological, economic, political, and artistic contexts. Faculty and students attempt to carry on this exploration through feminist perspectives. Women's Studies courses focus on material previously neglected by scholars and on material previously approached from a limited perspective. No major is presently offered, but concentrations in Women's Studies at the M.A. and Ph.D. levels are available in many departments.

In addition to courses listed in the regular course schedule, Women's Studies courses for University credit are offered by the Saturday and Evening Class Program and by Correspondence Study. Non-credit classes are taught at the Women's Resource and Action Center.

American Civilizations

45:002 American Civilization II (American Writers)
45:002 American Civilization II (American Women's Autobiographies and Journals)
45:002 American Civilization II (Women in 19th Century Utopias)
45:002 American Civilization II (Women in U.S. Reform Movements)
American Civilization II (Black Women Writers)

American Civilization II (American Family, New Alternatives)

Contemporary Black Experience (The Black Woman)

Introduction to Women's Studies; Sociology of Sex Roles

The Popular Image of Women in America

Changing Concepts of Women in Literature

Women in Literature (Representative British and American Women Writers)

Socialization and Self-Concept

Women's Roles: Cross-Cultural Perspective

Themes in Art History (Women Artists of the 20th Century)

Rhetoric (Women's Studies section)

Physical Education Skills (Self-Defense for Women)

Human Sexuality

Psychological Aspects of Women's Roles

Issues and Application in Counseling Women

Sex Role Stereotyping and Socialization in Education

American Regional Literatures (Southern Women Writers)

American Poetry (Autobiographical Mode: Women Poets of the '60's and '70's)

Modern British and American Poetry (Women Poets)

Literature and Philosophic Thought (Origins of British Feminist Thought)

Female Protagonists in German Literature

Historical Background of Contemporary Issues

European Women: Sex, Society and Culture

Studies in History of Women in America

Readings: History of American Women

Sex, Society and Culture: Traditional Europe

Sex, Society and Culture: Modern Europe

Discrimination in Employment

Nursing in the Social Order

Research on Women in Sports

Child Care Centers: Development and Administration


Women in Power

Introduction to Women's Studies: Sociology of Sex Roles

Images of Women in Hispanic Literature

Film in Society (Images of Women in Film)

Communicating in Public (The Articulate Woman)
World Order Studies
Program director: Barnes E. Voss (on leave)
Acting program director: T. D. Hidy

The existence and quality of life are increasingly threatened by forces over which humanitarians so far displayed little or no control: war, nuclear proliferation, exploiting populations, spreading famine, widening poverty, rampant pollution, and dwindling resources, to name a few. Some say there is nothing we can do to avert the ultimate catastrophe these forces imply. Others say civilization will survive no matter what. But whatever one's long-term viewpoint, the evidence is everywhere that these forces must be examined, discussed, and acted upon with urgency.

In direct response to his urgent need, The University of Iowa is offering a new multi-disciplinary, non-degree program in World Order Studies. The Program seeks the fullest possible development of individual capabilities in relation to ensuring human survival and human dignity on a worldwide basis. It is concerned with achieving heightened sensitivity to the basic interdependencies of "Spaceship Earth"—past, present, and especially future.

The World Order Studies Program provides an intellectually challenging opportunity to learn about significant global problems not adequately or thoroughly covered by any one department or college. Additionally, it encourages the integration of personal and professional concerns with an eye to human enrichment and service for the future.

As part of a growing field of international education and research that is preeminently policy-oriented and solution-orientated, the Program is considered especially useful to students who are working toward careers in government, the diplomatic service, and in the United Nations and related organizations. Further, it is highly relevant to careers in business, journalism, law, social work, and urban affairs, as well as engineering, medicine, and other applied fields. Students interested in the military, teaching, and other professions which are concerned with social attitudes and cultural values find the Program attractive. It is particularly appropriate to the field of education since almost any academic subject will profit from a World Order Studies perspective. In short, many diverse careers can benefit from the World Order Studies Program.

The Program is available to students from throughout the University, but is intended mainly for undergraduates. Thus it is designed with the following students particularly in mind: (1) students who want generally to broaden their knowledge about present and future world affairs; (2) students who wish to pursue a course in a traditional degree program; and (3) students who wish to establish an area of concentration in the program leading to the Bachelor of General Studies degree. In every instance, however, the Program is subject to all the requirements (including "core course" requirements) of a student's chosen department or college, and to all the rules and regulations of the departments and colleges associated with the Program.

Topical Focus
In the belief that a more peaceful and sane world is within human reach, the World Order Studies Program focuses primarily on the following four categories of critical global concern: war prevention, human rights, economic welfare, and ecological stability. Each of these broad categories is seen as a general curricular reference-point for many different issues of fact and policy. Consequently, each involves a diversity of inquiries from a variety of disciplinary perspectives. Seeking to bridge, and hence to augment, the traditional disciplines, they serve to call attention to those global problems which appear to have outstripped the existing nation-state system and which seem, therefore, most demanding of investigation and solution as humankind moves into the 21st Century: (1) how to limit violence and prevent wars so that nations and peoples will be governed more by persuasion than by coercion; (2) how to expand social justice so that discrimination and oppression will be reduced and more people given more opportunity to determine what should happen to their lives; (3) how to raise levels of economic well-being so that degrading poverty will no longer be the lot of billions; and (4) how to restore the global environment so that people can enjoy the benefits of Earth in good health and without fear of pollution and the waste of finite resources.

Methodological Orientation
Because the four problem areas comprising the topical focus of the World Order Studies Program involve many distinct issues of fact and policy, each is accorded detailed separate analysis. However, because each of them and the issues they embrace are fundamentally interdependent, they also are examined in a coordinated, multi-disciplinary manner. A principal aim of the Program is to encourage understanding of the four problem areas form an integrated global perspective—much as students of national politics and urban and regional planning view national and local community problems.

Additionally, as part of an updated form of world citizenship education, the Program stresses values clarification and futuristic thinking. It considers not only what is politically and technologically possible, but also what is humanistically desirable relative to the major problems facing the world community. Accordingly, it explores all the methods and skills of the behavioral and social sciences.

Finally, through lectures, films, simulations, and other pedagogical methods, the Program incorporates many different kinds of learning experiences. In time, building on particular student interests, field work and independent research will be encouraged.

Curriculum
The following newly developed and previously offered courses comprise the curriculum of World Order Studies Program to date, organized according to the Program's principal topical and methodological concerns. Because all courses are subject to schedule change, students are advised to consult the University's Schedule of Courses. Courses marked by an asterisk (*) are considered introductory, and therefore are listed out of numerical sequence.

General Introductory
*400-100 Global Interdependence and Human Survival: An Introduction to World Order Studies
016:178 The United States in World Affairs: 1900 to Present
050:013 Introduction to World Politics
050:110 Introduction to International Law
Same as 91:285:
050:151 The United Nations
044:155 The Changing World
Zoology

Most appropriate of these topical courses yet those marked by an asterisk (*) cover International Law (030:110, 091:285) and Preferred World Futures (042:157) also recommend.

Use II. All the basic Use I courses, plus the introductory courses to each of the four problem areas comprising the topical focus of the Program: Politics of War and Peace (030:146); Human Rights (030:165); Introduction to Global Poverty (054:079); and Introduction to the Global Environments (044:234). The courses are intended as a relatively detailed study of world order problems and issues, but if possible should be supplemented by introduction to International Law (030:110, 091:285) and Preferred World Futures (042:157), especially appropriate for students seeking a minor in a traditional degree program or an area of concentration in the program leading to the Bachelor of General Studies degree.

Use III. All the basic Use I courses, plus the introductory and three or four other courses listed under one of the four problem areas to comprise the topical focus of the Program. These are intended for intensive study in a particular area of world order concern. If possible, they should be supplemented by introduction to International Law (030:110, 091:285) and Preferred World Futures (042:157), as they are especially appropriate for students seeking a minor in a traditional degree program or an area of concentration in the program leading to the Bachelor of General Studies degree.

The above three uses of the World Order Studies Program are suggestions only. They are not seen as necessarily the best alternatives under all circumstances. For example, students admitted to Teacher Education Programs of the College of Education may find it sufficient to take only the basic introductory course (054:079) and the course listed under "Curriculum and Teaching." Nor are the above three uses mutually exclusive or incompatible of adaptation to related University courses not listed above. Thus, students interested in "area studies" courses which may relate significantly to the Program may prefer some variations on the above programs. So also may students specialising in foreign languages and cultures. Indeed, because the problems of world order often are a consequence of insensitivity to the unique perspectives of different peoples, the study of foreign languages and cultures is encouraged.

The Program Director is invited to consult with the Program Director as well as their immediate advisors when planning their schedules. In any event, questions relating to course priority and sequencing are best answered through close consultation.

Faculty
The faculty for the World Order Studies Program is drawn from throughout the University. The core faculty who have helped to develop the Program to date come from the fields of anthropology, economics, education, engineering, English, geography, history, law, microbiology, physics, political science, religion, social work and sociology. Each is interested in different aspects of world order, but all subscribe to the view that the problems of world order require an integrated, policy-oriented and futuristic approach.

Sponsorship
The World Order Studies Program was initiated by, and is offered through, the Center for World Order Studies, formerly a project of The Stanley Foundation (Muscovine, Iowa) in cooperation with the Center for World Order Studies, the Institute for World Order (New York City), the State University of Iowa Foundation, and The University of Iowa.

The Center first developed the Program with financial and other assistance provided by the Stanley Foundation, the Institute for World Order (New York City), the State University of Iowa Foundation, and The University of Iowa.

The Center is responsible for the coordination and continuing development of the Program. Additionally, it advises students, hosts guest speakers and conferences, and submits close liaison with other internationally concerned individuals and groups both within and outside the United States.

The Center is administered by a faculty director with the assistance of a rotating advisory committee comprised of University faculty and administrators. To ensure the multidisciplinary nature of the Program, ordinarily no more than one committee member comes from the same department or office.

Zoology

Department chairman: Jerry E. Kohler

Degree offered: B.A., B.S., M.S., Ph.D.; also M.S. in biology jointly with Biostatics Department

Undergraduate Program

The undergraduate degree program in zoology provides a sound liberal arts background for a career in biological science. Graduates may enter directly into government service or industry. The program also prepares students for advanced degree programs and leading to the research, teaching (university, four-year college, community college, secondary and primary schools) or health professions (medicine, dentistry, paramedical).

The basic courses offered in the Department serve both in own majors and others planning to enter health professions, or fields such as psychology, anthropology and sociology, as well as students are in other fields who have a cultural interest in biological science.

Principles of Animal Biology, a one-semester introduction, covers the major topics according to a sequence designed for the first course taken in the Zoology Department. Majors should take basic courses in genetics immediately following the introductory course, evolution and cell physiology. Beyond this "core" curriculum, the student has a virtually unlimited choice of 100-level courses in zoology, to a minimum of 33 semester hours. A student may substitute 100-level coursework in other areas of natural science or in mathematics (exclusive of the specific course requirements listed below) for up to eight hours of the 33-hour total in zoology. Courses required for a B.A. or B.S. degree in zoology are:

In other departments:

8W:10 Expository writing 3 s.h.
22M:16 or 22M:25 Calculus I 3 s.h. or 4 s.h.
Zoology

4:1, 4 Principles of Chemistry I, II 6 s.h.
4:6 Elementary Chemistry Laboratory 2 s.h.
4:123 Organic Chemistry I 3 s.h.
99:120 The Chemistry of Biological Materials 3 s.h.
29:17-18 Introductory Physics I-II 8 s.h.
or
29:1-2 College Physics 8 s.h.

In the Zoology Department:
37:3 Principles of Animal Biology 5 s.h.
37:128 and
37:129 Fundamental Genetics 3 s.h.
Genetics Laboratory 2 s.h.
or
37:109 Cell Physiology 4 s.h.
37:105 Cell Physiology 4 s.h.
37:131 Evolution 4 s.h.

17-18 s.h.

Electives in zoology or other science-mathematics 15-16 s.h.

Courses which may be used to fulfill the 33-hour requirement in zoology include 37:3 and any course numbered 100 or above (other than 37:125), except that no more than three hours can be included from 37:195-199. In addition, up to eight hours of courses beyond the requirements in other natural sciences and mathematics may be substituted, subject to the following limitations:

a) Courses taken in the departments of Botany, Chemistry, Geology, Physics, and preclinical departments of the College of Medicine must be numbered 101 or above; any such 100-level course may be used except A Plant in Civilization (12:125) and other comparable courses directed primarily at non-science students.

b) Any course taken in the Division of Mathematical Sciences must have first-semester calculus (22M:25) as a prerequisite.

Students are encouraged to take courses in zoology and other sciences beyond the required minimum.

For general requirements for B.A. and B.S. degrees, see "College of Liberal Arts."

Honors
Students in the college-wide Honors Program may earn an Honors degree in zoology by completing a total of at least six semester hours in 37:186 Honors Laboratory Research, 37:197 Honors Readings in Zoology and 37:198 Honors Seminar in Zoology.

Introduction to Research
The departmental program offers membership in a small, active group of undergraduates with common interests, and association with one of the Department's research groups. Experiments, running discussions of current research, the study of specialized topics and attendance at research lectures are pursuits of practicing scientists to which the students are introduced. An introduction to research activities can be obtained either in or outside the scope of the Honors Program and may be pursued in summer as well as during the academic year.

Graduate Programs
The various graduate programs of the Department are designed to prepare students for various kinds of professional activities, including teaching at various levels, participation in research in private, educational or government laboratories, or other kinds of professional service, frequently involving some planning or administrative functions. More than 80 percent of the doctorates of the last ten years have, at one time or another, been engaged in college or university teaching. A substantial number of students completing their training with an M.S. degree have obtained technical or professional positions, some of which require assumption of independent responsibility in performance or planning.

Each of the members of the Department carries out research. Programs in cell biology, developmental biology, genetics, molecular biology, pharmacology in its various aspects, ecology, behavior, physiology and parasitology are included in the Department, and most of these have auxiliary aspects which are served through work in other departments, sometimes with joint sponsorship of faculty in the other departments. For purposes of student advising, these programs have been consolidated into four general areas: developmental biology, ecology and behavior, genetics, physiology. Each student selects one of these areas as a specialty, and is thereafter advised by the faculty of that area, his or her program toward meeting the requirements of the advanced degree program is monitored by the faculty of that departmental area. The faculty area committee can specify courses which must be taken or audited. It can recommend that particular teaching or research experiences be sought. It has the obligation of offering advice and counsel. It is responsible for producing the M.S. examination, administering it and providing faculty members for the formal committee which oversees M.S. theses and evaluates the examinations. When a student is approved for continuation toward a Ph.D. degree, he or she also selects an advisory committee of five (one from outside the Department), and that committee is thereafter responsible for advising and monitoring the student's progress.

The M.S. Degree in Zoology
The M.S. degree with thesis requires 30 semester hours of graduate credit and a thesis based on original research. Ordinarily six to eight semester hours are required in thesis research and writing.

The remaining hours are to be selected in consultation with the student's advisory committee, and the choice of courses will be tailored to the student's background and career goals. Credit received in courses at the 100-level or above, with the exception of courses in zoology required to fill up deficiencies revealed by the diagnostic examination (see above), may be included in the 30-hour minimum if approved by the advisory committee. After the thesis is accepted, the candidate must pass a written examination covering his or her graduate program in zoology, with emphasis on the area related to the student's research. This is followed by an oral examination concerned mainly with the work reported in the thesis.
The M.S. degree without thesis requires 34 semester hours of graduate credit and a library research report. No more than four semester hours of credit may be granted for the research report. Credit may be earned in graduate courses in zoology or cognate sciences, these courses to be determined in consultation with the student's thesis committee and tailored to fit the student's background and career goals. Credit received in courses at the 100-level or above, with the exception of courses in zoology required to make up deficiencies revealed by the diagnostic examination (see above), may be included in the 34-hour minimum if approved by the advisory committee. On completion of the hours requirement and acceptance of the research report by the student's faculty sponsor, the student must pass a written examination covering his or her graduate program in zoology, including the area of the student's report.

The M.S. Degree in Biology

Thirty semester hours of graduate credit are required of all students who earn this degree with thesis. Ordinarily six to eight semester hours are assigned to thesis research and writing, eight to twelve semester hours to graduate courses in zoology, eight semester hours to graduate courses in botany and the remaining semester hours to free elective courses. Following acceptance of the thesis, the candidate must pass a written examination covering graduate programs in botany and zoology. This is followed by an oral examination based mainly on the work reported in the thesis. The Botany and Zoology departments offer a 16-semester hour program leading to the M.S. in biology, without thesis.

The Ph.D. Degree in Zoology

For each Ph.D. degree candidate a departmental committee is formed, of which the candidate's faculty sponsor is chairman. The committee is charged with establishing course or dissertation requirements which the candidate must meet. The background of the candidate, and his or her current and prospective research interests, are taken into consideration. The committee also establishes that portion of the formal coursework or particular responsibilities (such as ability to read certain modern foreign languages) which will be demanded of the student before admission to the comprehensive examination. In this examination the candidate is expected to demonstrate knowledge of the fundamentals of zoology and mastery of one or two specialized fields. Upon successful completion of the comprehensive examination, all of the requirements for a scholarly piece of work will be demanded. The acceptance of the thesis by the Department will be followed by the final oral examination over the thesis itself and the specialized field which it represents.

Graduate Student Awards and Aid

Nearly all of the graduate students in the Department receive some support, the largest number from fellowships, scholarships and research assistantships, provided either through the Graduate School or from individual research grants administered by faculty members.

Stipends and full tuition are available in federally-funded developmental biology, cell and molecular biology, and neurobiology training programs administered by the Department. Two of these programs support predoctoral fellows. Support through interdisciplinary programs in genetics (predoctoral) and cancer (postdoctoral) is also available.

The Department also participates in the University-sponsored program of teaching/research fellowships. Students who apply for any departmental award may be considered for others, if the reviewing committee considers them eligible. The Department provides some support each summer for students who arrange for training in marine laboratories on the coasts, or at other appropriate summer stations. Most assistantship and other requirements for the following academic year are filled by April 1. But opportunities occasionally exist for appointments at other times, including the beginning of the second semester. Requests for appointment should include clear statement of research interest, if such interest has been defined at the time of application.

Orientation

Prior to registration in August, all new graduate students take a diagnostic examination covering topics in developmental biology, genetics, physiology with an emphasis on cell physiology, evolution and ecology. On the basis of examination results, students may be excused from further work in one or all of these fields, or required to take specific courses to enhance their background in these areas. These requirements are made to ensure breadth of background for specialized graduate work. Any deficiencies in these areas of mathematics, chemistry or physics are to be made up during the first year. Applicants with a degree other than biology or zoology may request modification of certain of the area requirements, this is the province of the student's degree committee.

Admission

An applicant for graduate admission should have a grade-point average above 3.0 and a Graduate Record Examination Aptitude (Verbal + Quantitative) score above 1250. The GRE Advanced Biology score should also be submitted. Although the Department prefers applicants who have completed undergraduate programs much like its own, it will consider applicants with other backgrounds, such as biochemistry, biochemistry and other related areas.

Special Facilities

The Department is housed in a cluster of contiguous buildings, with additions completed in 1965 and 1971 more than doubling previously available research space, nearly doubling teaching space and permitting enlargement of the departmental library.

Many of the laboratory courses in the Department depend heavily upon the availability of living animals, and the Department is provided with animal-care facilities for mammals, birds, reptiles, amphibians, fishes, insects and invertebrates of various sorts, including protozoa. Special facilities exist for research with viruses, fruit flies and marine organisms. At least 12 walk-in and reach-in environmental chambers are provided for special culture or animal care needs.

There are four transmission electron microscopes, including one for teaching and student research purposes, and one with high resolution capabilities. The Department also houses the scanning electron microscope facility of the University.

The Department is as well as to carry out research in all areas in which graduate teaching is conducted. Light microscopes of a variety of types are available, including those with phase contrast and polarizing capabilities, and those with Nomarski optics. Confocal microscopes of various sorts, including refrigerated, high-speed and ultra-high-speed models, are available.

Other special equipment includes electron microscopes and chromato- graphic apparatus: electron amplifying and recording equipment

Zoology

219
In the field of business administration and economics began at the University of Iowa before 1900. A School of Commerce was organized in 1914 and was granted college status in 1921. It was named the College of Business Administration. The college offers the degree Bachelor of Business Administration; Master of Business Administration; Master of Arts in Accounting, Business Administration, and Economics; and Doctor of Philosophy in Economics and Business Administration (with specializations in accounting and various business administration areas).

These undergraduate and graduate programs are fully accredited by the American Assembly of Collegiate Schools of Business.

The college is organized into four academic departments: Accounting, Business Administration, Economics, and Finance. The College of Business Administration, the Department of Business Education. Undergraduate and graduate activities are supported by the Center for Labor and Management, Institute for Insurance Education and Research, Institute for Economic Research, and Industrial Relations Institute.

**Undergraduate Study**

The college offers the Bachelor of Business Administration degree in all four departments. The B.B.A. student completes background studies either in the College of Liberal Arts or in another institution and usually enters the College of Business Administration as a junior.

**Program Requirements**

To secure educational breadth and to permit limited specialization at the baccalaureate level, Iowa's B.B.A. curriculum requires 120 semester hours for graduation, with at least 48 hours in business courses and at least 48 hours in nonbusiness courses. Limited specialization is effected through the student’s option for a designated major or area of concentration.

The last 30 (or 45 of the last 60) semester hours must be earned in residence at Iowa following admission to the College of Business Administration; at least 24 semester hours of credit in courses offered by the College of Business Administration, and at least eight semester hours of credit in the student's major or six semester hours in each area of concentration, must be earned at Iowa.

If the quantitative methods, psychology/sociology, accounting and economics requirements are not satisfied when the student is admitted to the college, they must be undertaken in the first enrollment and completed successfully completed. In general, all common requirements should be completed by the end of the student's junior year.

To graduate, the B.B.A. candidate must have at least a 2.0 grade-point average on all coursework; on all coursework attempted at Iowa, on all business and economics coursework attempted at Iowa, on all coursework attempted in the major or area of concentration, and on all coursework attempted at Iowa in the major or area of concentration.

**Common Requirements**

The B.B.A. candidate must satisfy these minimum common requirements:

- **Biology/communications**
  - 6 s.h.
- **Humanities-culture**
  - 6 s.h.
- **Literature**
  - 6 s.h.
- **Natural sciences (excluding mathematics)**
  - 3 s.h.
- **Psychology or sociology**
  - 6 s.h.
- **Quantitative methods**
  - 8 s.h.
- **Accounting (1A-1 and 1A-2)**
  - 6 s.h.
- **Economics (5E-1 and 6E-2)**
  - 6 s.h.
- **Computer Analysis (6B-12)**
  - 3 s.h.
- **Finance (6B-15)**
  - 3 s.h.
- **Marketing (6B-31)**
  - 3 s.h.
- **Legal environment (6B-47)**
  - 3 s.h.
- **Management (6B-51)**
  - 3 s.h.
- **Economics**
  - 6 s.h.
- **Required courses in business policy**
  - 1 s.h.

- *Note: This is not an exhaustive list of all possible courses. Additional courses will be required as specified by the student’s major.*

- *Students must complete a major area of study in two areas of concentration. The requirements for a specific major are established by the department of the college.*

- An area of concentration consists of a combination of related coursework, selected by the student and approved by the advisor, which is designed to meet a specific academic or career objective.

- **Credit by Examination**

  Students may earn up to 12 semester hours of credit by examination. Selected exams from the College-Level Examination Program (CLEP) of the College Entrance Examination Board are used. It is possible to receive exemption with or without credit for some of the common requirements of the college. Information on the CLEP examinations is available from the liberal arts advisory office.

- **Major's Schedule**

  Course schedules of more than 18 semester hours for a semester or for a summer session require approval of the assistant dean.

- **Pass/Fail Grading**

  Of the total semester hours required for a B.B.A. degree, up to 32 may be taken on a pass/fail basis with the consent of the advisor and instructor. However, a student may not count more than 1
semester hours of pass/fail credit in his or her last 60 semester hours of coursework. Courses with the 6A, 6B, or 6C prefix which are taken to satisfy the common business requirements may not be taken pass/fail, nor may courses in the student’s major area or areas of concentration. Pass/fail registration must be completed during the first three weeks of a semester of the first two weeks of a summer session. For courses taken on a pass/fail basis, an earned grade of C or above is recorded as a P; otherwise, the grade earned (D or F) is recorded.

Second-Grade-Only Option

Unless otherwise involved and with permission of the assistant dean, a student may be permitted to repeat a University course and have only the grade and credit of the second registration used in calculating his or her cumulative grade-point average. This option may be applied to a maximum of 16 semester hours of work.

Admission

Admission is normally at the beginning of the junior year. Second-semester sophomores may be admitted if an accelerated program record has been established. Unconditional admission requires at least a 2.35 grade-point average (A=4) in all college-level course undertaken, including all courses undertaken at Iowa and all business and economics courses. The applicant should also have satisfied the following common requirements: rhetoric-communication, psychology/sociology, quantitative methods, accounting and economics, and either historical-cultural or literature.

No more than 60 semester hours, or equivalent, of transfer credit will be accepted for a student transferring from a two-year institution. Transfer credits for business and economics courses taken during the freshman and sophomore years are counted toward the B.B.A. degree only if such courses are normally offered as lower division courses at Iowa. Fulfillment of the minimum requirements does not ensure admission. The college’s admission committee reviews all applications and selects the applicants who appear best qualified. Students who have minor deficiencies in meeting admission requirements may be granted conditional or probationary admission.

Interdepartmental Graduate Programs

Master of Business Administration

The Master of Business Administration (M.B.A.) program is designed for individuals preparing for professional administration careers primarily in business. The program gives the individual a means of enhancing career opportunities and at the same time provides industry and government with the professional personnel required in a dynamic economy.

The curriculum is designed for candidates whose undergraduate majors were in liberal arts, science, engineering or other nonbusiness areas, as well as for graduates of schools or colleges of business administration. For the student who has taken no undergraduate business administration courses, 37 semester hours of coursework are required. For the student holding an undergraduate degree in business administration, certain of the requirements normally will be waived. However, in all cases, a minimum of 33 semester hours of graduate work is required. The following courses, totaling 24 semester hours, are normally required of the student with a nonbusiness baccalaureate degree. A student who majored in business must take any of these courses he or she has not already taken.

The work is normally taken in the first year of the M.B.A. program.

6A:192 Financial Accounting 3 s.h.
6B:193 Computer Methods—M.B.A. 2 s.h.
6B:194 Managerial Finance—M.B.A. 2 s.h.
6B:195 Management of Organizations—M.B.A. 3 s.h.
6B:196 Marketing Management—M.B.A. 2 s.h.
6B:197 Management Methods 2 s.h.
6B:198 Society, Law and Business—M.B.A. 2 s.h.
6E:100 Price Employment and Production Theory 3 s.h.
6E:190 Consumer and Firm Behavior 2 s.h.
6E:191 National Income Analysis 2 s.h.

In the M.B.A. core, the student has the opportunity to continue the broad study begun in the sequences of courses listed above and pursue in greater depth the special interests associated with his or her own career objectives. In addition to courses required of all students, each individual decides upon an area of concentration and, with the assistance of the M.B.A. advisor, selects six semester hours of coursework in that area. Areas of concentration may be specified in finance, marketing, industrial relations, organizational theory, management systems and accounting.

The following are the core course requirements, totaling 33 semester hours:

Integrated Core (18 s.h.):

6A:214 Accounting for Management 3 s.h.
6B:261 Administrative Science I—M.B.A. 3 s.h.
6B:265 Administrative Policy—M.B.A. 3 s.h.
6B:271 Statistical Methods—M.B.A. 3 s.h.
6B:273 Business Economic Theory—M.B.A. 3 s.h.
6B:276 Operations Research in Business—M.B.A. 3 s.h.

Applied Core (9 s.h.):
The student must take 3 of the following 4 courses:
6B:215 Financial Policy Decisions—M.B.A. 3 s.h.
6B:232 Marketing Management—M.B.A. 3 s.h.
6B:256 Industrial Relations—M.B.A. 3 s.h.
6B:280 Management Systems—M.B.A. 3 s.h.
Areas of Concentration 6 s.h.

Doctor of Philosophy in Business Administration

The Ph.D. program is intended for individuals preparing for faculty positions in universities or collegiate schools of business administration and for business or government careers as research directors, staff specialists and consultants. The program is sufficiently flexible to accommodate specialization according to the student’s interests, background and objectives. In all phases of the program, doctoral students can demonstrate proficiency through qualifying, area-exempt examinations, and they are encouraged to do so.

Basic Areas

The purpose of the basic areas is to develop competency in research methods and to provide knowledge needed for study in virtually any later sequence of more specialized courses. Ideally, the student should complete all requirements in the basic areas before proceeding to the elected and specialized areas. The
requirements in the basic areas may be satisfied by passing a qualifying examination or by successfully completing each course. The basic areas and required courses are:

Economic Theory
6E:203 Microeconomics I 3 s.h.
6E:204 Macroeconomics I 3 s.h.

Statistics and Quantitative Analysis
6E:288 Management Science for Decision Making—Ph.D. 3 s.h.
6E:286 Statistics for Decision Making I—Ph.D. 3 s.h.
6E:287 Statistics for Decision Making II—Ph.D. 3 s.h.

Behavioral Sciences
6E:266 Behavioral Science and Business Organization I 3 s.h.
6E:267 Behavioral Science and Business Organization II 3 s.h.

Social Environment
6E:206 Social Environment of Industry—M.B.A. 3 s.h.

Elective Areas
Each student elects two areas for intensive study. With the approval of the adviser and the director of graduate studies in business administration, the student chooses two 200-level courses in each of two areas. Any student who, in any elective, does not attain a scholastic level of achievement deemed essential for a Ph.D. candidate may be required to take a comprehensive examination, in addition to successfully completing the course.

One of the elected areas must be, and both may be, in business administration. The business administration elected areas may be accounting, finance, information theory, organizational behavior, marketing, industrial relations or insurance. However, no attempt is made to restrict the elected areas to traditional classifications. The elected areas may not be in the behavioral sciences, social environment or an area which combines economic theory, statistics and quantitative analysis.

Specialized Areas
As a preparation for dissertation research, the student selects two areas for specialization and takes two graduate-level courses in each. One or both specialized areas may be a continuation of the coursework taken in the elected areas. They also may be from three of the student's four basic areas.

It is possible for a student to move through the basic and elected areas without taking a comprehensive examination, but all students must pass written comprehensive examinations in both of their specialized areas. In neither specialized area is the examination limited to the two courses in that area; the examination assumes that the student has completed requirements which give him or her a mastery over the field which is being examined.

Following completion of all areas and after passing written comprehensive examinations over the specialized areas, the student must take an oral comprehensive examination.

The Dissertation
Normally, the original research, writing and the oral examination in defense of the dissertation require at least one year of full-time effort.

Graduate Admission
See "Graduate College:"

Facilities
The College of Business Administration is located in Phillips Hall, an air-conditioned high-rise building designed especially for programs of the college. Completed in 1965, the building contains seminar and conference rooms, a computer laboratory, an auditorium and the business and economics library, in addition to a wide range of classroom facilities.

Extensive research materials for business and economics are maintained in the Main Library, and the facilities of the University Computer Center are available to all students. Additionally, students have direct access to a complete computer laboratory within the college. The laboratory serves the instructional programs of the college, and the staff maintains a current library of computational programs and data tapes to service user needs.

Center for Labor and Management
As a major continuing education arm of the college, the Center for Labor and Management provides relevant information to management, labor and government representatives in Iowa and the Midwest. Current industrial relations and administrative knowledge is disseminated through on- and off-campus conferences and through a research-oriented publication series. Organizational research and development projects give students experience in research and teaching as well as the opportunity to discuss current societal problems with private and public sector labor and management officials.

The Institute for Insurance Education and Research
The Institute for Insurance Education and Research is the continuing education arm of The University of Iowa's College of Business Administration in the field of insurance. The institute conducts schools and seminars throughout the year at The University of Iowa campus in Iowa City and at other locations across the state. It also engages in contract research related to insurance for public and private organizations.

The Institute for Economic Research
The Institute for Economic Research exists in order to facilitate cohesive and continuing economic research and to establish a formal mechanism for providing interaction with and economic advice to industry and government. The main objectives associated with the Institute are to provide economic information and advice on a continuous basis to business and to public agencies; to provide a state focal point for applied economic research; and to promote and enhance academic research and teaching in economics.

The Industrial Relations Institute
The Industrial Relations Institute was established in the fall of 1975 by the College of Business Administration with the approval of the Iowa Board of Regents. The Institute is designed to bring together faculty and students with interests in industrial relations for the purposes of curriculum matters and research and to conduct continuing education seminars and workshops for practitioners in the field of industrial relations. Faculty associated with the
### Accounting

**Preliminaries**

- Undergraduate accounting major (or equivalent)
  - 6B:70 Quantitative Methods (or equivalent)
  - 6B:71 Statistical Analysis (or equivalent)

**Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
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<tr>
<td>6A:220 Managerial Accounting Theory</td>
<td>3 s.h.</td>
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<tr>
<td>6A:221 Financial Accounting Theory</td>
<td>3 s.h.</td>
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<tr>
<td>6A:222 Information Systems and EDP</td>
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**Accounting**

The program in accounting is designed to meet the needs of individuals who wish to prepare for professional careers in accounting and related fields. The program provides for advanced study in contemporary issues effecting both public accounting and corporate accounting, and establishes a conceptual base for analysis of future issues and for further graduate study.

- **6A:115 Income Tax Accounting** - 3 s.h.
- **6A:130 Accounting for Management Analysis and Control** - 3 s.h.
- **6A:132 Financial Accounting: Advanced Topics** - 3 s.h.
- **6A:144 Auditing** - 3 s.h.
- **6A:145 Senior Seminar in Accounting** - 1 s.h.

The program in accounting is designed to meet the needs of individuals who wish to prepare for professional careers in accounting and related fields. The program provides for advanced study in contemporary issues effecting both public accounting and corporate accounting, and establishes a conceptual base for analysis of future issues and for further graduate study.

The Master of Arts degree is awarded upon successful completion of 30 semester hours of graduate study after satisfying the following prerequisites.

**For Undergraduates and Graduates**

- **6A:105 Introduction to Accounting** - 3 s.h.
  - Survey and analysis of contemporary accounting information systems; emphasis on external reporting by firms to investors, creditors, suppliers, and government agencies. Prerequisite: 6A:104 or equivalent.

**For Undergraduates and Graduates**

- **6A:105 Introduction to Accounting** - 3 s.h.
  - Survey and analysis of contemporary accounting information systems; emphasis on external reporting by firms to investors, creditors, suppliers, and government agencies. Prerequisite: 6A:104 or equivalent.

**For Undergraduates and Graduates**

- **6A:105 Introduction to Accounting** - 3 s.h.
  - Survey and analysis of contemporary accounting information systems; emphasis on external reporting by firms to investors, creditors, suppliers, and government agencies. Prerequisite: 6A:104 or equivalent.

**For Undergraduates and Graduates**

- **6A:105 Introduction to Accounting** - 3 s.h.
  - Survey and analysis of contemporary accounting information systems; emphasis on external reporting by firms to investors, creditors, suppliers, and government agencies. Prerequisite: 6A:104 or equivalent.

**For Undergraduates and Graduates**

- **6A:105 Introduction to Accounting** - 3 s.h.
  - Survey and analysis of contemporary accounting information systems; emphasis on external reporting by firms to investors, creditors, suppliers, and government agencies. Prerequisite: 6A:104 or equivalent.

**For Undergraduates and Graduates**

- **6A:105 Introduction to Accounting** - 3 s.h.
  - Survey and analysis of contemporary accounting information systems; emphasis on external reporting by firms to investors, creditors, suppliers, and government agencies. Prerequisite: 6A:104 or equivalent.
6A/123 Financial Accounting: Advanced Topics 3 s.h.
Special topics in corporate and government financial reporting. May be repeated for additional credit with a change in content. Preliminary: 6A/121 or equivalent.
Prerequisite: 6A/121.

6A/141 Advanced Tax Accounting 3 s.h.
Partnership, corporation, gift, estate, and trust tax problems; tax planning and research. Preliminary: 6A/113 or equivalent.

6A/144 Auditing 3 s.h.
Review of internal controls in accounting systems and safeguards of assets; standards and procedures necessary to test integrity of accounting system and financial reports. Preliminary: 6A/136 and 6A/122 or equivalent.

6A/145 Senior Seminar in Accounting 3 s.h.
Advanced topics in accounting include: report writing, auditing, and systems design; financial reporting for special entities, such as not-for-profit and governmental organizations; approaches to tax decisions through planning and research. Preliminary: 6A/115, 6A/122, 6A/126 and senior standing.

6A/179 Special Topics in Accounting 3 s.h.
Elective course for senior accounting majors; advanced topics in accounting covered in greater depth; topics chosen by student and faculty interest. Multiple sections offered if more than one topic demanded. Preliminary: consent of instructor. 

6A/199 Financial Accounting 3 s.h.
Survey of current practice and thought relating to external reporting by firm in its investors, lenders and critics of current reporting methods and their alternatives. Preliminary for M.B.A. students without undergraduate accounting; not open to undergraduate business majors. Preliminary: senior standing or admission to the Graduate College.

Primary for Graduates

6A/214 Accounting for Management 3 s.h.
Internal financial information systems; accounting information acquired and analyzed in context of management decision systems and models; relevant economics, behavioral sciences and quantitative methods employed as tools for analysis and display of accounting data. Preliminary: 6A/192 and 6H/310, 6H/341. Prerequisite: 6A/192 or equivalent.

6A/216 Financial Information for External Users 3 s.h.
Concepts and methods of corporate external reporting; theoretical basis of current practice of financial reporting. May be repeated for additional credit with a change in content. Preliminary: 6A/114 and 6A/115 or equivalent. Prerequisite: 6A/192 or equivalent.

6A/211 Financial Accounting Theory 3 s.h.

6A/212 Financial Information Systems and EDP 3 s.h.
The evaluation and design of financial information systems and control systems. Topics include: supplying and analyzing financial data to EDP, analytical sampling and analytical review; information economics and systems design and analysis. Preliminary: 6A/233.

6A/231 Decision Models and Business Strategy 3 s.h.
Analysis of investment and strategic decision models in business strategy. Preliminary: 6A/191 or equivalent.

6A/232 Contemporary Issues in Accounting 3 s.h.
Specific topics dealing with contemporary accounting issues. Selection of material will vary from semester to semester, depending upon instructors and students' interests. Preliminary: 6A/211.

6A/240 Empirical Research in Accounting 3 s.h.
Methodology of research and key relationships to accounting problems. Conducting research and analyzing results in the field of professional practice. Required of all M.A. students in accounting.

6A/230 Seminar in Financial Accounting Thought 3 s.h.
Evolution of accounting thought as applied to the current and future development of a conceptual framework of accounting. Specific consideration of the impact of information economics, decision theoretic models and capital market pricing studies on financial accounting information system choice. Preliminary for doctoral students.

6A/231 Seminar in Managerial Accounting Thought 3 s.h.
General topics include measurement, research concepts, design, and methods for managerial and related issues. Advanced topics in information economics, managerial accounting and systems design and analysis. Preliminary for doctoral students. 

6A/237 Seminar in Selected Topics in Accounting 3 s.h.
Individual project study and research paper presentation in specialized topical areas. Preliminary: consent of instructor.

6A/238 Thesis: Accounting 3 s.h.
Preliminary: consent of instructor.

Business Administration

Department head: Bruce M. Rich

6A/220 Financial Accounting Thought 3 s.h.
Evolution of accounting thought as applied to the current and future development of a conceptual framework of accounting. Specific consideration of the impact of information economics, decision theoretic models and capital market pricing studies on financial accounting information system choice. Preliminary for doctoral students.

6A/221 Seminar in Managerial Accounting Thought 3 s.h.
General topics include measurement, research concepts, design, and methods for managerial and related issues. Advanced topics in information economics, managerial accounting and systems design and analysis. Preliminary for doctoral students. 

6A/227 Seminar in Selected Topics in Accounting 3 s.h.
Individual project study and research paper presentation in specialized topical areas. Preliminary: consent of instructor.

6A/230 Thesis: Accounting 3 s.h.
Preliminary: consent of instructor.

The purpose of Iowa's undergraduate program in business administration is to give the student a general overview of business with its individualized need to society. The program deals with business theory, decision-making and management systems generally, rather than specializing in a particular facet of business organization. Designed to teach students about business rather than how to conduct business, the program's behavioral approach stresses the concept of human interactions in business and society at large.

Students graduating with the B.B.A. in business administration has a wide range of career choices. The largest number go into marketing. Many are employed by financial institutions and in junior management positions. Others enter government service and other nonprofit fields requiring administrative skills. Many continue their studies toward advanced degrees. There is considereable latitude within career areas. For example, the avenues open to a business administration graduate with a major in marketing include advertising and promotion, costing, product development and improvement, and product distribution.

The student of business administration can choose between two options in fulfilling the degree requirements:

In addition to courses specified in the college's general statement, students can select those three-course sequences (usually nine semester hours) in areas of concentration approved by a faculty advisor (two of the courses in each area must be offered by the College of Business Administration).

In addition to courses outlined in the general statement, students can elect a major in one of the following areas:

6A/220 Financial Accounting Thought 3 s.h.
Evolution of accounting thought as applied to the current and future development of a conceptual framework of accounting. Specific consideration of the impact of information economics, decision theoretic models and capital market pricing studies on financial accounting information system choice. Preliminary for doctoral students.

6A/221 Seminar in Managerial Accounting Thought 3 s.h.
General topics include measurement, research concepts, design, and methods for managerial and related issues. Advanced topics in information economics, managerial accounting and systems design and analysis. Preliminary for doctoral students. 

6A/227 Seminar in Selected Topics in Accounting 3 s.h.
Individual project study and research paper presentation in specialized topical areas. Preliminary: consent of instructor.

6A/230 Thesis: Accounting 3 s.h.
Preliminary: consent of instructor.
Requirements for the Major in Finance
68:15 Financial Management
68:71 Statistical Analysis
68:111 Investments
68:113 Financial Markets and Institutions
At least two semester hours of accounting beyond the basic core are also required, followed by any two of the following:
68:112 Security Analysis
68:114 Commercial Banking
68:118 Intermediate Financial Management

Requirements for the Major in Financial Economics
68:15 Financial Management
68:111 Investments
68:132 Financial Markets and Institutions
68:173 Managerial Economics
or
68:103 Microeconomics
These are to be followed by two of the following:
68:114 Commercial Banking
68:117 Money and Banking
68:119 Economics of the Government Sector
68:141 Industrial Organization

Requirements for the Major in Insurance
68:20 General Insurance
68:212 Property and Liability Insurance
68:122 Life and Health Insurance
At least one, but no more than two courses from the following:
68:21 Insurance Mathematics
68:113 Public Economic Security Programs
68:124 Risk Management
Six additional hours of courses are specified by the student's advisor.

Requirements for the Major in Industrial Relations
68:158 Personnel Management
One of the following:
68:151 Employment Rights
68:152 Labor Relations Legislation
One of the following:
68:153 Collective Bartering
68:154 Employee Relations in the Public Sector
One of the following:
68:155 Manpower Policy and the Development of Human Resources
68:111 Labor-Manpower Economics
68:159 Current Issues in Industrial Relations
Any of the eight courses above not previously chosen, or others designated by area faculty.

Requirements for the Major in Administrative Management
68:158 Personnel Management
68:161 Individual Behavior in Organizations
68:162 Group Behavior in Organizations
68:163 Design and Management of Organizations
One of the following:
68:168 Managerial Information Processing and Decision Behavior
68:169 Selected Problems in Administrative Management
Other courses designated by the area faculty.

Requirements for the Major in Management Systems
68:72 Computer Analysis
68:177 Simulation Methods
68:180 Management Information Systems
68:181 Topics in Management Information Systems
A student who does not wish to take both 68:176 and 68:177 may take one of them and one of the following:
22C:16 Introduction to Programming with PL/I
and
22C:17 Programming with PL/I
568:144 Information Systems Design
68:178 Topics in Operations Management
A course approved by the student's advisor.

Requirements for the Major in Management Science
Two of the following:
68:70 Quantitative Analysis
68:71 Statistical Analysis
68:72 Computer Analysis
Two of the following:
68:175 Decision Theory for Business
68:176 Operations Management
68:177 Simulation Methods
One of the following:
68:173 Managerial Economics
68:178 Topics in Operations Management

Requirements for the Major in Marketing
At least four, but no more than five:
68:132 Marketing Distribution Systems
68:134 Marketing Research
68:135 Consumer Behavior
68:137 Advertising Theory and Planning
68:138 Marketing Communications
68:141 Senior Seminar in Marketing
58:147 Marketing Management
Master of Arts

The Master of Arts program in business administration is designed for the student who seeks an opportunity for intensive specialization and a research experience. The program is available on both a thesis and nonthesis basis. Whereas the student aspiring to be a business or public administrator would normally seek the M.B.A. degree, the M.A. student might be contemplating a research or teaching career in a specialized area of business or employment in a business-related position requiring some degree of specialized knowledge. A student may take the master’s degree as he or she proceeds toward a Ph.D. degree.

The M.A. program is flexible to permit specialization according to the student’s interests and objectives. The student may select a major in finance, insurance, marketing, management, quantitative analysis, international business, industrial relations or other areas.

The minor may be developed from approved course combinations within the College of Business Administration or, under special circumstances, elsewhere in the University.

Semester hour requirements for the Master of Arts degree with thesis in business administration include:

| Major area | 9 s.h. |
| Minor area | 6 s.h. |
| Economic theory and/or administrative science | 6 s.h. |
| Electives | 6 s.h. |
| Thesis | 3 s.h. |
| **Total** | **30 s.h.** |

The Master of Arts degree without thesis in business administration has the following requirements:

| Major area | 12 s.h. |
| Minor area | 6 s.h. |
| Economic theory and/or administrative science | 6 s.h. |
| Electives | 6 s.h. |
| Research methodology | 3 s.h. |
| Research reports (two) | 2 s.h. |
| **Total** | **35 s.h.** |

The minimum number of semester hours for either program is normally earned in course exclusively for graduate students (200 level), but where appropriate the student may take courses at the 100 level. Coursework beyond the minimum semester hour requirement may be required if the student’s undergraduate preparation does not permit him or her to take graduate courses in a selected area.

A student in the thesis program will be expected to defend his or her thesis in an oral examination, and may be required to take a written and/or oral comprehensive examination over his or her coursework. A final oral examination is required for the nonthesis program.

Any M.A. student without computer programming competence is expected to enroll in a credit or noncredit programming course available at The University of Iowa.

Courses

Primary for Upper-Division Undergraduates

- **60:18 Financial Management**
  - 3 s.h.
  - Financial planning and management of money-capital in business firms; securities markets. Prerequisites: Accounting 40:2 and Economics 30:1.

- **60:20 General insurance**
  - 3 s.h.
  - Theory of risk and risk bearing; arrangements for dealing with risk; insurance industry, types of insurers, functions of insurers and governmental regulation of insurance; social insurance, basic features of selected insurance coverages. Prerequisite: Economics 40:2.

- **60:21 Insurance Mathematics**
  - 3 s.h.
  - Elements from probability and mathematics of finance developed and applied to problems in determination of insurance premiums, benefits and reserves. Same as Statistics 220-95.

- **60:21 Introduction to Marketing**
  - 3 s.h.
  - General introduction to functions of marketing; marketing environment of organizations and its strategies with respect to marketing decisions; buyer behavior and development of marketing decisions.

- **60:47 Introduction to Law**
  - 3 s.h.
  - General history and structure of law: law’s role in guiding changing economic and social patterns. Prerequisite: Economics 40:2 or junior standing.

- **60:81 Administrative Analysis**
  - 3 s.h.
  - Overview of problems encountered by members of task-oriented organizations; organizational analysis; problem analysis and decision methods; environment as it interacts on organizational environment.

- **60:79 Quantitative Analysis**
  - 3 s.h.
  - Qualitative models and applications to decision-making; calculus, linear programming, matrix theory, game theory and other related operations research techniques.

- **60:71 Statistical Analysis**
  - 3 s.h.
  - Fundamental principles of business statistics; study of work processes involving statistical or inferential discussions of collective behavior of data.

- **60:72 Computer Analysis**
  - 3 s.h.
  - Philosophy of the computer; emphasis on its role in problem-solving; computer applications of quantitative models for decision-making using computer resources; and program analysis by the student, programming inclusive to 10-project studies to solve the computer.

- **60:46 Production Management**
  - 3 s.h.
  - Organization and management of manufacturing enterprises; production design and process planning, plant layout and material handling, cost analysis and measurement, production, inventory control, etc. Prerequisite: Economics 40:2.

Courses for Undergraduates and Graduate

**60:11 Directed Readings in Business Administration**
  - 1-9 s.h.
  - Directed guided readings in selected topics in business administration.

**60:111 Investments**
  - 3 s.h.
  - Modern methods in selecting among alternative financial assets from the viewpoint of the individual; present value, return, risk, security analysis and regulatory environment.

**60:112 Security Analysis**
  - 3 s.h.
  - General theory of corporate valuation; financial statement analysis; economic and regulatory environment.

**60:113 Financial Markets and Institutions**
  - 3 s.h.
  - The role of money and capital markets in the processes of change and development of the economic system; banking industry; monetary policy.

**60:114 Commercial Banking**
  - 4 s.h.
  - Management of commercial banks and other financial institutions. Emphasis on tools and concepts of a banking industry, its assets and liabilities. May be taken for credit or for lecture.

**60:116 Finance and Financial Markets**
  - 3 s.h.
  - Development of financial markets; basic principles of finance; corporate and personal investment decision making.

**60:118 Intermediate Financial Management**
  - 4 s.h.
  - Complex analysis approach; methods of analyzing and interpreting financial statements; analysis of management of all types of debt and equity capital structure planning; understanding of major financial issues; emphasis on capital and capital budgeting. Prerequisite: 60:11 or consent of instructor.

**60:119 Selected Topics in Finance**
  - 1-6 s.h.
  - Depth study of selected topics in finance not covered by regular courses; credit hours and course content determined by instructor. Prerequisite: consent of instructor.
MBA Prerequisites Courses

6B-102 Computer Methods-I.B.A. 3 s.h.
Use of computers in business management; computer programming languages emphasizing time-shared BASIC, library programs, system design, SIS, data base languages.

6B-104 Managerial Finance-I.B.A. 3 s.h.
Goals of management, characteristics of financial instruments and markets, costs of funds and allocation of resources, working capital management.

6B-106 Management of Operations-I.B.A. 3 s.h.
Fundamental concepts, research and applications used in organizing, coordinating, directing and controlling manufacturing and service projects. Emphasis on numerical treatment.

6B-107 Marketing Management-I.B.A. 3 s.h.
Marketing's role in business and society, influence of new market forces and services on marketing management.

6B-112 Diplomatic Readings in Business Administration 3 s.h.

6B-202 MBA Research Project 1 s.h.

6B-211 Principles of Financial Management 3 s.h.

6B-213 Financial Markets 3 s.h.
Organization, role and regulations of capital markets; influence of capital markets on business and government decisions; policies affecting capital and security market performance.

6B-218 Seminar in Business Administration 1 s.h.
Prerequisite: consent of instructor.

6B-220 Management of Financial Institutions 3 s.h.
Problems and techniques used by financial institutions in the management of financial institutions; strategies of management and control of financial institutions.

6B-254 Risk Management in Business 3 s.h.
Principles and techniques used in the management of investments and credit risk; strategies of management and control of financial institutions.

6B-256 Seminar in Business Administration 1 s.h.
Prerequisite: consent of instructor.

6B-301 Marketing Research Methods 3 s.h.
Methods of design and analysis of research projects in marketing; computer using to carry research projects and problems in marketing.

6B-310 Multivariate Methods in Marketing 3 s.h.
Prerequisite: 6B-301.

6B-314 Psychological Scaling in Marketing Applications 3 s.h.
Survey methods of psychological scaling techniques which may be used in the design and conduct of market research in the marketing of business products and services.

6B-315 Industrial Relations-I.B.A. 3 s.h.
Course for those already in business who desire to learn the principles and practices of labor relations.

6B-320 Industrial Relations-I.B.A. 3 s.h.
Course for those already in business who desire to learn the principles and practices of labor relations.

6B-321 Seminar in Industrial Relations 3 s.h.
Prerequisite: consent of instructor.

6B-325 Industrial Relations-I.B.A. 3 s.h.

6B-330 Management Science 3 s.h.
Principles of operations research used in the solution of business problems; the use of linear programming, queuing theory, inventory theory, and simulation techniques in the solution of business problems.

6B-331 Data Processing in Business 3 s.h.
Prerequisite: consent of instructor.

6B-340 General Marketing Management 3 s.h.
Principles and techniques used in the management of marketing programs; strategies of management and control of marketing programs.

6B-351 Marketing Policy 3 s.h.
Principles and techniques used in the management of marketing programs; strategies of management and control of marketing programs.

6B-352 Consumer Behavior 3 s.h.
Principles of consumer behavior used in the management of marketing programs; strategies of management and control of marketing programs.

6B-353 Marketing Operations 3 s.h.
Principles of marketing operations used in the management of marketing programs; strategies of management and control of marketing programs.

6B-354 Marketing Strategy 3 s.h.
Principles of marketing strategy used in the management of marketing programs; strategies of management and control of marketing programs.

6B-355 Sales Management 3 s.h.
Principles of sales management used in the management of marketing programs; strategies of management and control of marketing programs.

6B-356 Marketing Management 3 s.h.
Principles of marketing management used in the management of marketing programs; strategies of management and control of marketing programs.

6B-360 Business Administration 3 s.h.
Principles of business administration used in the management of marketing programs; strategies of management and control of marketing programs.

6B-361 Financial Management 3 s.h.
Principles of financial management used in the management of marketing programs; strategies of management and control of marketing programs.

6B-362 Business Planning 3 s.h.
Principles of business planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-363 Strategic Planning 3 s.h.
Principles of strategic planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-364 Marketing Strategy 3 s.h.
Principles of marketing strategy used in the management of marketing programs; strategies of management and control of marketing programs.

6B-365 Marketing Operations 3 s.h.
Principles of marketing operations used in the management of marketing programs; strategies of management and control of marketing programs.

6B-366 Sales Management 3 s.h.
Principles of sales management used in the management of marketing programs; strategies of management and control of marketing programs.

6B-367 Business Administration 3 s.h.
Principles of business administration used in the management of marketing programs; strategies of management and control of marketing programs.

6B-368 Financial Management 3 s.h.
Principles of financial management used in the management of marketing programs; strategies of management and control of marketing programs.

6B-369 Business Planning 3 s.h.
Principles of business planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-370 Strategic Planning 3 s.h.
Principles of strategic planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-371 Marketing Strategy 3 s.h.
Principles of marketing strategy used in the management of marketing programs; strategies of management and control of marketing programs.

6B-372 Business Administration 3 s.h.
Principles of business administration used in the management of marketing programs; strategies of management and control of marketing programs.

6B-373 Financial Management 3 s.h.
Principles of financial management used in the management of marketing programs; strategies of management and control of marketing programs.

6B-374 Business Planning 3 s.h.
Principles of business planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-375 Strategic Planning 3 s.h.
Principles of strategic planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-376 Marketing Strategy 3 s.h.
Principles of marketing strategy used in the management of marketing programs; strategies of management and control of marketing programs.

6B-377 Business Administration 3 s.h.
Principles of business administration used in the management of marketing programs; strategies of management and control of marketing programs.

6B-378 Financial Management 3 s.h.
Principles of financial management used in the management of marketing programs; strategies of management and control of marketing programs.

6B-379 Business Planning 3 s.h.
Principles of business planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-380 Strategic Planning 3 s.h.
Principles of strategic planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-381 Marketing Strategy 3 s.h.
Principles of marketing strategy used in the management of marketing programs; strategies of management and control of marketing programs.

6B-382 Business Administration 3 s.h.
Principles of business administration used in the management of marketing programs; strategies of management and control of marketing programs.

6B-383 Financial Management 3 s.h.
Principles of financial management used in the management of marketing programs; strategies of management and control of marketing programs.

6B-384 Business Planning 3 s.h.
Principles of business planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-385 Strategic Planning 3 s.h.
Principles of strategic planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-386 Marketing Strategy 3 s.h.
Principles of marketing strategy used in the management of marketing programs; strategies of management and control of marketing programs.

6B-387 Business Administration 3 s.h.
Principles of business administration used in the management of marketing programs; strategies of management and control of marketing programs.

6B-388 Financial Management 3 s.h.
Principles of financial management used in the management of marketing programs; strategies of management and control of marketing programs.

6B-389 Business Planning 3 s.h.
Principles of business planning used in the management of marketing programs; strategies of management and control of marketing programs.

6B-390 Strategic Planning 3 s.h.
Principles of strategic planning used in the management of marketing programs; strategies of management and control of marketing programs.
Business Major Option
Complete the requirements for a major in one of these areas in the College of Business Administration:

Accounting
Economics
Finance
Financial Economics
Industrial Relations
Insurance
Management Systems/Management Science
Marketing
Administrative Services (see below)

Areas of Concentration Option
Complete one nine-hour sequence from each of the two following areas in the College of Business Administration, in addition to the courses required in the business administration core:

Accounting
Economics
Finance
Financial Economics
Industrial Relations
Insurance
Management Systems/Management Science
Marketing
Administrative Services (see below)
Basic Business (see below)

Requirements for the Administrative Services Major
- 65:2 Business Typing Problems 3 s.h.
- 65:22 Transcription 3 s.h.
- 65:33 Business Machines Applications 2 s.h.
- 65:112 Word Processing 3 s.h.

One of the following:
- 65:125 Organizational Communication 3 s.h.
- 65:126 Written Communication in Business 3 s.h.

One of the following:
- 65:145 Office Management 3 s.h.
- 65:155 Business Data Processing 3 s.h.
- 17 s.h.

*Administrative services majors who do not intend to teach shorthand, substitute 65:147 Basic Systems Analysis 3 s.h.

Requirements for Area of Concentration in Basic Business
- Select one of the following:
  - 65:100 Decision Making for Consumers 3 s.h.
  - 65:108 Principles of Business 3 s.h.
  - 65:189 Basic Business and Consumer Issues 3 s.h.
  - 65:155 Business Data Processing 3 s.h.

Teacher Certification
The courses required for the Iowa Professional Teaching Certificate can be found in the College of Education section of this catalog.
In addition, these courses are required of all business education teaching majors:
- 65:191 Principles of Business Education 3 s.h.
- 75:187 Seminar: Curriculum and Student Teaching 1-3 s.h.

Courses for Nonmajors
Two areas of concentration in administrative services without the teacher certification courses (consisting of a minimum of three courses (9 s.h.) in each area or a total of 18 s.h.) can be arranged for students pursuing a nonseeking degree in business administration.

M.A. Program
This master's program in business education is designed for the graduate student who holds a teacher's certificate and has either a major or a minor teaching area in business education. Its purpose is to upgrade professional competence in teaching business subjects in the secondary school or at the community college level.
A minimum of 32 semester hours must be included in the program, within these highly flexible distributions:

Business Administration
Six to 15 semester hours of credit in business administration or related business areas, such as office management, data processing or communication.

Business Education
Nine to 17 semester hours of credit, including three of the following courses:
- 65:203 Seminar: Basic Business 2-3 s.h.
- 65:204 Seminar: Teaching Accounting 2-3 s.h.
- 65:205 Seminar: Office Education 3 s.h.
- 65:207 Seminar: Information Processing 3 s.h.
- 65:210 Managing Business Instruction 3 s.h.
- 65:240 Seminar: Business Teaching 3 s.h.

Education
Six to 12 semester hours of credit in general education areas which meet the professional needs of the student, such as counseling education, higher education, adult education, educational psychology or educational administration.

All courses must be selected with the approval of an advisor. The candidate selects one of two options: (1) three two-hour comprehensive examinations in business education, business administration and education, (2) or two three-hour comprehensive ex-
M.A.T. Program

The M.A.T. program is a 38-semester-hour nonthesis course of study. It is designed for superior baccalaureate graduates who have had few or no education courses. The program enables the student to enrich his or her background by completing graduate courses in a substantive area and professional education courses which constitute professional preparation for secondary school teacher certification.

Two summers and two semesters are usually necessary to complete the program. The certification sequence consists of 24–27 hour semester of graduate coursework as follows:

One elective course in education: 3 s.h.
- Audiovisual Teaching Methods
- Social Development of the School-Age Child
- Principles of Guidance
- Aesthetics of Urban Environment

Construction and Use of Classroom Tests 3 s.h.

Preprofessional Seminar: Educational Psychology 3 s.h.

Philosophy or History of Education 3 s.h.

Methods (credit arranged) 3-6 s.h.

Observation and Laboratory Practice 12 s.h.

Candidates for the M.A.T. degree must pass comprehensive final examinations in business education and in education. These examinations are taken at the end of the semester in which the candidate expects to receive the degree.

Ph.D. Program

One to the flexible nature of this program, the candidate may place emphasis in both colleges (Business Administration and Education), although primary emphasis normally will be given to the various programs in business with particular attention to business education.

Degree Requirements

Two core areas to be chosen from: foreign language, statistics, advanced mathematics, computer programming, scientific method, or other appropriate research tools approved by the advisor.

Appropriate doctoral-level coursework approved by the advisor in each area, for these series of study:
- Major area—business education (16 s.h.)
- Related area in business (9 s.h.)
- Minor or collateral area in education (9 s.h.)

Completion of at least 90 semester hours beyond the bachelor's degree, including the dissertation and two approved courses in economic theory.

A three-hour comprehensive examination is required in each area of study.

Dissertation.

Admission Requirements

Admission to the University of Iowa Graduate College

Evidence of satisfactory performance on the Graduate Record Examination

Evidence of good academic preparation to undertake doctoral work in business education

Courses

For Undergraduates and Graduates

84-91 Retail Management 3 s.h.

85-92 Individual and Organizational Behavior 3 s.h.

86-93 Business Communication 3 s.h.

87-94 Business Law 3 s.h.

88-95 Business Ethics 3 s.h.

89-96 Business Information Systems 3 s.h.

90-97 Business Statistics 3 s.h.

91-98 Business Economics 3 s.h.

92-99 Business Finance 3 s.h.

93-00 Business Policy 3 s.h.

94-01 Business Planning 3 s.h.

95-02 Business Ethics 3 s.h.

96-03 Business Law 3 s.h.

97-04 Business Information Systems 3 s.h.

98-05 Business Statistics 3 s.h.

99-06 Business Economics 3 s.h.

00-07 Business Finance 3 s.h.
Program for the B.B.A. Degree

In addition to the common requirements for students in the College of Business Administration, the B.B.A. degree in economics requires 11 semester hours in 100-level economics courses, including 60:103 Microeconomics and 60:105 Macroeconomics.

Candidates for the B.B.A. degree may meet the requirements for the degree through a combination of common requirements in the College of Business Administration and completing two areas of concentration, each consisting of at least three courses (nine semester hours), two of which must be courses offered by the College of Business Administration. A student may select courses from those offered by the Department of Economics to fulfill the areas of concentration requirement. The two areas of concentration must be approved by the student's advisor.

Graduate Programmes

The department offers graduate instruction leading to both the M.A. and Ph.D. degrees. The department enjoys a respected position in current national academic rankings for its excellence of graduate program and faculty. Graduates of the department have gone on to occupy professional positions in education, government, and industry. They hold academic posts in major universities and colleges all over the nation. Many hold posts in branches of the federal government, e.g., departments of State, Agriculture, Commerce, and Treasury; District Federal Reserve Banks and Federal Reserve Board, and the U.S. Tariff Commission. Others have made careers in industry and in private research organizations such as RAND, the Brookings Institution, and Arthur D. Little. Still others have served in various economic capacities abroad for the State Department, the United Nations, and the Ford Foundation.

Master of Arts

The M.A. degree offers the student a rigorous training in applied economic analysis which can be completed in three semesters. A student who has performed well in the first semester, he or she can transfer to the Ph.D. program at that time with no loss of credit. The department also offers a joint M.A.-J.D. program. In this program the Department of Economics accepts up to nine semester hours to be applied to the M.A. degree and the College of Law accepts coursework in economics to apply toward the law degree.

M.A. Course Sequence

First Semester
- 60:200 Topics in Economics 1 s.h.
- 60:180 Mathematics for Economics 2-3 s.h.
- 60:204 Macroeconomics I 3 s.h.
- 60:261 Economic History of North America 3 s.h.
- 60:216* 9-10 s.h.

Second Semester
- 60:203 Price Theory 3 s.h.
- 60:184 Methods of Quantitative Economics 3 s.h.
- 60:207 History of Economic Thought I 3 s.h.
- 60:208 History of Economic Thought II 3 s.h.
- Elective 3 s.h.
- 12 s.h.

Third Semester
- Electives 6 s.h.
- Thesis 4 s.h.
- 10 s.h.

"The student can postpone 6E:26 until the third semester if he or she wants to take an elective in the first semester."

The program requires a total of 31 semester hours and a thesis, or 33 hours and two semester papers written in two 200-level economics courses. Each program requires an oral examination.

The program is designed so that it can be completed in three semesters; however, those who find the work too heavy may wish to take six semester hours of work during the summer between second and third semesters, or take a fourth semester.

Doctor of Philosophy

The Ph.D. program has three components: a coordinated sequence of core courses, a set of major area courses, and the writing of a dissertation. It is designed to bring students to a high level of technical competence through the core sequence and then to allow them, under faculty guidance, to design a personalized sequence of courses within their major areas. The core areas are microeconomic theory, macroeconomic theory, mathematical economics, and econometrics. The core itself consists of nine courses designed to be taken in a specific sequence. The academic load of nine to ten semester hours in the sequence presupposes that the student is employed as a research teaching assistant. Students not employed may carry additional courses. The Graduate College requires 72 semester hours of graduate credit for a Ph.D.

The Ph.D. program has a minimum mathematics requirement of two semesters of calculus. This requirement must be satisfied by the end of the first semester of the program.

Ph.D. Core Courses

First Semester
- 60:200 Topics in Economics 1 s.h.
- 60:204 Macroeconomics I 3 s.h.
- 60:180 Mathematics for Economics 3 s.h.
- Field Course 3 s.h.

Second Semester
- 60:303 Microeconomics I 3 s.h.
- 60:211 Mathematical Economics I 3 s.h.
- Field Course 3 s.h.

Third Semester
- 60:206 Macroeconomics II 3 s.h.
- 60:221 Econometrics I 3 s.h.
- Field Course 3 s.h.

Fourth Semester
- 60:204 Microeconomics II 3 s.h.
- 60:222 Econometrics II 3 s.h.
- Field Course 3 s.h.

For students with a sufficient mathematical and statistical background, part or all of 6E:180 will be waived. Students planning to
major in econometrics should take 22S:153-154 Introduction to Mathematical Statistics I and II. Students planning to major in economic theory should take a third semester of calculus and 6E:212 Mathematical Economics II.

Major Area Courses
Each student will choose a major area of study in addition to the core courses. Major areas offered by the department include economic theory, mathematical economics, history of economic thought, econometrics, economic development, international economics, monetary theory, labor economics, health economics, economic history, industrial organization, economics of the government sector, and regional and urban economics. A major area consists of a minimum of 24 semester hours of coursework consisting of intensive study of a field and additional courses which both supplement the major field and provide the student with sufficient breadth to understand the relationship between his or her own specialty and other related fields. The major area must include at least one course (three semester hours) in either economic history or the history of economic thought.

The set of eight field courses chosen by each student must be approved by the graduate director in consultation with the graduate advisory committee. The student must maintain a 3.5 grade-point average or better in the field courses. A student earning a low grade in a field course may repeat the course the next time it is offered and have the grade earned the second time replace his or her earlier grade for departmental purposes.

Qualifying Examination
A written qualifying examination covers economic theory and mathematical economics. The purpose of the examination is to determine which students may continue for the Ph.D. degree and which students should complete an M.A. program.

Comprehensive Core Examinations
A written comprehensive core examination covers economic theory and econometrics.

Comprehensive Examination
The student will complete an oral comprehensive examination by presenting a thesis proposal before a departmental seminar of the faculty and graduate students. A committee of five members of the faculty appoints an occasion by the graduate director will evaluate the student's performance. The thesis proposal presentation, passing of the core examinations, and completion of the major area courses with an acceptable G.P.A. comprise the requirements for admission to candidacy for the Ph.D. degree.

Dissertation Examination
Satisfactory completion of a dissertation research project is the final program objective of the Ph.D. program. An oral examination in defense of the dissertation research is required before a committee of five members.

Teaching and Research
Teaching and/or directed research are required and important parts of the graduate program. Teaching assistants work closely with the faculty in the Principles of Economics (6E:1-12) program and meet with a number of their own discussion sections. Research assistants work closely with one or more of the faculty on research projects. Students on fellowships are also called upon to participate in the teaching and research program at some point in their studies.

Courses
Primary for Undergraduates
Note: 6E:1 and 6E:2 may be taken in either order or they may be taken simultaneously; they satisfy the social science requirement for S.A. and R.S. students.

6E:1 Principles of Economics
4 s.h.
Organization and workings of modern economic society; role of markets, prices, and competition in promotion of economic welfare; regulation of business and labor; income distribution; system analysis; international trade and balance of payments; agricultural policies; money and prices; income and wealth, economic factors in local environment, alternative economic systems; international trade; pros and cons of alternate systems. Prerequisite: satisfaction of University mathematics requirement.

6E:2 Principles of Economics
4 s.h.
National income and prices, employment and prices, money and credit, government finance; symmetry and fiscal policy, economic growth and development, international finance, economic systems, Pros and Cons of Alternative Economic Systems. Prerequisites: satisfaction of University mathematics requirement.

6E:7 Contemporary Economic Problems and Policy
3-5 s.h.
Contemporary economic problems and analysis of the latest national and international economic developments, problems and policy issues. Topics to be covered include inflation and price controls, employment, national military problems, energy, inflation, federal budget, transportation, environment, poverty, discrimination in labor market, energy crisis. No prerequisites. Intended primarily for students unable to fit Principles of Economics, or other economics courses, into their programs. Open to students who have taken 6E:1 or 6E:2.

Economic Analysis and Policy
6E:103 Price, Employment, and Production Theory
3-4 s.h.
Role of supply and demand processes, social costs and benefits, national income analysis, employment, growth, and economic policy, alternative economic systems. Prerequisites: Principles of Economics. Prerequisite: satisfied by previous courses in economics. Prerequisite: senior or graduate standing.

6E:109 Microeconomics
3 s.h.
Economic theory of consumer behavior, producer behavior, and role of markets in coordinating economic decisions, conditions for efficient resource allocation by market mechanism. Prerequisites: 6E:1 and 6E:2 in senior standing.

6E:105 Macroeconomics
3 s.h.
Measurement of national income, unemployment, inflation, depression, determination of national income, analysis of the role of multiplier, political economy, business cycle, money, fiscal and monetary policies, foreign trade, effects of government on the economy. Prerequisites: 6E:1 and 6E:2 in senior standing.

6E:111 Labor-Market Economics
3 s.h.
Impact of industrialization on labor markets with analysis of resulting problems area; unemployment, labor turnover, discrimination, wages and fringe benefits, working hours, and the role of government in labor market economics. Prerequisites: 6E:1 and 6E:2 in senior standing.

6E:113 Health Economics
3 s.h.
Structure of American health care industry and applications of economic analysis in its problems of production, pricing, and distribution; special attention to supply and demand economics in medical and hospital services, impact of changes in health care delivery systems on the payment system. Prerequisites: 6E:1 and 6E:2 in senior standing.

6E:115 Economics of Human Resources
3 s.h.
Applications of economic analysis to human beings considered as an economic resource; particular emphasis on problems in discrimination in labor markets. Prerequisites: 6E:1 and 6E:2 in senior standing.

6E:117 Money and Banking
3 s.h.
Conceptual framework of financial institutions, theory, policy, and policy with respect to the role of money in the determination of the price level, the business cycle, and the national economy. Prerequisites: 6E:1 and 6E:2 in senior standing.

6E:116 Economics of the Government Sector
3 s.h.
Economic functions of government with emphasis on financing, economic decisions relating to government, budgetary, taxation, and the role of government in determining the national debt. Prerequisites: 6E:1 and 6E:2 in senior standing.

6E:123 Political Economy of the Military-Industrial Complex
3 s.h.
Thematic study of the political economy as a significant dimension of the U.S. political economy, the U.S. military and world economy, the political and economic consequences of the development, and its economic, political, and social consequences. Prerequisites: 6E:1 and 6E:2 in senior standing.
6E:329 Seminar in Economic Development
Prerequisites: consent of instructor.

6E:330 Seminar in Econometrics
Prerequisites: consent of instructor.

6E:330 Seminar in Economic Development
Prerequisites: consent of instructor.

6E:340 Seminar in International Economics
Prerequisites: consent of instructor.

6E:345 Seminar in Monetary Economics
Prerequisites: consent of instructor.

6E:350 Seminar in Labor Economics
Prerequisites: consent of instructor.

6E:355 Seminar in Health Economics
Prerequisites: consent of instructor.

6E:360 Seminar in Economic History
Prerequisites: consent of instructor.

6E:370 Seminar in Industrial Organization
Prerequisites: consent of instructor.

6E:380 Seminar in Economics of the Government Sector
Prerequisites: consent of instructor.

6E:385 Seminar in Urban and Regional Economics
Prerequisites: consent of instructor.

6E:390 Seminar in Urban and Regional Economics
Prerequisites: consent of instructor.

3 a.h.
The College of Dentistry is both administratively and physically an integral part of the University. It draws upon and contributes to the University’s diverse resources, and its students enjoy all the advantages and privileges enjoyed by the general student body. The College benefits particularly from its cooperative relationship with the colleges of Medicine, Nursing and Pharmacy in the University Health Center, whose teaching, research and service activities have earned international recognition.

Basic Program in Dentistry

The basic educational program leading to the degree Doctor of Dental Surgery (D.D.S.) consists of at least three years of preprofessional study and approximately four years of study in the College of Dentistry. The dental curriculum consists of five basic units:

Basic Sciences
- Gross anatomy
- Biochemistry
- Biology
- Physiology
- General pathology
- Oral pathology
- Pharmacology
- Microbiology

Restorative Dental Sciences
- Gross, microscopic and radiographic dental anatomy
- Dental materials: endodontics
- Operative dentistry: fixed partial prosthesis: removable partial prosthetics

Oral Medicine
- Preventive dentistry: oral diagnosis
- Dental radiology
- Oral pathology
- Anesthesiology and pain control
- Oral surgery
- Periodontology

In addition, there are selected minor courses in the Bio- Science Options Program which are correlated between the basic and clinical sciences.

Community Dentistry

Pediatric Dentistry
- Facial growth and development
- Pedodontics and orthodontics

To achieve a close correlation of the basic sciences with clinical disciplines, the student is introduced to actual clinical work during the first year.

The second-year program includes additional correlative activities in the basic and clinical sciences, such as training in the effective coordination of auxiliary personnel. This instruction is in conjunction with the dental auxiliary utilization program.

Third-year dental students rotate through a series of "clerkships" which gives them meaningful exposure to each of the eight clinical disciplines.

Fourth-year dental students are involved in the delivery of comprehensive dental care in an environment which closely simulates conditions in private dental practice. Fourth-year students also are exposed to various extramural health programs at state and University Hospitals and the State Department of Health.

There are available preceptorships in which fourth-year dental students assist in selected dental offices throughout Iowa. These preceptorships expose students to facets of dentistry usually not observable in an academic setting, such as practical business management procedures, appointment-book control, the dynamics of presenting treatment plans to private patients and the relationship of the dentist to the community.

Program Flexibility

A dental student may satisfy departmental requirements by examination in lieu of course participation. The time thus gained may be used to progress through the curriculum at a faster rate.

Facilities

The Dental Science Building, a major unit in an expanded Health Center, enables the College to accelerate its research activities, and facilitates the development of interdisciplinary communication in Health Center teaching, research and patient-care activities. The Health Center includes the colleges of Medicine, Nursing and Pharmacy; a Basic Science Building; University Hospitals and a Health Sciences Library. The Health Sciences Library houses all of the University’s special health science holdings, including the College of Dentistry’s collection of more than 10,000 volumes on dentistry and allied scientific subjects, and more than 283 professional journals the College currently receives.

The Dental Science Building contains of connected four-story wings located on either side of a mall. The south wing is devoted to clinical teaching, with various departmental clinic facilities, support laboratories, clinical research space, offices and an automated learning center. The north wing houses a variety of teaching, administrative and research facilities, including teaching laboratories, research laboratories, administration area, an audior visual production center and the programs in community dentistry.

Promotions and Graduation

Student promotions and graduations are determined by the Academic and Professional Performance Committee appointed by the Dean from each of the broad areas of basic sciences, preclinical sciences, clinical sciences and from the other academic areas of the College.

The performance committee may recommend to the Dean that a student withdraw from the College or repeat specific courses when the student is deemed generally unprepared to be promoted or to enter the dental profession.
Committee for Appeals
When a student has been asked to withdraw from the College, or desires special consideration on problems concerning promotion or graduation, he or she may appeal this decision to the Dean. All appeals shall be heard by an ad hoc committee appointed by the Dean. The committee considers such matters as student scholastic achievement, promotions, pinecences and general fitness to enter the dental profession. The decision reached by the ad hoc appeals committee is final.

State Board of Dentistry Licensure Examination
The states of Kansas, Colorado, Missouri, Oklahoma, Iowa, Wisconsin, Nebraska, Minnesota, and South Dakota have joined in the formation of the Central Regional Dental Testing Service to replace clinical examinations previously given by the states individually. These examinations are administered at several testing sites located at schools of dentistry within the region. Examination dates are determined by the Central Regional Dental Testing Service and are available from the secretary-treasurer. Successful completion of requirements of the Central Regional Dental Testing Service will be accepted by the member states for a five-year period in lieu of their individual clinical requirements.

Expenses
The College of Dentistry maintains a Supply-Teilistration-Instru- ment Management System (S.T.I.M.S.) that provides the student with most of the instruments and supplies necessary throughout dental training. The instrument usage fee for the program leading to the D.D.S. degree is payable in installments over the first three years of the program.

In addition, a fee for expendable laboratory supplies will be charged for each of the first two years. A $100.00 breakage fee must also be deposited. The deposit is refundable upon graduation or termination of enrollment.

Financial Assistance
Under the Health Professions Scholarship and Loan Programs, eligible dental students may borrow up to $5,500 each year of their undergraduate professional studies. Preference is given to students who would not otherwise be able to finance health profession studies. Loans are issued at low interest rates and are repayable over an extended period of time after the recipient completes the course of study. There are also provisions for forgiveness of part or all of the loan in consideration of the graduate's selection of location of service in an area where there is a shortage of dentists.

The Armed Forces Health Professions Scholarship Program is open to dental students from the army, navy and air force. For information on this program, inquire at the College Dean's office.

A number of short-term loans are available from the American Dental Association, the Iowa Dental Association, the Kellogg Foundation, the Iowa Dental Achievement Fund and other sources, to help students in emergency situations.

Dental students are eligible for much of the assistance provided through the University's Office of Student Financial Aid. This includes opportunities for part-time employment.

For further information on financial assistance available to dental students, see the "Scholarships and Loans" section of the Catalog or inquire at the Office of Student Financial Aid.

Student Organizations
All dental students are eligible for membership in the American Student Dental Association. Students who rank in the upper 12 percent of the senior class are eligible for Omicron Kappa Upsilon, national scholastic honorary dental society. Two national dental professional fraternities, Delta Sigma Delta and Phi Omega, have chapter houses at Iowa, and both have wheelchair auxiliaries. There is also a Dental Student Wives Club.

Admission
Applications are accepted beginning June 1 of the year prior to the year for which study is in effect. The closing date for applications is December 1 for the class entering the College of Dentistry that following August.

The prospective dental student is encouraged to complete a program leading to a standard bachelor's degree before entering dentistry, or to consider a combined program which enables him or her to earn a standard bachelor's degree upon completion of the freshman year in dentistry. Preference will be given to applicants who have a bachelor's degree or who have completed requirements for the degree in a combined program.

General Basis for Admission
Each applicant must submit a completed application form and official transcripts from all colleges attended to AADAS (American Association of Dental Schools Application Service). The forms are available from the University Office of Admissions.

The basic academic requirement for admission to the College of Dentistry is the completion of no less than 94 semester hours of academic study at an accredited college.

Preclinical Studies
The preclinical program of study should include:

Rhetoric
Satisfactory accomplishment in English composition and speech commensurate with the academic requirements for a bachelor's degree.

Physics
One year (equivalent to eight semester hours), of which one-fourth must be laboratory work.

Chemistry
Two years (equivalent to 16 semester hours), including one year (equivalent to eight semester hours) of organic chemistry, with appropriate laboratory work in all courses, of which one-fourth must be laboratory work.

Biology
One year (equivalent to eight semester hours); this requirement may be satisfied by a one-year course in other general biology or zoology and botany (not botany alone), but in all cases one-half of the credit must be for laboratory work. 

Electives
The applicant should also have sufficient coursework in the social
sciences, philosophy, psychology, history, foreign languages and mathematics to provide a well-rounded educational background.

The dental admissions committee may waive or reduce some of the above requirements when the candidate for admission is considered outstanding in other respects. In exceptional circumstances, candidates with fewer than 94 semester hours of college work will be considered for admission if the applicant's performance and potential are considered outstanding. These candidates may be required to take the Graduate Record Examination Aptitude Test.

Combined Liberal Arts-Dentistry Course
The provision for acceptance by the College of Liberal Arts of 30 semester hours of elective credit earned in any other college of the University makes it possible for the student who enters the College of Dentistry to obtain the bachelor's degree from the College of Liberal Arts upon successful completion of the freshman year in dentistry. To take advantage of this plan, the student must fulfill all specific requirements for the bachelor's degree, including the requirements for a major in some department or area of concentration. The successful completion of the last 30 hours in the College of Liberal Arts at The University of Iowa preceding enrollment in the College of Dentistry satisfies the College of Liberal Arts residence requirement.

Grade-Point Requirement
The applicant should have a cumulative grade-point average of at least 2.5 (A = 4). In addition to the cumulative grade-point average, the admissions committee gives special consideration to the quality of the applicant's coursework in the preclinical sciences.

Interviews
Personal interviews may be required of applicants for admission to the College of Dentistry.

Required Dental Admission Test
All applicants must complete the Dental Admission Test sponsored by the Council on Dental Education of the American Dental Association. Tests for the dental profession are conducted by the University of Iowa in a testing center. Applicants must take the test no later than October in order to be admitted the following year. Applicants may obtain test application forms from the University or the American Dental Association. Test applications should be submitted well before the test deadline.

Deposit by Accepted Applicants
An accepted applicant is required to submit a deposit within 15 days after notification of favorable action on his or her application. This deposit is not refundable but is credited toward the first fee payment. An applicant who fails to make the deposit within the time specified forfeits a place in the entering class.

Physical Examination
Applicants accepted for admission are required to submit a satisfactory physical examination report to the University Student Health Service prior to registration.

Additional Admission Considerations
Fulfillment of the specific requirements listed for admission does not ensure admission to the College of Dentistry. From the applicants meeting minimum requirements, the admissions committee selects those who appear best qualified for the study and practice of dentistry. The committee considers applicants' academic averages, the scores on the required Dental Admission Test and several other factors. Since the available places in the freshman class of the College of Dentistry are limited, preference will be given to applicants who are residents of Iowa under the University's regulations on residency. If it is found possible to consider a limited number of applicants who are not residents of Iowa, preference will be given to nonresident students having the highest scholastic standing.

Admission to Graduate and Postgraduate Study
Programs of study leading to the Master of Science degree are offered by the College of Dentistry's departments of Fixed Prosthodontics, Dental Hygiene, Removable Prosthodontics, Operative Dentistry and Endodontics, Oral Pathology and Diagnosis, Oral Surgery, Orthodontics, Pedodontics and Periodontics.

Admission to any of the graduate programs requires satisfaction of all requirements for admission to the Graduate College, possession of the Doctor of Dental Surgery degree or its equivalent, and departmental approval.

Departments also offer postgraduate programs of study designed as preparation for clinical specialty practice. These programs do not lead to an academic degree. Prerequisites for admission to the postgraduate programs are the same as for graduate programs. A certificate is awarded upon satisfactory completion of the postgraduate program.

Basic Sciences in the Dental Curriculum
The following science courses are offered by departments in colleges other than Dentistry, and are a required part of the dental curriculum:

05.101 Human Gross Anatomy for Dental Students 8 s.h.
Graduate students must have consent of Department head. First year.
05.112 General Microscopic Anatomy for Dental Students 4 s.h.
Cell, tissue and organ study. First year.
05.256 Principles of Human Pathology 4 s.h.
Syllabus: gross and microscopic anatomy of normal structures, description of major pathologic conditions. Second year.
71.111 Pharmacology for Health Sciences: Dental 5 s.h.
Syllabus: drug effects on the body; chemical properties of drugs; effects of drugs on the body; effects of drugs on the body; and use of drugs in the treatment of disease. Second year.
71.112 Membrane Physiology 4 s.h.
Syllabus: and laboratory exercises in semester and laboratory exercises in semester and laboratory exercises in semester and laboratory exercises in semester and laboratory exercises in semester.
05.161 Biochemistry for Dentistry Students 4 s.h.
Chemical constituents and reactions of living matter. First year.

Clinical Management Concepts
Faculty: associate professor Thomas V. Getch; associate professor Nell H. Latkai; instructors Christopher O. Cormany, Clark L. Sorne.

College of Dentistry 243
Fixed Prosthodontics

112:106 Advanced DAI 1 a.h.
Self-contrived learning program introducing the basic concepts and skills needed to effectively utilize dental prosthetics. Topics covered include principles of work design, basic principles of materials, operating field maintenance and interpersonal communication. Prerequisites: senior dental student.

112:108 TEAM III 1 a.h.
Lectures, seminars and small group discussions designed to develop concepts and skills needed to manage dental care delivery teams. Special emphasis on auxiliary utilization, improved communication and personnel management. Prerequisite: senior dental student.

112:197 TEAM Clinic 2 a.h.
Clinical application of skills and concepts in 112:196. Students clinicians manage a team of auxiliaries in a multi-chair clinic. Prerequisite: 112:196.

Weekly series of meetings and student activities arranged to provide educational experiences in patient education and treatment coordination utilizing computerized patient record systems.

Special Courses
113:100 Essential Options: 1 a.h.
Selection from a series of elective mini-courses to emphasize the scientific basis of dental practice.

113:179 Programs Abroad 1 a.h.
Opportunities for foreign dental study are reported with the facilities of dental colleges abroad.

112:200 Advanced Dental St-100 1 a.h.

Fixed Prosthodontics

Department head: Keith E. Tupper
Faculty: Professor E. D. Tupper, J. L. Tuck; associate professor C. W. Swan; associate professor D. P. Roos; instructor N. Neil, B. M. Degree offered: M.D.

Predoctoral Program

The department participates in the D.D.S. program for dental students at all curricular levels. Preclinical courses at the first and second level prepare the student with a background in materials and techniques used in Fixed Prosthodontic treatment. Third-year students participate in a concentrated clinic program of patient treatment in the specialty area. The department provides a consultation service to students in the fourth curricular level.

Graduate Program

The primary purpose of the Master of Science program in fixed prosthodontics is to train and prepare dentists for careers in fixed prosthodontics education and research. It is also adaptable for individuals wishing to further prepare themselves for private practice in fixed prosthodontics. The program satisfies the formal training requirements for eligibility for the American Board of Prosthodontics examination.

The graduate student, in cooperation with the head of the Department, and/or the advisor, constructs an individual curriculum for his or her program which best fulfills personal interests, goals and desires while meeting all of the minimum requirements of the Department and of the Graduate College necessary for the awarding of the master's degree. This type of individual attention is possible since only two graduate students are normally accepted into the program each year.

Degree Requirements

A research project and thesis are required for the master's degree in fixed prosthodontics. The major emphasis of coursework is in fixed prosthodontic theory and treatment along with seminar courses in other specialties of dentistry. A course in research methodology as well as a course in statistics or elementary statistical inference in medicine is required. Some coursework in the general area of education or in the area of the basic science areas is also required. Oral and/or written exams are given during the regularly scheduled graduate degree exam period each year.

Any student who is unable to maintain the minimum 2.5 grade-point average during the first year of the program, or those individuals who elect to terminate their program, after one year, will be considered for issuing of certificates of attendance. Each student will be required to submit a manuscript suitable for publication in a nationally-recognized professional journal, based upon the student's research and/or thesis topic. He or she will be required to prepare one additional manuscript for publication on another topic.

Admission

The minimum requirements for admission into the program correspond to the minimum requirements for admission to the Graduate College of the University. In addition, the student must hold a D.D.S. or M.D. degree or its foreign equivalent. No advanced GRE is required.

Courses

81:121 Occlusion 2 a.h.
Introductory introduction to concepts of occlusion and mandibular.

81:140 Fixed Prosthodontics Techniques Lab 1 a.h.
Lectures covering introduction to fixed prosthodontics including definitions, materials and techniques used in construction of various types of restorations and prevention fixed restorations.

81:141 Fixed Prosthodontics Clinical Laboratory 3 a.h.
Technical procedures required in introduction of fixed prosthodontics. Lab: 81:140: Prosthodontics Materials Laboratory. 2 a.h.

81:121 Dental Materials 2 a.h.
Characterization of organic and inorganic structures of biological and mechanical properties of dental materials in tissue. Lab: 81:140 Fixed Prosthodontics. 4 a.h.

81:101 Advanced M.S. Research Seminar containing previously acquired knowledge is biologic and basic science and technical courses with clinical fixed prosthodontic procedures practiced in Dental laboratory supplement by individual supervision and demonstration.

Primarily for Graduates

81:238 Seminar: Fixed Prosthodontics 1 a.h.
Conferring on oral discussion on assigned research topics.

81:239 Seminar: Occlusion 1 a.h.
Conferring on oral discussion on assigned research topics.

81:237 Seminar: Dental Materials 1 a.h.
Conferring on oral discussion on assigned research topics.

81:236 Seminar: Fixed Prosthodontics Topics 1 a.h.
Assign research topics for student seminar presentations.

81:230 Research: Fixed Prosthodontics 1 a.h.
Research design and collection of data on selected research project.


81:236 Advanced Clinical Fixed Prosthodontics 3 a.h.
Student complete assigned cases in support of difficulty.


81:230 Library Assignments: Fixed Prosthodontics 1 a.h.
Literature search and preparation of bibliographies and abstracts.

81:230 Practica: Clinical Fixed Prosthodontics 1 a.h.
Teaching assignments for credit.
Comprehensive Care

Skeletion head: Richard G. Genter
Faculty: associate professors Robert Coen, Richard G. Genter, Roger L. Wright; instructors Howard W. Dethier, John V. Denehy, H. Douglas Hall, Debra J. Mul, John A. Straw)

Comprehensive care (family practice) is the capstone experience of the dental student's training, in which his professional education is integrated and synthesized into a system of comprehensive and continuing dental care management. The goal of the Division of Comprehensive Care is to provide an environment in which the biologically-oriented student may acquire the technical competence and health care management skills to reach a high level of professional maturity. The unique learning experiences are also designed to sensitize the student to the need for a lifelong pursuit of personal and professional growth in order to accommodate the advancements in the health sciences and the changing environment of dental health care needs and delivery systems.

The Division of Comprehensive Care draws its faculty and its learning resources from a broad range of academic and professional practice experiences. The ultra-modern facilities of the new Dental Science Building are designed to stimulate the spatial and operational environment of a model health care delivery system. Trained dental auxiliaries enrich the practice management and dental assistant utilization skills through the D.A.U. program. Thus the facilities, the faculty, the auxiliaries, and the curriculum blend is comprehensive care to produce the optimum development of clinical competence and patient dental health care management.

Courses
116:101 Comprehensive Care Lectures
1 credit
Symposium, analysis and evaluation of prior acquired knowledge and experience for an integrated and comprehensive system of dental health care management.
114:101 Comprehensive Care Clinic
1 credit
Clinical application of previous cognitive, psychomotor and affective learning experiences toward development of an integrated and comprehensive system of dental health care management.
114:102 Group Practice Seminar
1 credit
Dynamic application of a model dental group practice, with discussions of treatment progress of patients assigned to the group. Methods are explored and developed to achieve interpersonal and technical proficiency for the patient treatment by members of the group.
114:104 Specialties in General Practice
1 credit
Clinical lecturers from the various dental specialties provide current techniques and philosophies of their respective fields. Information about selection of graduate specialty programs.
114:105 Restorative Dentistry II Seminar
1 credit
Studies present documentation of diagnostic procedures used in the development of a treatment plan and prepare for selected clinical patients. Written survey questions challenge students to defend findings and recommendations.

Dental Hygiene

Department chairperson: Paul B. Straus
Faculty: associate professor Paul B. Straus, Dorothy Brown, Nancy Barry; instructors: associate professors Jane Bixler, Marlene Haynes, Elizabeth House, Patricia Perissin; instructors: assistant professors Kay Mastner, Jameson Jeff Olson, Donna Keys.

Degree offered: B.S., M.S.

In response to the growing interest of Iowa dentists to employ dental hygienists, the course was initiated as a field study project at the University in 1953. At that time major emphasis was placed on preparation of dental hygienists for private office practice. Within recent years increasing employment opportunities have become available for University of Iowa dental hygiene graduates in public health, public schools, community health centers and other related systems of health care delivery. This has resulted in an expansion of departmental objectives. In addition to providing primary oral health care delivery for Iowa, graduates are prepared to assume responsibility for organizing, implementing, and evaluating dental public health programs; to assume leadership roles in dental hygiene; and to pursue advanced degrees.

Undergraduate Program

Qualified by education and licensure, the dental hygienist applies knowledge of the basic, social, dental and clinical sciences in providing patient services for the prevention and control of dental disease.

The Bachelor of Science degree program in dental hygiene comprises two years of general education followed by two years of specialized study. Included in the general education requirements are courses in the basic and social sciences. These courses provide the student with educational preparation in disciplines relevant to specialized study in medical and dental sciences and in dental hygiene.

The specialized courses of study are taken during the junior and senior years. In the junior-year students are enrolled in the following medical and dental related courses:

- 87:061 Anesthesia Anesthesia
- 87:062 Human Microscopic Anatomy
- 87:063 Dental Radiology for Dental Hygienists
- 87:064 Topics in Dental Therapeutics
- 87:065 Basic Pathology
- 92:061 Introduction to Periodontology
- 82:061 Operative Dentistry I: Abhygienists

In addition, juniors learn the basic theory and clinical skills required for dental hygiene practice in 88:061 Dental Hygiene Core I and 88:062 Dental Hygiene Core II, which integrate content in dental anatomy with the theory and practice of clinical dental hygiene.

During the senior year students advance clinical skills (88:053 Clinical Dental Hygiene). Part of this experience is received in the Department of Periodontology. Each student is assigned to work with a graduate student of periodontics performing procedures on adults who have active periodontal disease. This experience not only advances the dental hygiene clinical skills, but provides both the hygiene and graduate dental students with a learning experience emphasizing the team approach. Weekly lectures and seminars reinforce clinical learning (88:086 Seminar: Community Dental Health).

Senior students also are enrolled in a community dental health core (88:086 Seminar: Dental Hygiene Concepts and Practice and 88:087 Practicum: Community Dental Health). Courses traditionally taught asisolated subject-oriented units, such as dental health education, public health and audiovisual media, are incorporated into an integrated core of learning. Learning emphasis is placed on the relationship between the underlying theory and practical application of community dental health. Weekly field experiences enable students to apply knowledge of human behavior, basic principles of communication skills, educational and research techniques to design, implement, and evaluate health care and educational programs.

Admission Requirements

Eligibility for admission to the professional program requires at least 60 semester hours of college credit and at least a 2.25 cumulative grade-point average (2.4 for a transfer student). In fulfilling the 60-hour requirement, the student must satisfy general
education requirements of the College of Liberal Arts and complete the following dental hygiene prerequisites:

- Five semester hours (eight for transfer students) of zoology or general biology (37:3 Principles of Animal Biology);
- Four semester hours of inorganic chemistry (4:1 General Chemistry I);
- Four semester hours of organic chemistry, including biochemistry (4:9 General Chemistry II, General Chemistry Laboratory);
- Four semester hours of microbiology (61:164 Microbiology);
- Three semester hours of nutrition (17:142 Nutrition);
- Four semester hours of psychology (31:1 Elementary Psychology);
- Four semester hours of sociology (34:1 Introduction to Sociology: Principles);
- Four semester hours of anatomy (60:1 Elementary Human Anatomy);
- Four semester hours of physiology (72:13 Introduction to Human Physiology).

These prerequisites provide the educational basis for the dental hygiene courses of study. Completion of a two-year associate degree program in dental hygiene, therefore, does not provide an appropriate background for transfer into the baccalaureate program at Iowa. Students begin the professional program in dental hygiene in the fall only. Students enrolled in the University of Iowa College of Liberal Arts need submit only the dental hygiene application. Transfer students must submit both College of Liberal Arts and dental hygiene applications. All applicants are interviewed by the dental hygiene admissions committee after submitting their dental hygiene application.

Graduate Program
The University of Iowa College of Dentistry’s graduate program in dental hygiene was developed in response to the need for qualified educators in dental hygiene. It is one of four established dental hygiene graduate programs in the nation.

Although a majority of the students who complete the master's degree program at Iowa choose positions in teaching and administration, graduates also are prepared to assume supervisory responsibilities in health care organizations and to conduct educational research and research in the biological and behavioral sciences for the advancement of dental hygiene knowledge.

The curriculum design provides the student with major concentrations in advanced dental hygiene theory such as the pathophysiology of dental plaque, the response of periodontal tissues to irritation, and the prevention of dental caries and periodontal disease. Although consideration is given to academic background and career interests, the following program goals are identifiable components of each student’s program of study: to acquire advanced scientific knowledge in dental hygiene and supporting fields of study, to understand, interpret, and apply results of new research and pedagogical developments in dental hygiene and related fields of study; and to demonstrate application of technical preparedness to conduct research. Additionally, students have the experience of applying research findings and advanced knowledge to aspects of undergraduate dental hygiene education.

The student may begin graduate study during the fall, spring, or summer semester. Students may complete the program in one academic year and one summer session. However, most students should expect to take three semesters and one summer session to earn the 34 semester hours of graduate credit, including a thesis on original research.

Under the guidance of the graduate adviser, the student plans an individualized program of study. Approximately twelve semester hours are assigned courses to advance knowledge in dental hygiene and ten semester hours are in research methodology and in thesis preparation and defense.

Courses required in dental hygiene are:

88:201 Seminar: Dental Hygiene Literature Review
88:202 Evaluation of Dental Hygiene Research
88:203 Research: Dental Hygiene
88:204 Selected Topics in Dental Hygiene Education
88:205 Socio-medical Topics in Oral Health Care
88:206 Thesis: Dental Hygiene

Other required courses are:

111:212 Statistical Methods in Biomedical Sciences or
7P:143 Introduction to Statistical Methods
82:224 Design and Evaluation of Research in Dentistry

The remaining twelve hours are to include electives in higher education and biomedical-scientific areas that are supportive fields of study.

Eligibility for Degree Candidacy
To be eligible for the graduate degree, the student must achieve a minimum cumulative grade-point average of 2.8 (A=4).

Traineeships
The United States Public Health Service traineeships are available to qualified applicants enrolled in the dental hygiene graduate program at Iowa. Traineeships cover full tuition, a yearly tuition-exempt stipend, and a dependency allowance.

If the recipient is unable to complete the required 34 semester hours and thesis in two semesters and a summer session, the traineeship may be extended. A prospective traineeship recipient must be admitted to the University of Iowa Graduate College and the dental hygiene graduate program before applying for a traineeship.

Graduate Admission Requirements
Applicants for admission are subject to the general rules of the Graduate College. Departmental requirements include an acceptable score on the aptitude test of the Graduate Record Examination and a 2.8 minimum undergraduate cumulative grade-point average (A=4). The undergraduate education of the applicant should include courses equivalent to those in the undergraduate dental hygiene major at The University of Iowa.

Special Programs
Through an independent study program, students can explore additional career options in dental hygiene or enrich their educational background in a dental hygiene-related field of study.
example, a student interested in clinical research may become involved in a faculty-directed research project. Others considering graduate programs in public health or dental hygiene education may, under the direction of faculty, conduct projects related to these areas.

Facilities

University of Iowa dental hygiene majors receive their professional preparation in the University's new Dental Science Building, which is part of the University of Iowa Health Care complex, one of the nation's outstanding health sciences teaching, research and patient care facilities.

Financial Aid

In addition to financial assistance available to undergraduate students, there are limited numbers of loans specifically for dental hygiene students. These loans are based on assessment of the student's academic record as well as financial need.

Courses

For Undergraduates

89:059 Dental Hygiene Core I 8 a.h. Introduction to dental hygiene theory, clinical skills, dental anatomy and oral diseases. Didactic and clinical experiences are related to concepts and principles and dental hygiene practice.

89:060 Dental Hygiene Core II 8 a.h. Emphasis on applications of dental hygiene theory in the performance of intermediate clinical dental hygiene and oral diseases control procedures.

89:062 Topics in Dental Therapeutics 4 a.h. Selected study of the effects of drugs on living tissue. Various classes of drugs are examined and application to the clinical practice of dentistry and dental hygiene.

89:063 Clinical Dental Hygiene 7 a.h. Practice of advanced dental hygiene procedures with emphasis on providing comprehensive care and clinical services.

89:066 Seminar: Dental Hygiene Concepts and Practice 4 a.h. Review of current research and advances in preventive procedures; ethical, legal and social responsibilities of health care providers; current and extended roles in dental hygiene practice.

89:067 Practicum: Community Dental Health 6 a.h. Knowledge of dental health, dental care, educational and research services are applied in field experiences in design, implement and evaluate health care and educational programs.

89:068 Seminar: Community Dental Health 4 a.h. Study of factors influencing health, health care delivery and utilization. Dental hygiene concepts, need and demand for dental care, dental care systems, and research methods and applications are emphasized.

89:111 Independent Study 4 a.r. Designed for majors who plan to pursue additional study or to explore career interest in dental hygiene education, research or public health.

For Graduates

89:251 Seminar: Dental Hygiene Literature Review 4 a.r. Analysis of dental hygiene literature as a tool in planning, conducting and evaluating dental hygiene education, research and other significant activities.

89:250 Evaluation of Dental Hygiene Programs 4 a.r. Evaluation of educational and clinical research in dental hygiene and related fields, and the effects of research findings on theory and practice of dental hygiene.

89:253 Research: Dental Hygiene 4 a.h. Emphasis on selection of research topic, preparation of proposal and design for master's thesis.

89:254 Selected Topics in Dental Hygiene Education 3 a.h. Theory and research related to specific areas of dental hygiene education in individual, dyadic or field settings. Content emphasis on theoretical and methodological issues.

89:255 Special Topics in Oral Health Care 4 a.h. Evaluation of current research conducted in cultural, sociological and psychological factors influencing oral health and oral care.
In compliance with basic Graduate College regulations for programs in dentistry, these degree requirements must be met:

Satisfactory completion of at least 60 semester hours of graduate level courses, including all core courses.

Preparation of an acceptable thesis based on original research. The student should plan to furnish his or her own financial support for the research and thesis.

Formal defense of the thesis and examination of the candidate by examining committee.

Satisfactory performance in a comprehensive written and/or oral examination which is of a functional character and does not duplicate semester examinations.

The director of the degree program will act as the student’s advisor and as chairman of the examining committee.

Courses

Operative Dentistry

D.D.S. Program

8.2168 Operative Dentistry Laboratory for Hygienists 2 a.h.
Basic study of dental materials and methods by which these materials are applied to the restorative procedures of operative dentistry.

8.2180 Dental Anatomy Lectures 1 a.h.
Lectures and seminars covering dental terminology, dental anatomy, nerves, pulpar spaces and cavities of human primary and permanent dentition.

8.2181 Dental Anatomy Laboratory 3 a.h.
Detailed study of human tooth morphology and function utilizing wax replacement model and natural and plastic teeth.

8.2182 Operative Dentistry I 2 a.h.
Lectures and seminars covering dental anatomy, principles and design of cavity preparations, reinforcement and placement of restorative materials; use of instruments in procedures pertaining to operative dentistry.

8.2183 Operative Dentistry Laboratory and Clinic I 2 a.h.
Study and application of procedures involved in preparation of human tooth to receive dental restoration; students prepare all classes of cavities in natural and plastic teeth, cut-varies dental restoratives to fabricate on manikins.

8.2184 Operative Dentistry II 1 a.h.
Lectures and seminars concerning the principles and design of cavity preparations, the restoration of teeth, pulp treatment, pain control and other aspects of clinical practice.

8.2185 Operative Dentistry II 1 a.h.
Clinical training in operative dentistry on patients in operative clinic. Second year.

8.2186 Operative Dentistry III 4 a.h.
Lectures, seminars, clinical demonstrations conducted with supervised patient treatment for each dental cavity on dentin adherent; students perform all forms of operative procedures including radicular plug, hardening of physiologic and aesthetic importance of restorative measures in patients. Third year.

Primary for Graduates

Discipline Studies

8.2206 Operative Dentistry Seminar I 1 a.h.
I. Review of operative dentistry. Pricing and organization of the research relating to the biomechanical aspects of cavity preparation and filling materials.

8.2207 Operative Dentistry Seminar II 1 a.h.
Readings and discussions of research relating to problems associated with maintaining dental pulp vitality.

8.2208 Operative Dentistry Seminar IV 1 a.h.
Readings and discussions of the research relating to dental materials and their use in Operative Dentistry.

Research Program

8.2330 Operative Dentistry Research I 3 a.h.
Topic selection, presentation and literature review for research project, begin research protocol.

8.2331 Operative Dentistry Research II 3 a.h.
Present completed, begin research investigation.

8.2332 Operative Dentistry Research III 3 a.h.
Complete research investigation, gather and organize data.

8.2333 Operative Dentistry Research IV 3 a.h.
Data gathered and organized, begin writing thesis.

8.2334 Theses Preparation Operative Dentistry arr.
Complete thesis, defense before the committee, and comprehensive examinations.

Clinical Studies

8.2640 Operative Dentistry Advanced Clinic I arr.
In-depth study of past and present operative procedures; reviews, restorative assignments on a monthly.

8.2641 Operative Dentistry Advanced Clinic II arr.
Treatment of patient cases in the Operative Clinic; seminars and discussions of case problems; concentration on analogs restorative procedures.

8.2642 Operative Dentistry Advanced Clinic III arr.
Treatment of patient cases in the Operative Clinic; seminars and discussions of case problems; concentration on oral gold restorative procedures.

8.2643 Operative Dentistry Advanced Clinic IV arr.
Treatment of patient cases in the Operative Clinic; seminars and discussions of case problems; concentration on metallic restorative procedures.

8.2644 Operative Dentistry Advanced Clinic V arr.
Treatment of patient cases in the Operative Clinic; seminars and discussions of case problems; concentration on orthodontic restorative procedures.

Endodontics

D.D.S. Program

8.1442 Endodontics 3 a.h.
Lectures, seminars and laboratory projects designed to give understanding of basic principles, concepts and technical procedures necessary for treatment of pulpal problems in human teeth.

8.1611 Clinical Endodontic Practice 4 a.h.
Clinical endodontic practice ceases clinical preparations, diagnosis of treatment of each individual case followed by student's practical application on simple suitable cases. Personality and behavior appraised.

8.1698 Special Topics in Endodontics arr.

Primarily for Graduates

8.2360 Endodontic Literature Review I 1 a.h.
Reading of the past and present of endodontic literature.

8.2361 Endodontic Literature Review II 1 a.h.
The introduction to modern methods and discussions of endodontics and discussion of dental materials used in endodontics.

8.2362 Endodontic Literature Review III 1 a.h.
Reading and discussion of biomechanical endodontic research.

8.2363 Endodontic Literature Review IV 1 a.h.
Research papers, seminars and discussions of methods and materials, and their use in endodontics.

8.2364 Research in Endodontics arr.
Topic selection; present preparation and curing investigations; completed research investigations and gathering of data; and writing of thesis and defense before thesis committee.

8.2398 Thesis Preparation in Endodontics 3 a.h.

8.2399 Endodontic Research IV arr.
Introduction for graduate students to areas of research in endodontics, also carries out a clinical or centralized project.
85:240 Oral Pathology Advanced Clinic
85:241 Oral Diagnosis Advanced Clinic
85:242 Dental Radiology Advanced Clinic
85:250 Pathologic Processes
85:356 Advanced Oral Pathology
69:201 General Pathology for Medical Students
69:202 Systemic Pathology for Medical Students
92:216 Dental Sciences Research Methodology
92:217 Advanced Biomedical Studies
92:214 Advanced Biomedical Studies

Facilities
The laboratories of the Department are equipped for training in histopathology, immunopathology, laboratory diagnosis and experimental pathology. Laboratories are available with facilities for investigation of ultrammicrotome of both soft and hard tissues.

Admission Requirements
Applicants must have completed an accredited program leading to the D.D.S. or D.M.D. degree or the foreign equivalent, with a minimum cumulative grade point average of 2.7 (4.0 scale), and must present satisfactory scores in the Graduate Records Examination Aptitude Test and in advanced tests on either biology or chemistry. Final decision on acceptance of any applicant meeting the requirements for admission will rest with the departmental staff. Prospective applicants are encouraged to discuss program requirements with the head of the Department prior to application.

Courses
85:081 Basic Pathology
2 s.h.
Clinical pathologic correlations between normal and pathologic oral tissues. Physiologic mechanisms involved in specific disease processes involved in significant diseases of the mouth. Required for dental hygiene.
85:082 Dental Radiology for Dental Hygienists
1 s.h.
Teeth, soft tissues, radiographs, film processing and mounting. First level.
85:088 Clinical Dental Radiology for Dental Hygienists
1 s.h.
Supervision of clinical experiences in taking dental radiographs, processing and mounting films. Second level.
85:180 Topics in Oral Pathology
Arr.
Lectures and demonstrations in unclassified areas of special knowledge to pathology. For advanced students in professional graduate college.
85:186 Oral Diagnosis and Treatment Planning
2 s.h.
Principles used in planning the oral cavity, correlation between oral and systemic conditions, use of diagnostic aids; translation of diagnostic aids; diagnosis of lesions; radiographs. Oral pathologic conditions and current accepted surgical approach. Second level.
85:188 Oral Pathology
Arr.
Lectures, seminars, demonstrations, laboratory course devoted to diseases involving oral organs. Senior level.
85:189 Introduction to Diagnoses
Arr.
Fundamental principles and techniques in diagnosis, pathology and clinical pathology required for clinical practice are presented in lectures, clinics and seminars. Second level.
85:191 Clinical Pathology
2 s.h.
85:192 Clinical Oral Diagnosis
2 s.h.
Practical application of diagnosis and treatment planning for patients. Third level.
85:186 Clinical Admissions: Emergency
1 s.h.
Supervised clinical experience in taking and recording medical and dental history, conducting oral examination and treating patients. Required for students pursuing a career in general dentistry.
85:186 Advanced Clinical Dental Radiology
1 s.h.
Supervised clinical experience in taking, processing and interpreting intraoral and extraoral radiographs. Fifth level.

Graduate Courses
85:001 Oral Pathology and Diagnostic Literature Review
Arr.
Assigned reading and preparation of seminars. Prerequisite: consent of instructor.
85:223 Oral Pathology and Diagnostic Seminar I
Arr.
Expanded concepts in clinical diagnosis and patient evaluation are presented. Emphasis is placed on understanding and utilization of "state of the art" science and technology. Prerequisite: consent of instructor. Fall only.
85:224 Oral Pathology and Diagnostic Seminar II
Arr.
Advanced studies and laboratory diagnostic techniques and their interpretation. Prerequisite: consent of instructor. Fall only.
85:225 Oral Pathology and Diagnostic Seminar III
Arr.
Advanced clinical and laboratory diagnostic techniques and their interpretation. Prerequisite: consent of instructor. Fall only.
85:227 Oral Pathology and Diagnostic Seminar IV
Arr.
Advanced clinical and laboratory diagnostic techniques and their interpretation. Prerequisite: consent of instructor. Fall only.
85:228 Research in Oral Pathology and Diagnosis
Arr.
Required for M.S. candidates and for any post to other qualified students whose interests coincide with existing departmental research facilities. Includes these preparatory prerequisite courses of instruction. May be repeated.
85:230 Oral Pathology Advanced Clinic
Arr.
Supervision of clinical experiences in taking dental radiographs, processing and mounting films. Participation in operations of the clinical laboratory. Prerequisite: consent of instructor.
85:241 Oral Diagnosis Advanced Clinic
Arr.
Advanced clinical, laboratory and radiographic methods will be applied to the evaluation, diagnosis and treatment of patients with complex clinical problems. Prerequisite: consent of instructor.
85:242 Dental Radiology Advanced Clinic
Arr.
Advanced biologic and colorectal radiographic techniques, interpretation. Prerequisite: consent of instructor. Spring only.
85:250 Pathologic Processes
Arr.
Basic processes of disease, with emphasis on cellular phenomena. Prerequisite: consent of instructor. Fall only.
85:256 Advanced Oral Pathology
Arr.
Intensive study of diseases involving oral organ, content is adaptable to special interests of students; bibliographic research, literature analysis of pathologic processes and diagnostic interpretation emphasized. Prerequisite: consent of instructor.

Oral Surgery
Department Chair: James W. Halsey
Director of graduate programs: Charles S. Odense

The Department of Oral Surgery is involved in both the predoctoral and residency programs. It combines clinical and didactic training and offers an individual basis to the interns, abilities and development of the students. The predoctoral programs is housed in the College of Dentistry, with some clinical assignments in the Division of Oral Surgery at University Hospitals. Graduate study is based primarily in the Residency Training Program at University Hospitals.

Predoctoral Program
The predoctoral curriculum is designed to develop a foundation of professional knowledge, coupled with known surgical skills, to enable the student to diagnose and manage properly surgical problems related to the practice of general dentistry. Emphasis is
placed on reinforcing high ethical standards and developing good surgical concepts, clearly indicating the moral responsibility ascribed for the surgical problems undertaken. The clinical portion of the curriculum allows the student to develop surgical skills and apply the theoretical knowledge acquired in the didactic course. The theory and application of anesthesia-analysis, intravenous sedation and nitrous oxide analgesia techniques are presented through didactic and clinical experiences.

Residency Program

The aim of the residency program in oral surgery is to provide preparation for specialty practice. The program is designed to combine clinical and didactic training on an individual basis. Every effort is made to adapt the program to the interests, abilities and previous experience of the individual student. However, it is essential to meet certain fundamental requirements.

The recommendations of the Council on Dental Education of the American Dental Association, the Committee on Graduate Training of the American Society of Oral Surgeons and the American Board of Oral Surgery have been carefully considered in planning the structure and scope of training.

Requirements for the Master of Science degree may be completed during residency. The M.S. program comprises a three-year course of integrated didactic and clinical study, and may include a research project and the preparation of a thesis.

Residency

The residency period covers three years of hospital training, providing an orientation to hospital procedures, integration of basic and clinical sciences, acquisition of the principles of surgery and familiarization with the various aspects of health services. Competence in clinical oral surgery requires knowledge of the basic medical sciences related to the specialty. Therefore, in addition to hospital and clinical training, the resident takes advanced coursework in such subjects as applied pharmacology, anatomy, pathology, physiology and microbiology, and reviews such closely-related disciplines as radiology, anesthesia, physical diagnosis and laboratory procedures.

The assumption of increased responsibility and the opportunity for clinical and operating room experience are important aspects of residency training.

The resident gains clinical training in anesthesiology through an assigned rotation in the Department of Anesthesiology. Previous advanced training in physical diagnosis, physiology, pharmacology and pathology now assume greater clinical significance. Increased responsibility in the operating room as first assistant and surgeon further develops surgical judgment and skills.

The development and implementation of a research project under staff supervision enhances the value of the residency training.

The senior resident may be given responsibility for major oral surgical cases during rotation in the University and VA hospitals. Each third-year resident is assigned on a rotational basis as a clinical and didactic coordinator and assumes responsibility to qualify for examination by the American Board of Oral Surgeons.

Admission

The deadline for graduate applications in oral surgery is November 1 for admission July 1 of the next year. Admission is limited to July 1 of each year for a full three-year program.

GRE Aptitude Test is required. The applicant must be a graduate of an accredited college of dentistry and be licensed to practice dentistry in the United States.

Information required includes application for graduate oral surgery, applicant appraisal form from applicant's references, transcripts, and letters of recommendation from the dean of the dental college from which the applicant graduated, and from two professional references.

Interviews are not required by strong recommendations. Applicants may be appointed any time after the application has been completed and the staff elects to take action. All appointments should be extended on or before January 1 prior to the July 1 effective date.

The graduate admission office will send an admission form to the applicant to be completed for the Graduate College by approximately March 1.

Facilities

The University Health Center has outstanding basic and clinical science departments which stimulate and support scholarly research and superior clinical practice. The facilities of the University Hospitals, the Iowa City Veterans Administration Hospital and the colleges of Dentistry and Medicine provide an appropriate environment for residency training in oral surgery.

Hospital Organizations

The organizational structure at University Hospitals includes a clinical Department of Dentistry with Divisions of Oral Surgery, General Dentistry and Pedodontics. Under state auspices, the above-mentioned Oral Surgery residency program is conducted, and, commencing July 1, 1976, a two-year general practice residency will be implemented.

Predoctoral Courses

87/88 Anesthesia, Analgesia I a.h.
87/88 Principles and techniques in use of local anesthetics: regional application of local anesthetics a.h.
87/115 Patient Evaluation and Management I a.h.
87/115 Principles and techniques of complete medical history, head and neck examination, cardiopulmonary and respiratory examination, neuroanatomical and psychophysiological aspects of pain, psychobiological aspects of local anesthetics and techniques in the use of local anesthetics a.h.
87/130 Oral Surgery I a.h.
87/130 Basic principles of infection, inflammation and healing; principles of antisepsis and sterilization; bacteriology of oral disease a.h.
87/145 Patient Evaluation and Management II a.h.
87/145 Theory and application of nitrous oxide sedation, emphasis on cardiovascular and respiratory physiology; instrumentation of nitrous oxide sedation; evaluation of nitrous oxide sedation; physical techniques of nitrous oxide sedation a.h.
87/158 Advanced Oral Surgery I a.h.
87/158 History, examination, diagnosis and treatment of diseases and traumatic injuries of the oral cavity a.h.
87/158 Clinical Oral Surgery I a.h.
87/158 Clinical experience in oral surgery a.h.
87/158 Oral Surgery and Management III a.h.
87/158 Concepts of infection, end and intravenous therapy and pain control; pharmacology of various agents used; evaluation of patient's ability to handle pharmacotherapeutic complications and their management in anesthesia and profit control a.h.
87/158 Introduction to Hospital Procedures a.h.
87/158 Diagnostic and treatment in the hospital environment in the Division of General Dentistry at University Hospitals; treatment of dental patients in hospital setting a.h.
Graduate Courses
87:251 Hospital Procedures 1 a.h.
Study of hospital planning, policies and department across general information relevant to hospital patients.
87:260 Dental Science Research 4 a.h.
In-depth dental and oral anatomy with diagnosis, hematology, pathology, etc.; special topics by medical and dental staff.
87:267 Biomedical Anatomy 1 a.h.
Study of dental and oral subjects found in major oral surgery procedures. Special emphasis on maxillofacial problems and surgical emergencies. May include animal surgery.
87:209 Path and Anatomy Control 3 a.h.
Concepts of tissue biology, morphology, oral and immunological science, and oral control; pharmacology of various drugs used; complications and their management.
87:250 Principles of Anesthesia 2 a.h.
Review of general anesthesia and special anesthetics and their effects on respiratory and cardiovascular systems.
87:212 Literature Seminars and Journal Club 1 a.h.
Special attention to material covered in assigned readings.
87:213 Surgical Case Reports 2 a.h.
Review of theory and techniques together with laboratory exercises.
87:213 Physical Diagnostics 2 a.h.
Review of principles of physical diagnosis.
87:214 Oral Pathology Conference 1 a.h.
Review and discussion of current clinical specktrum.
87:205 Advanced Oral Surgery Seminar I 1 a.h.
Aspire-mentoring.
87:205 Advanced Oral Surgery Seminar II 1 a.h.
Aspire-mentoring.
87:225 Advanced Oral Surgery Seminar III 1 a.h.
Aspire-mentoring.
87:227 Postgraduate Oral Surgery Seminar 1 a.h.
Aspire-mentoring: Presentation by student and faculty.
87:230 Oral Surgery Research I 2 a.h.
Topics selection, review contemporary literature, literature review.
87:231 Oral Surgery Research II 2 a.h.
Presentation and final research project. Literature review.
87:232 Oral Surgery Research III 3 a.h.
Thesis project. Complete research project and data gathering.
Thesis and defense. Comprehensive examination during these three years.
87:234 Clinical Oral Surgery I 1 a.h.
Specialty and technical seminars and patient treatment. Clinical practice as assigned patient problems.
87:235 Clinical Oral Surgery II 2 a.h.
Specialty and technical seminars and patient treatment. Clinical practice as assigned patient problems.
87:236 Clinical Oral Surgery III 2 a.h.
Referral of local and remote patients to medical and dental facilities. Special emphasis on maxillofacial problems.
87:237 Pre-Radiation Patient Treatment 1 a.h.
Planning dental treatment for pre-radiation patient; review of literature.
87:238 Clinical Dentistry I 2 a.h.
Specialty and technical seminars and patient treatment.
87:239 Clinical Dentistry II 2 a.h.
Specialty and technical seminars and patient treatment.

Orthodontics
Department head lecturer: John S. Carve, Ph.D., professor; George F. Schurman, assn. prof.; Richard J. Rovin, Charles D. Kornfeld, assoc. prof., John W. Atwood, Linda S. Block.

Graduate Courses
80:152 Orthodontic Laboratory 1 a.h.
Practical experience in taking and analyzing orthodontic diagnostic records, developing treatment planning, constructing appliances.
80:153 Orthodontic Diagnosis and Its Biological Foundations 1 a.h.
Interactions of various factors such as heredity, nutrition, diseases and their effects on the teeth and the philosophy of management of orthodontic problems; topics include biodynamic forces and physiology of soft tissue changes, oral and maxillofacial reconstructive surgery, growth, development, and the role of orthodontic treatment in growth.
80:154 Orthodontic Treatment I 2 a.h.
Range from初始的 orthodontic treatment to the use of different appliances to correct the malocclusion of the general practitioner can handle in his office.
80:155 Orthodontic Treatment II 2 a.h.
The following topics are covered in advanced slide strip series: intramaxillary, extramaxillary and non-extramaxillary and appliances needed in the general practice of orthodontics. Different types of removable appliances and different types of fixed appliances used in orthodontics. Discussion of the role of orthodontists in the overall management of patients with orthodontic problems, focusing on growth, development, and the role of orthodontic treatment in growth.
80:175 Orthodontic Clinic 1 a.h.
Clinical experience in orthodontic diagnostic treatment planning and treatment.

Predoctoral Program
The purpose of the predoctoral program in orthodontics is to enable the general practitioner of dentistry to recognize, diagnose and treat common and commonplace simple malocclusions of the teeth. The predoctoral program is a part of the orthodontic clinic.
selected patients with manifestations appropriate for undergraduate treatment; re-
cord-taking; diagnosis and treatment carried out under guidance of orthodontic
graduate student and staff member; may be staled during later part of second
year; students must follow protocol from initial records to completion of treatment; students
must bear all obligations to patients, which may include appointments during
summer months.
89:171 Advanced Orthodontic Concepts
art.
Provides exposure of interested students to advanced coursework in Department's
graduate program. Prerequisite: instructor's permission.
89:172 Basic Orthodontic Projects
art.
Undergraduate research projects designed to give students an opportunity to learn,
scientific methodology in investigation of a particular orthodontic problem. 
by special arrangement with faculty.
For Graduate Students
89:220 Control Theory and Craniofacial Morphogenetic Systems
3-4 a.h.
Introduces students' general biological perspective, acquaints them with what is now
recognized as general systems theory, control theory, cybernetics, systems analysis;
develop areas of perspective about role of applied human biokinetics; provide informa-
tion about the nature of human biology as a science.
89:251 Orthodontic Theory: Diagnosis and Treatment Planning
2 a.h.
Survey readings pertaining to art and science of orthodontic diagnosis.
89:262 Orthodontics and Treatment Planning
2 a.h.
Survey readings concerning orthodontic diagnosis; treatment of particular kinds of
orthodontic problems; students prepare case histories of patients treated in graduate
d clinic.
89:263 Advanced Orthodontic Technique
art.
Weekly laboratories into manual with students must reproduce on a scale of
1:1.5 immediate results of clinically significant problems practiced encountered
every day on a scale-model case per year, but includes complete exposure of principles
underlying all techniques developed since 1900, in contexts of modern medicine.
89:264 Biomechanics
art.
1-2 a.h.
Differs theories and principles related in the growth of the face.
89:265 Facial and Dental Growth
3 a.h.
Utilization of accepted concepts of facial growth to the treatment of individuals with
various types of malocclusions during their active growth period. 
89:207 Case Analysis
art.
Survey readings in diagnosis and treatment of mixed dentition patients; students
present case histories of patients treated by graduate students.
89:266 Orthodontic Prosthodontic
Clinical practice in the clinic.
89:210 Orthodontic Case Analysis
art.
Evaluation, discussion, criticism, defense of different diagnostic and treatment
approaches that may be used, under guidance by the chief orthodontist.
89:211 Problems Orthodontists
art.
89:213 Research Orthodontics
art.
art.
89:214 Research Methodology
art.
art.
89:215 Orthodontic Journal Club
art.
Reading of current biological and orthodontical publications; students critically evaluate
articles and present thoughts - minded thought; and to accept or reject concepts by
allowing them to prove itself.
89:216 Practice Management
art.
Business management of orthodontic practice; topics range from basic practice in
anesthesia, practice insurance.
art.
89:217 Orthodontics
art.
Survey of all fields of study (oral facial and maxillo-omniology) to the various anatomic
students who will be introduced to orthodontic diagnosis and treatment plan for
individuals with malocclusions. Additionally, orthodontia as a field of interest to
content in the clinic.
89:218 Scientific Writing
For master's degree students in orthodontics.
art.
art.
89:220 Craniofacial Anatomy
1 a.h.
Aims on the cranial, facial, and maxillo-omniological development and morphology of the
major structures of interest to orthodontics; oral facial form.
Pedodontics
Department head: Stephen A. W. Wei
Faculty members: Charles A. Fall, Alan Hayes, Jr., Larry L. Karlin, Frederick
M. Roth, Larry M. Schussman, Timmy J. Y. Tsai, Visiting professor Arthur J.
Haddad, Visiting professor Mary H. Westfall
Degree offered: M.S. (certification also offered).
The Department of Pedodontics is concerned with the prevention and treatment of dental diseases of children. A program of instruction combining didactic, laboratory, and clinical experi-
ences is offered to dental and graduate students. Special consider-
ation is given to reviewing the current literature and managing the dental problems of handicapped children. Excellent treatment through the proper utilization of dental auxiliary personnel and
record management is also emphasized.
Graduate study in pedodontics leads to either a certificate or master's degree.
The program is fully accredited by the Council on Dental Education. Signed support is available to qualified students.
Applications are submitted to the Graduate College.
The time devoted to the course of graduate study is divided into approximately 40 percent advanced clinical activity, 40 percent didactic courses, and 20 percent original research.
A core of clinical and basic science courses is supplemented by elective selections following the student's individual interests.
The choice of a minor subject area is recommended.
Close association with the Department of Pediatrics, the Uni-
versity Hospital School and the University Hospital permits em-
phasis on dental rehabilitation under general anesthesia, instruction in physical diagnosis and the management of exceptional children.
Dual degree programs have been arranged with several other
departments. The research carried out by graduate students has been selected on a number of occasions for national awards and
journal publications.
Graduate students are trained in all phases of pedodontics in order to equip them with the
knowledge, skills, and attitudes for a career in pedodontics. Special emphasis is placed on preparation for the American Board of
Pedodontics examinations.
Clinical and laboratory research projects are in progress, with financial support from federal agencies and other sources. Sig-
nificant contributions have been made in the areas of fluoride
studies on child and behavior management.
Faculty members hold numerous national and state offices, commit-
tee memberships, consultancies and honors. They serve as reviewers for several professional journals and federal granting agencies. They participate in continuing education programs for dentists and other health science personnel.
Courses
89:140 Pedodontics Diagnosis and Treatment
1 a.h.
Concepts of growth and development, behavior management and preventive-restora-
tive techniques for pediatric patient.
89:141 Pedodontic Technique
1 a.h.
Basic pedodontic procedures performed in laboratory.
89:180 Clinical Pedodontics
4 a.h.
Comprehensive clinical management of pediatric patients.
Periodontics

Preparation and defense of an acceptable thesis based on original research requiring 11 semester hours of research and three semester hours of thesis preparation; and

Satisfactory completion of a comprehensive written and oral examination.

Completion of the program will usually require a minimum of 26 calendar months of full-time study.

Certification Program

The certification program is designed to meet all the requirements of the American Board of Periodontology for eligibility for certification. The program provides a sound foundation for the clinical practice of periodontics.

Completion of the program will require 24 calendar months of full-time study, and will require:

Satisfactory completion of a minimum of 60 semester hours of the required and elective courses;

Satisfactory completion of a comprehensive written and oral examination; and

An acceptable literature review paper.

Opportunities are provided for experience in clinical and basic research.

Facilities

The department has 20 modern and well-equipped operatories devoted exclusively to periodontics and access to hospital experiences in adjacent University and V.A. Hospitals. Research facilities include a departmental research laboratory and college laboratories in the areas of Histology and Histochemistry, Microbiology and Biochemistry, Electron Microscopy with EM and x-ray capabilities and Growth and Development. These college facilities are in addition to those available by arrangement in the University and V.A. Hospitals and the basic science departments.

Financial Aid

The applicant must be financially prepared to undertake uninterested studies. Assistantships are offered dependent upon available resources.

Admission

Admission requires the D.D.S. degree or its equivalent, and satisfaction of Graduate College requirements. Interviews are encouraged but not mandatory.

Predoctoral Courses

50:051 Introduction to Periodontology 3 s.h.

Lecture and laboratory course devoted to basic concepts of periodontology for the dental hygiene.

50:140 Periodontal Methods 2 s.h.

Fundamental concepts of periodontology, presented in a self-paced, slide-tape lecture series augmented by laboratory and clinical experience.

50:160 Periodontics 3 s.h.

Comprehensive clinical management of the periodontal patient.

50:161 Periodontology 1 s.h.

Comprehensive concepts of periodontology and the clinical management of patients are presented by lecture and seminar topic.

Periodontics

50:210 Introduction to Advanced Clinical Periodontology 2 s.h.

For first-year graduate students, emphasis on grant and development, clinical management, preventive conservative techniques, and disease of periodontal type.

50:229 Periodontics Literature Review I 1 s.h.

Discussions on preventive orthodontics, anterior esthetics, periodontal disease, periodontal management, preventive-conservative techniques, and disease of periodontal type.

50:230 Periodontics Literature Review II 1 s.h.

Discussions of preventive orthodontics, anterior esthetics, periodontal disease, periodontal management, preventive-conservative techniques, and disease of periodontal type.

50:227 Periodontics Literature Review III 1 s.h.

Discussions of anterior esthetics, periodontal management, preventive-conservative techniques, multifactorial care for the handicapped child.

50:239 Periodontics Literature Review IV 1 s.h.

Discussions of orthodontics and preventive procedures, orthodontics and periodontal disease, and advanced periodontics for periododontics.

50:239 Dental Management of the Handicapped Child 3 s.h.

Principles and techniques for managing various handicapping conditions of children in the dental office.

50:239 Research in Periodontology 3 s.h.

Preparation of original research project and completion of thesis.

50:240 Advanced Clinical Periodontology 3 s.h.

Comprehensive clinical management of periodontal and special care dentistry.

50:240 Pediatric Physical Diagnosis for Dental Practice 1 s.h.

Principles and methods of making a physical examination of the child.

50:240 Pediatric Therapy for Dental Practitioners 1 s.h.

Principles of therapy in various disease conditions.

50:240 Pediatric Hospital Rehabilitation 3 s.h.

Comprehensive dental treatment under general anesthesia.

50:241 Pediatric Restorative 3 s.h.

Pediatric dentistry and their hospital management.

50:245 Practice Teaching in Periodontology 3 s.h.

Observation and practice in current teaching procedures.

Periodontics

Department heads: Phillip A. Laskin


Degree offered: M.S. (certificate also offered)

Predoctoral Program

The Department of Periodontics is concerned with the diagnosis, prevention and treatment of periodontal disease. A program of instruction combining didactic, laboratory and clinical experience is given to the predoctoral students. Emphasis is placed on applying the biological concepts of periodontology to the comprehensive clinical management of patients who have periodontal disease.

Master of Science Program

The Master of Science program is designed primarily to provide training for teaching, research and specialization in periodontics.

In compliance with the regulations of the Graduate College for programs of higher education in dentistry, and to meet all the requirements of the American Board of Periodontology for eligibility for certification, the following requirements must be met:

Satisfactory completion of a minimum of 60 semester hours of the required and elective courses;
Graduate Courses
92.261 Advanced Periodontology
92.262 Clinical Seminar in Periodontics
92.265 Methods of Instruction in Periodontics
92.266 Recent Advances in Periodontics
92.268 Periodontal Disease Seminar
92.269 Applied Oral Microbiology
92.274 Biochemical Aspects of Periodontontology
92.275 Dental Science Research Methods
92.277 Dynamics of Oral Soft Tissues
92.288 Periodontology Literature Review
92.289 Periodontology Literature Review II
92.290 Periodontology Literature Review III
92.291 Thera Preparations in Periodontology
92.298 Advanced Periodontal Service
92.299 Clinical management of the periodontal patient with emphasis on the complex case.

Preventive and Community Dentistry Division: Dr. Philip Thiers
Faculty: Professor W. Philip Thiers, associate professor Howard M. Pope, Helen S. Lamm, assistant professors Robert E. Geurts, Bruce H. Wilt, Lewis G. Wright, instructor John J. Schotter
Degree offered: M.S.

Programs in preventive and community dentistry are designed to provide dental students with experiences to increase their awareness of enter health needs and to encourage students to develop and implement approaches to alleviate these needs. Extensive programs provide students with opportunities to interact with health care teams and members of communities in Iowa. Using the community as the classroom, students are able to observe and participate in a variety of activities intended to make the student aware of the societal obligations he or she must assume in order to practice effectively. Offices attached to the department’s resources are two mobile dental vans, one with five operators and a second smaller unit designed for prevention programs. The vans are operated throughout Iowa, and give senior dental and dental hygiene students and graduate students an experience which closely simulates community dental practice.

Graduate Program
The Master of Science degree program is designed to prepare students in community dentistry, with emphasis on research, teaching or administration. The objective of the program is to help students achieve a high degree of professional competence in their respective areas of special interest. Successful graduates of this program will have met educational requirements necessary to establish their eligibility for the American Board of Dental Public Health.

The program requires 60 semesther hours of coursework. The usual full-time program requires two full academic years plus one summer session.

Courses
111.115 Preventive Dentistry
111.116 Community Dentistry
111.117 Clinical Pharmacology
111.118 Principles of Interprofessional Communication
111.119 Community Experience
111.120 Hospital Emergency Service

Baccalaureate Hospital Externship:
Students spend four weeks, in weeks of four, providing dental health care to patients in the hospital. Special emphasis here is placed on student participation in department of the hospital, including the Faculty Practice Group, and the Hospital Emergency Department.

Mental Health Externship:
In these two or three fields, students spend one week or two as externs at the Independence Mental Health Institute, with one or two hours per day in dental clinics, monistates (including evening work hours) and laboratory sessions, usually four weeks during the ten-week period of the hospital. Students are assigned for various aspects of practice, office management and interviewing activities.

Mobile Unit Program:
Two vans with mobile unit provide dental service to underserved people throughout Iowa under faculty supervision. Students are assigned to clinical group in community health courses from five to ten students per year for an 8 to 10-week period supervised by faculty. This group to be supervised by faculty. This group of students is supervised by faculty. This group of the public health dentistry program is supervised by faculty. This group of the public health dentistry program is supervised by faculty. This group of the public health dentistry program is supervised by faculty.
Removable Prosthodontics

Department Head: Ronnie S. Sandell

Degree offered: M.S.

Removable prosthodontics is the specialty of dentistry involving complete dentures and removable partial dentures.

The prosthodontic program provides the student with the basic principles, procedures and concepts of removable prosthodontics as required for the pre-clinical general dentistry. This is accomplished through laboratory projects and treatment of patients utilizing prosthodontic techniques.

The Master of Science degree program prepares the specialist for a career in education and research. Also, the program satisfies the formal training requirements for eligibility for the American Board of Prosthodontics examination.

The requirements are flexible, permitting the development of a plan of study which will fill the individual needs of each student. This is possible since normally not more than two students are accepted each year for advanced training in the Department. Each student is required to prepare a thesis based on original research and pass an oral and/or written comprehensive examination. The student's advisor will serve as chairman of the examining committee.

The student will be required to meet all the requirements for the master's degree as outlined in the Manual of Rules and Regulations of the Graduate College.

Minimum requirements for admission to the program correspond to the minimum requirements for admission to the Graduate College. In addition, the student must hold a D.D.S. or D.M.D. degree or its foreign equivalent. No advanced GREE is required.

Courses

3410 Removable Prosthodontic Technologic Lecture 1 a.h.
3411 Removable Prosthodontic Technologie Laboratory 3 a.h.
3412 Removable Prosthodontic Materials Laboratory 1 a.h.
3410 Prosthodontic Theory and Manipulation of denture materials 2 a.h.
3410 Removable Prosthetics 3 a.h.
3415 Complete Denture Seminar II 1 a.h.
3420 Removable Partial Denture Seminar I 1 a.h.
3421 Review of current research in prosthodontics, principles and concepts of complex denture construction.
3422 Complete Denture Seminar II 1 a.h.
3426 Removable Partial Denture Seminar I 1 a.h.
3427 Review of past research in principles, practices and concepts of complex denture construction.
3428 Removable Partial Denture Seminar II 1 a.h.
3429 Research: Removable Prosthodontics 1 a.h.
3431 Removable Prosthodontic Preparation and materials from the research project.
3432 Advanced Clinical Prosthodontics 3 a.h.
3433 Library Assignment: Removable Prosthodontics 3 a.h.
3434 Removable Partial Denture Seminar II 1 a.h.
3435 Journal Club 1 a.h.
3436 Review of current literature in prosthodontics.
3437 Library Assignment: Removable Prosthodontics 3 a.h.
3438 Discussion of assigned readings that are considered relevant to removable prosthodontic literature.
Dean: Howard E. Jones
Dean emeritus: Elmer T. Prudden
Associate dean emeritus: Henry D. Debake, Laverne A. Van Dyke
Assistant dean: Susan C. Davie, Alice B. Work, Owen L. Springer
Director, Iowa Testing Program: William E. Cliffman
Director, Educational Placement: Justin D. Hendrickson

The first permanent college-level department of education in the United States was established at The University of Iowa in 1872. The department became the School of Education in 1907 and the College of Education, structured in the basic pattern which governs it today, was founded in 1913. The growth of the College has corresponded to the growth of the University.

The College has eight divisions: Post-Secondary and Continuing Education; Educational Administration; Early Childhood and Elementary Education; Educational Psychology; Measurement and Statistics; Secondary Education; Counselor Education; Special Education; and Instructional Design and Technology.

The University is accredited by the National Council for Accreditation of Teacher Education (NCATE) for the preparation of elementary and secondary teachers and other professional school personnel, with the doctorate the highest degree approved.

Teacher Education Programs

The College of Education offers undergraduate programs in teacher education leading to certification in early childhood and elementary teaching, secondary school teaching, teaching in special education for mentally retarded and physically handicapped children, and health occupations education.

Admissions

Students who are interested in becoming teachers should indicate their proposed teaching major on the Application for Admission to the Department of Education. Students who indicate a later date to enter the Teacher Education Program (T.E.P.) must declare the appropriate teaching major as their major in the College of Liberal Arts Advisory Offices, 116 Schaeffer Hall, and submit an Application for Admission to the Teacher Education Program to the Office of Admissions, 170 Old Main by May 15th preceding the academic year in which the applicant plans to enroll in professional education courses. Applications received after that date will be approved only if faculty and program resources permit.

General Information

Students admitted to the T.E.P. are degree candidates in the College of Liberal Arts or College of Business Administration and must complete the requirements for the Bachelor of Arts, Bachelor of Science or Bachelor of General Studies degrees as explained in those college's sections of the University Catalog. Policies, rules and regulations of these colleges apply to students in the T.E.P. Students seeking the B.S. degree should especially note that a maximum of 40 semester hours of credit earned in the College of Education may be applied toward the degree.

Grade-Point Average

Although freshmen are admitted to the T.E.P., students are not eligible to enroll in professional education courses before they have completed 28 semester hours. The academic records of all students admitted to the T.E.P. will be reviewed at the end of each semester and students who have not maintained a 2.0 G.P.A. on all coursework attempted and on all University of Iowa coursework will be dropped from the T.E.P. Students who are dropped from the T.E.P. may reapply and may be re-admitted when the required 2.0 G.P.A. is achieved, if enrollment limits have not been reached.

Limitations on Enrollments

Because of the limits of faculty and teaching stations, it may be necessary to restrict enrollments in early childhood education, elementary education, special education and in social studies and English in secondary education. In the event that the number of T.E.P. applicants exceeds the capacity of a program, students will be selected by rank order on the criteria established by the faculty.

Admission Requirements

Undergraduates students must satisfy the following conditions before they will be admitted to foundations courses in education:

Have been admitted to The University of Iowa as a degree candidate;

Have completed the American College Test;

Be free of any health impairment or physical handicap which will preclude teaching success;

Have attained sophomore standing (26 semester hours) prior to the semester during which he or she seeks to enroll in the foundations of education sequence of courses;

Have achieved a 3.20 grade-point average on all college coursework attempted and coursework completed at The University of Iowa;

Have submitted an Application for Admission to the Teacher Education Program (see date, above).

Graduate students must satisfy the following conditions:

Admission to the Graduate College:
Have a cumulative grade-point average of not less than 2.50 (2.70 for M.A.T.) on undergraduate coursework;

Admission to a specific certification program (e.g., elementary education, special education or secondary English).
American government before a certificate can be renewed. Students are, therefore, encouraged to include such a course in their pre-service programs. The following courses will satisfy the requirement:

- **American Government**
  - 30:001 Introduction to American Politics 4 s.h.
  - 30:100 The American Political System 4 s.h.
  (Either course may also be used to satisfy up to four semester hours of the social science core requirement of the College of Liberal Arts.)

- **American History**
  - 16:061 American History, 1492-1877 3 s.h.
  - 16:062 American History, 1877-Present 3 s.h.
  - 16:061 The Colonial Period in America 3 s.h.
  - 16:162 American Revolution Period, 1740-1789 3 s.h.
  - 16:163 United States in the Middle Period, 1789-1860 3 s.h.
  - 16:164 United States in the Middle Period 1840-1877 3 s.h.
  - 16:167 The Contemporary United States, 1920-1940 3 s.h.
  - 16:168 The Contemporary United States, 1940-Present 3 s.h.

- **Advanced Studies**

  Graduate study in the College of Education is guided by the general regulations of the Graduate College, with certain additional requirements imposed by the faculty of the College of Education. Graduate students in education register in the Graduate College and receive their degrees from that college. The College of Education offers these graduate programs:

  - **Professional Improvement**
    - Students may be admitted to a Professional Improvement Program for purposes of taking limited coursework rather than a degree program. This program provides for minimal advisement and is appropriate for persons seeking salary credits, who are undecided about career plans, or whose applications are too late to permit processing for regular admission into degree programs. Faculty review committees may admit students to this program rather than as degree candidates due to incomplete information, unclear degree objectives and the like, in order to permit registration in the University.

  - **Certification Only**
    - Students who have not been certified as teachers and who do not wish to pursue the M.A.T. or do not meet its admission requirements may be admitted under the classification Certification Only. With students in this program, the advisor plans the academic major and educational sequence aspects of the program to meet the requirements for certification. Since enrollment is early childhood education, elementary education, special education and social studies and English in the secondary program is limited, admission of graduate students to this program is as carefully reviewed as for degree programs. Persons who wish to meet certification requirements for positions other than as a teacher (i.e., counselor, administrator or curriculum specialist) and who meet basic requirements and need only a few courses to validate or update their
Bulletin
Prospective graduate students should write to the College of Education for its bulletin, Advanced Studies in Education, which provides specific information about the various programs, admission procedures and requirements, and rules and regulations.

Advanced Degree Programs
The following are the College of Education's advanced degree offerings:

Counselor Education
School Counseling: M.A., Ed.S., Ph.D.
Rehabilitation Counseling: M.A., Ph.D.
College Student Personnel: M.A., Ed.S., Ph.D.
Counseling Psychology: Ph.D.

Educational Administration
Educational Administration: M.A., Ed.S., Ph.D.
Elementary Administration: M.A., Ed.S., Ph.D.
Secondary Administration: M.A., Ed.S., Ph.D.

Early Childhood and Elementary Education
Elementary Education: M.A., Ph.D.
Developmental Reading: M.A.
*Art Education: M.A., Ph.D.
*Math Education: M.A., Ph.D.
*Physical Education-Field House: M.A., Ed.S., Ph.D.
*Physical Education and Dance-Halsey Gymnasium: M.A., Ph.D.
*Science Education: M.S., Ed.S., Ph.D.

Educational Psychology, Measurement and Statistics
Educational Psychology: M.A., Ph.D.
Educational Measurement and Statistics: M.A., Ph.D.
Reading Disability: M.A.

Instructional Design and Technology
Instructional Design and Technology: M.A., Ed.S., Ph.D.

Post-Secondary and Continuing Education
Adult Education: M.A., Ph.D.
Higher Education: M.A., **Ed.S., Ph.D.

Secondary Education
Secondary School Curriculum: M.A., Ph.D.
*Art Education: M.A./M.A.T., Ph.D.
Business Education: M.A./M.A.T., Ph.D.
English Education: M.A./M.A.T., Ph.D.
Mathematics Education: M.A./M.A.T., Ph.D.
*Music Education: M.A., Ph.D.
*Physical Education-Field House: M.A., Ed.S., Ph.D.
*Physical Education and Dance-Halsey Gymnasium: M.A., Ph.D.
Science Education: M.S./M.A.T., Ed.S., Ph.D.
Social Studies Education: M.A., Ph.D.

Special Education
Special Education and School Psychology: M.A., Ed.S., Ph.D.

Master of Arts
The Master of Arts program is offered on both a thesis and non-thesis basis. The non-thesis M.A. program usually provides more specialized coursework than is found in the M.A. thesis program. The non-thesis program is not necessarily a terminal program, but students who expect to continue their studies on a doctoral program are urged to select the M.A. thesis program which offers more experience in research procedures. Students who complete a non-thesis M.A. program and are admitted to a Ph.D. program may be asked to submit evidence of writing and research skills to their advisor or division during the early part of their doctoral program.

Master of Science
Thesis and non-thesis programs are available for students desiring a concentration in science. The degree outlines and the use of the programs are similar to those above for the Master of Arts degrees.

Master of Arts in Teaching
The M.A.T. program is a 38-semester-hour (minimum) non-thesis program designed for academically superior liberal arts graduates who included few or no professional education courses in their undergraduate programs. The program leads to a master's degree and certification as a secondary teacher in such fields as art, business, English, foreign languages, home economics, mathematics, science, social studies and speech and drama. A grade-point of at least 2.70 on undergraduate coursework is required for admission. At least 18 semester hours of graduate coursework in the student's proposed teaching field must be completed. A sufficient number of semester hours of graduate work in education (not less than 20) must be taken to satisfy certification requirements.

Specialist in Education
This degree is granted upon the completion of a prescribed two-year, post-baccalaureate program designed for students preparing themselves professionally in such fields as teaching, administration and supervision and special services. Of the minimum of 60 semester hours required for the degree, 28 are prescribed in the area of specialization; the remaining credit may be selected from cognate fields, supervised experience, research and elective courses. The research must culminate in a written report. Other requirements and regulations applicable to the Ed.S. are the same as for the master's degree except that 15 semester hours of resident work on campus are required in one 12-month period or in two semesters. The student and coursework completed ten years prior to the final examination must be evaluated to determine the amount of credit that may be accepted toward fulfillment of the program requirements.

Doctor of Philosophy
The Ph.D. is the highest academic degree and is conferred upon those students who have demonstrated superior scholarship and mastery of research skills in coursework as well as in the preparation and defense of a dissertation.
College of Education

Non-Divisional Programs

Social Foundations: M.A., Ph.D.

*K-12 Programs are offered jointly through Early Childhood and Elementary Education and Secondary Education Division.

**Includes cooperative programs in teaching fields leading to certification for Community College teaching.

The M.A.T. is also offered in the areas of French, German, home economics, and speech and drama.

Support Units and Special Resources

Center for Educational Experimentation, Development, and Evaluation

The Center exists to facilitate cooperative research, development, and evaluation projects with participating school districts, colleges, and state and federal agencies. Programs include activities formerly administered through the Iowa Center for Research in School Administration and the Cooperative School Systems Program.

Computer-Based Education Lab

The Computer-Based Education Laboratory offers hardware and consulting support for computer applications and instructional development related to ongoing instruction of the College of Education.

Curriculum Laboratory

The Laboratory provides materials primarily for students and faculty members interested in curriculum problems. It brings into a convenient central location approximately 25,000 elementary and secondary textbooks, reference books, courses of study, bibliographies, pamphlets and non-print media such as filmstrips, games, records, etc. The Laboratory also houses a 17,000-volume youth collection.

Early Childhood Education Center

This facility provides practicum, curriculum development and research opportunities for undergraduate and graduate students preparing to work with pre-kindergarten children. The Center enrolls some 84 children ages two months to five years. Both full-day and half-day programs are provided.

Educational Media Laboratory

The Laboratory houses a variety of instructional equipment and materials. Its facilities provide opportunities to develop skills in design and production of instructional materials and in the operation of instructional equipment of all types. In addition, Laboratory staff members provide service to students and faculty of the College of Education in production of videotapes, color slides, filmstrips, super 8 film, thermofax, transparencies and other materials related to instructional development.

Educational Placement Office

The Educational Placement Office serves undergraduate teacher education students interested in teaching positions as well as graduate students seeking other certified school positions. Graduate students interested in college teaching positions in education or in other fields as well as those interested in administration or positions in higher education are also served by this office.

Education-Psychology Library

The Library has approximately 109,360 volumes. It provides books, periodicals, reference books, films, ERIC microfiche, tests and a reserved book room for students and faculty.

Instructional Activities for the Classroom Teacher

This is a cooperative program between The University of Iowa and the State Department of Public Instruction involving the whole state of Iowa. The purpose is to conduct an in-service program for all classroom teachers of the handicapped.

The Iowa Testing Programs

The Iowa Testing staff develops standardized educational tests, such as the widely-used Iowa Tests of Basic Skills and Iowa Tests of Educational Development, for use in elementary and secondary schools. This department also conducts research studies in educational measurement and evaluation, publishes brochures, sponsors lectures and symposiums, provides consultative services to school systems, and provides training experiences for graduate students in measurement and statistics.

North Central Association

Iowa is one of the 19 states included in the North Central Association (NCA) of Colleges and Schools, the largest and most active of six regional accrediting associations in the United States. The primary purpose of the NCA is to foster improvement in education at the elementary, secondary and collegiate levels by self-evaluation of educational program, visitation by evaluation teams and adherence to Policies and Standards for continued membership. The University of Iowa houses and supports the office of the chairman of the Iowa NCA State Committee.

Reading Clinic

The Reading Clinic makes possible investigations into the fundamental causes of reading deficiencies and experimentation with methods of overcoming these deficiencies. It provides opportunity for observation and practice in the diagnosis and teaching of severely retarded readers.

School Program for Emotionally Disturbed Children

This program is located in the child psychiatry unit of the University's Psychopathic Hospital. Children attending this school are residential patients in the child psychiatry unit. The Program is supported by the Psychopathic Hospital and directed by the College of Education. Opportunities are available for student teaching and practicum in school psychological services.

Statistical Laboratory

The Laboratory contains a variety of calculating equipment. It provides experience in the application of such equipment to the analysis of statistical data, and it provides facilities for the analysis of research.

Teacher Certification Services

Although each state has its own teacher certification requirements, a majority of state certification agencies have entered into an agreement to issue certificates to applicants who have completed ap-
proved teacher education programs in institutions accredited by the National Council for Accreditation of Teacher Education. The University of Iowa teacher education programs have been approved by the Council. Students planning to teach in special education are advised to be certain they will be eligible for certification if they plan to teach in a state other than Iowa.

University Counseling Services

The facilities of the University Counseling Services are available to students in counseling psychology for research and practicum purposes.

University Hospital School

University Hospital School is a university-affiliated facility and, as such, it serves to provide a viable balance of direct services to developmentally disabled youngsters, interdisciplinary training activities for personnel and research projects into program development and effectiveness. The facilities contain two unique but integrated service sections, a residential program for youngsters coming from throughout the State of Iowa who are physically disabled, and a day program for youngsters from surrounding school districts who are mentally retarded. In addition to providing direct services to developmentally disabled youngsters, the facility has two other closely related functions – specialized training for workers and trainers in all areas concerned with handicapped children, and clinical research pertaining to causes and prevention of handicapping conditions.

Placement of children into the facility is worked out cooperatively with parents, appropriate area education agencies and local school programs. The basic philosophy of the facility is to return children to their local community programs within the shortest possible time. This philosophy is reflected in the maintenance of cooperative ties with local community programs either through outreach activities for training, pre-placement and follow-up purposes, or through utilization of facilities at the School.

The financial support of the facility is provided by local, state and federal sources.

Financial Aids

The College of Education maintains experimental, research, and laboratory relationships with school systems and the University maintains schools for the physically handicapped, emotionally disturbed, and mentally retarded.

Other facilities providing graduate experience in research and practice include the Reading Clinic, Statistical Laboratory, Iowa Testing Program, and the Early Childhood Education Center. The College is served by a Curriculum Laboratory, Educational Media Laboratory, Computer Based Education Laboratory, and the Education-Psychology Library. These facilities provide faculty and students with opportunities for conducting research and developing new instructional techniques.

Persons interested in employment opportunities in these areas should contact the director of each facility and indicate their interests, their academic and experience records, and their career or degree goals at The University of Iowa. Positions as advisors in Women's Residence Halls, or Men's Residence Halls also offer an opportunity for employment for graduate students.

Graduate Assistantships

Individually academic programs provide opportunities for teaching, research, or service assistantships as well as fellowships and related employment opportunities. However, not all programs have such opportunities available. Inquiries should be addressed to the chairperson of the division or to the director of the special program in an area in which the student believes he or she can provide service or achieve an outstanding academic record. If the student has applied for admission, his or her student file is available for review by those responsible for selecting the assistantship(s) for their programs. Appointments are normally for one year, but students may remain for a second year if satisfactory progress is made.

Application for Graduate Appointment

These awards provide partial payment of tuition fees for graduate students for the academic year, a semester, or the Summer Session. A grade-point average of at least 3.00 is required. These awards are offered to students in Education who hold assistantships on College of Education or related budgets. Applications may be obtained from 201 Jefferson Building. Students who are eligible are required to register for a minimum of nine semester hours of courses for each semester or five semester hours for the Summer Session for which they expect to receive these tuition awards.

Applications are valid for the academic year and the following Summer Session. New applications must be filed for awards beginning with the Fall Semester each year.

Special Research Assistantship Program

The Iowa Testing Programs and the Iowa Measurement Research Foundation provide sufficient funds to support a limited number of Special Research Assistantships in Education. Students admitted to or pursuing any of the advanced degree programs offered by the College have the opportunity to be awarded these assistantships to the graduate assistants to the United States or Canadian citizens. The assistantships are for the academic year only, are renewable for a limited number of times, and, at the present, pay stipends of $4,500 for half-time work. Holders are assigned to work under the direction of a faculty member in a research capacity and must carry a study or personal research load of not less than nine, or more than 12, semester hours per semester. The appointments are renewable. All candidates must submit transcripts of college work completed (undergraduate as well as graduate), letters of recommendation, and scores on the Graduate Record Examination Aptitude Test. The application deadline is January 1 of each year.

Loans and Outside Employment

Information about commercial and federal loans as well as part-time employment in the University and the community may be obtained from the Office of Student Financial Aids.

L. A. Van Dyke Student Loan Fund

This loan fund has been established by former advisors, colleagues and other friends of Associate Dean Emeritus L. A. Van Dyke in recognition of his significant contribution to education in the state and the nation. Available to candidates for a degree in Secondary Education with superior performance records as scholars and as
College of Education

Graduate Awards

Awards are presented to outstanding graduate students in the College of Education at the Spring semester faculty meeting of the College. These are:

- Perry Eugene McElhannon Award: To the outstanding candidate for an advanced degree in educational administration.
- Paul C. Pucher Award: To the outstanding candidate for the master's degree in education.
- Harvey H. Davis Award: To an outstanding student in educational administration or higher education, particularly a student interested in the financing of education.
- Pi Lambda Theta Graduate Award-M.A. and Ph.D. levels: To outstanding graduate students of high scholarship, promise in the professional areas of research, teaching or writing, and satisfying personal qualities.

Faculty

Members of the College of Education faculty are productive in research and writing and are well qualified by preparation and experience. Ninety-seven percent of the members of the faculty with academic rank hold earned doctorates in their teaching fields, and 95 percent have had teaching or administrative experience in the public schools.

A major strength of the College is its close working relationship with the College of Liberal Arts. With few exceptions, professors on the College of Education faculty also hold academic rank in the College of Liberal Arts. A majority of the professors who teach secondary school methods have dissertations in their teaching disciplines, as well as preparation in education, and hold academic rank both in their academic departments and in education.

Research and Development

The College has a strong history of commitment to educational development and research, as evidenced by the presence of the Linguistic Center for Measurement. In addition to independent research by individual faculty members, several studies are being pursued with the support of foundation and federal grants awarded to divisions and individual staff members. Most members of the faculty are active in professional societies, and several recently have held or held key committee positions in such organizations at the national level. Systematic research programs are sponsored through the Center for Educational Experimentation, Development and Evaluation.

Non-Divisional Programs

Non-divisional programs in the College of Education are administered by coordinators who report to the Office of the Dean. Such programs include those which fall outside the province of one of the divisions, are interdisciplinary in nature, or are of a temporary and experimental nature.

Social Foundations of Education

Coordinator: Robert Boling
Faculty: professor Robert Boling, associate professor William Daffy
Degree offered: M.A., Ph.D.

The primary purpose of this program is to prepare college instructors in the broad areas of Social Foundations of Education. A master's degree in Social Foundations of Education is usually inadequate by itself; however, students who intend to pursue the Ph.D. in the area of Social Foundations of Education and who enter the program without a master's degree may find it desirable to work toward this degree. Course requirements for either degree will be tailored to the individual. Courses available are listed below. Areas of study within this field are: (a) philosophy-sociology of education, (b) history of education, and (c) comparative education.

Admission Requirements

General requirements as stated for admission to a doctoral program in the Graduate College. Personal interview is desirable and may be required; social sciences, philosophy, or general humanities undergraduate and/or graduate emphasis and two years of teaching experience are strongly recommended. Student must maintain a 3.0 grade-point average in social foundations courses (797) to remain in the program.

Courses

Social Foundations and Comparative Education

797 History of American Education—3 s.h.
Our educational thinking and action of past 300 years as they have contributed to today's schools in the United States.

798 European Schools—3 s.h.
Treatment of contemporary educational changes in five European nations: similarities and contrasts between school policies and plans in the USSR, Scandinavia, England and France.

799 Education in Newly Developing Countries—3 s.h.
Problems and trends in education in selected areas and countries of Latin America, Africa and South Asia.

799 History of Education—3 s.h.
Ideas and ethics of great educational contributors from earliest days to present; work of many educators, especially as they have influenced educational practice in United States.

799 The Evolution of Education and the Role of Race in Education—3 s.h.
Analyzes principal factors in the emerging roles of women in America's educational history; a reading list is provided through treatment of women's educational access to higher education in America as well as in other countries today.

799 Philosophies of Education—3 s.h.
Introductory survey of the principal educational philosophers and philosophies, their influence on Western education; stress placed on how philosophical views and conflicts have shaped to shape educational trends.

799 Educational Sociology—3 s.h.
Overview of major social trends, influences and coexistence in American culture; analysis of key interactions with social structures at social institution.

799 John Dewey and Education—3 s.h.
Dewey's philosophy of education and philosophy "progressive" with special emphasis on his theories of knowledge, education and society, especially as applied in educational theory and practice.

799 Sex Roles Theorizing and Socialization in Education—3 s.h.
Consideration of the various theories given in redefinition of sex in analyses of school's reinforcement of sex-typing and discussion of alternative approaches and strategies for change. Same as TC 140.

799 Individual instruction in Social Foundations and Comparative Education—3 s.h.
Prerequisite: consent of instructor.

799 Seminar: Social Philosophies and American Higher Education—3 s.h.
Comparison and analysis of competing social philosophies, theoretical bases and
Counselor Education

263

practical influence on contemporary higher education. Prerequisite: consent of instructor.

CE 206 American Contribution to Educational Philosophy 3 a.h.
American philosophy and its influence on American public education.

CE 300 Citizenship and Other Community Educational Systems 3-4 a.h.
Present issues, trends, and problems among schools in 12 representative nations considered. Seminar daily on topics selected in consultation with students. Students will present seminar lectures at the end of the semester.

CE 304 Seminar: Value Problems in the Administration of American Education 2 a.h.
Philosophical and sociological ideas which underlie American system for administering various public educational institutions; visitation of various educational systems in an of their own choice. Seminar presentations on issues chosen and shared with other students.

CE 402 Seminar: Psychology and Education of the Outer-City Child 2 a.h.
Readings and discussions to understand effective methods of education for children growing up in a lower-income environment. Seminar presentations on topics chosen by students.

Prerequisites: consent of instructor.

Interdisciplinary Courses

SE 103 Facilitating Career Development In Schools 4 a.h.
Conceptual framework for understanding work with youth on job analysis and a wide spectrum of individual career; review of career information methods and use of community resources with applications. Fall odd semesters.

SE 201 Current Issues in Education 2-3 a.h.
Seminar for first-semester students with special interest in educational issues; seminar participants and instructor to share and discuss in a more informal setting.

SE 293 Seminar: Psychology and Education of the Outer-City Child 2 a.h.
Readings and discussions to understand effective methods of education for children growing up in a lower-income environment. Seminar presentations on topics chosen by students.

Prerequisites: consent of instructor.

Counselor Education

Chairperson: Albert B. Reed

The Division of Counselor Education is primarily involved in the training of practitioners and scholars at the graduate level. In addition, however, the division offers training in interviewing and interpersonal skills for students in other professional and graduate programs as well as some basic courses in these areas for undergraduates.

College Student Personnel Administration and Counseling

M.A. in Arts Admission Requirements

Applicants must submit satisfactory evidence of ability to do graduate work, as demonstrated by adequate preparation in college and/or other professional experiences.

A personal interview is desirable, but not required. Applications will be accepted until the deadline indicated by the Department of Graduate Studies.

Counseling Psychology

Ph.D. Admission Requirements

Applicants should have completed at least one year of full-time work experience in rehabilitation and counseling with a minimum undergraduate grade-point average of 3.00 or better. A total score of at least 1,000 on the Graduate Record Examination (aptitude test) is required. A minimum score of 550 on one of the two aptitude portions of the Graduate Record Examination is required. Evidence of outstanding leadership in extracurricular activities at an undergraduate institution is also necessary. Highly successful experience in the field is desirable. Candidates must also evidence a high level of emotional balance, personality and interpersonal skills. Students admitted on an conditional basis will usually be required to earn a 3.00 G.P.A. to be admitted to regular status.

Ed.S. Admission Requirements

Completion of a master's degree in counseling, student personnel work or closely related areas; 3.00 grade-point average; successful experience in college student personnel work or equivalent experience is necessary. The M.A. degree or its equivalent is not necessary for admission to the Ph.D. program, but to take the Ph.D. comprehensive examination, the student must offer research evidence through his M.A. thesis or its equivalent.

Counseling Psychology

Ph.D. Admission Requirements

Preference will be given to applicants who have received their M.A. degree in psychology, or 3 years of related experience. G.P.A.'s of 3.00 or more; successful candidates for admission will typically have GRE (aptitude) scores of 1,150 letters of recommendation. In addition, a personal interview is required before final admission. All application materials must be received by March 1 of each year; students will be notified about March 15 concerning their applications. Very few students are admitted to the doctoral program each year.

Rehabilitation Counseling

M.A. Admission Requirements

Applications are reviewed March 1, for fall admissions only.

Ph.D. Admission Requirements

Similar to minimum requirements for Graduate College. In addition, applicants who have recently graduated from an M.A. program in rehabilitation counseling, and who have not had at least one year of full-time work experience in rehabilitation counseling, will be considered for admission at the Ph.D. level.
counseling, must submit a written explanation for not undertaking such work experiences prior to admission to the doctoral program. Such work experience is viewed as highly desirable and applicants without such experience will receive lower priority than applicants with such experience. Applications are reviewed March 1 for fall admissions. M.A. basis or equivalent necessary.

School Counselor Education

M.A. Admission Requirements

In addition to the Graduate College's minimum requirements, the faculty of the School Counselor Education program requires a minimum undergraduate grade-point average of 2.50 and the completion of specific courses by the applicant and reference persons. These forms will be sent by the Office of Student Personnel, College of Education.

Ed.S. Admission Requirements

To be admitted to the program, an applicant must possess a master's degree or its equivalent in counseling and have experience as a counselor. The applicant is also required to have a minimum grade-point average for all graduate study of 3.00 and complete the necessary forms (required by this program) which will be sent by the Office of Student Personnel, College of Education.

Ph.D. Admission Requirements

An applicant must demonstrate scholastic aptitude by meeting the minimum graduate grade-point average requirement of 3.25 and perform satisfactorily on the Graduate Record Examination. Also, an individual should possess a master's degree or its equivalent in a counseling area.

Special Program in Drug Counseling

A centrally-funded program leading to a drug counseling specialty is available as a minor area along with other M.A. programs in counselor education.

Special Facilities

A wide variety of practicum experiences is available to students in the various programs in counselor education in a large number of settings in neighboring community agencies, schools and colleges as well as in many agencies throughout the University.

Financial Aid

Graduate training fellowships are available (dependent upon federal funding) for students entering the Rehabilitation Counseling and Drug Counseling programs. Many other graduate students in the Counselor Education Division hold a variety of part-time graduate assistantships. For example, many of the University's students serve units that award part-time assistantships to graduate students in the College Student Personnel Program. Applicants for assistantships should contact the coordinator of the particular counselor education program they plan to enter.

Courses

For Undergraduates and Graduates

Counseling and Guidance

Directed toward these students, who are concerned about their educational and vocational goals, special emphasis is given to the counseling, decision-making, self-actualization and exploration of the world of work.

7C:106 Principles of Guidance

Focus upon guidance procedures and practices and classroom teacher in student counseling. Emphasis is given to understanding the counseling process, self-actualization and guidance of the world of work.

7C:108 Practical Experience in Counseling

Focus on the teaching and practice of student counseling. Emphasis is given to understanding the counseling process, self-actualization and exploration of the world of work. 

7C:106 Graduate Procedures and Practices for Classroom Teachers

Focus on guidance procedures and practices and classroom teacher in student counseling. Emphasis is given to understanding the counseling process, self-actualization and exploration of the world of work.

7C:108 Practical Experience in Counseling

Focus on the teaching and practice of student counseling. Emphasis is given to understanding the counseling process, self-actualization and exploration of the world of work.
TC-335 Counseling of Children and Parents 3 a.h.
Survey of methods, principles and research related to counseling of children and parents. Prerequisite: consent of instructor. TC-331 to TC-399 recommended.

TC-341 Foundations of Counseling 3 a.h.
Develops a systematic view of the counseling process and the role of the counselor. Prerequisites: consent of instructor.

TC-342 Rehabilitation Counseling 3 a.h.
Principles and techniques of counseling for individuals with disabilities. Prerequisites: consent of instructor.

TC-343 Military Aspects of Disability 3 a.h.
An overview of the military system and the role of counseling psychologists in service. Prerequisites: consent of instructor.

TC-344 Introduction to Rehabilitation Services 3 a.h.
Covers the basics of rehabilitation services with an emphasis on employment and vocational counseling procedures. Prerequisite: consent of instructor.

TC-351 Vocational-Educational Counseling 3 a.h.
Survey of topics in vocational counseling and the counseling of special populations. Prerequisites: consent of instructor.

TC-345 Appraisal in Counseling 3 a.h.
An overview of techniques for assessing students for counseling and other educational purposes. Prerequisites: consent of instructor.

TC-346 Educational Psychology 3 a.h.
Acquaints students with concepts and research related to educational psychology. Prerequisite: consent of instructor.

TC-347 Career Development 3 a.h.
Focuses on the process of career development and its implications for counseling practice. Prerequisite: consent of instructor.

TC-348 Minority Counseling 3 a.h.
Examines the counseling of minority groups. Prerequisites: consent of instructor.

TC-349 Counseling in Special Settings 3 a.h.
Covers the unique needs of counseling in special settings such as schools, hospitals, and community agencies. Prerequisites: consent of instructor.

TC-350 Seminar in Counseling 3 a.h.
Covers special topics in counseling. Prerequisite: consent of instructor.

TC-351 Seminar in Clinical Supervision 3 a.h.
Covers the supervision of counseling interns and practicum students. Prerequisite: consent of instructor.

TC-352 Seminar in Group Counseling 3 a.h.
Covers the principles and practice of group counseling. Prerequisite: consent of instructor.

TC-353 Seminar in Adlerian Psychology 2 a.h.
Covers the theory and practice of Adlerian psychology. Prerequisite: consent of instructor.

TC-354 Seminar in Career Counseling 2 a.h.
Covers the theory and practice of career counseling. Prerequisite: consent of instructor.

TC-355 Seminar in Personality 2 a.h.
Covers the theory and practice of personality assessment. Prerequisite: consent of instructor.

Covers the theory and practice of social psychology. Prerequisite: consent of instructor.

TC-357 Seminar in Learning and Behavior 2 a.h.
Covers the theory and practice of learning and behavior modification. Prerequisite: consent of instructor.

TC-358 Seminar in Counseling and Psychotherapy 2 a.h.
Covers the theory and practice of counseling and psychotherapy. Prerequisite: consent of instructor.

TC-359 Seminar in Counseling Research 2 a.h.
Covers the theory and practice of counseling research. Prerequisite: consent of instructor.

TC-360 Seminar in Counseling and Psychotherapy 3 a.h.
Covers the theory and practice of counseling and psychotherapy. Prerequisite: consent of instructor.

TC-361 Seminar in Counseling Research 3 a.h.
Covers the theory and practice of counseling research. Prerequisite: consent of instructor.

TC-362 Seminar in Counseling Research 3 a.h.
Covers the theory and practice of counseling research. Prerequisite: consent of instructor.

TC-355 Seminar: The Normal Personality 3 a.h.
Covers the theory and practice of the normal personality. Prerequisite: consent of instructor.

TC-359 Professional Issues in College Student Personnel 1 a.h.
Covers the theory and practice of professional issues in college student personnel work. Prerequisite: consent of instructor.

TC-360 Seminar in Counseling Research 3 a.h.
Covers the theory and practice of counseling research. Prerequisite: consent of instructor.

TC-361 Seminar in Counseling Research 3 a.h.
Covers the theory and practice of counseling research. Prerequisite: consent of instructor.

TC-362 Seminar in Counseling Research 3 a.h.
Covers the theory and practice of counseling research. Prerequisite: consent of instructor.

TC-363 Seminar in Counseling Research 3 a.h.
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TC-373 Seminar in Counseling Research 3 a.h.
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TC-374 Seminar in Counseling Research 3 a.h.
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TC-375 Seminar in Counseling Research 3 a.h.
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TC-376 Seminar in Counseling Research 3 a.h.
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TC-391 Seminar in Counseling Research 3 a.h.
Covers the theory and practice of counseling research. Prerequisite: consent of instructor.

TC-392 Seminar in Counseling Research 3 a.h.
Covers the theory and practice of counseling research. Prerequisite: consent of instructor.

TC-393 Seminar in Counseling Research 3 a.h.
Covers the theory and practice of counseling research. Prerequisite: consent of instructor.
Early Childhood and Elementary Education

Early Childhood and Elementary Education

Preparation: Jerry N. Kohr

Graduate course in Teaching and Research: A.A., B.S., M.A., & Ph.D.

The programs offered by the Division are designed to prepare students for employment in specific positions in public schools and institutions of higher learning. All programs have been approved by the Iowa Department of Public Instruction and meet National Council for Accreditation of Teacher Education approval standards.

Undergraduate Programs

Early Childhood Education

Early childhood teaching requires an understanding and appreciation of young children from infancy through the early elementary school years, and competence in encouraging and enhancing the growth and development of the total child.

Preparation for early childhood teaching involves study of child development, parent-child relationships, and organization and administration of child-centered activities, in addition to curriculum and methodology appropriate for young children. The program involves wide reading, creative planning, and application of knowledge in working with groups of young children in public or private early childhood centers or classrooms. The early childhood education program is designed specifically to prepare students to teach children in infant-toddler groups, in classes for three-, four-, and five-year-old children, and in kindergarten and meet the requirements of the Iowa Department of Education for nursery school/kindergarten teachers.

Students interested in dual certification as the natural school/kindergarten level and the kindergarten/elementary level should follow the early childhood education program with the early childhood area of specialization beginning in enrollment numbers 10 and 53.

Program Requirements

Special Core Requirements

Students majoring in Early Childhood, Elementary and/or Special Education should complete the special Science-Mathematics Foundation designed for them. Completion of this core requirement is a prerequisite to enrolling in 7E:162 Methods: Elementary School Mathematics. This core requirement may be satisfied in one of three ways:

Satisfactory completion of courses 97:55, 97:56, and 22M:80; or

Satisfactory completion of equivalent courses at another four-year approved college or university; or

Prior to declaration of an education major and/or admission to a teacher education program, successful completion of The University of Iowa's natural science core curriculum and the passage of special test dealing with the content of 97:55-97:56 and 22M:80. Students not passing the science competency examination must register for 97:104. Students not passing the mathematics examination must register for 22M:80.

Foundations Courses

7P:75 Educational Psychology and Measurement 3 s.h.
7E:100 Introduction: Elementary and Early Childhood 3 s.h.
7V:101 Operation of Audio-Visual Equipment 1 s.h.

Undergraduate students should complete the Foundations Courses in their sophomore year. Graduate students may elect equivalent graduate-level courses with the approval of their advisors.

Major Courses

Minimum course requirements which must be completed before student teaching:

17:10 Growth and Development of the Young Child 3 s.h.
or
7P:106 Child Development 3 s.h.
31:14 Introduction to Child Psychology 3 s.h.
*17:124 Nutrition Work with Children 3 s.h.
7E:120 Methods and Materials: Music for the Classroom Teacher 3 s.h.
7E:122 Methods and Materials: Art for the Classroom Teacher 3 s.h.
7E:126 Literature and Storytelling for Children 3 s.h.
7E:157 Methods: Early Childhood Education I 3 s.h.
7E:91 Pre-Education Practicum (to be taken concurrently with 7E:157) 1 s.h.
7E:157 Methods: Early Childhood Education II 3 s.h.
7E:91 Pre-Education Practicum (to be taken concurrently with 7E:167) 1 s.h.

Additional courses required to complete the Early Childhood Education major (may be taken before or after student teaching):

*17:114 Parent-Child Relationships 3 s.h.
7U:135 The Culturally Different in Educational Settings 3 s.h.
42:125 Child Care Centers Development and Administration 3 s.h.

*Requires advance registration. See your adviser.
Student Teaching
Students should make application to the College of Education by March 15 preceding the academic year during which they plan to do their student teaching. Students register for 7E:158 Supervised Teaching in an Early Childhood Center. The student teaching period is one full semester for 15 semester hours of credit. No additional coursework may be taken during the student teaching semester.

Areas of Specialization
A minimum of three courses (or nine semester hours) from an area of specialization is required. The areas of specialization offered for early childhood education majors are child and family services, the family, child growth and development, language development, and educational needs of special children.

The student should consult with his/her advisor concerning the choice of the area of specialization. Copies of the requirements for each area of specialization are available in the College of Education Office and in the Early Childhood and Elementary Education Division Office. Courses in the area of specialization may be taken pass/fail if this option is offered for them.

Elementary Education
Elementary teachers guide the learning experiences of children during the approximate age period 5-12 years. They serve in a variety of school organizational patterns including self-contained rooms wherein the teacher assumes responsibility for most of the curricular areas, departmental positions wherein their responsibilities are concentrated in one or two subject areas, and teams teaching assignments wherein two or more teachers assume shared responsibility for the total instructional endeavor.

Preparation for elementary teaching involves: the acquisition of a general education background; a depth study of at least one elementary curriculum subject area; and, professional study of the learning process, the selection and structure of curricular materials suitable for school age children, and of the methodological procedures most appropriate for presenting these materials.

Study in the program is rigorous. It involves wide reading, creative planning and application of knowledge in the classroom.

The elementary education program is designed specifically to prepare students to teach kindergarten through fifth grade. Special sequences are also available for students seeking the nursery school/kindergarten endorsement and for those seeking approval for teaching in middle schools or junior high schools.

Students interested in seeking certification approval to teach art (approval number 34), music (approval number 60), or physical education (approval number 65) in grades K-9 must complete the requirements for the elementary education endorsement (number 10) and the appropriate Area of Specialization. Students interested in certification for elementary teaching and approval for special education should note the requirements for admission to each of these programs. Students interested in this combination must make a separate application to each program and these applications will be considered independently.

Program Requirements
Special Core Requirement:
See description under Early Childhood Education.

Foundations Courses
7E:91 Pre-education Practicum or equivalent 2 s.h.
7E:100 Introduction to Elementary and Early Childhood Teaching 2 s.h.
7P:75 Educational Psychology and Measurement 3 s.h.
7V:101 Operation of Audio-Visual Equipment 1 s.h.

Upperclassmen should complete these in their sophomore year. Graduate students may elect equivalent graduate level courses with the approval of their advisors.

Methods Sequence
7E:160 Methods: Elementary School Language Arts 3 s.h.
7E:161 Methods: Elementary School Social Studies 3 s.h.
7E:162 Methods: Elementary School Science 2 s.h.
7E:163 Methods: Elementary School Mathematics 2 s.h.
7E:164 Methods: Elementary School Reading 3 s.h.

The elementary methods sequence must be completed before the student will be eligible for student teaching.

Student Teaching
Students should make application to the College of Education by March 15 preceding the academic year during which they plan to do their student teaching. Students elect 7E:191 Supervised Teaching in an Elementary School or 7E:192 Laboratory Practice in Elementary School; 7U:191 Laboratory Practice in Education of the Physically Handicapped Child; 7U:192 Laboratory Practice in Education of the Mentally Retarded Child; and 7E:158 Supervised Teaching in an Early Childhood Center may also be elected where appropriate. The student teaching period is one full semester for 15 semester hours of credit. No additional coursework may be taken during the student teaching semester. No more than two certifiable student teaching experiences may be taken in a given semester.

Areas of Specialization
An Area of Specialization is required in a teaching field. The areas of specialization offered are elementary art, early childhood, elementary language arts, elementary mathematics, elementary music, elementary reading, elementary physical education (men's and women's), elementary science, elementary social science, special education and elementary generalist.

The student should consult with his or her advisor concerning courses which will serve to strengthen preparation for teaching in a subject area and meet the specific requirements for that area.

Copies of the requirements for each Area of Specialization are available in the College of Education Office and at the Early Childhood and Elementary Education Division Office. Courses in the area of specialization may be taken pass/fail if this option is offered for them.
Graduate Programs

M.A. in Elementary Education
This degree program, which may be taken with (30 s.h. minimum) or without (32 s.h. minimum) thesis, is designed to prepare master elementary teachers capable of serving as team leaders, grade level or subject area supervisors, or curriculum consultants. Successful completion of this degree together with four years successful teaching experience qualifies the student for certification as an elementary school supervisor, Iowa endorsement number twelve. Only one course, 7E300 Elementary Curriculum, is specifically required of all candidates but each candidate must complete at least one course from each of three areas: Social Foundations, Educational Psychology and Measurement, and Supervision. In addition, each candidate must complete an area of specialization and selected course work in advanced methodology.

M.S. in Elementary Science
This degree program, which may be taken with (30 s.h. minimum) or without (34 s.h. minimum) thesis, is designed to prepare master elementary science teachers capable of serving as team or departmental science specialists. The admission requirements are the same as those established by the Graduate College and, in addition, the applicant must have completed an undergraduate program of teacher preparation equivalent to that required for Iowa Elementary Teaching endorsement number ten. Prior to completion of the degree, the applicant must have one year of successful teaching experience.

Four courses are required of all candidates:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>7E302</td>
<td>The Science Curriculum in the Elementary School</td>
<td>2-3 s.h.</td>
</tr>
<tr>
<td>7E262</td>
<td>Advanced Techniques of Teaching Science in the Elementary School</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>7E350</td>
<td>Seminar: Science Education</td>
<td>1 s.h.</td>
</tr>
<tr>
<td>7E762</td>
<td>Current Readings in Science Education</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>

In addition, all candidates must complete coursework in at least two science areas. A minimum of ten semester hours must be completed in one science area.

M.A. in Developmental Reading
This program, which may be taken with (30 s.h. minimum) or without (32 s.h. minimum) thesis, is designed to prepare graduate students for positions as reading specialists in Kindergartens and grades 1-12. Successful completion of this program, together with four years successful teaching experience, qualifies the student for certification as a Reading Specialist, Iowa endorsement number 54.

Four courses are required of all candidates:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>7E264</td>
<td>Building Foundations for Reading: Pre-primary and Primary</td>
<td>2-3 s.h.</td>
</tr>
<tr>
<td>7E265</td>
<td>Supervision of Intermediate Grade Reading</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>7E364</td>
<td>Seminar: Elementary Reading</td>
<td>2-3 s.h.</td>
</tr>
<tr>
<td>7E184</td>
<td>Methods: Reading in Second Grade</td>
<td>2-3 s.h.</td>
</tr>
</tbody>
</table>

In addition, candidates must complete one or more courses in each of the Social Foundations and the Elementary School Curriculum and Supervision areas. In consultation with the major advisor, the student selects additional courses appropriate to his or her background.

Ph.D. in Elementary Education
The purpose of this program is to prepare students for college and university teaching and research positions in elementary education and for research, administration, supervisory, or administrative positions in public school systems and governmental educational agencies. A minimum of 90 semester hours, including hours earned for the dissertation, are required. The plan of study for each student is developed on an individual basis in consultation with an advisor. The final plan of study must be approved by the advisor and the Division chairperson. As a general guideline, each student is expected to have a good general background in all facets of elementary school education and a very strong area of specialization in at least one facet. Commonly selected specialization areas are: Elementary School Administration, Children's Literature, Early Childhood, Curriculum, Language Arts, Mathematics, Reading, and Social Studies. Each doctoral student must also complete a seminar or related field of concentration. The external field may be a professional specialization such as Educational Psychology and Measurement, Special Education, or General School Administration; or, it may be a subject field, such as English.

In addition, all students must demonstrate competency with respect to appropriate research tools, most commonly Statistical Analysis and Data Processing.

Financial Assistance
A number of teaching assistantships are available for graduate students pursuing advanced programs in early childhood and elementary education. Specific assignments vary. Some assistantships involve teaching in the Early Childhood Education Center; some involve the supervision of undergraduate majors enrolled in 7E91 Pre-Practice Pracicum; and some involve the teaching of sections of undergraduate methods courses and the supervision of student teachers. Most assistantships are classified as one-half time. This classification permits students to register for a maximum of 12 semester hours of credit per semester. Holders of assistantships must register for a minimum of nine semester hours per semester.

All assistantships are awarded on a competitive basis. To be considered for an assistantship an applicant must have been admitted on regular status to the Graduate College and have been accepted in an advanced program by the College of Education. Inquiries concerning assistantships should be directed to the Division chairperson.

Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>7E371</td>
<td>Methods and Materials: Elementary School Physical Education</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>7E372</td>
<td>Methods and Materials: Elementary School Physical Education</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>7E371/M</td>
<td>Methods and Materials: Elementary School Physical Education</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>

For physical education majors only. Same as Physical Education for Women (37/2).

For physical education majors only. Same as Physical Education for Women (37/2).

The prerequisite involves working with children and teachers in elementary schools and early childhood centers for at least ten hours per week for each semester hour of credit.
7E381 Observation and Analysis of Intra-Oral Practice 2-3 a.h.
Observation of elementary school instructional practices; critical analysis of evidence related to instruction.
7E384 Laboratory Practice in Supervision 2
Individualized practical experiences in a variety of supervisory roles; practical experience of instruction.
7E385 Practicum in Classroom Teaching 2
Practicum: content of instruction
7E386 Special Projects in Science Education 2-4 a.h.
Individualized research projects which may evolve into thesis for advanced students; causes of passing evidence with special investigations for advanced students.
Practicum: content of instruction
7E387 Professional Field Experience in Elementary Education 2
Practicum: content of instruction
7E388 M.A. Thesis in Elementary Education 2
Practicum: content of instruction
7E395 Educational Specialist Research in Elementary Education 2
Practicum: content of instruction
7E396 Seminar: Child Art and Art Education 3-2 a.h.
Analysis and evaluation of current concepts of child art and art development; perception, creativity and art education; historical development of child art, child development and art education. Same as TE 405.
7E398 Research in Art Education 3-2 a.h.
Individual research under supervision; application of thesis preparation and to doctoral dissertation development. May be repeated for credit.
7E399 Ph.D. Thesis in Elementary Education 2
Practicum: content of instruction

Educational Administration

Chairpersons: To be named

M.A. in Educational Administration

The purpose of this program is to prepare individuals for appointment as superintendent of elementary or secondary school principals, central staff, certain positions with state department of education, or positions with educational agencies.

The thesis program is recommended for students who plan to do graduate work for an advanced degree or who have a special career in mind.

Persons who wish to be certified as an elementary or secondary school principal must have had four years of teaching experience on a valid teacher's certificate. Within certification guidelines, programs are developed to meet the individual emphasis of the student.

Ed. S. in Educational Administration

The purpose of this program is to prepare students for appointments as superintendents of schools, in state departments of education, state educational agencies, or the U.S. Office of Education and to assist school administrators in upgrading their administrative skills.

Persons who wish to be certified as an elementary or secondary principal or superintendent of schools must have had four years of teaching experience on a valid teacher's certificate. Within certification guidelines, programs are developed to meet the individual emphasis of the student.

Ph.D. in Educational Administration

The program of this program is to prepare students for positions at all levels of school administration or to teach educational administration at the college level or university level.

Persons who wish to be certified as an elementary or secondary school principal or superintendent must have had four years of teaching experience on a valid teacher's certificate. Within certification guidelines, programs are developed to meet the individual emphasis of the student.

Courses

Educational Administration

7E381 Foundations of School Administration 2
Introduction to school administration; emphasis on processes concerned in all phases of educational administration; conceptual framework for administration of elementary schools and of junior high schools; hearing on conferences, decisions-making and organizational theory.
7E382 The Elementary School in the Community 2
Principles of educational data processing and computers with applications in educational administration, instruction and research.
7E383 Educational Systems and Operations Research 2
Application of system analysis and operational research methods in educational planning and decision-making; methods include linear programming, queuing, decision tables, strategic, getting, and networks.
7E384 Secondary School Administration 2
Rules and responsibilities of secondary school administrators in planning and implementing the educational program; staff relations, utilization and improvement, supervising appropriate student personnel services and the management of administrative opportunities.
7E385 Elementary School Principalship 2
Organization, supervision and evaluation of elementary schools, curricular leadership, instructional practice and personnel relations; role analysis and the development of character, skills and qualification requirements in administration program.
7E386 Elementary School Organization Patterns 2
Organizational approaches appropriate to specific situations intended to strengthen patterns; emphasis given to new trends in instructional procedures.
7E387 School-Site Systems Evaluation in Educational Decision-Making 2
Development of strategies, processes and mechanisms of evaluation and design; systems in the evaluation and review of the collection, organization, formulation and evaluation of information, development of criteria for evaluation and program administration.
7E388 School-Public Relations 2
Relationships between public school and social institution and community, basic concepts, propaganda and democratic processes, agents of influence, measurement of emphasis on field work.
7E389 Administration of Professional Personnel 2
Problems of recruitment, employment, instruction, inservice development, salary and welfare policies influencing professional personnel of schools.
7E386 School Safety Systems 2
Preventive: content of interest
7E386 Comprehensive planning of school safety procedures, from identification of need through articulation of the problem, including development of educational and safety selection of architecture, design of site, financing authorities, legal aspects.
7E386 Individual Instruction in Educational Administration 2
Practicum: content of interest
7E386 State and Federal Planning of Public Education 2
Federal implications of public education; determination of policy and practice in financing of public schools; local, state and federal legislative development principles of adequate tax programs and designing systems of more support of public education.
7E386 Financial Management 2
Practicum: content of interest
Overview of school business administration and role of school business officer, with emphasis on budgetary procedures, uniform accounting techniques and capital outlay funding.
7E387 Theory and Administration 2
Practicum: content of interest
7E387 Administration of Educational Programs 2
Administrative practice and leadership and organizational behavior in educational systems; development of theoretical constructs in the description, analysis and methodology of administrative behavior.
7E387 Federal Aspects of Educational Administration 2
Administrative practice and leadership and organizational behavior in educational systems; development of theoretical constructs in the description, analysis and methodology of administrative behavior.
7E387 Legal Aspects of Educational Administration 2
Emphasis on the legal rights of the teacher and student with some attention to the principal, superintendent, school board and school system, including liability, organization, rights, privileges and responsibilities of school personnel; examination of principles of law derived from
dary education. Recommended areas from which other electives may be chosen include Educational Psychology, Statistical Methods, Educational Measurement, Computer Programming and Data Processing, Mathematical Statistics, Counseling and Guidance, Special Education and Mathematics.

Candidates must write comprehensive examinations covering the fields of Educational Measurement and Applied Statistics. They may also opt to write a third comprehensive examination covering Educational Psychology or an approved substitute, in which case the coverage of the examinations will be somewhat less comprehensive.

M.A. in Reading Disability

Only a non-thesis (32 s.h.) minimum program is available in this area. The purpose of the program is to provide training in the diagnostic teaching of reading leading to endorsement (certification) as a Reading Clinician. Graduates may return to classroom teaching or serve as reading clinicians, resource teachers, or consultants.

The admission requirements are the same as those established by the Graduate College, except for the added requirement of two years of successful teaching experience.

All candidates are required to complete a common core of courses totaling 16 semester hours. Courses included in this core are:

- 7P:170 Psychology of Reading 3 s.h.
- 7P:273 Reading Clinic: Diagnosis 2 3 s.h.
- 7P:150 Educational Measurement for the Classroom Teacher 3 3 s.h.
- 7U:241 Individual Intelligence Testing 3 3 s.h.
- 7U:244 Introduction to Behavior Disorders/ Learning Disabilities 3 s.h.

In addition, each candidate must complete at least five semester hours of curriculum-type courses chosen from an approved combination of:

- 7E:365 Reading Clinic: Supervision 3 s.h.
- 8P:370 Teaching in a Reading Laboratory 3 s.h.

Elective courses (11 s.h.) minimum may be chosen from such fields as Speech Pathology and Audiology, Elementary and/or Secondary School Literature and Language Arts, Educational Psychology, and Elementary and/or Secondary School Curriculum.

All students are required either to write a three-hour comprehensive examination in Reading Disability and two 90-minute comprehensive examinations in related fields, or to take an experience-type comprehensive examination involving the investigation of a reading problem such as would be encountered by a reading clinician or consultant in the field.

Ph.D. in Educational Psychology

The purpose of this program is to prepare training that will qualify graduates to teach and to conduct research in educational psychology.

The admission requirements are the same as those established by the Graduate College, except that if the candidate's GRE total score is less than 1000 or if other evidence (GPA, academic preparation, and experience) warrants it, the admission will be conditional. Teaching experience is highly desirable but not required for admission. Qualified candidates who do not hold M.A. degrees will be admitted to the M.A. with thesis program and expected to earn that degree prior to formal acceptance into the Ph.D. program.

A minimum of 72 s.h. is required for the Ph.D. degree but few students are able to qualify for graduation within this minimal amount of formal training. The typical student finds it necessary to earn 90 or more semester hours of credit to satisfy the degree requirements.

Specific minor course requirements (25 s.h.) include 17 s.h. of statistics and research methodology, including at least one course in educational or psychological measurement, plus three courses (9 s.h.) from the general areas of Teaching and Learning and Developmental Processes, with at least one of these courses being from each area.

The balance of the student's course program is planned by the student and his advisor and may be tailored to enable the student to pursue his personal goals and interests.

The written comprehensive examinations call for three hours of writing in two or more areas from among general educational psychology, human development, learning motivation, and instructional design.

The dissertation topic (10 to 15 s.h. may be earned in the form of dissertation credit) is selected by the student in consultation with his advisor.

The final requirement consists of an oral defense of the completed dissertation before a committee of at least five members of the graduate faculty, at least one of whom must be from outside the College of Education.

Ph.D. in Educational Measurement and/or Statistics

The purpose of this program is to prepare students for high-level professional positions in educational measurement, evaluation and statistical methods, such as are frequently found in colleges and universities, state departments of instruction, public and private school systems, test-publishing firms and research or evaluation centers.

Admission requirements are the same as those established by the Graduate College except that the candidate's GRE total score is below 1000 and no satisfactory evidence of superior ability is available, the admission may be on a conditional basis. Students expecting to complete in statistics should have training in college mathematics through multivariate differential and integral calculus. At least one year of professional experience in teaching, research, or related fields is highly desirable. Qualified candidates who do not hold M.A. degrees will be admitted to the M.A. with thesis program and expected to earn that degree prior to formal acceptance into the Ph.D. program.

While a minimum of 90 s.h. is required, there are no specific course requirements beyond those required for the M.A. degree. The program of study is jointly planned by the student and his advisor during the first year, and it is tailored to meet the individual goals and interests of the student. Typical programs include advanced work in educational measurement, evaluation, and scaling; classical and Bayesian methods of data analysis; research methodology and the planning of experiments; and educational psychology.

Students who concentrate in the area of statistics are expected to take upper division work in mathematical statistics. Those who concentrate in the area of educational measurement and
evaluation will be advised to take appropriate courses in curricu-

lum, guidance or higher education. Work in other departments of

the University is encouraged.

The written comprehensive examinations normally involve
three one-hour examinations over the fields of statistics, educa-
tional measurement, and educational psychology (or an approved
'substitute area'.

The written examinations are followed by an oral examination
conducted by the candidate's comprehensive examination com-
nittee.

The dissertation topic (12 to 16 s.h.) must be chosen by the student in consultation with
his adviser from the fields of educational measurement, evaluation or
statistical methods.

The final requirement consists of an oral defense of the com-
pleted dissertation before a committee of at least five members of
the graduate faculty, at least one of whom must be from outside
the College of Education.

Possible Degree Programs

Ph. D. in Educational Psychology with Concentration in Reading Disability

Students are expected to meet the admission and degree require-
ments of the Educational Psychology Ph.D. degree program
above) except that one of the written comprehensive examinations
must be in the area of reading disability, and the dissertation topic
must be chosen from this area.

In addition to pertinent courses offered by the divisions of
Special, Elementary, and Secondary Education, the elective por-
tions of the student's program will include relevant courses
offered by the Department of Speech Pathology and Audiology,
the Department of Linguistics, and courses selected from the
developmental psychology program of the Department of Psy-
chology.

Ph.D. Program in Educational Psychology with Concentra-
tion in Instructional Design

Students are expected to meet the admission and degree require-
ments of the Educational Psychology Ph.D. program (above) except
that at least one of the comprehensive examinations must be
in the area of Instructional Design, and the dissertation topic
must be chosen from this area.

Pertinent methods and curriculum courses, as well as courses
chosen from the field of Educational Media, make up the elective
portion of the student's programs.

Educational Aides

The Division normally employs two graduate students as teaching
assistants in educational psychology and two in educational sta-

tistics. These are half-time academic year appointments and hold

ship permits to carry a study and/or research load of up to 12
s.h. per semester. These positions are generally awarded to expe-
rienced advanced doctoral students in either educational psychol-
ogy or educational measurement and statistics. Possible candidates
may address inquiries to the chairmen of the divisions.

Other types of graduate assistantships are supported by the Iowa
Tests of Basic Skills and the Iowa Tests of Educational Develop-
ment. Duties are varied, including such responsibilities as test
development, test scoring, and counseling with teachers in the
field whose pupils have participated in these testing programs.

There are also a few other assistantships supported by the Iowa
Testing Programs which are not specific to the two programs cited
above. Inquiries should be directed to the program directors.

TP: 75 Educational Psychology and Measurement

3 s.h.

Principal role is the development and classroom learning; study of student chrac-
teristics; problems in classroom management; construction, use, interpretation and
evaluation of educational tests. Same as Psychology 31:17

TP: 102 Learner Characteristics

3 s.h.

Descriptive and individual differences found to have direct implications for teaching.

TP: 108 Child Development

3 s.h.

An introduction to the psychological development of the child. Emphasis on the
behavioral, emotional, social, and cognitive processes of children. Same as Psychology
11:11.

TP: 109 Personality and Mental Hygiene

3 s.h.

Personality and adjustment of normal child; emotion and control of individual
behavior pattern; principles for modifying behavior; prevention of adjustment
problems.

TP: 161 Socialization of the School-Age Child

3 s.h.

Social development, pre-school influence, development of attitude and interest, effects
of social class on social development.

TP: 162 Educational Psychology

3 s.h.

Psychology in teaching and learning: development concepts, social processes,
language and thought, personality and social trends, models of teaching and
research; theory and applications of learning process. Same as Psychology 31:15.

TP: 172 The Adolescent and Young Adult

3 s.h.

Behavior and adjustment within physiological and psychological and social factors in
social environments social factors in social environments. Same as Psychology 31:16.

TP: 174 Introduction to Programmed Learning

3 s.h.

Theoretical bases of programmed learning; techniques of teaching machines and
other devices for the structuring of learning; model programs for summarized
learning; frame construction.

TP: 175 Computers in Education

3 s.h.

Characteristics and roles of micro-computers in education, design and use of
educational software, computer-managed instruction, instructional models and
simulation, use of computer in guidance and counseling, testing administrative
applications of computers and social factors influencing the use of computers in
education.

TP: 180 Introduction to Instructional Design

3 s.h.

Planning and evaluation concerning various instructional design models and
implications for instructional application.

TP: 182 Introduction to Statistical Methods

3 s.h.

Analysis and interpretation of research data; descriptive statistics (frequency dis-
tributions, measures of central tendency, principal components analysis); formulating
hypotheses (sampling theory, simple t-tests); introduction to correlation and linear
regression; analysis of variance; chi-square; tests of significance. Same as Statistics
20:25 and Psychology 31:45.

TP: 184 Bayesian Statistics I

3 s.h.

Introduction to the basic concepts and some of the recent, advanced procedures, analysis of
problems of the complexity, regression analysis, normal models, comparison of means and variance, simple correlation and regression; case studies. Prerequisites: TP: 143 or equivalent. Same as Statistics 20:27.

TP: 190 Educational Measurement for the Classroom Teacher

3 s.h.

Discussion of the process of measuring pupil achievement; selection of appropriate
objectives to be measured, conduction of valid instruments, administration and
scoring, interpretation of pupil performance and general analysis of test quality;
overview of standardized achievement and aptitude tests; interpretation and use of
selected test results and suggestions for using results to improve teaching and
learning. No prior background in statistics required.

TP: 192 Psychological and Linguistic Analysis of Reading Programs: Implications for Teaching
Methods and Materials: Factors Related to Reading Performance.

3 s.h.

TP: 191 Introduction to Theories of Learning

3 s.h.

Survey of learning psychology and educational theory: overview of theories, past and present, as they relate to teaching.

TP: 192 Cognitive Development in Childhood: An Introduction to Piaget

3 s.h.

Introduction to Piagetian theory of cognitive development with emphasis on core concepts and Piaget's stage analyses.

TP: 193 Special Readings and Projects

arr.

Supervised individual study. Prerequisites: oral and standing consent of instructor.
Undergraduate Program
The Division does not offer an undergraduate degree. That is, however, a number of courses open to undergraduate students.

Graduate Programs
The general goal of the graduate program in Instructional Design and Technology is to help students acquire and engage in research and development extending knowledge related to the systematic development of instruction. This includes knowledge about how students learn, and the full range of methods and materials by which such learning can be facilitated. Because such a goal requires that the student be given a broad perspective, the programs in Instructional Design and Technology are strongly interdisciplinary.

The programs allow for work in instructional program and product development, educational media program management, instructional psychology and visual learning and thinking. Specific available areas of specialization are administration, computer applications, educational program, educational technology, educational psychology, media production, and visual-scholarship program. The programs can be planned in such a way as to lead to the media specialist endorsement to a teaching certificate (endorsement 39).

M.A. Program
Minimum total semester hours required: 35 s.h.
Purpose: To provide a basic background in Instructional Design and Technology for classroom teachers or for those who plan careers as instructional designers and technologists in education, business or industry. May be taken with or without thesis.
Admission: A minimum g.p.a. of 2.50 on all previous course work and a composite GRE (Quantitative plus Verbal) of at least 1000 are required for regular admission. Students with GRE composite scores of less than 1000 are granted provisional admission, provided the student is not further below 250. In all, the combination of academic training is important. Teaching or relevant work experience may be helpful.

Ed.S. Program
Minimum total semester hours required: 60 s.h.
Purpose: To provide specialized training in Instructional Design and Technology beyond that attained in the M.A. program.
Admission: Same as for M.A., except that a minimum g.p.a. of 2.70 on all previous graduate work is required for regular admission.

Ph.D. Program
Minimum total semester hours required: 90 s.h.
Purpose: To provide a broad background for students interested in teaching, research, and leadership positions in the field of Instructional Design and Technology. There is a relatively heavy emphasis in this program on helping the student acquire the knowledge and skills necessary to expand their understanding of learning and instruction and those factors which influence them.
Admission: Same as for Ed.S., except that a minimum grade-point average of 3.00 on all previous graduate work is required for regular admission.

Courses
TV/201 Operation of Audio-Visual Equipment
Principles and practice in operating and mixing picture projectors, audio and video tape recorders, sound stages, cable installations, television systems, the dry-mount press and printing devices.
TV/202 Selection and Utilization of Instructional Media
Primarily for students expecting to teach, but open to other educational media: provides experiences in planning for, selecting, using and evaluating instructional materials; basic techniques for developing teacher-oriented instructional units. Prerequisite: TV/201, which may be taken concurrently.
TV/211 Introduction to Educational Communications and Technology
Role of audio-visual communications and technology in teaching and learning; professional roles, opportunities, problems and goals are investigated. Prerequisite: TV/202 or consent of instructor.
TV/232 Digital Communication Materials
Planning and production of graphic materials for communication and instruction; exposure to designing, drafting, engraving, drawing, preserving, duplicating, speech and image and high contrast photographic techniques. No graphics background required.
TV/144 Photography for Instruction
Planning and production of Instructional materials using still or motion picture materials.
Post-Secondary and Continuing Education

Coursework in Professional Education

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>7P:131</td>
<td>Educational Psychology</td>
</tr>
<tr>
<td>7P:150</td>
<td>Educational Measurement for the Classroom Teacher</td>
</tr>
<tr>
<td>7P:102</td>
<td>History of American Education</td>
</tr>
<tr>
<td>7P:107</td>
<td>History of Education</td>
</tr>
</tbody>
</table>

Program Requirements

- **Group I**
  - 7P:136 Introduction to Instructional Design
  - 7E:161 Designing Learning Programs for Health Career Education

- **Group II**
  - 7H:162 Learning Strategies for Career Education
  - 7A:112 Teaching of Adults

- **Group III**
  - 7H:271 The Community College
  - 7H:197 Philosophy of Vocational Education
Additional Requirements
7H:191 Community College Teaching Internship 12 s.h.
7H:190 Seminar, Health Occupations Education 3 s.h.
Additional specialty coursework in health occupations education 10 s.h.

Students may avail themselves of special workshops or courses offered by specific health colleges when appropriate prerequisites have been met.

Coursework may now be taken in specific basic sciences supporting health occupations education.

In addition to coursework in the health specialty and basic sciences, students may also choose electives from the following:

7H:175 Post-High School Faculty Development Workshop 0-2 s.h.
7P:136 Introduction to Instrumental Design 3 s.h.
7P:143 Introduction to Statistical Methods 3 s.h.
7P:181 Introduction to Theories of Learning 3 s.h.
7P:283 Motivation in Education 3 s.h.
7C:110 Processes of Change and the Counselor 2-3 s.h.
7C:150 Psychological Aspects of Women’s Roles 1-3 s.h.
7V:105 Selection and Utilization of Educational Media arr.
7V:116 Introduction to Educational Communications and Technology arr.

Coursework in the health occupations education specialty and supportive fields should be carefully planned in consultation with the advisor.

Graduate Programs

Higher Education

Master’s Program (without thesis)
Purpose: To prepare students for entry-level staff and administrative positions such as assistant dean of instruction in two- and four-year colleges.

Educational Specialist Program
Purpose: To provide the advanced graduate education modeled by instructors at the undergraduate level in two- and four-year colleges and by administrators in higher education not planning to continue for the doctorate; the Specialist degree may be awarded upon completion of a joint program in higher education and an academic discipline comprising a minimum of 60 semester hours of graduate work, or upon completion of a higher education sequence following a master’s degree program.

Doctoral Program
Purpose: To prepare professional personnel for teaching, research and administration in higher education.

Adult Education

Master’s Program (with or without thesis)
Purpose: To provide basic understanding of adult learning theory, instructional methodology and adult group processes in preparation for careers as professional adult educators or in areas that involve working with adults in such areas as schools, libraries, extension, public health and community development programs.

Doctoral Program
Purpose: To prepare for teaching, research and advanced leadership positions in the field of adult education; emphasis given to a broad background with cross-disciplinary relationships.

Iowa Community College Certification
Students who wish to meet certification requirements for community college teachers in Iowa (Endorsement 72) must complete a minimum of six semester hours of course work in higher education and/or closely related areas. Required or specific alternates may be chosen in consultation with the Office of Community College Affairs.

7H:271 The Community College 2-3 s.h.
7H:211 Problems in College Teaching 2-3 s.h.
7E:106 Electives 6 s.h.

At least two semester hours of American history or American government are required for Iowa certification.

A master’s degree in the student’s teaching area is required for certification in arts and science areas.

Special Facilities
A resource and document collection relating to community colleges is housed in room 416 Jefferson building. This collection is available for students doing research on topics related to community colleges for seeking employment information in relation to these institutions. Informational data, accreditation and approval reports, college brochures, etc., are to be found in the collection.

Fiscal Aid
One quarter-time graduate assistantship is assigned to the coordinator of the higher education program, and one half-time assistantship is assigned to the foreman of the community college program.

Courses

Higher Education

7R:101 Individual Study: Higher Education 1-2 s.h.
Purpose: Enrichment of background.
7H:100 Problems and Policies in Higher Education 3 s.h.
Study and analysis of current selected functions, problems and policies in American higher education. A basic course open to non-majors and undergraduates.
7H:161 Designing Learning Programs for Health Careers Education 3 s.h.
Emphasis placed on development and evaluation of educational programs; suggested planning procedures and typical curricula analyzed and practical applications provided. Activities individualized to meet various backgrounds and objectives. Same as Vocational Rehabilitation 50:161.
7H:165 Learning Strategies for Career Education 3 s.h.
Role of health specialist in career education; variety of teaching strategies explored through discussions, observations and teaching; activities individualized to meet various backgrounds and objectives.
7H:175 Post-High School Faculty Development Workshop 0-2 s.h.
Designed to provide post-high school faculty with work in other discipline areas or in some aspect of professional education; workshop topics may include programs for upgrading of administrative and supportive personnel as well as faculty members.
Focus on development of understanding of planning processes and applications in higher education at the institutional, statewide and national level. Emphasis on conceptualizations of planning; the environment for educational planning; issues in educational planning; planning techniques, methodologies and data bases for planning; government systems, policies and plans. Analysis and appraisal of exemplary institutional and agency plans.

72117 Administrative Decision-Making in Higher Education 3 s.h.
Adolescent development, decision making, conflict resolution. Not open to Criminal Justice majors. Prerequisites: 72128, or consent of instructor.

72228 Bachelor of Science in Education 12 s.h.
Four-year variable curriculum leading to a B.S. in Elementary Education in the arts and sciences. Required for teacher certification in the field.

72320 Practicum in Higher Education 1-6 s.h.
Prerequisites: consent of instructor.

72325 Seminar: History and Philosophy of American Higher Education 3 s.h.
Discussion of scholarly literature and contemporary topics of special interest to the history and philosophy of American higher education. Prerequisite: consent of instructor.

72326 Seminar: Social Issues in Higher Education 3 s.h.
Seminar dealing with issues in higher education. Prerequisites: Consent of instructor.

72328 Seminar: Theories in Higher Education 3 s.h.
Prerequisite: consent of instructor.

72330 Seminar: Educational Specialist Research in Higher Education 3 s.h.
Prerequisite: consent of instructor.

72401 Advanced Seminar in Higher Education 3 s.h.
Advanced Seminar topics and major areas of professional and research interest. Invited for Ph.D. majors in higher education. May be repeated up to a total of four s.h.
Prerequisite: consent of instructor.

72410 Thesis in Higher Education 1-6 s.h.
Prerequisites: consent of instructor.

Secondary Education

Chairperson: John E. Mckown

Faculty: professors G. Robert Cambon, Robert H. Heffner, James H. McCullough, Frank E. Mator, Robert D. Yager, Merle A. Brum, professors Donald J. LeVoit, Hubert P. Stewart, Lauren A. Van Dusen, associate professor David R. Helms, assistant professor John A. Broome, associate professors—who are to be approved by the academic senate; and one graduate assistant. Also, two additional faculty members are to be approved by the academic senate.

Bachelor of Science in Education in Secondary Education: includes such activities as student teaching, administration and supervision, evaluation, counseling, and general management. Prerequisite: consent of instructor.

72552 Bachelor's Research in Higher Education 3 s.h.
Full-time research; continued beyond the one-semester program upon approval by the faculty advisor.

72553 Seminar: Recent Research in Higher Education 2 s.h.
Analysis of research in the field, with special emphasis on the development of critical thinking and research skills; preparation and presentation of one major research project.

72555 Seminar: Education for the Professions 3 s.h.
Characteristics of the professions and their educational implications, the role of theory and practice, educational experiences: each student will analyze education of the selected profession. Prerequisite: consent of instructor.

72556 Seminar: Innovation in Higher Education 3 s.h.
Potential functional changes in the educational program; change strategies. Prerequisites: consent of instructor.

72515 Curriculum Development in Higher Education 3 s.h.
Prerequisite: consent of instructor.

72516 Theory and Practice of Planning in Higher Education 3 s.h.
Secondary Education

secondary school students must have an understanding and appre-
ciation of adolescents, a sound background in the liberal arts, an
open-minded attitude toward contemporary society and its problems, and
enthusiasm for the subject taught.

Junior and senior high school teachers usually specialize in a
particular subject, although they often teach classes both in their
major subject and in related subjects. Teachers of home econom-
ics, agriculture, music, art, industrial arts, and business education,
less frequently than other teachers, conduct classes in subjects
outside their major field.

In addition to their classroom work, secondary school and
college students plan and develop teaching materials, construct and
correct tests, keep records and make out reports, consult with parents, and perform
other administrative duties.

They are also involved in supervision of student activities,
including clubs and social functions, and in out-of-school affairs
as interested members of the community where they teach.

Maintaining good relations with parents and the local community
is an important facet of the teacher's responsibility.

Undergraduate programs

Students preparing for secondary school teaching must fulfill the
general requirements for a bachelor's degree in the College of
Liberal Arts or in the College of Business Administration, must
fulfill the requirements for a major in a specific department or
division in the College of Liberal Arts or College of Business
Administration, and must complete the professional courses neces-
sary for Iowa teacher certification, totaling from 22-28 semester
hours, which includes a semester of classroom teaching during the
senior year.

Students preparing to teach art, music or physical education
should take methods courses and acquire student-teaching experi-
ence at both the secondary and elementary levels.

During the freshmen and sophomore years, the student com-
pletes most of the general requirements for the bachelor's degree
by acquiring proficiency in rhetoric, mathematics, physical edu-
cation and a foreign language, and by satisfying core requirements in
literature, natural science, social science and historical-cultural
fields.

Program Requirements

Foundation Courses

Undergraduate candidates for a certificate to teach in a secondary
school (junior and senior high school) should complete the founda-
tion courses listed below in their sophomore or junior year.

Graduate students may elect equivalent graduate courses with the
approval of their advisor.

72:100 Introduction to Secondary School Teach-
ing

72:101 First-Year-Teacher Practicum

72:103 Introduction to Secondary School Teach-
ing

72:105 Education and Measurement

72:106 Educational Psychology and Measure-
ment

Methods and Student Teaching

Students must complete the special methods course in their major
teaching field prior to the semester in which they elect to do
student teaching.

Students should make applications for student teaching by March
15 preceding their senior year. Students elect 72:191 and/or

72:192 Observation and Laboratory Practice in Secondary

Schools. The student teaching period is one full semester for 12
semester hours of credit.

Students who want or need more than 12 semester hours in that
semester may elect one of the options:

72:190 Individual Projects in Laboratory Teach-
ing

72:187 Seminar in Library Science

72:105 Selection and Utilization of Educational

Media

Teaching Majors and Minors

A sufficient number of courses must be completed to satisfy the
requirements for a teaching major in a department within the
College of Liberal Arts or the College of Business Administration.

The completion of an academic major as defined by the
major department will satisfy this requirement in most cases.

It is strongly recommended that students elect sufficient work in
a field outside the major of the area of the major to obtain approvial
by the University for teaching in a second field (18-24 s.h.). Copies of
the teaching major and minor requirements are available in the
College of Education Office and at the Secondary Education
Division office.

Graduate Program

Members of the Division of Secondary Education serve as advisors
to graduate students who are candidates for the M.A.T., M.A.
M.S., Ed.S., or Ph.D. degrees.

Opportunities are provided for advanced study in such fields as
secondary school administration, secondary school curriculum, art
education, business education, English education, mathematics
education, music education, physical education, science educa-
tion, social studies education and speech education.

Programs leading to the M.A.T. degree are provided in some
teaching fields for students with superior academic records who
have earned the baccalaureate degree but who have not acquired
certification for teaching by the completion of required work in
professional education. Other graduate programs leading to the
M.A., M.S. or Ed.S. degrees, which usually combine ad-
vanced work in the academic disciplines and professional educa-
tion, are designed to enhance the preparation of master teachers,
department heads, supervisors, curriculum consultants, directors,
and coordinators for secondary schools and community colleges.

More advanced interdisciplinary programs extending to the Ph.D.
degree also prepare individuals to serve as college or university
instructors in their respective fields of specialization in colleges of
education or in the academic departments of their major field, in
addition to the types of positions previously mentioned. Some of
the "combined" programs are administered jointly by the Col-
lege of Education and another academic department of the Uni-
versity, whereas other programs are administered primarily by
only one of the cooperating units.

Programs leading to the M.A., Ed.S. and Ph.D. degrees are also
provided for the preparation of administrative and supervisory
personnel who may assume positions of leadership in the field of
secondary education, including college and university instruction
in this area.

Generally speaking, the minimum requirements pertaining to
admission, registration, academic standing, residency, etc., of
students in advanced degree programs in secondary education do not exceed the requirements outlined in the "Manual of Rules and Regulations of the Graduate College." Two major exceptions to this generalization do frequently occur, however: specifications for admission to most of the degree programs in this Division require a year or more of successful teaching experience, and in the cases noted in the following matrix, the minimum grade-point requirement exceeds the Graduate College minimum.

The following are the types of advanced programs offered by the Division of Secondary Education:


*Minimum grade point average for admission is 3.0. More specific information about such items as admission requirements and procedures, required and elective courses, departmental requirements and comprehensive examinations in the various advanced degree programs cited above is contained in the bulletin entitled Advanced Studies in Education.

Financial Aids

A limited number of half-time assistships is available for students pursuing Ph.D. degrees in secondary education. Holders of such assistships are permitted to register for no more than 12 hours of semester. Through special permission, holders must register for at least nine hours per semester. The assignments of assistants vary, but most involve the participants in teaching selected undergraddate methods courses or in the supervision of practicum experiences.

Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Catalog Number</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>78-91</td>
<td>Pre-Education Practicum</td>
<td>1.0 a.h.</td>
<td>Teach reading, writing, and reading techniques to each level of two to six hours per week. To be taken concurrently with 78-92.</td>
</tr>
<tr>
<td>78-92</td>
<td>Introduction to Secondary School Teaching</td>
<td>2.0 a.h.</td>
<td>Review of secondary education, including past and present educations goals, studies explore characteristics of teachers, students and schools for improvement among these groups.</td>
</tr>
<tr>
<td>78-101</td>
<td>Principles to Education</td>
<td>3.0 a.h.</td>
<td>Basic principles of education, consideration of administrative organization, historical principles and contemporary problems at both elementary and secondary levels.</td>
</tr>
<tr>
<td>78-146</td>
<td>Advanced Methods: Art</td>
<td>2.0 a.h.</td>
<td>Theory and practice at elementary and secondary levels: curriculum, art, and lines planning, evaluation, motivation, and instructional approach: evaluation techniques.</td>
</tr>
<tr>
<td>78-147</td>
<td>Introduction to Environmental Studies for K-12 Programs</td>
<td>1.0 a.h.</td>
<td>An introduction to materials and activities available for introducing environmental education in K-12 schools: a course outline and course materials for use in college courses. Same as 78-106.</td>
</tr>
<tr>
<td>78-148</td>
<td>Implementation of Environmental Study for K-12 Programs</td>
<td>2.0 a.h.</td>
<td>Consideration of essential activities in the area of environmental education, association with classroom implementation of activities in the area of environmental education. Same as 78-107.</td>
</tr>
<tr>
<td>78-149</td>
<td>Implementation of Environmental Studies for K-12 Programs</td>
<td>2.0 a.h.</td>
<td>Same as 78-107. Consideration of essential activities in the area of environmental education, association with classroom implementation of activities in the area of environmental education. Same as 78-107.</td>
</tr>
<tr>
<td>78-150</td>
<td>Studio Business and Consumer Issues</td>
<td>2.0 a.h.</td>
<td>Exploration of issues which affect consumer welfare and the business community: courses issues such as buying, fuel, economics, and other ways affecting life style, personal welfare and consumer issues. Same as 80-106.</td>
</tr>
<tr>
<td>78-151</td>
<td>Methods: Business Subj.</td>
<td>2.0 a.h.</td>
<td>Study of objectives, content, methods, and techniques for teaching business subjects: students may enroll for three to six semester hours of credit, depending upon area of specialization chosen, in consultation with student's advisor, from the following sequence: accounting (1.0 a.h.); business (1.0 a.h.), office administration (1.0 a.h.); bookkeeping/accounting (1.0 a.h.); business ethics (1.0 a.h.).</td>
</tr>
<tr>
<td>78-152</td>
<td>Methods: Journalism</td>
<td>2.0 a.h.</td>
<td>Improving journalism activities in secondary schools, with focus on methods of teaching: problems involved in achieving student proficiency and effectiveness in the production of student publications. Same as Journalism 19:104.</td>
</tr>
<tr>
<td>78-153</td>
<td>Seminar in English</td>
<td>2.0 a.h.</td>
<td>Instruction in methods, materials and organizational techniques in teaching high school English during laboratory sessions, integrated with lecture and discussion courses, student practical experience in student teaching situations. Same as English 26:106.</td>
</tr>
<tr>
<td>78-157</td>
<td>Workshops Introduction to Intermediate Science Curriculum Study for High School Science</td>
<td>2.0 a.h.</td>
<td>Revised currently available science program and middle school's developed specifically for the junior high school: particular emphasis on the ICS program.</td>
</tr>
<tr>
<td>78-159</td>
<td>Implementation of ICS Junior High School Science</td>
<td>2.0 a.h.</td>
<td>Continuation of 78-158.</td>
</tr>
<tr>
<td>78-163</td>
<td>Workshop Introduction to TEP (Technology, People and Environment)</td>
<td>0.0 a.h.</td>
<td>Introduction to TEP: workshops and activities available to provide students with interdisciplinary, hands-on approach to the study of current and future socio-economic problems and issues. Same as Economics 78:127.</td>
</tr>
<tr>
<td>78-164</td>
<td>Implementation of TEP (Technology, People and Environment)</td>
<td>2.0 a.h.</td>
<td>Consideration of activities, methods, and implementation strategies which facilitate teaching when the elementary or secondary teacher utilizes the material with the student, backboard, or complemented. Same as Economics 78:128.</td>
</tr>
<tr>
<td>78-165</td>
<td>Implementation of TEP (Technology, People and Environment)</td>
<td>2.0 a.h.</td>
<td>Consideration of activities, methods, and implementation strategies which facilitate teaching when the elementary or secondary teacher utilizes the material with the student, backboard, or complemented. Same as Economics 78:128.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>78-166</td>
<td>Workshop for Secondary School Journalism Teachers</td>
<td>2.0 a.h.</td>
<td>Workshop designed for teachers responsible for journalism publication.</td>
</tr>
</tbody>
</table>
Secondary Education

Political Experience, Economics in Society and Sociological Perspectives in the Social Sciences

7/174 Workshop in Social Studies Project 3-3 a.h.
Looking at the states, education, teaching strategies and materials of a number of significant Mexican developments for upper elementary, middle, junior and senior high schools. Use of course materials, development of model lessons and plans for adapting the materials to your school situations.

7/177 Theatre Production Institute 3-3 a.h.
Same as Speech and Dramatics Arts 367/140.

7/178 Workshop in Teaching Drama & Speech 3-3 a.h.
Focus on methods and materials for teaching speech, drama and various social and in various situations, opportunities for survey of methods, references and periods of Education and University Library; study of courses of study and other curriculum materials in the Curriculum Laboratory, and examination of films, tapes, and other audio-visual materials in the Audio-Visual Center. Same as Speech and Dramatics Arts 367/178.

7/179 Workshop in Group Oral Interpretation 3-3 a.h.
Students will study various concepts of oral interpretation, practice and present a modern theatre program. Same as Speech and Dramatics Arts 367/179.

7/180 Workshop in Teaching Mass Communication and Media in Secondary Schools 3-3 a.h.
Examination of use of radio and video with emphasis on film criticism, students produce radio and film projects. Same as Speech and Dramatics Arts 367/190.

7/181 Workshop in Interpersonal Communication 3-3 a.h.
Designed especially for public school teachers interested in increasing concept of socio-cultural communications, interpersonal communications, and human relationships study two classroom situations. Same as Speech and Dramatics Arts 367/181.

7/182 Workshop in Children’s Literature and Creative Dramatics 3-3 a.h.
Students required to present a variety of children’s stories, learn various techniques of criticism of children’s literature, receive training in use of creative dramatics for students in Grades 1-4, Same as Speech and Dramatics Arts 367/182.

7/185 Art Education Workshop 3-3 a.h.
Curriculum content for secondary school art as emphasis on creative processes, new methods and materials; includes study of psychology, art appreciation, demonstrations, criticism, and teaching experiences. Same as TD 185.

7/186 Curriculum Foundation Arts 3-3 a.h.
Elementary and secondary background knowledge in curriculum: definitions, historical perspective, methodology, theories of learning, behaviorism, and development of social studies, visual arts, creative arts. Same as TD 186.

7/187 Seminar in Curriculum and Student Teaching 3-3 a.h.
Discusses the curriculum and teaching of critical incidents, viewing of videos of student classroom performance in those of all ages, problem analysis, and evaluation. Same as TD 187.

7/190 Individual Projects in Laboratory Practice 1-3 a.h.
Projects concerned with curriculum and individual research related to project in school in which student is teaching. Same as TD 190.

7/191 Observation and Laboratory Practice in the Secondary School 1-3 a.h.
Affords student various opportunities to acquire experience of performing duties of regular classroom teacher under relatively close supervision in junior and senior high school. Prerequisite: consent of instructor.

7/192 Observation and Laboratory Practice in the Secondary School 1-3 a.h.
Continuation of 7/191. Prerequisite: consent of instructor.

7/193 Literature for Adolescents 3 a.h.
Reading and evaluation of literature projects for junior and senior high school students. Same as TD 193.

7/194 Methods: Reading in Secondary School 3 a.h.
Methods and procedures of teaching reading in junior and senior high school.

7/197 Mathematics Education 3 a.h.
Introductory course designed to acquaint an education major and other interested education students with available material for education study on algebra and some within framework of parent classrooms related to other subject matter. Same as 7/197.

7/198 Managing Business Instruction 3 a.h.
Development of teaching materials for teaching business education at all educational levels selected to demonstrate effective instructional design, methodology, and supervision. Same as Business Ed 219.
Special Education

Chairperson: Alan B. Frank
Faculty: professors Clifford E. Hove, Raymond B. Swepson, Paul M. Bertke; associate professors Luisa P. Brown, Alan B. Frank, John P. Judy, Jr., Anthea J. McGinnis; assistant professors Kathryn C. Geter, Alison Melvin-Jares
Degrees offered: B.A., B.S., M.A., Ed.S., Ph.D.

Undergraduate Programs

The Division of Special Education expects its graduates will continue to find opportunities as teachers of special classes in the public schools or as consultants and resource persons for teachers working with handicapped children in regular classrooms. Opportunities in the latter area reflect the trend in special education toward the accommodation of handicapped children in regular classrooms with supplemental help rather than the segregation of handicapped children in special classes.

The student who wishes to maximize career opportunities in special education should plan to pursue advanced degree work.

The major program in special education aims to give the student a knowledge of the characteristics of exceptional children, education programs currently provided for exceptional children and methods of teaching exceptional children.

Sixty students are admitted to the introductory courses in special education each year. Total cumulative grade-point average is the sole criterion for admission. Students are notified by mail about June 15 regarding their admission to the program for the upcoming fall term. The program sequence is established to begin in the fall of the sophomore year and is a three-year sequence.

A student majoring in special education has three options: to qualify for approval to teach the mentally retarded at the elementary level (approval number 81); approval to teach the mentally retarded at the secondary level (approval number 81, enrollment number 20); or approval to teach the physically handicapped at the elementary level (approval number 84). Both elementary programs require that the student also complete the requirements for certification in elementary education (approval number 10). At the secondary level, the student must complete the regular secondary education foundations program and complete the major in special education, including student teaching with the mentally retarded at the secondary level.

The program is enriched by team teaching, guest lectures, field trips, simulated teaching experiences, the use of observation techniques, practicum experiences and extensive use of media.

The special education major requires a common core of coursework plus courses in the chosen area of teaching – either the mentally retarded or the physically handicapped.

Program Requirements

Special Core Requirement-Nature Science

Students majoring in Early Childhood, Elementary and/or Special Education should complete the special Science/Mathematics Foundation designed for them. Completion of this core requirement is a prerequisite to enrolling in 70:162 Methods: Elementary School Science and 70:163 Methods: Elementary School Mathematics. This core requirement may be satisfied in one of three ways:

Satisfactory completion of 97:55-56 Science Foundations I-II and 228:40 Theory of Arithmetic

Satisfactory completion of equivalent courses at another four-year approved college or university;

Prior to declaration of an education major and/or admission to a teacher program, successful completion of The University of Iowa natural science core requirement and passage of special tests dealing with the content of 97:55-56 and 228:40. Students not passing the science competency examination must register for 97:104; students not passing the mathematics examination must register for 224:30.

Continuous Core

7U:30 Introduction to and Observation of Exceptional Children I 3 s.h.
7U:31 Introduction to and Observation of Exceptional Children II 3 s.h.
7U:34 Pre-Psychiatric Practicum: Exceptional Children 2 s.h.
7U:32 Instructional Methods and Procedures in Special Education I 3 s.h.
7U:33 Instructional Methods and Procedures in Special Education II 3 s.h.
7U:35 Methods Practicum in Special Education 2 s.h.

All students must complete the common core requirements. The following are additional requirements for each area of concentration.

Certification in Elementary Education and Elementary Special Education with Emphasis in Mental Retardation

Coursework required by Special Education:

7U:190 Laboratory Practice in the Education of the Mentally Retarded Child 7 s.h.

Certification in Elementary Education and Elementary Special Education with Emphasis in the Physically Handicapped

7U:139 Orientation to Rehabilitation of the Physically Handicapped Child 3 s.h.
3:15 Introduction to Speech and Hearing Processes and Disorders 3 s.h.
7U:191 Laboratory Practice in Education of the Physically Handicapped Child 7 s.h.

Certification in Secondary Special Education (Mental Retardation)

Coursework required by Special Education:

7U:133 The Culturally Different in Educational Settings 3 s.h.
7X:103 Facilitating Career Development in the Schools 4 s.h.
7U:192 Laboratory Practice in the Education of the Mentally Retarded Child 15 s.h.
Special Education 287

Other required coursework:
77:75 Educational Psychology and Measurement 3 s.h.
78:91 Pre-Education Practicum (optional) 1-2 s.h.
78:100 Introduction to Secondary School Teaching 2 s.h.
78:170 Psychology of Reading 2 s.h.
78:171 Psychology of Learning 2 s.h.
78:191 Operation of Audio-Visual Equipment 1 s.h.
78:300 Teaching and Utilization of Educational Media 3 s.h.
34:1 Introduction to Sociology: Principles 4 s.h.
34:140 Criminology 3 s.h.
or
34:141 Juvenile Delinquency 3 s.h.

Students are encouraged to elect additional courses in content fields appropriate to potential instructional roles.

Graduate Programs
Graduate programs are offered in mental retardation, physically handicapped, behavior disorders/learning disabilities, school psychology, work-study coordination, administration of special education and teacher training.

General Admission Requirements
The following are required for admission to any of the graduate programs in the Division of Special Education:

All applications are reviewed by an admissions committee of the Division of Special Education.

A minimum grade-point average of 2.50 is required for admission to master's and education specialist degree programs; a 2.70 minimum is required for doctoral work.

The applicant is expected to have completed the Graduate Record Examination (aptitude test) before being admitted to the program. Combined (aptitude test) scores of 1000 or above are preferred.

The applicant must have the ability to work with children and youth (see specific requirements in each program area).

The applicant must provide letters of recommendation regarding interpersonal competence and successful work with children and/or youth. A personal interview may be required.

School Psychology students should note that the application deadline is March 1 of each year. All application materials must be received by this date. No more than 10 students are accepted in the School Psychology program each year.

M.A. Program (non-thesis)
Minimum total semester hours required: 38

Purpose: To prepare teachers to implement a wide range of educational plans to assist the exceptional child in school, to function as resource teachers, itinerant teachers and teachers in self-contained classrooms. Successful completion of this program qualifies the person for recommendation for certification in teaching the mentally retarded, the physically handicapped, the emotionally disturbed or the learning disabled.

Admission requirements: See general admission requirements above. Students must have certification in elementary education (Iowa endorsement number 10); or secondary education (Iowa endorsement number 20). It is preferred that candidates have one or more years of teaching experience.

Ed.D. Program with Emphasis in Special Education
Minimum total semester hours required: 60

Purpose: To provide advanced graduate training for professionals in the field of special education. This may include individuals in consultation, supervisory work and work-study coordination in special education.

Admission requirements: See general admission requirements above. Additional requirements include a master's degree or its equivalent; preparation and certification in special education; and a minimum of one year full-time teaching experience before admission to the program.

Ed.S. Program with Emphasis in Special Education Administration
Minimum total semester hours required: 60

Purpose: To provide sufficient training and experience to enable graduates to be competent directors of local, regional and state special education programs. Successful completion of the program qualifies the person for certification in Iowa to serve as a director of special education, and students are encouraged to complete sufficient coursework in general school administration to qualify for the superintendent's credential.

Admission requirements: See general admission requirements above. Additional requirements include a master's degree or its equivalent; preparation and certification in at least one of the areas of special education; and teaching or related relevant experience with exceptional children. A minimum CEE (aptitude test) score in excess of 1000 is preferred.

Ed.S. Program with Emphasis in School Psychology
Minimum total semester hours required: 60

Purpose: To provide the necessary coursework and internship training in the areas of education and psychology, to enable graduates to be competent school psychologists. Successful completion of the program qualifies the person for certification in Iowa (endorsement number 40) to serve as a school psychologist, providing the graduate of the program has had two years of successful teaching experience; otherwise, temporary certification is granted until two years of successful performance as a school psychologist have been completed.

Admission requirements: See general admission requirements above. The applicant must also have work experience which demonstrates an interest in children and/or adolescents and demonstrates the ability to work with them individually and in groups; the experience must be verified by letters of reference and evalua-
tion. A 3.00 grade-point average on master's degree coursework is preferred; applicants without a master's degree must have a 2.70 undergraduate grade-point average.

Ph.D. Program

Minimum total semester hours required: 90

Purpose: To prepare students as consultants, school psychologists, directors of special education and university teacher trainers. The program permits students to study and practice more extensively in their area of interest in special education.

Admission requirements: See general admission requirements above. Additional requirements include a master's degree or equivalent; a minimum of one year full-time teaching experience with exceptional children in all areas except school psychology; and a statement indicating the student's preparedness to teach.

Special Facilities

Special facilities available to students in Special Education include the University Hospital School (for mentally retarded and physically handicapped) and the University Psychiatric Hospital/Child Psychiatry Program for children and youth with behavior disorders.

Financial Aid

A limited number of teaching and research assistantships are available to full-time students in M.A., Ed. S. and Ph.D. programs. The Janet Zuber Memorial Tuition Stipend is available to an upper division or graduate student in a training program for teachers of the physically handicapped.

Couples

7U26 Introduction to and Observation of Exceptional Children I 3 s.h.
Various types of exceptional children and their education problems as described and discussed. Restricted to freshmen in special education. Fall.

7U27 Introduction to and Observation of Exceptional Children II 3 s.h.
Continuation of 7U26. Restricted to sophomore, junior, senior, or graduate majors. Prerequisites: 7U26. Spring.

7U28 Instructional Methods and Procedures in Special Education I 3 s.h.
Participation in videotaped teaching simulations; emphasis on educational measurement and selection; utilization of various methods and materials applicable for one or more different kinds of handicapped children. Prerequisites: 7U25. 51, 54 or equivalent and admission to Teacher Education Program in Special Education. Fall.

7U29 Instructional Methods and Procedures in Special Education II 3 s.h.
Continuation of 7U28. Prerequisites: 7U29. Spring.

7U36 Pre-Examination with Exceptional Children 3 s.h.
Involves observing and working with children with various types of handicaps. Restricted to majors in special education. Taken concurrently with 7U26 or 7U27.

7U38 Methods of Observation with Exceptional Children 3 s.h.
Methods of working with exceptional children. Taken concurrently with 7U36 and 7U37. Prerequisites: 7U26 and 7U27. Spring, summer.

7U39—7U42, 7U113 The Culturally Different in Educational Settings 3 s.h.
Problems in teaching culturally different children of school age, research on impact of disadvantaged background on learning potential of students. Spring, summer. Same as 7U113.

7U150—7U153 Mental Retardation 5 s.h.
Problems of retarded child and his or her problems; causes, diagnosis and psychological problems of retardates; principles, theories and conditions in learning of educable mentally retarded in public school setting. Spring, summer.

7U128 The Traumatic and Sub-Traumatic Mentally Retarded Child 2 s.h.
Selection of pupils, organization of program, management of trainable children. Corequisites: corequisites specific to programs for mentally trainable children. Prerequisite: consent of instructor. Spring.

7U127 Education of the Gifted 2 s.h.
Three preparatory meetings will be held on campus, as specified by the instructor, prior to the meeting, knowledge base of history and programs for gifted, methodology and techniques for providing in adequate educational environment for the gifted, techniques for evaluating program for the gifted. For those interested in educational processes and procedures for gifted individual. Fall, spring.

7U126 Orientation to Rehabilitation of the Physically Handicapped Child 3 s.h.
Medical, psychological and educational aspects; special problems involved in evaluation, treatment and general management of handicapped children; nature of various handicapping conditions, causes and special considerations of each. Fall, summer.

7U191 Laboratory Practice in Education of the Physically Handicapped Child 3 s.h.
 cleric teaching with physically handicapped. Prerequisite: consent of instructor.

7U189 Laboratory Practice in Education of the Mentally Retarded Child 3 s.h.
Student teaching with the mentally retarded. Prerequisite: consent of instructor.

7U189 Individual Instruction in Special Education: Undergraduate Art. Prerequisite: consent of instructor.

7U201 Exceptional Children: Assessment and Research 4 s.h.
A program of current trends in special education—evaluation, assessment and research in special education. Usually taken concurrently with 7U202, working directly with handicapped children in public schools, institutional and residential settings.

7U202 Practicum with Exceptional Children 3 s.h.
Practicum experience usually taken concurrently with 7U201 and 7U203. Working directly with handicapped children in public schools, institutional and residential settings.

7U206 Advanced Problems in Psychology of Exceptional Children 3 s.h.
Current psychological techniques in interviewing and evaluating exceptional children.

7U226 Administration and Supervision of Special Education 3 s.h.
For director, assistant director, and local school administrative personnel.

7U227 Practicum in School Psychological Services 3 s.h.
Supervised practicum in psychological and educational evaluation in school settings. Prerequisites: 7U228, 7U231, 7U232, and consent of instructor. May be repeated.

7U228 Diagnostic and Remedial Follow-up of Learning Disabilities 2 s.h.
Administration of individual educational assessment instruments and interpretation of test results; supervised practical experience in assessment and placement. Prerequisites: 7U215 or consent of instructor. Spring.

7U210 Survey: Community and Residential Services for the Handicapped 3 s.h.
Organization of community and regional services to mentally retarded, i.e., day centers, clinics, residential care, rehabilitation, and vocation services; experience provided in assessing need for services as well as planning for implementation of services. Prerequisites: consent of instructor.

7U242 Behavioral Personality and Development of the School-Age Child 3 s.h.
Understanding of the variables that influence a child's behavior. Special emphasis on the use of behavior rating scales, objective and projective personality tests. Prerequisite: consent of instructor. Fall.

7U244 Introduction to Behavior Disorders/Learning Disabilities 3 s.h.
Systematic examination of sociological factors and behavioral disorders and tentative diagnostic services within various community settings providing psychological, social and educational programs for children and youth with behavior difficulties. Prerequisite: consent of instructor.

7U245 Behavioral Disorders/Learning Disabilities I 3 s.h.
Tested; theories, principles, concepts, problems, lesson, methods and procedures of specific educational programs concerning educational practice for children and youth with behavioral dysfunctions. Prerequisites: consent of instructor.
7U:549 Behavior Disorders/Learning Disabilities I
3 s.h.
Combination of 7U:347. Prerequisite: consent of instructor.

7U:547 Practicum: Behavior Disorders/Learning Disabilities I
1 s.h.
Supervised practice with children, youth with psychological disorders, where concurrently with 7U:344 and 7U:246. Prerequisite: consent of instructor.

7U:548 Practicum: Behavior Disorders/Learning Disabilities II
5 s.h.
Combination of 7U:347, where concurrently with 7U:346 and 7U:350. Prerequisite: consent of instructor.

7U:549 Seminar: Behavior Disorders/Learning Disabilities I
1 s.h.
Integration of theory and practice; group education of practice experience; notes concurrently with 7U:347 and 7U:349. Prerequisite: consent of instructor.

7U:550 Seminar: Behavior Disorders/Learning Disabilities II
1 s.h.
Continuation of 7U:349, notes concurrently with 7U:346 and 7U:348. Prerequisite: consent of instructor.

7U:251 Individual Intelligence Testing
3-4 s.h.
Administration of individual intelligence tests and interpretation of test results; issues in psychological testing; factors which influence test results. Prerequisite: 7U:142, 7U:346, or consent of instructor.

7U:252 Advanced Laboratory Practice with Exceptional Children
1 s.h.
Observation, measurement, and individual instruction pertaining to problems of teaching, guidance, and administration; evaluation, construction, and application of curricular materials for exceptional children. Prerequisite: consent of instructor.

7U:253 Individual Instruction in Special Education
1 s.h.
Programs for exceptional children. Prerequisite: consent of instructor.

7U:256 Seminar: Advanced Problems in Teacher Education for Prospective Teachers of Exceptional Children
1 s.h.
Perspective on problems related to programs designed to prepare teachers; methods, experiences and evaluation practices; recruitment; selection; certification; accreditation; practice problems. Prerequisite: consent of instructor.

7U:258 Seminar: Current Issues in School Psychology
2 s.h.
Restricted to Ed. S. and Ph.D. students. Prerequisite: consent of instructor.

7U:254 Seminar: Research Practicum in Special Education
1 s.h.
Arias of research in special education; design of small-scale research projects; particular attention in planning, managing, and reporting research; students assigned to current projects for practical experience in research. Prerequisite: consent of instructor. Fall.

7U:256 Seminar: Program Development in Special Education
1 s.h.
Prerequisite: consent of instructor.

7U:257 Seminar: Current Issues in Special Education Administration
1 s.h.
Prerequisite: accept of instructor. Spring.

7U:258 Practicum in College Teaching
1 s.h.
Prerequisite: consent of instructor.

7U:256 Supervision of School Psychology Practicum
1 s.h.
Dedicated emphasis on experience supervising school psychology practicum student. Prerequisite: consent of instructor.

7U:252 Field Service Project in Special Education Internship
1 s.h.
Prerequisite: consent of internship.

7U:250 M.A. Thesis in Special Education
1 s.h.
Prerequisite: consent of instructor.

7U:256 Educational Specialties Research
1 s.h.
Prerequisite: consent of instructor.

7U:250 Ph.D. Thesis in Special Education
1 s.h.
Prerequisite: consent of instructor.

7U:244 Ph.D. Thesis in School Psychology
1 s.h.
Prerequisite: consent of instructor.
Engineering is the profession in which a knowledge of the mathematically and natural sciences is applied to develop ways to economically utilize the materials and forces of nature for the benefit of mankind. The major aim of engineering is the creation of a new process, product, material or system that is useful to our society. This activity demands a high degree of creativity coupled with broad knowledge, good judgment and practical sense of economics.

The College of Engineering prepares young men and women for one or more of the many career opportunities in the engineering profession. Such opportunities include positions in design, production, development, research, management and consulting. Engineers are employed in industrial organizations, governmental agencies and in private practice.

The College of Engineering has two major responsibilities. The first is the responsibility for the undergraduate engineering curricula, laboratories, counseling and other aspects of the undergraduate engineering programs. The second responsibility is the graduate programs leading to the M.S. and Ph.D. degrees in modern areas of engineering. Education at the graduate level includes extensive activities in creative research and design in laboratories of the College by faculty members and graduate students.

Programs Offered
The College of Engineering offers curricular programs leading to the Bachelor of Science, Master of Science and Doctor of Philosophy degrees in the professional fields of chemical engineering, civil engineering, electrical engineering, industrial and management engineering.

The College also offers an undergraduate program leading to the Bachelor of Science degree in engineering for those students whose career objectives cannot be met by the professional programs; typical of such programs is the biomedical engineering program.

Any of the undergraduate programs offered by the College of Engineering may be combined, in a five-year option, with a program leading to the Bachelor of Arts degree in the College of Liberal Arts.

Graduate programs leading to the Master of Science and Doctor of Philosophy degrees in mechanics and hydraulics and in environmental engineering complete the offerings of the College.

The undergraduate programs in Chemical, Civil, Electrical, Industrial and Management, and Mechanical Engineering are accredited by the Engineers Council for Professional Development.

Organization of the College
Extraordinary demands have been placed on the engineering profession in general and on engineering education in particular by the broadening spectrum of activity in which the engineer practices and the increasing complexities of technology. The College has responded to these demands by departing from the traditional pattern of organizational structure of engineering colleges. The College of Engineering has organized its faculty and facilities into different types of administrative units—academic programs, divisions, and institutes.

The academic program units are identified as Biomedical Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Engineering, Industrial and Management Engineering, Mechanical Engineering, and Mechanics and Hydraulics.

Each program unit consists of faculty who have a major interest in and are responsible for the area represented by the curriculum. The faculty are responsible for design of curricula at all degree levels; for counseling of undergraduate and graduate students; and for all other matters affecting the individual student and his or her academic programs. The chief administrative officer of a program is the program chairman.

The divisions are identified as Energy Engineering, Information Engineering, Materials Engineering, and Systems Engineering. These units are the basic operating units of the College and consist of faculty and facilities organized to meet the functional needs of individual programs.

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The Iowa Institute of Hydraulic Research (IIHR) is the third basic unit of the College. The Institute is widely acknowledged to be one of the world's leading organizations in the areas of basic and applied hydraulics research.

The Institute conducts programs of fundamental research and advanced design and analysis in the areas of environmental pollution, bioengineering, naval hydrodynamics, river mechanics, ice hydraulics, hydrology, water resources, hydraulic structures, fluid mechanics, and advanced instrumentation and data handling techniques for fluids research.

The Institute's activities are housed in three separate laboratories. Major research facilities include an IBM 1605 Data
Acquisition and Control System for on-line acquisition and analy-
sis of experimental data; a ship model towing tank; three large
wind tunnels; a refrigerated frame and ice fense testing facilities;
an environmental flow facility for modeling of atmospheric flows;
two large tanks for conduct of river and coastal model studies;
and a variety of flume, special air-flow apparatus and liquid flow
circuits. Most of the Institute's research engineers, which cur-
cently numbers in excess of 20, also hold professorial appointments
in the College of Engineering.

Direct student participation in all research and consulting activ-
ities is one of the hallmarks of the Institute's operation.

College Facilities
The Engineering Library
The Engineering Library is a center of College activity, its
collection includes 32,000 books and 720 periodicals. It is
equipped with microfilm and microfiche readers.

Computer Services
Services of the University Computer Center are used extensively
by students and faculty of the College, under the auspices of the
College computer committee. The College itself maintains remote
terminals for conversational access to the University computer and
key-punch equipment in the CBE Laboratory.

Computer Based Education (CBE) Laboratory
The Computer Based Education Laboratory provides on-line in-
terraction with the University's IBM 360-65 and ITP-2000 com-
puter systems via video display and hard copy terminals. The
laboratory also contains on-campus commonly used computer accessory
equipment such as key punch and line printers, as well as video
equipment for instructional purposes.

Placement Services
Students and alumni can avail themselves of the placement ser-
ices provided by the College of Engineering. Interview rooms
and a placement library of informational material are located in the
Engineering Building. Assistance is available for arranging inter-
views and obtaining information on job opportunities.

Undergraduate Programs
Degree Requirements
The Bachelor of Science degree in engineering requires a min-
umum of 128 semester hours of credit including satisfaction of the
specific requirements of the major program as described in fol-
lowing sections. The candidate must enroll in the College of
Engineering for at least the last 30 semester hours or 45 of the last
60 semester hours and must have a minimum GPA of 2.0 on all
College work used to satisfy the degree requirement and on all
work undertaken at The University of Iowa.

Curricular Structure
The undergraduate programs in Engineering at Iowa are designed to
provide the student with a strong background in those fund-
damental areas upon which all engineering is based, substantial
depth in the branch of engineering chosen for specialization, and
sufficient background in the social sciences and humanities to
appreciate the societal implications of engineering projects.

The curriculum consists of four stems extending through the
entire four years of undergraduate study. The stems are mathe-
matics, basic and applied sciences, socio-humanistic studies, and
analysis and de sign. The mathematics, basic and applied
sciences, and socio-humanistic studies courses develop the back-
ground required for engineers. The practice of engineering in-
volves the utilization of this education to design practical solutions
to real problems. This ability is developed in the analysis and
design stems. The course sequence begins with introduction to
Engineering in the first semester of the freshman year and termi-
nates with senior level design courses during the final year.

The program curricula are based upon a core program composed of
courses which are basic to all engineering and upon which all
engineering programs draw. The courses involved consist of
mathematics, chemistry, physics and statics, in addition to engi-
neering courses, and constitute approximately one half of the total
curriculum.

In addition to core courses and the socio-humanistic elective
sequence, each program specifies a group of courses which are
required of students majoring in that program. These courses
provide the common background which the faculty considers to be
expected of every graduate.

The remaining courses are technical electives chosen by the
student in consultation with an academic advisor. These courses
allow the student to develop additional depth in areas of special
interest, and are ordinarily taken at the senior level. The philoso-
phy of a core program permits the first semester to be entirely
common and the first three semesters to be arranged so that a
student may follow any program major, transfer between majors,
or not declare a major during this period with only minor adjust-
ments in schedule. This permits ample time before declaring a
major to become familiar enough with the various programs so that
the major chosen best fits the interests of the individual student.

The curriculum for the freshman year is:

First Semester
41 Principles of Chemistry I 3 s.h.
101 or 102 Rhetoric 4 s.h.
22M.35 Engineering Calculus I 4 s.h.
580.001 Introduction to Engineering: Design I 2 s.h.
580.003 Introduction to Engineering: Graphics 2 s.h.
15 s.h.

Second Semester
4.6 Elementary Chemistry Laboratory 2 s.h.
10.2 Rhetoric or free elective 3 s.h.
22M.36 Engineering Calculus II 4 s.h.
580.002 Introduction to Engineering: Design II 2 s.h.
580.004 Introduction to Engineering: Computa-
tion 2 s.h.
13 s.h.

* A maximum of 7 s.h. is allocated to satisfaction of the rhetoric
requirement. Those students who qualify for 10.3 will be allowed
3 s.h. of free elective while those taking the 8 s.h. sequence of
10.1; 10.2; 10.3; only 7 s.h. toward their engineering pro-
gram. The courses listed above are required of all students in
engineering. One additional course during the second semester is
recommended for students who have chosen biomedical and

College of Engineering
chemical engineering majors (6-4 Principles of Chemistry II) or civil and mechanical engineering majors (560/307 Statics).

**Socio-Humanistic Stem**

The goal of the socio-humanistic stem is to provide more effective preparation for professional responsibilities by integrating humanities and social sciences into the undergraduate engineering curriculum. Supportive of this goal a minimum of 16 semester hours of socio-humanistic electives are to be selected by the student with the advisor’s approval so as to provide at least six hours of course work in the social sciences and six hours in humanities.

The social science electives shall consist of appropriate courses from the following departments: anthropology, economics, geography, political science, psychology, sociology, journalism, and social work, or other departments approved by the College faculty. Students may select courses from departments not included above with the approval of the associate dean for undergraduate programs. To insure an adequate depth of knowledge in a chosen area of study, students shall select a minimum of three semester hours of advanced (100-level) coursework. This material will logically build on the background previously acquired in an elementary course.

The historical-cultural electives will consist of College of Liberal Arts core courses in the historical-cultural area and/or appropriate courses from any of the following departments: American civilization, art and art history, classics, English, European literatures and thought, history, music, philosophy, religion, Chinese and oriental studies, linguistics, and speech and dramatic art, or other departments approved by the College faculty. Students may select courses from departments not included above with the approval of the associate dean for undergraduate programs. Students will select a minimum of three semester hours of advanced (100-level) coursework in the historical-cultural area to secure sufficient depth of knowledge in an elected subject of study. Language courses will not satisfy any of the historical-cultural requirements unless the courses are at or beyond the second-year level. Studio courses in art and music will not fulfill the requirement.

**Classification of Students**

Students in the College of Engineering are classified by the number of semester hours credit which has been earned and are applicable to a bachelor’s degree in engineering according to the following table: Freshman—less than 28 semester hours Sophomore—28 to 55 semester hours Junior—62 or more semester hours Senior—90 or more semester hours

**Academic Probation and Good Standing**

A student in the College of Engineering who fails to attain the following minimum semester and cumulative grade-point average based on all work taken at The University of Iowa shall be placed or continued on academic probation:

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>1.70</td>
</tr>
<tr>
<td>Sophomore</td>
<td>1.80</td>
</tr>
<tr>
<td>Junior</td>
<td>1.85</td>
</tr>
<tr>
<td>Senior</td>
<td>1.90</td>
</tr>
</tbody>
</table>

A student whose semester and cumulative grade-point average equal or exceed these appropriate to his or her classification is considered to be in good standing in the College.

A student will be removed from, or placed on, academic probation only at the end of a semester. A student will not be permitted to register following two consecutive semesters on probation without specific approval. If satisfactory improvement is not made the student may be dismissed from the College. A student dismissed from the College of Engineering for poor scholarship may petition the associate dean for undergraduate programs for permission to re-enroll after an interval of two regular semesters. Further information may be obtained from the office of the dean of engineering.

**Cancellation of Registration**

A student in good academic standing who cancels his or her registration during the final four weeks of a regular semester, or during the final three or two weeks of a twelve or eight-week summer session, respectively, will not be permitted to enroll for the immediately-following semester without specific approval from the associate dean for undergraduate programs.

A student on scholastic probation who cancels his or her registration at any time without good cause will be considered as having been dismissed for poor scholarship. Cancellation cards for students removed in the College will be signed by the associate dean for undergraduate programs only after recommendation of the student’s advisor and program chairman.

**Credit by Examination**

Students who have acquired knowledge in subject matter areas from sources other than course registrations may be granted the opportunity to obtain credit toward graduation by examination. Conditions and limitations of this policy are established by the faculty of the College of Engineering. A student wishing to exercise this opportunity should apply to the associate dean for undergraduate programs.

**Pass-Fail Option**

Students in the College of Engineering may enroll for no more than two hours of credit on a pass-fail basis. The P-F option may not be used for courses taken to fulfill the rhetoric requirement.

**Second-Grade-Only Option**

A student may elect to repeat a course with only the new grade being counted in his or her GPA. This option can only be elected prior to the time of completing a course for which the repeated course is prerequisite. The option may be applied to a maximum of 16 semester hours of work. Students wishing to exercise this option should apply to the associate dean for undergraduate programs.

The **Combined Program**

In response to an increasing demand for engineers with strong backgrounds in the humanities, social sciences and business, Iowa offers a combined program leading to the Bachelor of Arts degree in the College of Liberal Arts and the Bachelor of Science degree in the College of Engineering. By proper scheduling of
Cooperative education program involves the integration of academic work with practical experience in an organized program. Participating students spend alternate periods in full-time academic study on campus and in full-time engineering-related employment in business, industry, or government.

While the student can earn a substantial portion of college expenses during the work periods, the success of the program depends on the work experience having significant educational value as well. This is assured by careful monitoring of the work experience provided by participating employers and by matching student interest and ability to the work situation.

The insights gained by involvement in the practical application of subject matter studied in the classroom usually results in improved motivation during the study periods with a corresponding improvement in academic record. Another important aspect of the experience gained, although it is difficult to evaluate, is the increased awareness of the many nontechnical considerations involved in any engineering project.

The co-op phase ordinarily begins following the sophomore year and continues until the beginning of the senior year. The total time for the degree program under this option is normally five years and includes at least one full year of work experience. The program is an option available to qualified students on a voluntary basis.

Freshmen
To qualify for admission to the College of Engineering as a freshman, an applicant must have:

Completed the American College Test with a composite standard score of 24 or above and a standard score of 24 or above in mathematics;

Successfully completed at least one and one-half units of algebra, one unit of plane geometry, and one-half unit of trigonometry;

Rank in the upper one-half of his or her high school graduating class.

High school physics and chemistry are recommended for all applicants.

Transfer Students
The applicant must submit a formal application and official transcripts of all college work. Each applicant should have:

Completed at least one semester of calculus or its equivalent;

Maintained a cumulative grade-point average of at least 2.25 (C+) based on a four-point marking system.

A maximum of 64 semester hours credit (or the equivalent) from a junior college will be accepted toward the baccalaureate degree.

After reviewing the records of either a freshman or transfer student applicant who does not meet minimum admission requirements, the Director of Admissions may admit the applicant unconditionally, admit with probation, require a summer session trial enrollment, or deny admission.

Applicants who do not meet all of the criteria for admission to the College of Engineering are automatically considered for admission to the pre-engineering program in the College of Liberal Arts.

Student Organizations and Activities
The College of Engineering student body is organized as the Associated Students of Engineering. This provides a mechanism for planning and carrying out activities involving the entire College such as the annual Open House, MECCA Week and the student-faculty reception for new students. Other college-wide activities of general student interest are also handled through the A.S. of E.

Engineering students publish their own student journal, the Hawkeye Engineer. All positions are staffed by students, with faculty serving only in an advisory capacity.

Student Branches of the American Institute of Chemical Engineers, the American Institute of Industrial Engineers, the American Society of Civil Engineers, the American Society of Mechanical Engineers and the Institute of Electrical and Electronics Engineers are active at Iowa.

The U of I chapter of Tau Beta Pi, an honorary engineering society, gives special recognition to superior students in their junior and senior years. Senior and graduate engineering students who have special ability in research are eligible for election to Sigma Xi, Phi Lambda Upsilon, honorary chemistry and chemical engineering fraternity; Chi Epsilon, honorary civil engineering fraternity; Eta Kappa Nu, honorary electrical engineering fraternity; and Pi Tau Sigma, honorary mechanical engineering fraternity. They recognize the work of outstanding students in their respective fields.

Student organizations dedicated to providing support and assistance in the development of more equitable enrollments of women and minorities in the College are the Black Students in Engineering and the student chapter of the Society of Women Engineers. A local chapter of Theta Tau, a national professional engineering fraternity, is active in service to the College and draws its membership from students throughout the College.

Professional Registration
Registration as a professional engineer is governed by the laws of each state. The minimum requirements include graduation from a recognized engineering curriculum of at least four years, followed by at least four years of practical experience.

The Iowa Board of Engineering Examiners has adopted the plan of admitting College of Engineering graduates to the "Engineer in Training" by an examination on engineering fundamentals given at the University near the time of graduation. Completion of registration as a "Professional Engineer" requires satisfactory completion of an advanced examination following approved professional experience.

Course Numbering System
The title of each course offered by the College of Engineering is preceded by a three-digit prefix and a three-digit suffix separated
by a colon. The prefix serves to identify the course as an offering in the College of Engineering. The suffix identifies the course level (undergraduate, upper level undergraduate, lower level graduate, graduate), type of course (seminar, topics, research) and the disciplinary area within the division. All courses are offered by division for the curricular programs of the College. The last digit of the prefix is 5 which identifies the course as being offered by the College of Engineering. The second digit of the prefix identifies the division of the College which offers the course according to the correspondence presented below:

<table>
<thead>
<tr>
<th>Energy Engineering</th>
<th>Information Engineering</th>
<th>Materials Engineering</th>
<th>Systems Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>54</td>
<td>56</td>
<td>58</td>
</tr>
</tbody>
</table>

The third digit of the prefix identifies the curriculum program for which the division offers the course with the correspondence between the third digit and the curriculum programs being shown below:

<table>
<thead>
<tr>
<th>0</th>
<th>Undergraduate Engineering Core Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Biomedical Engineering</td>
</tr>
<tr>
<td>2</td>
<td>Chemical Engineering</td>
</tr>
<tr>
<td>3</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td>4</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>5</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>6</td>
<td>Industrial and Management Engineering</td>
</tr>
<tr>
<td>8</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>9</td>
<td>Mechanics and Hydraulics</td>
</tr>
</tbody>
</table>

The three digit suffix of a course number identifies the level and type of course. Generally, the suffix numbers below 100 designate courses primarily for undergraduates, numbers 100 to 199 designate courses for undergraduates and graduates, and numbers 200 and above designate courses primarily for graduates. The table below provides further means of conveying information on the level and type of course.

<table>
<thead>
<tr>
<th>201-209</th>
<th>Freshman core program courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>020-029</td>
<td>Sophomore core program courses</td>
</tr>
<tr>
<td>030-039</td>
<td>Junior core program courses</td>
</tr>
<tr>
<td>050-059</td>
<td>Required courses in undergraduate program</td>
</tr>
<tr>
<td>091-094</td>
<td>Undergraduate professional program seminars</td>
</tr>
<tr>
<td>095-097</td>
<td>Contemporary topics courses for undergraduates</td>
</tr>
<tr>
<td>098</td>
<td>Individual investigation courses for undergraduates</td>
</tr>
<tr>
<td>101-109</td>
<td>Courses for which little or no engineering, science or mathematics background is required</td>
</tr>
<tr>
<td>110-189</td>
<td>Undergraduate elective or lower level graduate course</td>
</tr>
<tr>
<td>190</td>
<td>Readings courses for non-engineering majors</td>
</tr>
<tr>
<td>191-194</td>
<td>Seminars for undergraduates and graduates</td>
</tr>
<tr>
<td>195-197</td>
<td>Contemporary topics courses for undergraduates and graduates</td>
</tr>
<tr>
<td>198</td>
<td>Individual investigations for graduates</td>
</tr>
<tr>
<td>199</td>
<td>M.S. thesis research</td>
</tr>
<tr>
<td>210-289</td>
<td>Upper level graduate courses</td>
</tr>
<tr>
<td>291-294</td>
<td>Seminars for graduates</td>
</tr>
</tbody>
</table>

295-297 Contemporary topics courses for graduates
299 Ph.D. thesis research

The courses offered by each division are listed within each division’s section by the level of the course and proceeding to the highest level course with a defined range of the last two digits of the suffix. For example, the courses in the discipline engineering and applied statistics within the Division of Synthesis Engineering are confined to the numerical range 300-399 with 380-035 Probability and Statistics for Engineering and Physical Sciences through 586-232 Regression Analysis.

Most courses have prerequisites stated in terms of courses at this university. Equivalent academic background may have been obtained by a student through previous coursework at other colleges and universities. The student should consult with the course instructor if there is any question concerning the academic background needed for a particular course, and the student should obtain the consent of the instructor to register in the course. A student may enroll in any course in the College of Engineering if the student receives the consent of the instructor. Consent of the instructor will be based primarily on the mathematics, science and engineering course background of the student and that considered necessary to satisfactorily undertake the coursework.

**Biomedical Engineering**

<table>
<thead>
<tr>
<th>Program chairman: Xuexiong Ruan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty: Professor Dan Q. Wang, Professor Donald J. McDonald, James O. Geiser, Xuexiong Ruan, Associate Professor Chaolong Chen, Donald M. Levy, Norman J. Miller, Associate Professor Robert Koert, Theodore F. Atkins</td>
</tr>
<tr>
<td>Degree offered: B.S.</td>
</tr>
</tbody>
</table>

The past two decades have seen a tremendous growth of technological activity in biology and medicine. As engineers have become increasingly involved with projects in the life and health sciences, there has been increased need for them to become more familiar with the fields of biology and medicine. Recognition of this need has led to the emergence of a new interdisciplinary engineering activity designed to bridge the gap between the life sciences and engineering—the biomedical engineering profession. The undergraduate biomedical engineering program is a curriculum option offered within the Bachelor of Science program in engineering. The curriculum outlined below is built on the foundation provided by the College of Engineering curriculum, and has been developed to prepare students for the challenges and opportunities associated with careers in the fields of biology and medicine. Students who complete this program may pursue career opportunities in industry (the design and development of biomedical instrumentation, diagnostic aids, life support systems, prosthetic and orthotic devices, man-machine systems, etc.), or they may elect to continue their formal education in the engineering, medical, or legal professions. The program has been carefully designed so that it is possible to satisfy the course requirements of the Graduate College and the colleges of Medicine, Dentistry and Law.

Extension graduate-level biomedical engineering research activities within the College of Engineering have led to numerous M.S. and Ph.D. degrees. Many engineering college faculty members have joint appointments in the colleges of medicine and dentistry. Because the graduate and graduate engineering students participate actively with college faculty members and their colleagues...
### Curriculum

#### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>4:1</td>
<td>Principles of Chemistry I</td>
<td>7 s.h.</td>
</tr>
<tr>
<td></td>
<td>10:1 or 10:3</td>
<td>Rhetoric</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>22M:35</td>
<td>Engineering Calculus I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>580:001</td>
<td>Introduction to Engineering: Design I</td>
<td>2 s.h.</td>
</tr>
<tr>
<td></td>
<td>580:003</td>
<td>Introduction to Engineering: Graphics</td>
<td>2 s.h.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15 s.h.</td>
</tr>
<tr>
<td>2nd</td>
<td>4:6</td>
<td>Elementary Chemistry Laboratory</td>
<td>2 s.h.</td>
</tr>
<tr>
<td></td>
<td>10:3</td>
<td>Rhetoric or free elective</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td>22M:36</td>
<td>Engineering Calculus II</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>580:002</td>
<td>Introduction to Engineering: Design II</td>
<td>2 s.h.</td>
</tr>
<tr>
<td></td>
<td>580:004</td>
<td>Introduction to Engineering: Computer</td>
<td>2 s.h.</td>
</tr>
<tr>
<td></td>
<td>4:4</td>
<td>Principles of Chemistry II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16 s.h.</td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>22M:37</td>
<td>Engineering Calculus III</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>520:016</td>
<td>Thermodynamics I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>540:011</td>
<td>Dynamic Systems Analysis I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td>560:015</td>
<td>Materials Science I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td>560:017</td>
<td>Mechanics of Solids</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>18 s.h.</td>
</tr>
<tr>
<td>2nd</td>
<td>540:023</td>
<td>Electromagnetic Theory</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>22M:38</td>
<td>Engineering Calculus IV</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>37:3</td>
<td>Principles of Animal Biology</td>
<td>5 s.h.</td>
</tr>
<tr>
<td></td>
<td>540:012</td>
<td>Dynamic Systems Analysis II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16 s.h.</td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>580:039</td>
<td>Probability and Statistics for Engineering and Physical Sciences</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td>580:021</td>
<td>Principles of Design I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>520:020</td>
<td>Mechanics of Fluids and Transfer Process</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>521:031</td>
<td>Elementary Bio-engineering</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>17 s.h.</td>
</tr>
</tbody>
</table>

#### Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>29:82</td>
<td>Physics I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>4:121</td>
<td>Organic Chemistry I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>580:022</td>
<td>Principles of Design II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td>Technical electives*</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td>Socio-Humanistic electives</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 s.h.</td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>561:083</td>
<td>Biomedical Engineering Design I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td>Technical electives*</td>
<td>6 s.h.</td>
</tr>
<tr>
<td></td>
<td>Socio-Humanistic electives</td>
<td>6 s.h.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 s.h.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>561:084</td>
<td>Biomedical Engineering Design II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td>Technical electives*</td>
<td>9 s.h.</td>
</tr>
<tr>
<td></td>
<td>Socio-Humanistic electives</td>
<td>9 s.h.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 s.h.</td>
</tr>
</tbody>
</table>

#### Chemical Engineering

**Program Chairperson:** James O. Obena

**Faculty:** professor: Soo-Tick Ivan, James O. Obena, Kyriakos C. Valianakis

**Professor:** associate professors: Kothe, associate professors: Fedor Baudrus, Edward Mihail, Arthur F. Vani, associate professor: C. Wu

**Degree offered:** B.S., M.S., Ph.D.

Chemical engineering is the art and science of engineering applied to processes in which chemical reactions play a dominant role. One very important application is in the production of engineering materials from basic raw materials.

Courses which have been designated primarily for the chemical engineering program are identified by the digit 2 in the third position of the course number prefix. Course descriptions are provided in this catalog primarily within the section devoted to the Division of Materials Engineering.

### Undergraduate Program

The Bachelor of Science degree program in chemical engineering prepares the student for work in design, supervision, development, or sales. The curriculum includes extensive training in chemistry,
in addition to the basic engineering courses. Undergraduate students have the opportunity to work with faculty members and graduate students on significant problems.

Curriculum

Freshman Year

First Semester
4:1 Principles of Chemistry I 3 s.h.
10:1 or 10:3 Basic Physics 4 s.h.
23M:35 Engineering Calculus I 4 s.h.
580:001 Introduction to Engineering: Design I 2 s.h.
580:003 Introduction to Engineering: Graphics 2 s.h.
15 s.h.

Second Semester
4:6 Elementary Chemistry Laboratory 2 s.h.
10:2 Rhetoric or free elective 3 s.h.
23M:36 Engineering Calculus II 4 s.h.
580:002 Introduction to Engineering: Design II 2 s.h.
580:004 Introduction to Engineering: Computer Design 2 s.h.
13 (16)* s.h.

Sophomore Year

First Semester
23M:37 Engineering Calculus IV 4 s.h.
580:017 Mechanics of Solids 4 s.h.
540:011 Dynamic Systems Analysis I 3 s.h.
540:015 Materials Science I 3 s.h.
Socio-humanistic elective 4 s.h.
18 s.h.

Second Semester
23M:38 Engineering Calculus IV 4 s.h.
540:025 Electromagnetic Theory 4 s.h.
540:012 Dynamic Systems Analysis II 3 s.h.
562:047 Process Calculations 3 s.h.
530:020 Mechanics of Fluids and Transfer Processes 4 s.h.
4:4 Principles of Chemistry II 3 s.h.
21 (19)* s.h.

Junior Year

First Semester
4:131 Physical Chemistry I 3 s.h.
29:82 Physics I 3 s.h.
562:048 Design for Energy and Momentum Transfer 4 s.h.
580:021 Principles of Design I 3 s.h.
562:091 Professional Seminar 0 s.h.
16 s.h.

Second Semester
4:132 Physical Chemistry II 3 s.h.
4:143 Advanced Chemistry Laboratory I 3 s.h.
562:042 Chemical Engineering Thermodynamics 3 s.h.
562:049 Mass Transfer Operations 3 s.h.
Socio-humanistic elective 3 s.h.
562:091 Professional Seminar 0 s.h.
15 s.h.

Senior Year

First Semester
4:121 Organic Chemistry I 3 s.h.
562:051 Chemical Reaction Kinetics 3 s.h.
562:052 Biochemistry in Design 3 s.h.
562:053 Unit Operations Lab 2 s.h.
Socio-humanistic elective 3 s.h.
562:091 Professional Seminar 0 s.h.
14 s.h.

Second Semester
4:122 Organic Chemistry II 3 s.h.
4:144 Intermediate Chemistry Lab I 2 s.h.
562:054 Unit Operations Lab 2 s.h.
562:056 Chemical Engineering Process Design 3 s.h.
Socio-humanistic elective 3 s.h.
562:091 Professional Seminar 0 s.h.
16 s.h.

Courses in the Socio-humanistic stem must be selected to satisfy the College of Engineering policy.

Graduate Program

The programs leading to the M.S. and Ph.D. are more flexible than the undergraduate program. The emphasis is on research since most of the opportunities for graduates are in industrial research and development. About one-third of the program is devoted to a research project, and a thesis is required for each degree.

Research is currently being carried out in reaction kinetics, irreversible thermodynamics, metrology, transport phenomena, constitutive equations, particle characterization and use, and biomedical engineering. More recently the faculty have embarked on research in such interdisciplinary areas as chemomechanics and radiation and aging effects in materials.

Research can be carried out during the summer session and the independent study session, and students in neighboring cities may take courses under the College of Engineering's guided self-study plan.

In addition to fulfilling the general degree requirements outlined in the "Graduate College" section of the Catalog, a Ph.D. candidate will assist in teaching or faculty research during two or three semesters as part of the graduate training.
Civil Engineering

Program chairman: Harleen Kae
Faculty: professors: Yee S. Beamon, Richard R. Dagas, Harleen Kae, John F. Kennedy, Howard W. Metcalfe, Wayne L. Paulson; adjunct professors Kenneth J. Dartier; adjunct associate professors Neal W. White, associate professor Emeritus John J. O'Meara; assistant professors Nancy A. Allen, Thomas E. Cokely, Sr., Babatunde C. Jem, Lei D. McMullen; adjunct assistant professors Jean C. Tschida; instructor Joseph A. Beall

Degrees offered: B.S., M.S., Ph.D.

Civil engineering has traditionally been concerned with facilities which are both large-scale and essential to modern life. Civil engineering projects range from transportation systems to move masses of people and products, such as bridges, highways, public transit systems, tunnels, harbors, airports, seaports, and even spaceports; large scale structures and office building to provide enclosed working and living space; environmental and hydraulic systems to provide clean water and air including filtration plants and distribution systems for municipal and industrial water supplies, waste water treatment plants, dams, levees and irrigation systems.

In fact, if something is one of a kind, large and important in the daily lives of a great many people, the chances are it was planned, designed and constructed by civil engineers.

The continuing need for these kinds of projects accounts for the steady demand for civil engineers through both good and bad economic times, and the variety of tasks that the individual civil engineer is qualified to perform ensures flexibility and the capacity to adjust to shifting demands.

In planning and design, the civil engineer works with architects, landscape architects, planners, economists, financiers, sociologists, lawyers and other specialists as members of the design team. Some civil engineers work as engineering officers; others may be called upon to construct or supervise the projects they have designed. These field assignments, few of which are in remote and fascinating parts of the world, are particularly appealing to many civil engineers.

Undergraduate Program
The course of study in civil engineering builds on the College of Engineering core curriculum and is designed to give the student the broad educational background essential to modern civil engineering practice. Electives in the senior year permit additional concentration in such areas of specialization as structural and foundation engineering, environmental engineering, hydraulic engineering, and transportation engineering.

Curriculum

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>4001: Principles of Chemistry I</td>
</tr>
<tr>
<td>101:1 or 103:1 Rhetoric</td>
</tr>
<tr>
<td>224M:035 Engineering Calculus I</td>
</tr>
<tr>
<td>520:005 Introduction to Engineering: Design I</td>
</tr>
<tr>
<td>240:003 Introduction to Engineering: Graphics</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Second Semester

| 4006: Elementary Chemistry Laboratory | 2 s.h. |
| 10:002: Rhetoric or free elective | 3 s.h. |
| 224M:036 Engineering Calculus II | 4 s.h. |
| 560:007 Statics | 2 s.h. |
| 580:002: Introduction to Engineering: Design II | 2 s.h. |
| 580:004: Introduction to Engineering: Computation | 2 s.h. |
| **Total** | **15 s.h.** |

Sophomore Year

First Semester

| 224M:037: Engineering Calculus III | 4 s.h. |
| 520:016: Thermodynamics I | 4 s.h. |
| 540:011: Dynamic Systems Analysis I | 3 s.h. |
| 560:010: Dynamics | 3 s.h. |
| 560:015: Materials Science I | 3 s.h. |
| **Total** | **17 s.h.** |

Second Semester

| 224M:038: Engineering Calculus IV | 4 s.h. |
| 530:020: Mechanics of Fluids and Transfer Processes | 4 s.h. |
| 540:012: Dynamic Systems Analysis II | 3 s.h. |
| 560:019: Mechanics of Deformable Bodies | 3 s.h. |
| Socio-humanistic elective | 3 s.h. |
| **Total** | **17 s.h.** |

Junior Year

First Semester

| 225:039: Probability and Statistics for Engineering and Physical Sciences | 3 s.h. |
| 523:150: Principles of Environmental Engineering* | 3 s.h. |
| 546:025: Electromagnetic Theory | 4 s.h. |
| 563:031: Structural Analysis I* | 4 s.h. |
| 563:062: Professional Seminar** | 3 s.h. |
| 580:021: Principles of Design I | 3 s.h. |
| 583:073: Transportation Engineering I* | 3 s.h. |
| **Total** | **16 or 17 s.h.** |

Second Semester

| 29:092: Physics I | 3 s.h. |
| 523:065: Flow Systems in Environmental Engineering* | 3 s.h. |
| 563:035: Structural Design I* | 3 s.h. |
| 563:092: Professional Seminar** | 3 s.h. |
| 580:022: Principles of Design II | 3 s.h. |
| 583:074: Transportation Engineering II* | 3 s.h. |
| Socio-humanistic elective | 4 s.h. |
| **Total** | **16 s.h.** |
**Senior Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>563:066</td>
<td>Soil Mechanics 3 s.h.</td>
</tr>
<tr>
<td>563:091</td>
<td>Professional Seminar** 0 s.h.</td>
</tr>
<tr>
<td><em>Design elective</em>** and/or technical elective(s)</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>Deferred sequence*</td>
<td>3 or 4 s.h.</td>
</tr>
<tr>
<td>Socio-humanistic elective</td>
<td>3 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15 or 16 s.h.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>563:091</td>
<td>Professional Seminar** 3 s.h.</td>
</tr>
<tr>
<td><em>Design elective</em>** and/or technical elective(s)</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>Deferred sequence*</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>Socio-humanistic electives</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>563:097</td>
<td>Senior Project 1 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16 s.h.</td>
</tr>
</tbody>
</table>

*A sequence 225:065, 150 or 563:031, 035 or 583:073, 074 should be deferred to the senior year.

**Registration in 563:091 Professional Seminar is required in each semester of the junior and senior years.

***One design elective is required in the senior year. Design electives are:

<table>
<thead>
<tr>
<th>First Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>523:151</td>
</tr>
<tr>
<td>563:135</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>529:164</td>
</tr>
<tr>
<td>529:173</td>
</tr>
</tbody>
</table>

Courses in the Socio-humanistic area must be selected to satisfy the College of Engineering policy.

**Graduate Programs**

Work is offered in the general areas of structural engineering, geotechnical engineering, traffic engineering and transportation planning. Programs in environmental engineering and science and in hydraulic engineering are also offered in the College of Engineering; these programs are listed separately in this catalog.

**Master of Science**

The master of science programs in civil engineering are designed to permit further concentration in the area of the student's choice. Each program may be slanted toward design, analysis, research or a combination of these. Graduates of these programs are placed in advanced technical positions in industry, consulting firms or in government; or they may continue their graduate study if qualified. Current and projected demand for M.S. graduates is excellent. There is considerable flexibility in the curriculum for the master's degree. The plan of study must include a minimum of 30 semester hours' credit, with or without thesis as determined by the candidate and his or her graduate committee.

**Doctor of Philosophy**

The doctoral degree is granted primarily on the basis of achievement and has no prescribed curriculum. The candidate will normally need at least three years of full-time work beyond the baccalaureate degree. He or she must pass written and oral comprehensive examinations and pass and defend a dissertation which contributes to knowledge in the field. No foreign language is required.

The Department cooperates in interdisciplinary doctoral programs in the Programs in Applied Mathematical Sciences (see Graduate College).

**Special Faculty Strengths**

The American Council on Education's most recent ranking of civil engineering departments offering graduate studies placed the Iowa Program of Civil Engineering among the top 40 of the more than 200 departments in the nation.

**Admission Requirements**

The prerequisite for admission to candidacy for the master's degree is normally the earning of a baccalaureate degree in civil engineering or a physical science, with a cumulative grade point average of 2.5 (A=B). Candidates who do not have an engineering degree or whose grade point averages are slightly lower are invited to correspond regarding admission possibility. For admission to candidacy for the doctorate, the minimum grade point average is 3.2, based upon previous graduate work.

The applicant must meet the general admission requirements of the Graduate College (see Graduate College).

**Financial Aid**

A number of research assistantships are available; selection of recipients is usually based on scholastic achievement and research interest.

**Electrical Engineering**

Undergraduate program chairman: Donald M. Levy
Graduate program chairman: Doug H. Ching
Degree offered: B.S., M.S., Ph.D.

Undergraduate Program

The undergraduate program provides the basis for professional training in engineering, particularly that which deals with the electronics of instrumentation, communications systems, computers, and electric power generation and distribution. Electrical engineers are employed in space satellite, semi-conductor, aircraft, radio, television, computer and power industries. With the B.S. in electrical engineering, the engineer is prepared to do engineering work in design, development, manufacturing, sales, market analysis, controlling, field service and management. The employment outlook for the foreseeable future is quite favorable.

To prepare the student for the electrical engineering profession, the curriculum provides the background in circuits, control systems, electromagnetics, communication theory, electronics and design, in addition to the basic engineering core of mathematics, engineering design, engineering science and humanities. Techni-
cal electives and advanced programs are offered in biomedical systems, electronic circuits, signal processing, digital and control systems, applied physics, and solid state devices.

### Curriculum

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10:1 or 10:3 Rhetoric</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>22M:35 Engineering Calculus I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>4:1 Principles of Chemistry I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>590:001 Introduction to Engineering Design I</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>590:003 Introduction to Engineering Graphics</td>
<td>2 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15 s.h.</strong></td>
</tr>
</tbody>
</table>

#### Second Semester

| 10:2 Rhetoric or free elective | 3 s.h. |
| 22M:36 Engineering Calculus II | 4 s.h. |
| 4:6 Elementary Chemistry Laboratory | 2 s.h. |
| 580:002 Introduction to Engineering Design II | 2 s.h. |
| 580:004 Introduction to Engineering Computation | 2 s.h. |
| **Total** | **13 s.h.** |

#### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>560:017 Mechanics of Solids</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>22M:37 Engineering Calculus III</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>520:016 Thermodynamics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>560:015 Materials Science I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>540:011 Dynamic Systems Analysis I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18 s.h.</strong></td>
</tr>
</tbody>
</table>

#### Second Semester

| Socio-Humanistic electives* | 3 s.h. |
| 22M:38 Engineering Calculus IV | 4 s.h. |
| 540:080 Logic and Digital Systems | 3 s.h. |
| 540:012 Dynamic Systems Analysis II | 3 s.h. |
| **Total** | **17 s.h.** |

#### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>29:81 Physics I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22S:39 Probability and Statistics for Engineering and Physical Sciences</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>540:080 Principles of Electrical Engineering Design I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>545:040 Electronic Circuits I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>545:091 Professional Seminar**</td>
<td>0 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15 s.h.</strong></td>
</tr>
</tbody>
</table>

Second Semester

| Socio-Humanistic elective* | 4 s.h. |
| 29:83 Physics II | 3 s.h. |
| 545:081 Principles of Electrical Engineering Design II | 3 s.h. |
| 545:041 Electronic Circuits II | 3 s.h. |
| 545:060 Control Systems | 3 s.h. |
| 545:091 Professional Seminar** | 3 s.h. |
| **Total** | **16 s.h.** |

#### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-Humanistic elective*</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>545:070 Electrical Engineering Materials and Devices</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>545:082 Principles of Electrical Engineering Design III</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>545:091 Professional Seminar**</td>
<td>0 s.h.</td>
</tr>
<tr>
<td>Science core elective**</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>Technical electives</td>
<td>4 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16 s.h.</strong></td>
</tr>
</tbody>
</table>

#### Graduate Program

The Department offers programs leading to the Master of Science and Doctor of Philosophy degrees. Both thesis and non-thesis M.S. programs are available, and either may be followed by Ph.D. studies.

Excellence in scholarship and research is stimulated through close contact with the faculty throughout the period of graduate study and through programs tailored to fit individual needs. Each graduate student is regarded as an important member of the program whose contributions are highly valued.

Each student selects his or her own adviser, and together with the adviser plans his or her individual graduate program, with freedom of choice bound only by a few broad guidelines imposed by the Graduate College and by the program. Foreign languages and research tools, for example, are not required by

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*Socio-Humanistic elective courses must be selected to satisfy the College of Engineering policy.**

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### Notes:

- **Socio-Humanistic electives**: 4 s.h.
- **Engineering Calculus IV**: 4 s.h.
- **Dynamic Systems Analysis I**: 3 s.h.
- **Dynamic Systems Analysis II**: 3 s.h.
- **Logic and Digital Systems**: 3 s.h.
- **Socio-Humanistic elective courses**: 3 s.h.
- **Engineering Calculus III**: 4 s.h.
- **Thermodynamics**: 4 s.h.
- **Materials Science I**: 3 s.h.
- **Mechanics of Solids**: 4 s.h.
- **Physics I**: 3 s.h.
- **Engineering Calculus I**: 4 s.h.
- **Electromagnetic Theory**: 4 s.h.
- **Electronics and Circuits**: 3 s.h.
- **Introduction to Engineering Design I**: 2 s.h.
- **Introduction to Engineering Graphics**: 2 s.h.
- **Mechanics of Solids**: 4 s.h.
- **Probability and Statistics for Engineering and Physical Sciences**: 3 s.h.
- **Principles of Electrical Engineering Design I**: 3 s.h.
- **Principles of Electrical Engineering Design II**: 3 s.h.
- **Electronic Circuits I**: 3 s.h.
- **Control Systems**: 3 s.h.
- **Professional Seminar**: 3 s.h.
either the Graduate College or by the program but are introduced into the program by the student to the advisor and the graduate committee. This must include at least 12 semester hours of coursework in electrical engineering, including courses required for the degree program and, at least nine semester hours of coursework outside of electrical engineering, customarily from mathematics and physics. With thesis, up to eight semester hours of coursework outside of electrical engineering, ordinarily from mathematics and physics, is required. Without thesis, at least three semester hours of 547:198. Individual Investigations are required in addition to the 12 semester hours in electrical engineering. This independent study is to be a special project completed under the supervision of the student's advisor.

The candidate for the master's degree in electrical engineering must also successfully complete a final examination which is conducted by a committee of at least three faculty members, of which the advisor is the chairman. One part of the final examination must consist of an oral defense of the thesis for the thesis candidates or of the materials in 547:198 Individual Investigation for the non-thesis candidates.

Doctor of Philosophy

Requirements other than those stated in the University's graduate manual are:

Selection of a program advisor and filing of a tentative plan of study with the Department during the first year;

Successful completion of the Ph.D. qualifying examination;

Successful completion of the Ph.D. comprehensive examination;

Successful completion of a research program;

Successful completion of a final oral defense of the thesis.

Financial Aid

A number of fellowships, traineeships, assistantships, scholarships and industrial grants are available to graduate students who qualify. These are awarded on a competitive basis.

Admission Requirements

The normal graduate admission requirement of the program is at least a 2.7 grade-point average on all courses in electrical engineering, mathematics and physics for M.S. students, 3.0 for Ph.D. students. An M.S. student with a grade-point average less than 2.7, but better than 2.3 in courses in electrical engineering, mathematics and physics, may be admitted on probation. Each application is reviewed on an individual basis. Extenuating circumstances may permit deviations from the normal standards.

Engineering

Program chairman: George M. Lance
Faculty: professors J. Wayne Jorgenson, Shih-Fu Huang, George Lance, Howard McCullough, associate professor James Andrews; assistant professor February S. Dinh
Degree offered: B.S.

The increasing emphasis on interdisciplinary and non-traditional career objectives emphasizes the desirability of having available a degree program which combines a strong background in engineering fundamentals with the flexibility of choosing a major elective sequence to achieve specific educational goals of individual students. The primary objective of the Bachelor of Science in Engineering program is to provide such an option for students whose specific goals cannot be achieved within the framework of any of the designated degree programs.

The breadth and depth of required engineering core courses assures a sound engineering background. The elective sequence can then be used to develop those areas of special interest to the student which led to the choice of the designated engineering program.

Undergraduate Program

The objective of the undergraduate degree program is to provide the opportunity for each student to develop an individually-tailored program. However, a proper balance between breadth and depth must be maintained in order to result in a well balanced education. To accomplish this, the curriculum contains a strong base of engineering core courses with the remainder of the program consisting of a guided elective sequence. The specified portion of the program contains sufficient breadth and depth in fundamentals to guarantee an excellent background in engineering fundamentals.

The major portion of the elective program is scheduled for the final three semesters and builds from background acquired in the engineering core courses. This elective sequence is planned in consultation with an advisor to achieve a coordinated program.
which satisfies the specific objectives of the student. The sequence is selected not later than the fifth semester of study and must be approved by the Program Review Committee (PRC). The PRC is also responsible for monitoring the progress of all students in the program and offering suggestions and advice as required.

Curriculum

Freshman Year
First Semester
4:1 Principles of Chemistry I 3 s.h.
10:1 or 10:3 Rhetoric 4 s.h.
22M:035 Engineering Calculus I 4 s.h.
580:001 Introduction to Engineering: Design I 2 s.h.
580:003 Introduction to Engineering: Graphics 2 s.h.

15 s.h.

Second Semester
4:6 Elementary Chemistry Laboratory 2 s.h.
10:2 Rhetoric or free elective 3 s.h.
22M:36 Engineering Calculus II 4 s.h.
580:002 Introduction to Engineering: Design II 2 s.h.
580:004 Introduction to Engineering: Computation 2 s.h.

15 s.h.

Sophomore Year
First Semester
22M:37 Engineering Calculus III 4 s.h.
520:016 Thermodynamics I 4 s.h.
540:011 Dynamic Systems Analysis I 3 s.h.
550:015 Materials Science I 3 s.h.
550:017 Mechanics of Solids 4 s.h.

18 s.h.

Second Semester
22M:38 Engineering Calculus IV 4 s.h.
540:012 Dynamic Systems Analysis II 3 s.h.
560:019 Mechanics of Deformable Bodies 3 s.h.
540:025 Electromagnetic Theory 4 s.h.
Socio-humanistic elective 3 s.h.

17 s.h.

Junior Year
First Semester
580:039 Probability and Statistics for Engineering 3 s.h.
29:82 Physical Science 3 s.h.
520:020 Mechanics of Fluids and Transfer Processes 4 s.h.
580:021 Principles of Design I 3 s.h.
Socio-humanistic elective 3 s.h.

16 s.h.

Second Semester
29:83 Principles of Engineering Management Science 3 s.h.
SR0:022 Principles of Design II 3 s.h.
SR0:027 Engineering Management Science 3 s.h.
Technical elective 3 s.h.
Socio-humanistic elective 4 s.h.

16 s.h.

Senior Year
First Semester
Design course 3 s.h.
Technical electives 12 s.h.
Socio-humanistic elective 3 s.h.

18 s.h.

Second Semester
Design course 3 s.h.
Technical electives 9 s.h.
Socio-humanistic elective 3 s.h.

15 s.h.

Socio-humanistic elective courses must be selected to satisfy the College of Engineering policy.

Environmental Engineering

Program chairman: Richard R. Edge

Departmental M.S., Ph.D.

The first advanced degree in the environmental engineering area was awarded by the College of Engineering in 1927. Since then, nearly 200 M.S. and/or Ph.D. degrees in environmental engineering have been awarded.

Prior to 1968, the graduate program in environmental engineering was open only to individuals holding an undergraduate degree in engineering. Since 1968, individuals with undergraduate degrees in civil engineering or a basic science have been accepted for graduate work in environmental engineering.

The Environmental Engineering Program now has two basic stems, one engineering and the other applied science. Much of the coursework and research activity is common to both stems.

The Program maintains a heavy emphasis on interdisciplinary research and academic activities through close working relationships with other programs and colleges on campus, including the Iowa Institute of Hydraulic Research, the Institute of Agricultural Medicine and Environmental Health, the Institute of Urban and Regional Planning, and the Colleges of Business, Law and Liberal Arts.

Coursework and research emphases are designed to enable selection of a broad, general program of study or specialization in one of three areas: water quality management, air quality management or solid waste management. Through the appropriate selection of elective courses students may emphasize the analysis
and design of pollution control facilities, water resources, environmental planning, the assessment of environmental impacts or other disciplines of importance in the broad area of environmental quality control.

Laboratory and other facilities available in the Environmental Engineering Program are described in the Division of Engineering Engineering section of this catalog. Courses which have been designed primarily for the Environmental Engineering Program are identified by the digit 5 in the third position of the course number prefix. Course descriptions are provided in this catalog within the section devoted to the Division of Engineering.

Master of Science
The master’s degree may be granted in either a thesis or non-thesis basis. The thesis program requires a minimum of 30 semester hours of credit. This includes a minimum of 24 s. h. of coursework and a 6 semester hours of credit for research. The non-thesis program requires a minimum of 36 semester hours of credit. Twenty-three semester hours of the total must be earned through graduate-level coursework. A major report on an approved topic is also required for the non-thesis program, with 3 semester hours of credit allowed for the report.

The minimum undergraduate grade-point average requirement for regular admission to the program is 2.5. Conditional admission may be allowed for individuals with grade-point averages as low as 2.3. If admitted on condition, students must achieve a minimum grade-point average of 2.7 on the first 12 semester hours of graduate coursework. Regular students who fail to maintain a grade-point average of 2.7 are placed on academic probation. Candidates for the degree are required to pass a comprehensive written and oral examination at the end of their program. The emphasis of the written examination is on previous coursework and related topics. The oral examination is conducted by the student’s advising committee and emphasizes topics related to the thesis or major report.

Doctor of Philosophy
The doctoral program is aimed at developing both a breadth and depth of competence in environmental engineering and applied science. This is accomplished through coursework and research. No set package of courses is required for the Ph.D. Each program is developed individually to build on the student’s background and to develop new areas of competence.

A master’s degree with thesis in either engineering or a basic science is considered a prerequisite to admission to the doctoral program. Exceptions may be made for individuals who have a master’s degree without thesis but who have outstanding backgrounds in other respects.

The minimum grade-point average for admission to the doctoral program is 3.2 based on previous graduate work. Conditional admissions are not allowed. To remain in good standing, doctoral students must achieve a minimum grade-point average of 3.0 for the first 12 semester hours of graduate courses taken at The University of Iowa and must maintain a grade-point average of 3.2 prior to admission to candidacy for the degree.

The Ph.D. degree requires a minimum of 72 semester hours of credit beyond the basic undergraduate degree. Up to 18 semester hours of this total may be applied to thesis research. A minimum of one year of on-campus residency is required.

Doctoral students are required to pass both written and oral comprehensive examinations prior to formal admission to candidacy for the degree. These examinations are conducted at a time when substantially all of the student’s coursework has been completed. These examinations cover previous coursework and related topics, including the student’s research project. Prior to award of the degree, doctoral candidates must successfully defend their dissertation before an oral examining committee.

Financial Aid
Financial aids are available through research and teaching assistantships, fellowships, and direct employment on contractual research projects and studies conducted through the Environmental Engineering Program.

Industrial and Management Engineering
Program chairman: J.M. Lichtenberg
Degrees offered: B.S., M.S., Ph.D.

The industrial and management engineering has many opportunities for employment and service in industrial, governmental, research and public service organizations. Employment opportunities are among the most varied in the engineering field. The industrial and management engineer may hold a staff position in which he is directed by management or, he may be in a line unit participating directly in decision-making. His job title might be operations analyst, industrial engineer, systems analyst or engineer, operations research analyst, internal consultant, supervisor or manager. He may be employed by a manufacturing firm, a government agency, or a service organization such as an airline, bank, hospital or university.

In general, the industrial and management engineer is concerned with the analysis, design and implementation of systems involving the optimal use of resources—human, material and financial. The systems involved may range from small subsystems to extremely large systems. In order to accomplish these varying activities the industrial and management engineer is skilled in mathematics, physical sciences, management and human relations, as well as in computer systems, economics, optimization and systems analysis and design methods. Both undergraduate and graduate programs in Industrial and Management Engineering are designed to provide courses in these areas, while at the same time offering the student an opportunity to specialize in an area of his choice.

Undergraduate Program
The undergraduate curriculum in industrial engineering requires a strong foundation of courses in management and engineering science, mathematics, design, social sciences and humanities. Advanced courses include specialty courses in manufacturing, operations research, statistics, human engineering and computing. An undergraduate handbook, describing the program in greater detail, is available upon request.

Industrial and Management Engineering
<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman Year</td>
<td>Principles of Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Rhetoric</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Engineering Calculus II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Introduction to Engineering: Design I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Introduction to Engineering: Graphics</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>15</td>
</tr>
<tr>
<td>Second Semester</td>
<td>Elementary Chemistry Laboratory</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Rhetoric or fine elective</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Engineering Calculus II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Introduction to Engineering: Design II</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Introduction to Engineering: Computation</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>14</td>
</tr>
<tr>
<td>Sophomore Year</td>
<td>Materials Science I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Engineering Management Science</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Engineering Calculus III</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Dynamic System Analysis I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Mechanics of Solids</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>17</td>
</tr>
<tr>
<td>Second Semester</td>
<td>Materials Science II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Economics elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Engineering Calculus IV</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Dynamic Systems Analysis II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Thermodynamics I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>17</td>
</tr>
<tr>
<td>Junior Year</td>
<td>Materials Processing I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Qualitative Methods</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Probability and Statistics for Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>and Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Principle of Design I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Electromagnetic Theory</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Professional Seminar</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>16</td>
</tr>
<tr>
<td>First Semester</td>
<td>Physics I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Introduction to Operations Research</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elementary Psychology</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Principles of Design II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanities elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Professional Seminar</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>17</td>
</tr>
<tr>
<td>Sophomore Year</td>
<td>Technical elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Technical elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Human Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Quality Control, Reliability and Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanities elective (100-level)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Professional Seminar</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>16</td>
</tr>
</tbody>
</table>

**Strongly recommended social science electives**

**Program courses satisfying technical elective requirements include:**

- Communications in Industry I
- Operational Systems Design
- Engineering Administration I
- Production Inventory Models
- Qualitative Investment Analysis
- Sequencing and Scheduling
- Digital Systems Simulation I
- Advanced Managerial Psychology

**The science core elective may be selected from:**

- Physics II
- Mechanics of Deformable Bodies
- Mechanics of Fluids and Transfer Processes

**The economics elective may be selected from:**

- Price, Employment and Production Theory
- Managerial Economics
- Microeconomics
- Labor-Manpower Economics
+The two historical-cultural electives must be selected to form a sequence of the courses from several departments of the College of Liberal Arts. These departments include American Civilization, Art and Art History, Classics, English, European Literature and Thought, History, Music, Philosophy, Religion, Chinese and Oriental Studies, Linguistics, and Speech and Dramatic Arts. At least the second course should be at the 100 level.

++ Students not qualifying for direct entry into 103-104 or 102-103. In lieu of 103 and the second semester freshmen elective course.

Graduate Program

The goal of the Industrial and Management Engineering graduate program at both the M.S. and Ph.D. levels is to provide a modern, highly flexible curriculum of graduate studies. Each student's course of study will be based on his background, career objectives, and sound academic practice. Program faculty have research interests in areas related to engineering management and human factors; operations research, computing and applied statistics; materials processing and transportation.

Students programs emphasizing operations research or engineering management and human factors may be developed from Division of Systems Engineering courses offered mainly by I. & M.E. program faculty. M.S. students desiring a more general program may combine these emphases as at the M.S. level, while some desiring some specialization in applied statistics, computing, or materials processing may accommodate these preferences through the combination of I. & M.E. program courses and appropriate electives from other programs and departments of the university. Ph.D. student programs center either in the areas of operations research and applied statistics or engineering management and human factors. Graduate students with special interests in law or transportation may participate in programs which are jointly administered with the College of Law and Program in Urban Transportation. A graduate handbook, describing the program in greater detail, is available upon request.

Master of Science Degree

Students may be admitted from accredited baccalaureate curricula in any engineering discipline and the mathematical or physical sciences with a minimum grade point average of 2.50 on 4.00 and/or an acceptable score on the Graduate Record Examination (typically, at least 450 Verbal, 650 Quantitative). Students may be considered for conditional admission with a 2.50 of 4.00 grade point average and lower GRE scores. Students from business or social science programs who have adequate mathematical preparation may also be considered for regular or conditional admission. The student on conditional status must achieve regular status within two semesters of registration by attaining a grade point average of at least 2.75 and regular acceptance by the I. & M.E. program faculty.

The minimum M.S. program requires 30 semester hours of course work and research. Students may choose either a thesis or a non-thesis program. Most students, however, are encouraged to obtain the master's degree with thesis. Students desiring eventual admittance to Ph.D. study are especially advised to select the thesis option. A tentative plan of study for each student is determined through consultation with his advisor; the final plan of study is reviewed by the student's examining committee, approved by the I. & M.E. program chairman and by the Graduate College Dean.

Doctor of Philosophy Degree

Students may be admitted from accredited baccalaureate or post-baccalaureate curricula in any engineering discipline and the mathematical and physical sciences with a minimum grade point average of 3.00 on 4.00 and an acceptable score on the Graduate Record Examination (typically, at least 500 Verbal, 700 Quantitative). Students may also be admitted from business or social science programs on an individual basis. Students with a Ph.D. objective, who enter with a 3.0-3.3 degree are usually first admitted to the M.S. program. All doctoral programs in the Graduate College must contain a minimum of 72 semester hours of graduate work and include at least two semesters of residence. Typically Ph.D. programs in I. & M.E. consist at least 90 hours of study including research for the dissertation. Part time Ph.D. study is discouraged. There is no foreign language requirement.

Admission to degree candidacy will require a minimum grade point average of 3.35 on all graduate work taken at the University of Iowa and the demonstration of capability for individual achievement. Upon completion of the master's work specified by his advisor and examining committee with the GPA stipulated above, and upon recommendation by his advisor, the student will be admitted to the comprehensive examination. During this examination, which includes both written and oral parts, the student will be examined for the comprehensive examination and knowledge of the subject. Part of this examination will usually include the presentation of a dissertation proposal so that the comprehensive committee can evaluate the student's academic preparation in the light of the research to be performed.

Having successfully completed this examination, the student is accepted as a candidate for the Ph.D. and normally has only to complete and defend his dissertation.

Extension and Guided Self-Study

In cooperation with the Extension Division, program faculty will periodically offer extension classes in Cedar Rapids, Des Moines, or the Quad Cities. The program chairman should be consulted for offerings in any semester. Program faculty also offer a limited guided self-study program for off-campus students.

Financial Aid

Financial support is available primarily through research and teaching assistantships. Stipends currently vary from $1050 to $6440 for an academic year of graduate study. Awards are based
Mechanical Engineering

Program chairman: J. M. Trumbel

Undergraduate Program

The undergraduate program in mechanical engineering prepares the student for a career in engineering with an emphasis on the technical areas of thermal energy systems and the conversion of thermal energy to mechanical and electrical energy, mechanical systems and machines, and design and control of these systems.

The undergraduate curriculum provides a substantial number of electives in both the technical and sociotechnological areas. In consultation with his or her advisor, a student can plan to develop capabilities to meet individual goals within the framework of the curriculum. All undergraduates are strongly encouraged to undertake individual projects involving either an experimental or analytical design solution to a current problem.

Curriculum

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
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<tbody>
<tr>
<td>41:1 Principles of Chemistry I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>10.1 or 10.3 Physics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>22M:35 Engineering Calculus I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>580:003 Introduction to Engineering: Design I</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>580:003 Introduction to Engineering: Graphics</td>
<td>2 s.h.</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>15 s.h.</strong></td>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>4.6 Elementary Chemistry Laboratory</td>
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<tr>
<td>10.2 Rheology or free elective</td>
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<tr>
<td>22M:36 Engineering Calculus II</td>
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<tr>
<td>580:002 Introduction to Engineering: Design II</td>
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<tr>
<td>580:004 Introduction to Engineering: Computation</td>
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<tr>
<td>560:007 Statics</td>
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<td><strong>Total</strong></td>
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Sophomore Year

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<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td>22M:37 Engineering Calculus III</td>
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<tr>
<td>560:010 Dynamics</td>
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<tr>
<td>540:011 Dynamic Systems Analysis I</td>
</tr>
<tr>
<td>560:015 Materials Science I</td>
</tr>
<tr>
<td>520:016 Thermodynamics I</td>
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<td><strong>Total</strong></td>
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Junior Year

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<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td>225:39 Probability and Statistics for Engineering and Physical Sciences</td>
</tr>
<tr>
<td>29:82 Physics I</td>
</tr>
<tr>
<td>580:027 Principles of Design I</td>
</tr>
<tr>
<td>520:020 Mechanics of Fluids and Transfer Processes</td>
</tr>
<tr>
<td>528:091 Professional Seminar</td>
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<tr>
<td>528:091 Socio-humanistic elective</td>
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<tr>
<td><strong>Total</strong></td>
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</tbody>
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Senior Year

<table>
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<tr>
<th>First Semester</th>
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</thead>
<tbody>
<tr>
<td>528:081 Heat Transfer</td>
</tr>
<tr>
<td>568:062 Mechanical Systems Design I</td>
</tr>
<tr>
<td>528:091 Professional Seminar</td>
</tr>
<tr>
<td>528:081 Socio-humanistic elective</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>
Mechanics and hydraulics

Second Semester
528-082 Mechanical Engineering Design II 3 s.h.
528-091 Professional Seminar 0 s.h.
Technical electives 9 s.h.
Socio-humanistic elective 3 s.h.
Total 15 s.h.

Socio-humanistic elective courses must be selected to satisfy College of Engineering policy.

Graduate Program
Graduate programs leading to the Master of Science degree, both with and without thesis, and to the Doctor of Philosophy degree are available to qualified students. General degree requirements are specified in the "Graduate College" section of this Catalog. No explicit requirements beyond those specified by the Graduate College are imposed by the program, in keeping with the belief that the student's program can best be developed individually within the framework of College requirements. It is felt that both the appropriateness of the student's program and his or her depth of achievement in it are adequately ensured by the advisor and through a review by the examining committee. As soon as possible after admission, each student should select a program faculty member who by mutual agreement will serve as major advisor to the student. The major advisor will assist the student in planning all aspects of his or her graduate program and usually will serve also as the research advisor.

The Program of Mechanical Engineering cooperates in interdisciplinary doctoral programs.

Master of Science
The Master of Science degree with thesis requires a minimum of 30 semester hours of academic credit, excluding not more than eight semester hours of credit for thesis work. Completion of a thesis and satisfactory performance in a final oral examination are required. A Master of Science degree without thesis is also available but only to well-qualified students who have the approval of their faculty advisors.

Doctor of Philosophy
The Doctor of Philosophy degree is granted primarily on the basis of achievement rather than on the accumulation of semester hours of credit. However, the candidate is normally expected to have completed three academic years of residence, or two years if he or she alone holds a recognized master's degree. The candidate must pass a written and oral comprehensive examination and a final examination which is a defense of the thesis.

Financial Aid
A limited number of assistantships and scholarships are available to graduate students who qualify. Some are awarded on the basis of competition; others see the result of appointments.

Admission
Minimum requirements for admission to a graduate program in mechanical engineering are the same as for the Graduate College. Although graduate students in mechanical engineering will ordinarily be a baccalaureate degree in mechanical engineering or a closely related field, students who are interested in interdisciplinary programs may be admitted, if a careful review of their qualifications and objectives finds them desirable.

Mechanics and Hydraulics
Program Chairman: Kenz, Ray

Program Descriptions: The Program in Mechanics and Hydraulics offers graduate curricula preparing students for professional careers and for further study in fluid mechanics, solid mechanics, hydraulic engineering, biomechanics and water resources and flow instrumentation. The Program is strongly committed to the development of such interdisciplinary areas of great need and promise as biomechanics, ordinal design and water resources. The Program also cooperates in the interdisciplinary Program in Applied Mathematical Sciences (see "Graduate College"). The Program is associated with the Iowa Institute of Hydraulic Research, whose laboratory is world renowned. The major staff members of the Institute are professors in the Program and devote about half-time to teaching. The Institute has unusually sophisticated instrumentation with strong emphasis on electronic observation and processing of data. The mechanics of solids program makes use of good laboratory facilities available in the colleges of Engineering and Medicine.

Master of Science
The master's degree can be secured by earning 30 semester hours of credit in an approved course of study. Approximately half of these hours are required and the other half selected by the student with the approval of his or her advisor. The M.S. thesis is optional, but when chosen it usually requires about six semester hours of credit. Candidates for the degree are expected to have a minimum grade-point average of 3.0 and to pass written and oral examinations.

Doctor of Philosophy
Doctoral candidates are expected to maintain a 3.5 grade-point average throughout the doctoral program. Approximately 60 semester hours beyond the master's are to be earned. About 25 semester hours are devoted to the dissertation, and 15 or more semester hours to mathematics or other closely related areas, leaving approximately 20 semester hours of major courses to be taken in the Program. Choice of major subject is based on the particular line of interest the student wishes to follow. Normally the coursework is in the same area as the dissertation. All Ph.D. candidates are required to have one year of foreign language proficiency in cultural history. The ability to pass examinations for the first year of a language is accepted in lieu of actual requisites. Further, students from non-English-speaking countries are allowed to use English as their foreign language and to take a year or at least six hours of English at the appropriate level. A thesis supervision is appointed for each graduate student, with consistent consideration of the student's wishes. Under Graduate College rule, the comprehensive examination must be taken by the
next to the last academic period, and the final examination, entirely on the dissertation, culminates the program.

Financial Aid
There is a considerable amount of support available for graduate students. A significant volume of research work relies on enlisting a large number of graduate students as research assistants.

Admission Requirements
Each curriculum of the Program is quite flexible, and students are admitted from all discipline of engineering as well as the mathematical and physical sciences.

An applicant for the master’s degree program is expected to have graduated in the upper quarter of his or her undergraduate class and to have a grade-point average above 2.5; usually, 3.0 is expected. Ph.D. candidates should have a 3.0 grade-point average in their master’s degree work. Applicants must meet the general admission requirements of the Graduate College (see "Graduate College").

Division of Energy Engineering
Chairman: John F. Kennedy
Associate chairman: Victor C. Field

The responsibilities of the Division of Energy Engineering include the development and teaching of courses at all levels, development and maintenance of teaching and research laboratories and conduct of basic and applied research in the disciplinary fields of fluid, thermal, and environmental sciences. The Division's mission is to train professionals in the teaching and scholarly activities, while remaining responsive to the changing engineering needs of society and its demands for the engineering profession.

The applications of the fundamental principles of biological, chemical, fluid, and thermal sciences to the design of engineering components and projects, to the production, distribution and utilization of water, energy, and materials, to the protection of the environment and to the ever-increasing interaction between engineering and health sciences are conveyed to the undergraduate students through a series of integrated courses at various levels. In addition, a number of graduate students in all engineering curricula through the core program, the Division offers specialized courses for students major in: chemical, mechanical, chemical, civil, and mechanical engineering, and campus-wide general courses highlighting the complex interaction between engineering and other fields of learning in dealing with the problems of energy and environment.

At the graduate level, the Division offers courses in thermal sciences and transport phenomena, environmental sciences, fluid mechanics, hydraulic engineering and water resources for students pursuing advanced degrees in the Civil Engineering, Environmental Engineering, Mechanical Engineering and Mechanics and Hydraulics Programs. The diversity of the teaching and research interests of the faculty of the Division and the opportunities available to graduate students pursuing M.S. and Ph.D. thesis research under their direction are best illustrated by listing the currently active research projects.

Active Research Projects
Fluid Mechanics: Dispersion and diffusion of passive and reactive contaminants in rivers and lakes; experimental and theoretical studies of turbulent boundary layers, wakes, jets and plumes; analytical and numerical solutions of problems in ship hydrodynamics; physiological flow phenomena in cardiovascular and intubated systems; wind loads on structures; detection and removal of airborne particles.

Hydraulic Engineering: Design, modeling and on-site testing of intake and outfall structures; thermal discharges into natural water bodies; cooling tower performance; sediment transport; formation of ice covers and ice jams; strengths of ice; forces on structures. Instrumentation: Laser and hot-wire anemometry; measurement of sediment and very-low fluid velocities; real-time acquisition and processing of fluid motion data.

Thermal Sciences: Biological heat transfer and human comfort; dynamics of aerocooler suspensions; radiant heat transfer through real gases; enzymatic heating; plaque non-equilibrium; remote heat-flux measurements; applications of power plant waste heat; analysis of power plant cooling systems; economics of power production; design and use of solar energy collectors.

Water Quality: Mathematical modeling of water quality in streams and lakes; optimal allocation of resources to control water pollution; removal of trace organics in water treatment; kinetics of nitrification in streams; sludge stabilization in wastewater treatment; disposal of sludge from water and wastewater treatment; effect of nitrogen load variations on nitrification with the rotating bio-discs; scrubbing of hydrogen sulfide from anaerobic digestor gases with ferric chloride solutions.

Water Resources: Economics of water usage; management of reservoirs; stochastic hydrology, systems analysis; watershed modeling; water utilization by waste heat management.

Special Facilities
The laboratory for undergraduate instruction in fluid and thermal sciences is located in the Engineering Building and contains a small wind tunnel, a water tank, various air, water and oil flow devices, and numerous small-scale experiments which demonstrate the principles of mass, momentum and energy transfer. More specialized experiments are also performed in the other laboratories of the Division and with the facilities of the Iowa Institute of Hydraulic Research. Experiments in the environmental sciences are performed at the laboratories in the University Wool Plant and the P.P. Morgan Sanitary Engineering Laboratory.

The research facilities available to the Division's faculty and their graduate students is divided into three categories. Since most members of the senior research staff of the Institute of Hydraulic Research were involved in the Division of Energy Engineering, the teaching and research facilities of the Division are closely connected with the research and consulting activities of the Institute. This is particularly so in the area of fluid mechanics, hydraulic engineering, flow instrumentation, and general research facilities related to dispersion and dispersion of waste heat in water. The Institute houses some of the most modern research facilities in the world. The equipment includes a 330 foot towing tank, several
hydraulic flumes and wind tunnels, a dispersion flume, a wave tank and a special low-temperature flow facility for investigation of ice phenomena. A new building constructed recently on the east bank of the Iowa River hosts a unique environmental flow facility: a water flume that measures 7.6 ft. high, 10 ft. wide, and 66 ft. long, and operates with speeds up to 3 ft/sec. The recent completion of this facility has added a new dimension to the laboratory simulation of environmental dispersion and diffusion problems in water as well as in the atmosphere. The Institute is also equipped with an IBM 1800 data acquisition and control system for on-line recording, storage and processing of experimental data gathered at various points in the laboratory.

Research in environmental sciences and engineering is conducted in the Division's laboratories located at the Philip F. Morgan Sanitary Engineering Research Laboratory, situated on the site of the Iowa City Municipal Waste-water Treatment Plant, and in the Water Plant Laboratory, located in the University West Treatment Plant. The Morgan Laboratory is devoted to research activities in the wastewater treatment area. It includes a modern wet chemistry laboratory and space for bench and pilot scale studies of the physical, chemical and biological operations and processes of wastewater treatment. Permanent pilot facilities at the Morgan Laboratory include a 10,000 gallon aeration tank, a gallon-per-minute activated sludge treatment system, and a gallon-per-minute rotating biological disc unit. The Water Plant Laboratory is the center of research in the water treatment and natural aquatic systems area. The laboratory is fully equipped for both routine and advanced chemical and biological analyses of water and provides space for both bench and pilot scale studies. The entire 4,000,000 gallon per day water plant is especially designed to enable the isolation of treatment operations for special study without undue interference with the production and supply of treated water to the University. The Iowa River, which flows through the University Campus, and the Coralville Reservoir, located approximately 5 miles upstream, serve as "natural laboratories" for water quality and limnological research.

The Division is also located in the Engineering Building and include a bi-directional reflectance facility for radiation property measurements, a solar energy research laboratory, an interferometric biophysics laboratory, a well-stabilized RF plasma facility with spectroscopic diagnostic equipment, and a carbon dioxide application facility for the separation of combustible materials from solid waste is presently under construction.

Financial Aid
Since the Division's faculty is engaged in a wide variety of sponsored research projects, a majority of the 75 graduate students working with the professors in the Division receive research assistantships. Of these, the Institute of Hydraulic Research employs some 30 to 35 graduate students half-time to work on projects in the fields of civil and environmental engineering, water quality, and water resources. The Division of Energy Engineering offers similar assistantships for project participation in research projects in the thermal and environmental sciences. A limited number of fellowships and teaching assistantships are also available from the Division. In all cases, the appointments are made on the basis of scholastic achievement and research interest.

The Division of Energy Engineering also encourages undergraduate involvement in its research through the University Work Study Program and the Undergraduate Research Participation Program. In order to be considered for financial aid, the prospective student should complete the Graduate Awards Application Form and forward it to the Chairman of the appropriate academic program.

Courses

Core Engineering Program Courses

Core Engineering Program Courses 

Core Engineering Program Courses 

Course  Description Credit 

Core Engineering Program Courses 

Core Engineering Program Courses 

Special Program Courses

Special Program Courses 

Special Program Courses 

Special Program Courses 

Special Program Courses 

General Courses

General Courses 

General Courses 

General Courses 

General Courses 

General Courses 

General Courses 

General Courses 

General Courses 

General Courses 

General Courses 

General Courses 

General Courses
second order partial differential equations. Same as 560:113. Prerequisite: Mathe-
natics 222/223.
562:114 Mathematical Methods In Continuum Mechanics II 3 s.h.
567:185 Analog & Digital Techniques for Data Reduction 3 s.h.
Topics include computer-aided experimentation involving analog and digital techniques as presented in the laboratory; computer simulation, digital conditioning, analog-to-digital and digital-to-analog conversion, microcomputer interfacing. Prerequisite: senior or graduate standing in engineering.
569:211 Numerical Analysis 3 s.h.
Partial differential and integral equations by finite difference, finite elements and characteristics; boundary value problems, similarity solutions, consistency, convergence, stability bounds, acceleration techniques; emphasis on nonlinear problems; examples drawn from diffusion, fluid mechanics, wave propagation in solids. Same as 560:311. Prerequisite: 560:111 or equivalent.
569:212 Advanced Engineering Analysis 3 s.h.
Modeling of engineering problems by mathematical equations; mathematical solution techniques for differential equations; interpretation of mathematical solutions; em-
phasis on modeling, solution techniques and interpretation may vary with instructor and student interest in applications in transportation, mechanics, vibrations, fluid me-
chanics and heat transfer. Same as 560:312. Prerequisite: 560:112 or equivalent.
Thermal Sciences and Transport Phenomena
572:010 Thermodynamics I 3 s.h.
Basic elements of classical thermodynamics, including first and second laws, entropy, irreversibility, Carnot Cycle, properties of pure substances, closed simple systems and one-dimensional steady-state flow systems; engineering applications. Prerequisite: Mathematics 222/223. Chemistry 4-1.
572:040 Thermodynamics II 3 s.h.
Kinetic theory of gases; micromolecular mixtures; thermodynamics of combustion and chemical equilibria; power and refrigeration cycles; thermody-
namics of compressible flow; introduction to statistical thermodynamics. Prerequi-
572:043 Chemical Engineering Thermodynamics 3 s.h.
Applications of thermodynamic principles to chemical and physical processes; prediction of material properties: phase-equilibria and chemical equilibrium applied to industrial process systems. Same as 572:043. Prerequisite: Chemistry 4-13.
572:045 Heat Transfer 3 s.h.
Introduction to theory of heat transfer by conduction, convection and radia-
tion; analytical and numerical methods of solutions; applications to engineering problems. Same as 572:045. Prerequisite: 572:040.
572:049 Design for Energy and Momentum Transfer 3 s.h.
Applications of heat and mass transfer processes and thermodynamic processes in the design of chemical process equipment for heat transfer, evaporation and drying. Same as 572:049. Prerequisites: 572:030, 572:047, Mathematics 228/229.
572:140 Intermediate Thermodynamics 3 s.h.
Thermodynamics of irreversible processes; kinetic theory; rational thermody-
namics; applications in thermodynamic properties and selected topics. Same as 572:140. Prerequisites: Mathematics 228/229.
572:144 Direct Energy Conversion 3 s.h.
Basic elements of energy conversion, thermal, photovoltaic and NIF generation, fuel cells, solar, biomass, bioremediation, etc. Same as 545:176. Prerequisite: senior or graduate standing in engineering.
572:145 Intermediate Heat Transfer 3 s.h.
Study and comparison of conduction, convection and radiation; surface and phase-change, radiation; conduction and evaporation; analytical and numerical methods and applications. Prerequisite: 572:045. Prerequisite: 572:045.
572:160 Bioprocess Transport Processes 3 s.h.
Applications of moving averages, heat and mass transfer principles to biological systems with particulate emphasis on human beings. Such topics as fluid mechanics of two-dimensional flows in the circulatory system, heat exchange between biological system and environment as well as mass transfer in membranes are examined. Prerequisite: 572:040. Prerequisites: 572:045, 551:081.
572:167 Nuclear Reactor Heat Extraction 3 s.h.
Problems related to conversion of heat from moderators to power reactors. Determina-
tion of thermal-diffusion processes, thermal stress, heat transfer, fluid flow rate for typical systems; consideration of heat transfer and safety with respect to the design problem. Prerequisite: 572:040.
572:168 Solar Energy Applications 3 s.h.
Solar radiation, extraterrrestrial and at the earth’s surface: measurements and estimates; radiation characteristics of opaque and partially transmitting materials; flat plate and focusing collectors; energy storage; complete systems for building and water heating and for air-conditioning. Prerequisite: 572:045 or consent of instructor.
572:169 Transportation Phenomena I 3 s.h.
Unified treatment of engines, mass, energy transport in chemical engineering problems; use of water and steam systems to express equations of continuity, momentum and energy. Same as 562:149. Prerequisites: 572:042, 572:046.
572:170 Advanced Thermodynamics 2-4 s.h.
Advanced topics in thermodynamics are treated. Examples include kinetic theory of gases and surfaces, equilibria and non-equilibrium statistical thermodynamics, and irreversible thermodynamics. Prerequisite: 572:149 or equivalent.
572:171 Kinetics of Gaseous Reactions 2-4 s.h.
Kinetics of reactions and reaction mechanisms. Prerequisite: 572:170 or equivalent.
572:195 Simulation of Process Systems 3 s.h.
Introduction to simulation of process systems. Prerequisite: 572:170 or equivalent.
572:240 Equilibrium Thermodynamics II 3 s.h.
Conceptual treatment of irreversible phenomena; internal variables, absolute state theory, relations to internal variables; equilibrium thermodynamics of concentrated solutions for dissipative systems. Same as 562:245. Prerequisite: 572:240.
572:242 Non equilibrium Thermodynamics I 3 s.h.
Phenomenological treatment of irreversible processes; foundations of non-equili-
'brium thermodynamics; conservation laws; energy balance; Friction relations; theory of constitutions; applications to continuum mechanics; similar phenomena. Same as 562:245. Prerequisite: 572:240.
572:245 Nonequilibrium Thermodynamics II 3 s.h.
Introduction to nonequilibrium thermodynamics. Prerequisite: 572:242.
572:246 Conductive Heat Transfer 3 s.h.
Fundamentals of conductive heat transfer; analysis of conductive heat equation, thermal conductivity, steady and transient heat conduction, and heat conduction with varying boundary conditions; analytical and numerical treatment of practical problems. Prerequisite: 572:145 or equivalent.
572:248 Convective Heat Transfer 3 s.h.
Fundamentals of convective heat transfer; analysis of forced and free convection; differen-
tial and integral formulations of boundary layer; heat, mass and momentum trans-
fer in laminar and turbulent flows inside tubes and in external surfaces; membranous and free convection; convection at high velocities. Prerequisite: 572:145 or equivalent.
572:249 Heat Exchanger Design 3 s.h.
Introduction to heat exchanger technology and analysis of heat exchanger design and equipment. Prerequisite: 572:246.
572:250 Radiation Heat Transfer 3 s.h.
Introduction to radiative transport and analysis of radiative interchange among surfaces separated by non-participating and participating media; radiation properties of solids and gases; geometry; combined radiation-conduction-radiation-conce-
dauxiliary heat transfer.
572:252 Heat Transfer Fundamentals 3 s.h.
Application of finite element method to thermal and hydraulic analysis, boundary layer theory; turbulent, laminar, transition; finite element technology. Prerequisite: 572:250.
572:262 Environmental Phenomena I 3 s.h.
Fundamentals of environmental modeling, deposition, dispersion, fate and effects, or other environmental problems. Prerequisite: 572:262.
572:264 Environmental Microbiology 3 s.h.
Fundamentals of environmental microbiology with emphasis on water quality and wastewater treatment systems. Prerequisite: 572:262.
572:265 Environmental Sanitation 3 s.h.
Fundamentals of environmental science with emphasis on air and water pollution treatment, air pollution control and solid wastes management. Prerequisite: senior or graduate standing in engineering.
572:269 Hydraulics Systems Design in Environmental Engineering
Application of hydrostatic principles to the design of transport systems in environ-
mental engineering with emphasis on transport of wastewater, rainwater, stormwater and stormwater collection and treatment systems. Prerequisite: 572:045.
572:290 Environmental Biotechnology 3 s.h.
Principles of general, qualitative, and physical and biological chemistry applied to water and air systems. Prerequisite: Chemistry 4-1 or equivalent.
572:314 Environmental Chemical Laboratory 2 s.h.
Laboratory procedures in the physical, chemical and biological analysis of water, wastewater and solid wastes. Peer or co-requisite: 572:152.
572:315 Environmental Microbiology 3 s.h.
Modern techniques for the treatment of wastewater and stormwater systems. Prerequisite: 572:262.
572:340 Oceanography 3 s.h.
Modern techniques for the treatment of wastewater and stormwater systems. Prerequisite: 572:262.
572:350 Environmental Operations & Processes 3 s.h.
computational and simulation. In addition several microprocessors and their associated peripheral devices are available.

Financial Aids
A number of fellowships, traineeships, assistantships, scholarships and industrial grants are available to graduate students who qualify. These are awarded on a competitive basis.

Courses
Core Engineering Program Courses
640:011 Dynamic Systems Analysis I 3 s.h.
Analysis of dynamic behavior of physical systems; use of mathematical methods to aid in understanding system response; correct treatment of electrical, mechanical, fluid and thermal systems. Laboratory included. Prerequisite: Computer Science 2206-38.

640:012 Dynamic Systems Analysis II 3 s.h.
Continuation of 640:011; treatment of open-loop systems in steady-state; development of general techniques applicable to all types of physical systems. Laboratory included. Prerequisite: 640:011. Mathematics 2206-94.

640:014 Dynamic Systems Analysis for Transfer Students 3 s.h.
One-semester treatment of essential concepts (e.g. 640:011 and 640:012); for transfer students having one year of credit in statics. Physics included. Prerequisite: Mathematics 2206-94.

640:025 Electromagnetic Theory 4 s.h.
Electric and magnetic fields, Maxwell's equations; wave propagation; applications to reflection, guided waves, circuit theory and electromagnetic energy propagation. Prerequisites: 2206-57 and 560:011.

Special Program Courses
640:000 Principles of Electrical Engineering Design I 3 s.h.
The course consists of several design projects using basic electrical circuits and equipment. Emphasis is on the operation of electronic devices; e.g. chokes, transformers, FETs, etc. Prerequisite: 640:012 or 640:014.

640:081 Principles of Electrical Engineering Design II 3 s.h.
The course consists of several design projects in electrical engineering, with emphasis on small scale and medium scale integrated circuits and advanced amplifier techniques. Prerequisite: 640:085. 640:083.

640:082 Principles of Electrical Engineering Design III 3 s.h.
Design projects for basic electrical engineering areas. The areas currently chosen are linear integrated circuits, digital integrated circuits, circuit simulation, microprocessors and electrical machinery. Prerequisites: 560:013, 560:023.

640:084 Principles of Electrical Engineering Design IV 3 s.h.
This final design course is an individual project of the student's own choice. Demonstration of the completed project will be presented at the final engineering report session. Prerequisite: 640:082.

641:185 Biomedical Systems Analysis 3 s.h.
Aplication of principles of control theory to analysis of biomedical systems; development of computer simulation techniques to study dynamic aspects of physiological systems. Prerequisite: 640:082, 2206:22 or 2206:21.

641:186 Biomedical Measurements 3 s.h.
Design, development and utilization of contemporary electronic instrumentation for measuring biomedical variables of clinical and research interest. Students may choose one or more elective credits. Clinical course instructor for specific modules available. Prerequisites: 640:012 or 2206:29 or 2206:21.

Digital Systems
640:090 Logic and Digital Systems 3 s.h.
Logic of switching circuits; analysis and synthesis of combinatorial and sequential circuits; introduction to digital computers, organization and operation, computer organization and digital computers: lab arranged. Prerequisite: 560:004.

640:125 Biophysics and Molecular Biology 3 s.h.
Continued and sequential logic networks; cellular logic arrays; hazards and faults; fault finding and diagnosis, design techniques in fault tolerance, reliable logic networks; automated design. Prerequisite: 340:020.

640:126 Computer Organization 3 s.h.
Microprocessors; real computers, summer modules including memories, arrays, central modules, input-output organization, input-output modules, arithmetic algorithms, microprogramming with applications, timing and interrupt organization, latches, busses for real-time applications. Prerequisite: 640:090.

640:126 Computer Communications 3 s.h.
Communications systems components: digital communication systems; classical errors, codes for error control, network diagrams, networks, multiple digital communication systems; data structures, transmission protocols, neural networks, computer networks. Prerequisite: under standing in electrical engineering or computer science.

640:139 Small Computer Systems 3 s.h.
Introduction to micro and main-computers; machine and assembler language, programming for on-line and real-time systems, special purpose small computers. Prerequisites: 640:090 or 2206:010.

640:137 Small Computer Applications 3 s.h.
Design of small computer based systems; micro-computers, micro-processors and expert systems, databases, micro-computer and computer control systems, special projects. Prerequisite: 640:135.

640:139 Advanced Bullying Theory 3 s.h.
Liquor compliance, modular logic design, asynchronous sequential circuits, synchronous sequential circuits, fault diagnosis, logic design to facilitate testing, fault-tolerant circuits, topics from current literature. Prerequisite: 640:130.

Electronics
640:085 Electronic Circuits I 3 s.h.
Physics of solid state electronic devices; pn junction diodes, field effect transistors, bipolar transistors, vacuum tubes, and phenomena linear circuit models; basic amplifiers and biasing networks. Prerequisite: 640:012.

640:086 Electronic Circuits II 3 s.h.
Active circuit design based on device theory from 640:080; amplifier design, basic feedback and oscillatory theory, high-frequency applications of solid state devices; electronic communication systems design theory. Prerequisite: 640:080.

640:143 Linear Integrated Circuits 3 s.h.
Sub-systems, biasing, biasing, amplifying, modulating, modes of operation and characteristics of operational amplifiers, differential amplifiers and other IC devices. Circuit design techniques for integrated devices. Prerequisite: 640:081.

640:412 Electronics for Applications 3 s.h.
A low-voltage, current-switching, multifunctional operational amplifier and linear digital integrated circuits, and practical amplifiers, with emphasis on the use of the OP-AMP as a measurement, signal processing and other applications. Prerequisite: 640:012.

640:141 Electronic Computer Design 3 s.h.
Large scale operation of semiconductor devices, complexities of logic families, performance criteria, digital computer components, computer architecture of both sequential and parallel designs. MLI and LSI devices. Prerequisite: 640:012.

640:145 Digital Signal Processing 3 s.h.
Formulation and simulation of digital processing problems in time and frequency domains. Use of flow diagrams and transformations. Practical digital filter design. Course is top down. Prerequisite: 640:012.

Communications
640:090 Data Transmission Systems 3 s.h.
Introduction to digital representation; processing with linear filters and systems, amplitude modulation, phase modulation, frequency modulated systems, digital communications. Prerequisite: 640:090.

640:090 Statistical Communication Theory 3 s.h.
Design and analysis of random and periodic signals and power spectral densities, modulation theory, sampling and quantization, multistaging, signal-to-noise ratio enhancements, information theory and coding. Prerequisite: 640:090.

640:193 Advanced Communication Theory 3 s.h.
Unified approach to principles underlying analog and digital communication systems, modern waveforms, optimum receiver principles, efficient signaling for message sequences. Prerequisite: 640:090.

640:213 Information Theory 3 s.h.
Quantitative measures of information; discrete and continuous sources; source encoding and decoding; source coding and concatenated codes, channel coding and decoding. Prerequisite: 640:190.

640:231 Fourier Analysis 3 s.h.
Use of coding techniques to improve reliability and security of communication and computer systems, error-correcting codes, forward and reverse error-correcting, cryptographic codes. Prerequisite: 640:140 or 640:190.
Chemical Engineering Laboratory
Located in the Chemistry-Botany Building, this laboratory includes pilot plant equipment for the study of industrial evaporation, distillation, drying, fluid flow and heat transfer. In addition there are a subcritical nuclear reactor and facilities for bio-organic research and investigation of plastics and other materials. Laboratories for individual research by graduate students are equipped with chromatography, analog computers and other instrumentation. A small shop is available for students to use under the supervision of a technician.

Electron Microscope Laboratory
This instructional and research facility is equipped with a RAC EMU-3F Electron Transmission Microscope and the necessary specimen preparation equipment to permit examination of specimens by the use of thin foil and replica microscopy and selected area diffraction. This facility complements the adjacent facility involving the mechanical behavior of materials. Such phenomena as the following may be studied by use of this foil technique: the behavior and distribution of dislocations as a result of plastic deformation, stacking fault energy, subgrain boundary formation, radiation damage. Electron fractography and the study of surfaces may be done by use of the replica technique, and phase transformation may be studied by use of selected area diffraction.

Materials Processing Laboratory
These laboratories consist of the Metal Casting and Welding Laboratory, Metal Cutting Laboratory, and the Heat Treatment and Metallurgical Laboratory. They are equipped to conduct laboratory instruction and research involving primarily the liquid and solid state of metallic materials. They are equipped with such items as melting and heat treating furnaces, a variety of welding equipment, foundry sand testing and molding equipment, pyrometer and destructive testers, metal testing tools and test force meters, metal forming equipment, metallurgical specimens mounting presses and polishes, a variety of metallurgical microscopes and a darkroom.

Materials Testing Laboratory
This laboratory is equipped for the determination of physical and mechanical properties of materials of engineering interest such as metals, polymers and biomaterials. It includes a compression testing machine, an axial testing machine and a universal testing machine with mechanical and sophisticated multichannel electronic instrumentation for measuring deformation and stress. It also includes a TENS machine suitable for the investigation of fatigue properties of materials. An additional facility in the form of a random function generator for the study of fracture is being added.

In addition to this laboratory, there is a modern testing capability with a thermostatically controlled chamber for conduction of experiments at high temperatures. Pulse generator equipment has been acquired more recently for the dynamic response of metals in the high frequency range.

Mechanical Engineering Laboratories
The mechanical engineering laboratories are equipped and instrumented to provide students with educational experience in a wide variety of fields using modern methods of measurement and analysis including computers, a variety of strain gages, a photoelastic laboratory and other conventional instrumentation. Particular areas include study of material behavior with emphasis on the mechanics of dynamic systems and mechanisms of failure under both static and cyclic loading.

Powders and Particulates Laboratory
A modestly equipped powders laboratory is available containing sampling devices; devices for characterizing bulk properties of powders; various mixers, grinders, sizing equipment; optical sizing apparatus, scanning furnaces, mounting and polishing equipment. In addition there is access to a scanning electron microscope QuantuMax 7200 system, computer center and specialized engineering and chemistry library facilities and laboratories.

Structural Testing Laboratory
This laboratory is equipped for the determination of physical properties of materials in engineering construction, such as soils, aggregates, concrete, metals, timber and plastics. Included are a compression testing machine, a universal testing machine and an axial testing machine, along with mechanical and electronic instrumentation for the accurate measurement of deformations under load. The structural laboratory also contains a press-molding bed and frame which permits construction of press-molded concrete structural members. A soils laboratory contains blow-oscillation and triaxial testing equipment of the latest design.

Divisional Financial Aid
5-report is available for graduate students from several sources including assistantships, scholarships and federal grants. Stipends are comparable to those of other departments and academic units of the University and are granted on the basis of academic excellence and research interest of the Division. Graduate enrollment is approximately 66 students. Limited financial aid for undergraduates is available from assistantships and grants. These are in addition to the scholarships awarded by the University and the College of Engineering.

Courses

Core Engineering Program Courses

560:077 Statics
Vector algebra, forces, couples, equivalent force and couple systems, Newton's Laws, kinematics, kinetic analysis of particle and rigid bodies; applications. Computer: 220:05.

560:100 Dynamics
Vector calculus, Newton's Laws, dynamics of particle motion, multibody systems and rigid bodies in plane motion; applications. Prerequisite: 560:077, 220:05.

560:104 Material Science 1
Fundamentals of materials science to show relationship between structural and properties of materials at atomic, micro and macro levels. Prerequisite: 4.3.

560:177 Strength of Solids

560:175 Methods of Analysis

560:210 Mechanics of Deformable Bodies

560:215 Mechanicals of Deformable Bodies

560:218 Mechanics of Deformable Bodies

560:219 Mechanics of Deformable Bodies

560:220 Mechanics of Deformable Bodies

560:225 Mechanics of Deformable Bodies

560:230 Strategic Program Courses

560:600 Experimental Engineering
Principles of physical measurement, standards, calibration, estimation of error;
structure and dynamic performance of measuring systems; laboratory experiments; planning experiments. Same as 359.060. Prerequisites: junior standing.
586.025 Mechanical Engineering Design Services 3 a.h.
586.029 Computer Aided Design 3 a.h.
586.032 Machine Design 3 a.h.
586.033 Manufacturing Processes 3 a.h.
586.035 Kinematics and Dynamics 3 a.h.
586.036 Mechanical Engineering Graphics 3 a.h.
586.037 Manufacturing Processes Design 3 a.h.
586.038 Manufacturing Processes Design 3 a.h.
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Operations Research Courses

586:140 Quantitative Methods
3 a.h.
Topics from discrete mathematics leading to useful methods in operations research: elements of linear algebra and matrix theory, finite differences and difference equations, discrete transforms and elementary numerical methods. Prerequisite: 220:10. Fall.

586:141 Introduction to Operations Research
3 a.h.
Topics and algorithms from operations research including linear, nonlinear, and dynamic programming, and inventory theory. Prerequisite: 220:10 or 220:20. Fall, Spring.

586:142 Production Inventory Models
3 a.h.
Study of mathematical models, operations research methodology, and computer-based systems for production planning, controlling inventory levels and forecasting product demand. Prerequisites: 586:141 and 225:30 or equivalent. Spring.

586:143 Quantitative Investment Analysis
3 a.h.
Investment analysis, cost benefit and break-even analysis, replacement and capacity expansion, capital budgeting, economics of risk and applications. Prerequisites: 586:141 and 225:30 or equivalent. Fall.

586:144 Advanced Management Information Systems
3 a.h.
Structure and design of computer-based management information systems; concepts of computer hardware, software, communications networks, and file structures; methods used in system design; case studies; management. Prerequisite: Programming experience. Fall.

586:147 Sequencing and Scheduling
3 a.h.
Sequencing and scheduling in machine shops, computer systems, construction and D. projects and other complex systems; rules for optimal and suboptimal scheduling; simulation; evaluation of system performance. Prerequisite: 586:141. Spring.

586:160 Systems Simulation I
3 a.h.
Simulation of operating characteristics of complex systems using modern digital computers. Prerequisites: 586:201 or 586:202. Topics include random number generation; empirical and computer simulation experiments and statistical analysis of simulation output. Prerequisites: 586:141 and 225:30. Fall.

586:520 Mathematical Programming I
3 a.h.
Study of mathematical models, theory and algorithms for linear and nonlinear optimization; emphasis on linear programming (including various facets of the simplex method, post optimality analysis, computer programming, transportation and network problems, and duality theory. Prerequisite: 586:141 or equivalent; knowledge of matrix algebra.

586:523 Mathematical Programming II
3 a.h.
Theoretical aspects of optimization and mathematical programming; development of large-scale problems, aspects of duality theory and other current topics in the field. Prerequisite: 586:520.

586:524 Software Systems for Management Balance
3 a.h.
Advanced concepts of computer systems as related to management problems: overview of operating system; file organization, and analysis of software systems; relationship of system requirements to the design, testing, and implementation of business systems. Prerequisites: Programming experience; 586:144 desirable. Spring.

586:540 Digital Simulation I
3 a.h.

586:541 Stochastic Service Systems II
3 a.h.
Study of non-Poisson models of several types, including research and repair systems; capacity analysis. Prerequisite: 586:540. Summer.

586:542 Integer Programming and Linear Integer Programming
3 a.h.
Theory, algorithms, and applications for integer and mixed-integer mathematical programming. Algorithms include cutting-plane, implicit enumeration, branch and bound, and related topics. Study of network, fixed charge, facility location, and assignment problems. Prerequisite: 586:540 or advanced graduate standing. Summer.

586:543 Digital Simulation II
3 a.h.
Continuation of 586:149 with advanced languages such as GASP-IV. Topics include file management, Monte Carlo methods, and advanced methods for analyzing simulation output. Prerequisite: 586:540 or advanced graduate standing. Spring.

Human Factors Courses

586:155 Human Engineering
3 a.h.
Design of man-machine systems and development of optimum work environments by applying principles of behavioral science: emphasis on anatomy and peripheral processor, motor skills, experimental methodology, some as Psychology 31:155. Spring.

586:156 Psychology in Management
3 a.h.
Application of psychological principles to human relations and supervision: discussion of motivation, leadership, communication, group pressures, other topics. Same as Psychology 31:156. Fall.

586:157 Advanced Management Psychology
3 a.h.
Discussion of selected recent literature on managerial psychology. Prerequisites: 586:130 or equivalent. Fall, every other year.

586:223 Advanced Human Factors
3 a.h.
Discussion of selected recent research in human factors engineering. Prerequisites: 586:130 or equivalent. Fall, every other year.

Transportation Courses

586:243 Transportation Engineering I
3 a.h.
Location and design of routes of transportation, competition and urban roads, roads and airports, highway systems. Prerequisites: 580:221 and 225:30. Fall.

586:244 Transportation Engineering II
3 a.h.
History of transportation, regulation and control of services, economic analysis, and related topics. Prerequisites: 586:243. Fall.

586:273 Airports System Design
3 a.h.
Design, construction, and operational planning projects for integrated transportation facilities. Topics include aircraft, air traffic control, terminals, and airport system design projects. Prerequisites: 586:174 or course work similar to 587:272. Spring.

586:175 Traffic Systems Analysis
3 a.h.
Analysis of traffic engineering design and operation of facilities; traffic methods and analysis of traffic engineering problems; traffic control and transportation systems. Prerequisites: 586:307 or course work similar to 587:272. Spring or Summer.

587:273 Urban Transportation Planning
3 a.h.
Application of city planning principles and traffic engineering techniques in the formulation of solutions to transportation problems: road characteristics, improving traffic capacity, traffic surveys, urban transportation systems. Prerequisites: Primary for graduate studies in Urban Transportation Program. Fall.

Seminar, Advanced Topics, Research

587:670 Transportation Engineering Seminar
3 a.h.
Professional seminar for graduate students and practice in industrial and management problems. Prerequisites: 586:243 or 586:244. Must be open to PAM. Fall, Spring.

587:680 Individual Investigations
3 a.h.
Independent investigations for undergraduate students. Prerequisites: consent of a supervising instructor. Fall, Spring.

587:100 Readings
3 a.h.
Readings. Use of this reading, qualified graduate students who are not enrolled may receive credit for certain undergraduate courses offered by the division. Fall, Spring.
497/498 Advanced Topics
Advanced topics in systems engineering. Offerings based on student interest.

497/98 Individual Investigations
Individual investigations by senior undergraduate or graduate students. Prerequisite: consent of a supervising instructor. Fall, Spring.

598/991 Graduate Seminar
Professional seminar for graduate students in Industrial and Management Engineering. Guest lectures, student reports and seminars. Fall, Spring.

597/395 Advanced Topics: Engineering Management and Human Factors
Advanced topics in engineering management or human factors. Offerings based on student interest.

597/396 Advanced Topics: Operations Research and Engineering Statistics
Advanced topics in operations research and engineering statistics. Offerings based on student interest.

597/397 Advanced Topics: Transportation
Advanced topics in transportation. Offerings based on student interest.

597/296 M.S. Research Research at the master's level, primarily for the M.S. thesis.

Faculty

The graduate faculty comprises University faculty and administrative personnel in the ranks of associate, assistant, and full professor. A 12-member Graduate Council, elected from and by the graduate faculty and the Graduate Student Senate, is the executive committee of that body and is advisory to the dean of the Graduate College.

The Graduate College

The University of Iowa has been a leading center of advanced study for three-quarters of a century. Presently, one-fourth of its enrollment is in the Graduate College. This unusually high ratio reflects the breadth of the University’s graduate programs and resources, the strength of a graduate faculty with a long tradition of personal and professional guidance for students and the opportunities afforded graduate students for involvement, recognition and support.

Graduate courses are offered in all colleges of the University, both professional and nonprofessional. The Graduate College provides the framework through which graduate degree programs are supervised and coordinated.

The Graduate College is responsible for the review and approval of proposals for new graduate programs and for the periodic survey and evaluation of existing programs. Through its administration of scholarship, fellowship and research funds, the Graduate College encourages research and strengthens departments. It offers extensive assistance to individual faculty members in finding the resources necessary for research projects. The Graduate College works with the departments and other colleges of the University in the formulation of policies concerning selection and in the supervision and support of graduate students.

Advanced Degree Programs

The University offers graduate programs leading to the Master of Arts, Master of Science, Master of Business Administration, Master of Arts in Teaching and Master of Comparative Law degrees; the two-year degree, Master of Fine Arts, Educational Specialist and Master of Social Work; and the Doctor of Philosophy and Doctor of Musical Arts degrees.

The University offers advanced degrees in the following areas:

- Anatomy—M.S., Ph.D.
- Anthropology—M.A., Ph.D.
- Agricultural Meteorology—Ph.D.
- Agronomy—M.A., M.S., Ph.D.
- Art History—M.A., Ph.D.
- Asian Civilization—M.A., Ph.D.
- Astronomy—M.S., Ph.D.
- Biochemistry—M.S., Ph.D.
- Biology (Biological Science)—M.B.S., Ph.D.
- Biology (Ecology Department)—M.S., Ph.D.
- Business Administration (Department)—M.A.
- Business Administration (Interdepartment)—M.B.A., M.S., Ph.D.
- Business Education—M.A., Ph.D.
- Chemical Engineering—M.S., Ph.D.
- Chemical Physics—M.S., Ph.D.
- Chemistry—M.S., Ph.D.
- Child Behavior and Development—M.A., Ph.D.
- Chinese Language and Literatures—M.A., Ph.D.
- Civil Engineering—M.S., Ph.D.
- Classics—M.A., Ph.D.
- Classics—M.S., Ph.D.
- Community Dentistry—M.S.
- Comparative Law—M.C.L., J.D.
- Comparative Literature—M.A., Ph.D.
- Computer Science—M.S., Ph.D.
- Criminal Justice and Corrections—M.A.
- Cultural Anthropology and Linguistics—B.A., M.A., Ph.D.
- Dental Hygiene—M.D.H., D.M.D.
- Dental Hygiene—M.A., Ph.D.
- Education—M.S., M.A.T., M.S.E., Ph.D.
- Electrical Engineering—M.S., Ph.D.
- English—M.A., M.F.A., Ph.D.
- Environmental Engineering—M.S., Ph.D.
- Family Practice—M.S.
- Finance—M.A., Ph.D.
- Geology—M.A., Ph.D.
- Geography—M.S., Ph.D.
- Geology—M.S., Ph.D.
- Geology—M.S., Ph.D.
- Greek—M.A., Ph.D.
- History—M.S., Ph.D.
- Home Economics—M.A., M.S.
- Hospital and Health Administration—M.A., M.S., Ph.D.
- Industrial and Management Engineering—M.S., Ph.D.
- Journalism—M.A.
- Latin—M.S.
- Marine Science—M.A.
- Linguistics—M.A.
- Mass Communications—Ph.D.
- Mathematical Sciences—M.S., Ph.D.
- Mechanical Engineering—M.S., Ph.D.
- Mechanics and Hydraulics—M.S., Ph.D.
- Molecular Biology—M.A., Ph.D.
- Motor—M.A., M.S.
- Music—M.A., M.F.A., M.S., Ph.D.
- Nutrition—M.S.
- Nutrition—M.S.
- Nursing—M.S.
- Optometry—M.S.
- Operative Dentistry and Endodontics—M.S.
- Orthodontics—M.S.
- Otolaryngology—M.S.
- Ophthalmology—M.S.
- Pathology—M.S.
- Pediatrics—M.S.
Graduate College

Graduate Fellowships
$3,200 for the academic year.

Other Sources
University and National Defense Education Act loans are available through the Office of Student Financial Aid. Many departments offer additional support through teaching, part-time employment in research or part-time teaching appointments. The Office of the Vice-President for Educational Development and Research maintains a library of information on public and private agencies which provide funds for research and graduate study. A considerable amount of material has been collected concerning awards for overseas study.

Graduate Student Senate
The Graduate Student Senate is the University graduate student body's representative organization. Representatives are elected annually from each department of the University having a graduate degree program. The Senate's primary purpose is to serve the interests of the graduate student body in matters affecting their welfare. The Senate advises the Graduate Dean on matters pertaining to the Graduate College.

Rules and Regulations of the Graduate College
The Academic Program

Section 1: Admission to the Graduate College

A. Application Procedure
All student seeking to register for the first time in the Graduate College of The University of Iowa must secure a formal application permit from the Director of Admissions. Applicant may obtain the proper forms from the Director of Admissions. The application must be submitted within the year prior to the expected date of enrollment.

In addition to these forms, the official transcripts from each undergraduate and graduate institution attended must be submitted to the Director of Admissions. The admissions deadline is generally the third week in January for first-semester enrollment, December 1 for second-semester enrollment or May 1 for summer-session enrollment.

B. Graduate Record Examination
All applicants prior to consideration for admission should take the Graduate Record Examination (GRE) or, if applicable to graduate programs in business administration, the Graduate Management Admission Test (GMAT). Applicants for whom admission data are complete, with the exception of scores on the GRE or the GMAT, may, dependent on departmental policy, be admitted if they meet all other requirements. The GRE, or the GMAT, must be taken within one semester after registration. The test is given several times a year at test centers established under the direction of Educational Testing Service, Princeton, New Jersey. The judgment of acceptable levels of performance on this test will be taken into account in the decision to admission of a student is left to the departments. Some departments in
fields where GRE Advanced Tests are available require these in addition to the Aptitude Test. Enquiries about the Aptitude Test may be directed to University Evaluation and Examination Service, and inquiries about the requirement of the Advanced Test should be addressed to the executive of the department in which the applicant is interested.

C. English for Foreign Students
Prior to consideration for admission, foreign student applicants whose native language is other than English must take and pass TOEFL (Test of English as a Foreign Language), unless they have received a degree from an accredited college or university in the United States, the United Kingdom, Canada (except Quebec), Australia or New Zealand. The examination is given at various times of the year and in many centers throughout the world. Inquiries should be addressed to the Director, TOEFL, Educational Testing Service, Princeton, New Jersey 08540.

Foreign students transferring from unfinished degree programs of other universities in the United States who have not taken this examination, or who have received a grade lower than the minimum established by the Graduate Dean, must take the TOEFL examination and receive a passing grade prior to consideration for admission.

The Graduate College will advise the departments of those students barred from passing the TOEFL test. Individual departments may require such students to take and pass a course at The University of Iowa in English usage designated especially for foreign students.

D. Early Admission
A student who is within four semester hours of having satisfied all the requirements for the bachelor's degree at The University of Iowa or any other accredited college may be given conditional admission.

E. Candidacy
Admissions to the Graduate College is not the equivalent of acceptance as a candidate for an advanced degree, which must be earned through work successfully completed at The University of Iowa. (See "Section X. Master's Degrees," and "Section XII, Doctor's Degrees.")

F. Declaration of Major and Degree
Every applicant for admission must indicate on the application form the department or degree program or certificate program of his or her major interest and the degree, certificate or professional objective he or she intends to pursue. The only exceptions to this regulation are the limited number of applicants registered as "special students." (See definition of "special status" in next paragraph.) Changes in the major or degree status may be made in the course of a student's graduate study with the approval of the department to which the transfer is proposed. To initiate such action the student must file a change of major or degree status in the Office of Admissions.

G. Status upon Admission
All students upon admission fall into one of the following categories:

1. Regular—Students who have met the minimum requirements for admission and who have been accepted by a department, or interdepartmental degree program, for work leading to a graduate degree or certificate or professional improvement.
2. Conditional—Students who are interested in working toward a graduate degree or certificate but who are required by a department to demonstrate their ability to do satisfactory work before being admitted to regular status. To be admitted on a conditional basis, the student must be recommended by a department, which will assume responsibility for advising him or her. (See minimum grade point requirements, "Section I.H.") The student on conditional status must achieve regular status within two sessions of registration in the Graduate College by attaining a grade-point average of at least 2.50 and acceptance by the major department, or be dismissed.
3. Special—Students in receipt of a valid bachelor's degree who wish to register for no more than two courses at a time and who are not planning to become candidates for a graduate degree or certificate. These students, relatively few in number, must obtain special permission to register from the Director of Admissions. Special graduate students are not eligible for a graduate degree or for a certificate in a certificate program.
4. Summer Session—Students with a valid bachelor's degree and at least a 2.3 grade-point average may register for one summer session without being accepted by a department or college. (See "Section H." below.) The deadline for application for admission to the summer session will be determined by the director of the summer session and the Director of Admissions. Before admission to any subsequent session, including another summer session, the student must file an application and be admitted to regular or conditional status.

H. Minimum Requirements for Admission
Graduates of any college or university accredited by regional accrediting associations may be admitted to the Graduate College, if their academic records meet the required standards. At the master's level, a minimum grade-point average of 2.3 is required for admission to conditional status. A minimum of 2.5 is required for admission to regular status. The grade-point average is computed only on graduate work if the student has completed at least 12 graduate hours. If the student has not completed 12 graduate hours, the grade-point average is computed upon the "undergraduate and graduate work completed. In cases in which a student applying for admission has a grade-point average below the minimum required, but has a Graduate Record Examination score above a point to be designated by the Graduate Dean, his or her papers shall be forwarded to the department concerned for examination and decision.

Students applying for admission to a doctoral program must meet a minimum GPA of 2.7 based on completed graduate work, or the entire record of collegiate work if the student has less than 12 semester hours of graduate credit.

Departments, or committees in charge of interdepartmental degree programs, may, and often do, set higher minimum admission requirements than those set forth above for the University as a whole. Information concerning department or program requirements may be obtained directly from the executive of the department concerned.

For detailed information about the requirements for admission, see "Appendix" of the Catalog.
I. Admission of Faculty Members to Graduate Study

Persons who hold faculty rank of assistant professor (including clinical assistant professor) or above at The University of Iowa may be admitted as special students. (See "Section G" above.) A person holding faculty rank as specified above may petition the Graduate Dean for permission to enter a departmental program for work leading to an advanced degree, certificate or professional improvement except in the departments of his or her appointment or related departments. Such petitions must have prior approval of the department of appointment, dean of the college of appointment, the department in which study is to be pursued and the Graduate Council.

Section II. Registration

A. Standard Schedule

Students registered in the Graduate College may register for no more than 15 semester hours of credit in graduate courses. In a schedule of mixed graduate and undergraduate courses, two hours of undergraduate credit may be substituted for one hour of graduate credit, with registration limited to a total of 16 semester hours. This applies to the calculation of academic load only. Graduate credit is not given for courses numbered under 100. The maximum for the eight-week summer session is eight semester hours, or nine semester hours if two or more semester hours of undergraduate work are included. The maximum semester hour registration for work scheduled outside of the regular 8-week summer session will be arranged on a basis proportionate to that stated above with the approval of the Graduate Dean. Nine semester hours in the regular session constitutes full-time registration. (Fellows are required to carry at least nine semester hours during a semester as a condition of their appointment.) One-quarter-time and one-third-time appointees are permitted to register for the maximum 15 semester hours per semester and eight semester hours during the eight-week summer session.

B. Courses Not Included in Total Registration

In addition to a full schedule, a graduate student may register for courses printed in the Schedule of Courses as carrying no semester hour credit.

C. Changes in Announced Credit

Graduate students may not register for more credit in any course than that printed in the Schedule of Courses, but may register for less credit, or no credit, by permission of the instructor. The number of courses a graduate student may take for limited or no credit is subject to the consent of his or her advisor and the approval of the Dean of the Graduate College.

D. Reduced Schedules for Teaching and Research Assistants and Other Appointees

1. One-half-time appointees may register for not more than 12 semester hours during a semester or six semester hours during the eight-week summer session.

2. Five-eighths-time appointees may register for not more than 10 semester hours during a semester or five semester hours during the eight-week summer session.

3. Two-thirds-and three-quarter-time appointees may register for not more than nine semester hours during a semester or five semester hours during the eight-week summer session.

4. Seven-eighths-time appointees may register for not more than seven semester hours during a semester or four semester hours during the eight-week summer session.

5. Full-time appointees, including full-time instructors, may register for not more than six semester hours during a semester or three semester hours during the eight-week summer session.

E. Retroactive Registration

No form of retroactive registration is permitted.

F. Registration for Part of a Semester

A graduate student may register at any time during the semester or the 8-week summer session for not more than one semester hour of credit for each of the remaining weeks of classes (not including the examination period) in the term. The total registration may not exceed the 15 semester hours permitted for a semester and the eight semester hours permitted for the 8-week summer session. Registration after the last day of the third week of a semester or the third day of the second week of a summer session is permitted only in courses involving special projects, readings, individual study, thesis or research, with the signed approval of the instructor concerned and the Graduate Dean.

G. Extramural Registration

After admission to the Graduate College, registration for work done off campus is accepted for residence credit under the following circumstances:

1. Traveling Scholar Program of the Committee on Institutional Cooperation (see "Section III").

2. Research at approved locations under the direction of members of the faculty at The University of Iowa.

3. Field work as part of a regularly scheduled course or research program.

4. Courses taught off campus by members of the graduate faculty (see "Section X.D." and "Section XII.C." for minimum semester hours required on campus for the master's and doctor's degree).

5. Residence graduate credit from another Iowa Regents' University (see "Section V.F.").

6. As many as nine semester hours of graduate work taken at the Quail Creek Graduate Center from faculty other than faculty of the Iowa Regents' Universities, provided the work is acceptable by the student's major department for the specified degree.

Extramural registration does not count toward residence credit in the following circumstances:

1. Coursework transferred from another institution;

2. Correspondence courses.

H. Extramural Fees and Privileges

Students registered for extramural courses for graduate residence credit must apply for admission to regular status (see "Section I.G.") and pay established fees. (See "Section XII.K." for special fees applicable to post-comprehensive registrants, which should not be confused with extramural registration for resident credit.)

I. Correspondence Courses

Correspondence study credits do not count as residence credits.
Graduate correspondence study credit earned prior to a student's acceptance as a degree candidate at The University of Iowa may be counted toward an advanced degree upon the approval of the appropriate college or department. No more than one semester hour of graduate correspondence work can be accepted for credit for an advanced degree. Such credit must be acceptable for the student's Plan of Study and must be earned after the student has attained graduate status. A student enrolled for residence credit may not register for correspondence courses without the approval of the executive of his or her major department and of the Dean of the Graduate College.

J. System of Course Numbers

Courses primarily for graduate students are numbered 200 or above in each department. Courses open to and counting for both graduate and undergraduate students are numbered from 100 to 199. Courses below 100 are not accepted for graduate credit.

K. Auditing of Courses

In special cases, and upon the recommendation of the instructor and the adviser, the Dean of the Graduate College may grant permission to graduate students to audit courses for no credit. Auditing is permitted only to a student who is currently registered.

L. Dropping of Courses

All graduate students who drop courses after the deadline established by the Dean of the Graduate College for each session and published by the Registrar shall receive the grade of F unless the course registration is canceled. This regulation may be waived only by the Graduate Dean on the recommendation of the Student Health Director or the Student Counseling Service. If a student cancels registration after the deadline date, he or she must obtain permission from the Dean of the Graduate College before he or she is permitted to re-register.

Section III. Traveling Scholar Program

A. Purpose

The program under the auspices of the Committee on Institutional Cooperation representing 11 universities in the Midwest enables a doctoral student to take advantage of special resources available on another campus but not available on his or her own campus: special course offerings, research opportunities, unique laboratories and library collections.

B. Procedure

1. A CIC Traveling Scholar must be recommended by his or her own graduate adviser, who will approach an appropriate faculty member at the possible host institution in regard to a visiting arrangement.

2. After agreement by the student's adviser and the faculty member at the host institute, graduate dean at both institutions will be fully informed by the advisor and have the power to approve or disapprove.

3. A CIC Traveling Scholar will be registered at the home university, and fees will be collected and kept by that institution.

4. Credit for the work taken will be recorded at the home university.

5. Those seeking additional information should inquire at the office of the Graduate College.

C. Conditions

CIC Traveling Scholars will normally be limited to two semesters or three quarters on another campus. Each institution retains its full right to accept or reject any student who wishes to study under its auspices.

Section IV. Academic Standing, Probation and Dismissal

A. Master's, Specialist or Certificate Students

A student on regular status shall be placed on probation if, after completing eight semester hours of graduate work, his or her cumulative grade-point average on graduate work done at The University of Iowa falls below 2.50. If, after completing eight more semester hours of graduate work at this University, his or her grade-point average remains below 2.50, he or she shall be denied permission to re-register; otherwise, the student shall be restored to good standing.

B. Doctoral Students

A doctoral student on regular status shall be placed on probation if, after completing eight hours of graduate work, the student's cumulative grade-point average on graduate work done at The University of Iowa falls below 2.70. If, after completing eight more semester hours of graduate work at this University, the student's cumulative grade-point average remains below the required level, the student shall be dropped from the program and denied permission to re-register unless he or she applies and is accepted for another degree or certificate program. If the condition of probation is not met, the student is restored to good standing.

C. Restriction on Students on Probation

A student on probation shall not be permitted to take comprehensive or final examinations in any degree program, nor may the student receive any graduate degree or certificate.

D. Departmental Regulations and Dismissal for Incompletes

In addition to the above University-wide requirements, departments may establish further requirements which will determine the individual student's standing with regard to probation and dismissal. To this end, each department or program shall compile a written list of standards and procedures for work in that area. These documents shall be on file in each departmental office and in the office of the Dean. Copies are to be available for students in the departmental office, and departments shall make all reasonable efforts to inform students. Subsequent changes in standards or procedures shall be communicated by the department to each student and the Graduate Dean. Whenever departments revise standards for a given program, the new regulations will not apply retroactively to the disadvantage of those already in the program. In addition to notifying students that they are subject to the rules of the Graduate College as set forth in the Manual of Rules and Regulations, any standards established by the department more stringent than the general Graduate College requirements shall be stated. Information shall be provided outlining required courses applicable to the various departmental programs of study, examination procedures and other formal evaluations, departmental policies with regard to awarding and renewing as-
Graduate College

Scholarships, prizes limits on programs of study, departmental regulations, departmental grade-point requirements, requirements for changing from one degree program to another within the department, especially from the master’s to the Ph.D., departmental probation and dismissal policies and procedures (see II (growing), and such other matters as are appropriate. The nature of the departmental advisory system shall be explained to the incoming students.

II. Academic Progress, Departmental Probation and Dismissal Procedures

If a student is failing to meet departmental standards, the department shall warn the student of this fact in writing. The notification shall specify in what ways the student is failing to meet the standards. The student shall be provided a reasonable amount of time to meet the standards prior to departmental dismissal. If, in the judgment of a student’s progress, conditions such as conditional admission or probation are imposed, the department shall give at the time of its imposition written explanation of this status and its time limits.

A student who will not be permitted to register for fall semester to meet standards shall be notified of this fact in writing with reasons for the action provided. Such dismissal may follow failure to meet conditions of admission, conditions of probation, pre-announced departmental grade-point requirements or other standards, or failure of a regularly scheduled examination or formal evaluation. If a student judges the dismissal decision improper, the student has a right to review such decision. Each department shall establish procedures for handling such reviews. The procedures are to be approved by the Graduate Dean, and shall afford a fair and expeditious review. A description of these procedures shall be included in the departmental regulations described above. (See Section IV.D.)

P. Graduate College Review of Departmental Dismissal

Questions involving judgment of performance will not be reviewed beyond the department level, if, however, the student feels there has been unfairness or some procedural irregularity concerning dismissal, the student may request a review by the Graduate College. This review may be conducted by the Graduate Dean alone or the Dean may appoint a Graduate College committee consisting of both student and faculty members to conduct the review and recommend to the Dean possible course of action. The review by the Graduate College is final.

Section V. Credits

A. Transfer of Graduate Credit

Graduate work at other institutions will be entered on the student’s permanent record by the Registrar and a report of this action will be sent to the student, his or her major department and the Dean of the Graduate College. Credit for these courses toward an advanced degree at Iowa State must have the approval of the major department and the Dean of the Graduate College.

B. Residence Transfer Credit

After admission to the Graduate College, residence graduate credit from another Iowa Regents’ University may be counted as residence credit in this institution, provided such work is acceptable by the student’s major department on the basis of the department’s determination of its applicability toward the degree. (See “Section X.D." and "XII.C" for minimum semester hours required on campus for the master’s and doctor’s degrees.)

C. Reduction in Credit

For courses in seminars in independent study, thesis and research an instructor may report less credit than the number of semester hours for which a student is registered.

D. Graduate Credit for Veterans

Credit may be granted for studies pursued in war and military situations under such regulations as may be formulated by the national educational agencies and under such adaptation of stealing rules as the Graduate Council may authorize from time to time to meet group or individual situations. The value of such credit in satisfying requirements for a degree will be determined by the major department with the approval of the Dean.

E. Cancellation of Registrations and Proportional Credit for Students Entering Military Service

1. Students who leave within the first six weeks of the semester receive no credit.

2. Students who leave within the period of seven to nine weeks receive one-half credit.

3. Students who leave within the period of 10 to 12 weeks receive two-thirds credit.

4. Grade reports for the one-half and two-thirds credit periods: (a) instructor reports grades only as Satisfactory or Unsatisfactory; (b) credit is to be assigned on the basis of final examination minus letter grade; (c) course is to be counted toward specific degree requirements only after the student returns and then only on the department’s approval.

5. Students who complete the seventh week receive full credit.

6. Grade reports for the full-credit period: (a) grades to be reported only at the end of the semester; (b) credit is to be reported in specific courses.

7. In each instance the instructor reports the student’s credit, grade and date of cancellation. No credit is granted unless the student’s work is satisfactory at the time of leaving.

8. The amount of credit in thesis and research registration is to be reported to the Registrar by individual instructors on the above basis except that less or no credit may be assigned.

Section VI. Marking System

A. Marking Carrying Advanced Degree Credit

These are A, B, C and S-satisfactory.

B. Marking Carrying No Credit for Advanced Degrees

These are D—poor, F—failed, I—incomplete, W—withdraw-without
time discrimination, R—registered and U—unsatisfactory.

C. Audit

R is assigned when a student registered for no credit stands as an auditor throughout the course; if the student drops the course before the close of the term, W is assigned.
D. Incomplete
The grade of I is to be used only when a student's work during a session cannot be completed because of illness, accident or other circumstances beyond the student's control. In registrations for thesis, research or independent study, the S/U grades may be applied. (See next paragraph.)* Students who receive the mark of I must remove that mark within the first session of registration after the closing date of the session for which it is given, or else the grade becomes F, except that student(s) from the spring semester are exempt from completing the course during the succeeding summer session.
Specific deadlines for the submission of student work to the faculty and for the faculty's report on I grades to the Registrar will be set by the Graduate Dean for each session and printed in the academic calendar. Courses may not be repeated to remove incompletes; removal of an I is accomplished only through the completion of the specific work for which the mark is given.
E. Thesis, Research, Readings, Independent Study and Special Projects
Grades of S and U may be used for registrations in thesis, research, readings, independent study and special projects. S-satisfactory means that the student receives credit for the work; U-inunsatisfactory means that he or she receives no credit. Neither S nor U is used in computing grade-point averages. At a later date, the instructor may change the S to a letter grade. In addition, departments may ask the Graduate Dean for permission to use grades of S and U at prescribed above for courses which, because of their special or experimental nature, are judged to be more appropriate for such grading. In general, these requests may be granted for no more than one semester and must be reviewed by the Graduate Council before being granted for longer periods. The type of grading system to be used in the above cases should always be mutually agreed upon by the instructor and student.
F. Grades of S and U
S and U may be used for courses taken by a graduate student outside the major department or interdepartmental degree program provided that the instructor of the course and the student's departmental advisor approve the registration. Arrangements for S/U grading in these courses are accomplished by filling a card with appropriate signatures in the Registrar's office at the time of registration, or no later than the last day of the third week of a semester or the third day of the second week of a summer session. No change can be made to an S/U grade or vice-versa will be allowed after these dates. It is not the policy of the Graduate College to abandon the traditional letter grades described in this section; however, in certain exceptional instances, departments having several areas of concentration involving widely differing types of effort may request the Graduate Council for permission to allow students majoring in one area to register in courses in another area within the same department or program on an S/U basis. In these instances, S/U cards will be used as described in the preceding paragraph. G. Computed Grade-Point Average
This is based only upon graduate work graded A, B, C, D and F.
(A=4, B=3, C=2, D=1, F=0)

Section VII. Graduate Appointments
A. Scholarships
Scholarships are competitive and are awarded on merit.
1. Eligibility for graduate scholarships and fellowships will include: (a) a grade-point average of at least 3.0; (b) a GRE score or a GMAT score above a level to be designated by the Graduate Dean; and (c) a satisfactory rate of progress in completing the program for the degree.
2. Preference will be given to candidates for the doctoral degree.
3. Recommendations for graduate scholarships may be made to the Graduate College by the appropriate department executive, director or dean. A graduate scholarship may be awarded whether or not a student holds an assistantship. The amount of scholarship for the academic year may vary, but in no case exceed the assistantship fee for semester. Scholarships will be credited to the student's University account.
B. Graduate College Fellowships
Fellowships are awarded by the Graduate College upon recommendation by departments to students with outstanding academic records. Fellowships must be registered as full-time students. The primary purpose of the awards is to permit the advanced student to complete his or her dissertation or creative project and complete the degree. Other terms of the award will be established by the Graduate Dean in consultation with the Graduate Council.
C. Faculty Research Assistantships
Faculty research assistantships are awarded to qualified graduate students and serve two purposes: (a) to provide research service to professional members of the academic staff and (b) to provide apprenticeship experience for graduate students who are in training in research. Not more than 20 hours of service per week are required of appointment. Other part-time service is scaled in proportion, and a limited academic schedule is permitted (see "Section II U."). Appointments are ordinarily made for the nine-month academic year, but appointments may be made for other periods of time by special arrangement. Stipends vary with the qualifications of the appointee and the amount of service rendered. Faculty research assistantships appointed by the Graduate College pay their own fees. Graduate appointments beginning in September are usually made by the Graduate Dean upon recommendation of the various departments in March of each year, although applica-
tions may be considered at any time. Appointments should be made on the form provided by the Graduate Council, and should be accompanied by recommendations and letter summarizing the student's qualifications.
D. Graduate Assistantships
These assistantships serve two purposes: (a) assistance in the instructional program of the University and (b) the preparation of future college teachers. In order to achieve both aims, scholarship-and-superior graduate students and teachers are selected for graduate assistantships. All appointments are made by the dean of the appropriate college on recommendation of the department.
E. Eligibility for Scholarships, Fellowships and Research Assistantships

Scholar, fellow and faculty research assistantships in the Graduate College budget must be registered as regular students in good standing in order to hold such appointments. Appointments will be terminated when registration and/or student status is terminated. In no instance may a student be prioritized or tendered an appointment until after approval for admission to the Graduate College by the Director of Admission.

F. Dismissal of Assistantships

A uniform policy concerning procedures to be followed in the dismissal of assistantships has been approved by the Board of Regents. Copies of this policy are available in the Office of the Graduate Dean.

G. Research Assistantships and Postdoctoral Fellowships

These provide for independent research. Appointment is made by the Graduate Dean upon recommendation of the department.

H. Credit

No academic credit is allowed for the teaching or research service for which the student receives payment as a graduate or a faculty research assistant.

I. Loans

Graduate students requiring financial assistance may apply for loans at the Office of Student Financial Aid. See "Scholarships and Loans" section of the Catalog.

J. Other Forms of Support

Many departments offer financial assistance in the form of traineeships, part-time employment or other teaching. Inquiries should be addressed directly to the major department.

Section VIII. Advanced Programs Offered in the Graduate College

The subject areas in which the Graduate College offers degree programs are listed under "Advanced Degree Programs" in the front part of the Graduate College section of the Catalog.

Section IX. General Requirements for Advanced Degrees

A. Application for Degree

The student must file an application for an anticipated degree with the Registrar not later than 10 weeks after the start of the semester or one week after the start of the summer session in which the degree will be conferred. The student must have the application signed by his or her advisor. Failure to file the application by that date will result in postponement of graduation to a subsequent graduation.

B. Enrollment in Final Semester

The student must be enrolled during the semester in which the degree is to be conferred, except as noted in the following paragraph. Students who must register for the session in which the degree is to be conferred but are away from the University campus during the final session may meet this requirement by registering for independent study, research or thesis according to the practice in the various departments. Doctoral candidates who have completed all work except the final examination may register for the post-comprehensive registration described in "Section XII. C." if such registration is appropriate. Master's candidates who have completed all work except the final examination may register for a fee equivalent to the "postcomprehensive registration." If such registration is appropriate, registration is a correspondence course will not satisfy this requirement.

Students completing all requirements (including the final examination and thesis deposit) for a graduate degree while enrolled in the Independent Study Session may receive their degree in the following session without additional registration.

Section X. Master's Degrees

A. Kinds of Degrees

Master's programs requiring a minimum of 30 semester hours lead to the Master of Arts degree, Master of Science degree, Master of Business Administration degree, Master of Arts in Teaching degree and such other master's degrees as are approved by the Graduate faculty.

B. Plan of Study

The applicant for a master's degree must file a plan of study approved by the adviser and the departmental executive with the Graduate College within the session in which the degree is to be granted and by a date to be established by the Graduate Dean. The plan shall meet the requirements for the degree approved by the Graduate faculty. (See also "Section IV.D. Departmental Regulations and Dissemination of Information").

C. Major and Related Fields

The plan of study should provide for reasonable concentration in the major field of instruction, subject to the approval of the major department, may include related subjects from other departments.

D. Residence Requirement

Of the minimum of 30 semester hours required for the degree, at least 24 semester hours must be completed under the auspices of The University of Iowa. After admission to the Graduate College, various forms of extramural registration may qualify toward fulfillment of this 24-semester residence requirement (see "Section II. G. Extramural Registration"). In addition to regular on-campus registration. However, at least 8 semester hours on campus are required, except for those departmental programs which ensure sufficient interaction between the students and the graduate faculty and have received approval from the Graduate Council and the Dean of the Graduate College for reduction of this on-campus requirement.

E. Reduction of Old Credits

Credits for a master's degree dating back more than 10 years from the semester in which the degree is to be conferred are not counted toward fulfillment of degree requirements. This rule may be waived by the Dean in cases affected by military service.
Graduate College

F. Limit on Law, Medical or Dental Courses

Work taken by a student in the colleges of Dentistry, Law or Medicine while enrolled as a candidate for a professional degree may be counted on a graduate program of study leading to a master's degree, provided such courses were taken after the student had satisfied the requirements for the bachelor's degree, or work equivalent to the bachelor's degree at The University of Iowa. The work accepted from the professional college must be directly related to the student's major field of study in the Graduate College and be approved as a part of the plan of study by the student's advisor and the major department. Work completed while registered for a professional degree in Law, Medicine or Dentistry will be counted as part of the residence requirement for the doctoral degrees in the Graduate College only when the student is registered in an appropriate joint degree program.

G. Two Master's Degrees

The granting by this University of two master's degrees simultaneously or in succession requires the satisfaction of all requirements for each degree separately, including both theses, where the thesis is required, and two examinations, with a minimum combined total of 60 semester hours of graduate credit.

H. Master's Degree with Thesis

Not more than eight semester hours of credit for thesis preparation shall be counted in satisfying the 30-hour minimum requirement. The thesis may be a scholarly study or an artistic production. One copy of the thesis, in typed manuscript or print, must be presented to the Graduate College for a check of formal characteristics not later than four weeks before the graduation in which the degree is to be conferred. (See Graduate College publication: Requirements for Graduate Theses.) After approval by the Graduate College, the candidate and his committee of the thesis must be deposited with the Graduate College not later than 10 days before graduation.

The thesis committee shall consist of at least three members of the Graduate faculty and may or may not be identical with the final examination committee. (See "G. Examining Committee.")

I. Master's Degree Without Thesis

A master's degree without thesis, consisting of at least 30 semester hours of graduate study, may be awarded upon the completion of a curriculum prescribed by a department and approved by the Graduate Council.

J. Final Examination

The requirements for all master's degrees include a final examination, which, at the discretion of the major department, may be written or oral. Such an examination will not duplicate course examinations. It will be evaluated by the examining committee as satisfactory or unsatisfactory with two unsatisfactory votes making the committee report unsatisfactory. The report of the final examination is due in the Graduate College not later than 48 hours after the date of the examination. If the examining committee so recommends, a candidate who fails the examination may present himself or herself for reexamination, but not sooner than the next regularly scheduled examination period in the following term (semester or summer session). The examination may be repeated only once.

Upon recommendation of a department, the comprehensive examination for the Ph.D. degree may be substituted for the master's examination.

K. Examining Committee

The examining committee for the master's degree consists of at least three members of the Graduate faculty, appointed by the Graduate Dean upon recommendation of the major department or program, at least two of whom are from the major department. If the examination covers work in another department, one member of the committee must be from that department. Upon recommendation of the major department, the Dean may appoint additional qualified persons (not necessarily members of the Graduate faculty) to serve as voting members of the examining committee, and at his or her discretion the Graduate Dean may add a member to the committee.

Section XI. Two-Year Degrees

A. Master of Fine Arts Degree

This degree is awarded for creative work in the visual arts, dramatic art, music and literature. It is designed for students preparing themselves professionally in such fields as painting, design, mural decoration, sculpture, playwriting, acting, producing, stage design, musical performance composition, instrumentation, poetry, fiction and translations. Central to the program, the thesis may consist of a novel, a painting, a play, a musical composition or any other approved artistic accomplishment.

The program for the Master of Fine Arts requires at least two years of residence credit in a graduate college. This requires a minimum of 48 semester hours of graduate credit, at least 24 of which must qualify for residence credit at this University. A Master of Arts degree may be earned while the student is working toward the Master of Fine Arts degree, but the student must meet all requirements for each degree separately, with a minimum combined total of 60 semester hours of graduate credit.

For other requirements see "Section X.B. Plan of Study"; "C. Major and Related Field"; "D. Reduction of Old Credits"; "H. Master's Degree with Thesis"; "I. Final Examination"; and "K. Examining Committee."

B. Specialist in Education Degree

This degree is granted upon completion of a prescribed two-year postbaccalaureate program designed for students preparing themselves professionally in such fields as teaching, administration and supervision, and special services. Of the minimum of 40 semester hours required for the degree, at least 24 semester hours must be completed in residence at this University of which 15 semester hours must be earned while the student is on campus within one 12-month period or during two summer sessions.

Twenty-eight of the 60 semester hours are prescribed in the area of specialization. The others are in cognate fields, supervised experience and electives. Four semester hours of research culminating in a written report.

Courses successfully completed 10 or more years prior to the final examination will be evaluated by the major department in order to determine the amount of credit that shall be allowed for such work. Evaluation of such old credits will be reported to the Graduate College by the departmental executive at the time of
C. Master of Social Work Degree

The M.S.W. degree is conferred by the University upon those students who give evidence of knowledge and competence in the professional practice of social work by meeting the following requirements:

1. A minimum of 24 semester hours in residence at The University of Iowa;
2. A minimum of 52 semester credit hours in graduate social work, including a research requirement, and
3. A final comprehensive examination, written or oral or both, covering all work for the degree.

The requirements of 52 semester credit hours may be integrated to mean that a student who can satisfy the faculty of the School that he has accomplished, in the junior or senior undergraduate years, the clear equivalent of part or parts of the graduate curriculum in social work may be permitted, upon recommendation of the faculty of the School, to qualify for the M.S.W. degree in less than 52 credit hours. In no case may a student qualify for the degree on less than 40 credit hours in graduate social work study.

The curriculum is organized into four general areas: social work practice, human growth and behavior, the social services and research. During the two-year graduate program, classroom is combined with field practice in social agencies or social work departments. Since classroom and field practice are arranged sequentially, students can enter the School of Social Work only in August.

For other requirements, see "Section II.B. Plan of Study": "E. Reduction of Old Credits"; "F. Limit on Law, Medical or Dental Courses"; and "T. Examining Committee."
H. Joint Program for Master's and Doctoral Degrees

Those students who expect to continue their training through the doctorate degree may take a joint program for the master's and doctor's degrees. The master's examination may be combined with the comprehensive examination for the doctorate for these candidates. The examining committee will file separate reports of its actions on the final examination for the master's degree and for the comprehensive examination. Upon recommendation of the department and approval of the Graduate Dean, students who are well qualified by previous training may submit a plan of study that leads directly to the doctoral degree without earning the master's degree as an intervening part.

I. Requirement in Foreign Languages

There is no general Graduate College requirement in foreign languages. Those departments which require competence in one or more foreign languages establish standards as to the extent and level of competence, as well as methods of testing. Specific requirements will be found in the departmental statements of standards and procedures (See "Section IV, D.2"). Departmental executive officers are responsible for reporting completion of requirements to the Registrar for entering on the student's record.

Specifications of departmental requirements in foreign languages are filed in the Graduate College office and may be changed upon the initiative of the department.

J. Comprehensive Examination

The candidate must pass a comprehensive examination, consisting of written or oral parts or both at the discretion of the major department. Admission to the comprehensive examination is granted upon the recommendation of the major department, the filling of the plan of study and the approval of the dean of the Graduate College. A student must be registered in the University at the time of the comprehensive examination, which must be passed not later than the session prior to the session of graduation. This examination, administered only on campus, is intended to be an inclusive evaluation of the candidate's mastery of the major and related fields of study, including the tools of research in which competence is required.

The comprehensive examination is not a deferred qualifying examination. It is intended to evaluate the candidate's mastery of his subject or at near the end of his or her formal preparation and prior to the completion of the dissertation. The comprehensive examination and the final examination, which is concerned chiefly with defense of the thesis and related subjects, are the two principal examinations for the doctoral degree.

The comprehensive examination will be evaluated by a meeting of the committee and reported as satisfactory, satisfactory with reservations or unsatisfactory to the Graduate College office within 14 days after the completion of the examination. Two "unsatisfactory" votes will make the committee report unsatisfactory. The name of the supervising professor for the candidate's dissertation, the name of the supervising committee and the specific stipulations of the committee may be reported in the record form. If the stipulations involve further examination in a particular area of study, the statement should be specific in defining the area, in requiring additional courses or other procedures, and in specifying the time and method of satisfying the stipulation. The candidate will not be admitted to the final oral examination until such stipulations have been satisfied. The executive of the major department should promptly send a written report to the Graduate College giving date of removal of reservations.

In the event of a report of unsatisfactory in a comprehensive examination, the committee may grant the candidate permission to present himself or herself for reexamination not sooner than four months after the first examination. The examination may be repeated only once, at the option of the department.

K. Postcomprehensive Registration

The student is required to register each semester after passing the comprehensive examination until the degree is awarded. If a student fails to register, he or she may not be readmitted to candidacy until he or she has submitted an application which has been approved by his or her advisor, the departmental executive and the Graduate Dean.

All registrations should accurately reflect the amount and type of work undertaken, the use of University facilities and the amount of consultation with the faculty. The student should register for the course, research and thesis necessary to complete the plan of study.

When the registrations required for the plan of study have been completed, the student may meet the continuing registration requirement by paying a special minimum fee (Ph.D. postcomprehensive registration) for any semester in which the department (i.e., department chairman or director of graduate studies) and the student's advisor determine that the student is neither making significant use of the University facilities (except library privileges) nor partaking of consultation with the faculty. It is understood that no registration for a summer session is required when the student makes no use of University resources unless the student is taking a degree at the end of that session.

L. Dissertation for the Doctoral Degree

Two copies of the dissertation must be presented at the Office of the Graduate College not later than four weeks before the graduation date at which the degree is to be conferred and deposited there in final form ten days before graduation.

Regulations concerning preparation of the dissertation copy shall be promulgated by the Dean of the Graduate College. Dissertations will be microfilmed and thus made available on a permanent basis. An abstract of the dissertation, not to exceed 600 words of text, is to be deposited with the dissertation. The abstract must be approved and signed by the dissertation adviser. The abstract is published in the journal of Dissertation Abstracts. One copy of the dissertation typescript is bound and indexed at the University Library.

If the dissertation is in some nonprint form (e.g., painting, statue, performance in music) the librarian in charge of theses will help the student and faculty adviser work our an appropriate method of preparing the accompanying manuscript, if such help is needed. Once the manuscript is accepted, it is treated the same as any other.

Written dissertations shall be made available to all members of the examining committee not later than two weeks before the date of the examination.

M. Dissertation Fee

A nonrefundable dissertation fee is charged each candidate to
cover the cost of the above processing of the dissertation and abstract.

N. Final Examination

The work for the degree culminates in a final oral examination administered on campus. This examination should include: 1) a critical inquiry into the purposes, methods and results of the investigation—not a mere recapitulation of the procedures followed; 2) intensive questioning on areas of knowledge constituting the immediate content of the investigation.

The final examination may not be held until next sessions following successful completion of examination and until the first check of the dissertation by the Graduate College; however, a student must take the final examination no later than five years after passing the comprehensive examination. Failure to meet this deadline will result in a recommendation of the student to determine his or her qualifications for taking the final examination. The procedures to be followed are the same as those for the comprehensive examination. (See "XIII. Comprehensive Examination."

Final examinations for the doctorate are open to the public. Members of the faculty of the Graduate College are especially invited to attend and, subject to the approval of the chairman, to participate in the examination.

The report of this final examination is due in the Graduate office not later than 48 hours after the date of the examination. The final examination will be evaluated as satisfactory or unsatisfactory. Two unsatisfactory votes will make the committee report unsatisfactory. In case of a report of unsatisfactory in the final examination, the candidate may not present himself or herself for reexamination until the next semester. The examination may be repeated only once, at the option of the major department.

O. Examining Committees

The comprehensive and final examinations are conducted by committees of no fewer than five members of the Graduate faculty appointed by the Graduate Dean upon recommendation of the major department, except that departments may ask the Dean for permission to replace one of the five members of the Graduate faculty by a recognized scholar of professional rank from another academic institution. A member of the Graduate faculty from outside the major department is required in those cases where a related field outside the major department is included in the comprehensive examination. For the final examination one member of the committee must be a member of the Graduate faculty from outside the major department.

Upon recommendation of the major department, the Graduate Dean may appoint additional qualified persons (not necessarily members of the Graduate faculty) to serve as voting members of the examining committees, and at his or her discretion the Graduate Dean may add a voting member to the committee.

Exceptions

Petitions to waive these regulations may be made for appropriate and justifiable reasons on behalf of any graduate student through the departmental executive to the Dean and the Graduate Council.
College of Law

Dean: N. William Hess
Deans emeriti: Henry Labatt

Associate deans: James E. McElnay
Assistant deans: Howard A. Porter, Thomas C. Stew"
Graduation Honors
The J.D. degree may be granted with special honors as follows:
With Highest Distinction—cumulative weighted average of 85 or more;
With High Distinction—cumulative weighted average of 80-84;
With Distinction—cumulative weighted average of 75-79.

Related Activities
The Iowa Law Review
Published five times a year and circulated to more than 5,000
subscribers, the Review is edited and managed by College of Law
students, who also write much of its material. Its editorial staff is
selected from students showing exceptional ability in legal writ-
ing.

The Iowa Advocate
Written, edited, and published by law students, The Iowa Advocate
provides a vehicle for College news, editorials, expressions of
student opinion, and profiles of College faculty members and
guests.

Community Legal Assistance
The College has arranged with several eastern Iowa agencies for
clinical programs in which students have opportunities to relate
their legal knowledge to actual problems by interviewing clients,
writing pleadings and other documents, conducting legal and
other research, and, in some instances, appearing in court. Stu-
dents may earn academic credit for some of these activities.
Cooperating agencies include the Hawkeye Legal Services Society
of Iowa City and the Cedar Rapids Legal Aid Society; students are
also involved in habeas corpus and civil projects at the Men's
Reformatory in Anamosa, a habeas corpus project at Fort Madison
State Penitentiary, an Iowa Civil Liberties Union referral project,
programs in several county prosecutors' offices and in the office of
the United States Attorney, a program with the Iowa state police,
and a law office which the College of Law has established in a
disadvantaged area of Davenport, Iowa.

Center for World Order Studies
The Center for World Order Studies (a project of The Stanley
Foundation of Muscatine, Iowa) was established in June 1972 at
The University of Iowa as a Midwest center for education and
research in the causes of and potential cures for existing and future
world order problems, particularly those related to the use of
military power across national boundaries. In cooperation with
public and private schools, colleges and universities, and civic and
business organizations throughout the country and especially in the
Iowa-Illinois area, the major function of the Center is to promote
increased understanding of these world order problems through
curriculum innovation and revision, teacher training, conferences
and workshops, simulation exercises, coffee seminars, publica-
tions, mass media activities, essay contests and debates, and other
learning techniques.

Student Organizations
Law student organizations at Iowa include the Order of the Coif, a
national honorary whose membership is drawn from the top ten
percent of the senior class; the Iowa Society of International Law;
Phi Delta Phi and Phi Alpha Delta, national law fraternities; and
the Black American Law Students Association. All students are
members of the Iowa Student Bar Association, whose functions
include placing students as voting members on faculty commit-
tees.

Facilities
The Law Building contains a library and air-conditioned class-
rooms. With its collection of approximately 190,000 bound
volumes, the law library is an outstanding research facility. A
broad open-access policy makes it readily available to students.

Fees and Expenses
In addition to regular tuition and fees, books and supplies average
about $180 per year. Housing costs and personal expenses will
vary with individual circumstances.

Financial Aid
The College requires all students to enroll for a full schedule and
discourages their taking outside employment. It has developed a
comprehensive financial aid program which enables most students
to meet expenses without outside employment. In addition to the
awards listed in the "Scholarships and Loans" section of the
Catalog, the College offers research assistantships with substantial
stipends. Assistantships are awarded to high-ranking upperclass
students who have demonstrated ability for research and scholar-
ship.

Placement
A wide variety of placement opportunities is available upon
graduation from the College of Law. These include opportunities
to work in government, as clerks to judges, in corporations and
in private practice. In recent years approximately half of the gra-
duating class have assumed positions in Iowa. Each year nu-
umerous law firms, corporations and government agencies visit
the University to recruit students from the College of Law.

Admission
Prelaw Studies
No prescribed program of undergraduate study is required for
admission to the College of Law at Iowa. The student should
pursue a program adapted to his or her own intellectual interests.
However, the objectives of the program should include increased
capacity for verbal comprehension and expression, increased un-
derstanding of human institutions and values, and increased facil-
ity of thought.

Admission Requirements
Students may enter the College of Law in the fall semester or
summer term. Except for good cause shown, a prospective student
must apply for admission by March 1 preceding the fall semester or
summer session he or she wishes to enter.

The College must have received, by the deadline date, the
applicant's Law School Data Assembly Service report and Law
School Admission Test results. The applicant is responsible for
having all of his or her college transcripts sent to the Law School
Data Assembly Service, located in Princeton, New Jersey. The
Law School Admission Test is administered by the Educational
Testing Service, also located in Princeton.

To be considered for admission to the College of Law, the
applicant must have attained at least a 3.0 cumulative grade-point
average.
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Problems in International Law and Policy
Current problems of public international law and policy, such as control of the resources of the sea and control of international traffic; students are encouraged to begin preparing reading before commencement of the school year, and are required to complete a one-hour tutorial paper.

Land Use Planning Seminar
Problems arising in controlling use of land through zoning, public and private land arrangements; urban renewal, eminent domain, development of services and subdivisions and development ordinances; mechanism of control through various governmental agencies, city, regional, state and federal; coordination of control efforts.

Legislative History
Examines major episodes which have been of importance in shaping modern law; development of law by jury; effect of common law, royal grants and the writ system; beginnings of Parliament; contract law and equity; and 18th-century context for superseding common law courts. Parliament, the King, and the other organs of sovereignty, and the effect of sovereignty in shaping our common law; how many of our concepts of civil liberties arose. Attention directed to the process of substantive law applied at particular times as it is in processes of legal development. Law of contract, torts, property, wills and trusts, employers, and limitations encountered in attempts to resolve critical issues.

Partnership Planning
Examines the role of the lawyer in the formation and operation of a limited liability company. The student will be required to write a comprehensive paper on the subject.

Public Law
Selected problems in constitutional law and administrative law. Student interest will largely determine specific topics selected. Areas from which specific topics may be chosen are: equal protection of the laws including sex and race discrimination; due process and the rights of students, employees of government aid, governmental employees, and the mentally ill; separation of powers issues on the state and national level; laws to administrative agencies; laws to administrative agencies; law administrative procedure act; and administrative law reform in Iowa; right to a hearing before administrative agencies; public participation in formulation of administrative policy; control over the informal administrative process. Prerequisite or co-requisite: 91:332 Constitutional Law II.

Selected International Law Problems
Intensive study of one or more current problems of international law and policy, conducted on an individual basis and group study basis, with emphasis on student-selected research and writing.

Mathematical Economics Seminar
Survey of specialized body of law which has grown up around Indian peoples; included are considerations of development of sovereignty arrangements over Indian peoples, tribal, territorial and legal provisions on tribal reservations; special problems of property taxes and land use affecting Indian lands, Indian hunting and fishing rights, the history of federal Indian policy and its impact on modern Indian problems, tribal self-government, and federal Indian benefits and bureaucracies.

United States Supreme Court
In-depth study; paper required. Prerequisite: 91:116 and 91:232; 91:235 recommended.

Public Employment Relations Seminar
In 1974 Iowa enacted the Public Employment Relations Act authorizing collective bargaining for public employees at all levels of government. This seminar will study and analyze the statutory provisions and regulations and compare them with the analogous provisions of other public employment collective bargaining legislation, the other states having relatively recent federal government employees, and the National Labor Relations Act. The seminar will place considerable emphasis on problems of administration and interpretation. Students will be encouraged to choose a paper topic some aspect of the general subject of public employee collective bargaining that includes both an important legal problem as well as an actual application of that problem in practice. Prerequisite or co-requisite: 91:201 Labor Law or permission of the instructor.
The University of Iowa College of Medicine accepts 175 freshman students each year into its four-year course of study leading to the degree, Doctor of Medicine. Its faculty members provide undergraduate and graduate instruction in the biomedical sciences of anatomy, biochemistry, microbiology, pharmacology, physiology and biophysics, preventive medicine, environmental health and radiation biology, to some 1,500 non-medical students each semester—most of them from the three other University of Iowa health profession colleges: Dentistry, Nursing and Pharmacy, but many others from the life science areas of the College of Liberal Arts.

The College of Medicine is responsible for allied medical programs for the education of Physician's Assistants, Medical Technologists, Physical Therapists and Nuclear Medicine Technologists. And it carries on a year-round program of continuing medical education, in which several thousand practicing physicians update their knowledge and skills through "refreshers," short-courses, clinics and conferences each year.

Beyond its academic responsibilities as the only college in Iowa offering work toward the M.D. degree, the College of Medicine is concerned with broad public issues of distribution and organization of health care services. Medical faculty members advise and serve as members of state and regional health planning councils, health boards and various health agencies; some faculty also take part in the University's Health Services Research Center.

To provide opportunities for young physicians to experience the satisfactions of providing primary care in a community setting, undergraduates and medical students have several opportunities to gain first-hand experience in physicians' offices and community hospitals. For medical graduates, a statewide system of family practice residency programs provides concentrated opportunity to learn his specialty in one or another of 16 community hospitals in eight cities throughout the state. The College of Medicine promotes and sponsors experimental programs that demonstrate methods of organizing health services at the local level.

According to the American Hospital Association and the Association of American Medical Colleges, the College of Medicine meets the requirements of all state licensing boards. Its diploma admits the holders to all privileges granted to graduates of all medical colleges before such boards.

The M.D. Program

The Doctor of Medicine in Iowa differs in several significant ways from the traditional forms of medical education. Its two-year introductory phase consists of three semesters of basic medical science and one semester of progressive orientation in clinical medicine. The third year consists of a summer session and two semesters of clinical clerkships, in which the student participates in patient care under supervision of staff physicians. The fourth year is devoted to an intensive Study Program in which the student focuses on whatever facet of medical education best relates to his or her professional interest.

The Doctor of Medicine degree candidate's time of study must include attendance during at least four years of instruction. At least one year must be taken at The University of Iowa. A passing grade in each of the courses must be attained, and all other requirements of the College satisfied.

Combined M.D.-Graduate Programs

Students who want to pursue the M.D. degree in combination with an M.A., M.S., or Ph.D. program may do so by gaining admission both to the College of Medicine and to the Graduate College, and making detailed arrangements with the graduate department chairman and the associate dean for Medical Student Affairs of the College of Medicine.

Graduate Programs

Programs leading to graduate degrees through the Doctor of Philosophy are offered in anatomy, biochemistry, microbiology, nutrition, pharmacology (including toxicology), physiology and biophysics, preventive medicine and environmental health science and radiation biology. In addition, graduate degree programs leading to the Master of Science degree are offered in entomology, zoology, and pathology.

Faculty

All faculty members are full-time, their work in practice and research being part of not a part from-day to-day teaching. Many have earned national and international honors.

Facilities

Classes are taught in the Basic Science and Medical Laboratories buildings. A new Health Sciences Library is at the core of the medical campus.

Clinical Experience

Clinical experience is provided in the 1,818-bed University Hospitals and Clinics complex, in the adjacent Veterans Administration Hospital, and in a score of affiliated hospitals and ambulatory care centers throughout the state. College of Medicine and College of Dentistry faculty members comprise the 325-member clinical staff for University Hospitals and Clinics, whose 16 clinical services are directed by heads of the corresponding academic departments in those colleges. These faculty members also provide instruction for the 470-plus resident physicians and dentists who comprise the House Staff of University Hospitals, which
Learning Resources Unit

The Learning Resources Unit of the College of Medicine is composed of librarians and media specialists who serve the faculty, staff and administration. The Unit has four major charges: to provide educational materials, to provide audio-visual services, to initiate and cooperate in educational research endeavors and to conduct teacher education activities.

Financial Aid

Loans are available to medical students on the basis of need, and to the extent that loan funds are available. Most of these loans come from the United States Public Health Service’s Health Professions Student Loan Program. Smaller and shorter-term loans are usually available through the Office of Student Services of the College of Medicine.

The College of Medicine awards approximately 100 tuition scholarships each year. Most scholarships are awarded on the basis of need, although, in accord with the donor’s wishes, some are awarded on other criteria. These awards range in value from $500 to $1500.

Annual summer research fellowships with a stipend of $1000 are awarded on the recommendation of the sponsoring faculty members.

Admission

The College of Medicine participates in the American Medical College Application Service (AMCAS), a nonprofit centralized application processing service for applicants to U.S. medical schools. Preliminary applications are processed by AMCAS beginning July 1 of the year preceding the beginning of the class for which application is being made. Prospective students are urged to apply as early as possible. The closing date is December 1.

Final applications will be forwarded to those persons whose AMCAS applications pass a review conducted by the College of Medicine. The fee of $10 must accompany the final application from those who have not completed work in residence at The University of Iowa. This fee is not refundable except to residents of Iowa who are denied admission. Each applicant must also file with the Office of Admissions an official transcript from each college he or she has attended.

An applicant for admission to the College of Medicine must have:

- Received the baccalaureate degree, or
- Completed three years of a curriculum qualifying him or her to receive the baccalaureate degree after completing the first year in medicine, or
- Completed three years of a baccalaureate program meeting the general graduation requirements of the college he or she is attending.

Prospective students must have earned at least 94 semester hours of credit, or the equivalent, including the following:

Physics: a complete introductory course.

Mathematics: college algebra and trigonometry, or advanced college mathematics for applicants who completed college algebra and trigonometry in high school.

Chemistry: as a minimum, a complete introductory course in organic chemistry, ordinarily following a complete introductory course in modern general chemical principles.

Biological Sciences: a complete introductory course in the principles of animal biology, or zoology and botany (not botany alone), and an advanced biology course. All the foregoing must be taken with appropriate laboratories.

Completion of the specific requirements for admission does not ensure admission to the College of Medicine. From the applicants meeting the requirements, the admissions committee of the College of Medicine will select those who appear to be best qualified for the study and practice of medicine.

Applicants who have completed the baccalaureate degree and required courses five or more years before seeking admission to the College of Medicine will be considered by the admissions committee only under exceptional conditions.

To be considered for admission, an applicant must have attained a grade-point average of at least 2.5 (A = 4) for all-college work undertaken. Because the quality of work in premedical science is basic to success in medicine, special attention will be given by the admissions committee to grades in science. Where the college offers an option to take courses on a graded or pass-fail basis, it is expected that applicants will take the required science courses on a graded basis.

Preference will be given to applicants with high scholastic standing who are residents of Iowa, but consideration will also be given to outstanding applications exclusively under the Early Decision Plan. Under this plan a single early application is submitted to one’s first choice school by August 15 and the decision is made by October 1. Applicants are required to take the Medical College Admission Test (or the replacement test schedule for introduction in 1977) administered by the Association of American Medical Colleges in May or October of the year preceding the one for which they are seeking admission. Students may make arrangements to apply for this examination through the University’s Evaluation and Examination Services.

Personal interviews will be arranged as desired by the admissions committee.

Applicants accepted on or prior to February 15 must submit $50.00 advance payment by March 1. Applicants accepted after February 15 must submit this payment within two weeks after they receive notification of acceptance. The advance payment is credited toward tuition and fees.
Anatomy

Department Head: T. H. Williams


Anatomy is concerned with the structure of all tissues and organs of the body. The student is encouraged to develop a comprehensive understanding of the body's organization and function through the study of gross anatomy, histology, and embryology.

The course structure includes lectures, laboratory sessions, and practical workshops. Students are expected to participate actively in all components of the program. The course is designed to provide a solid foundation for further study in specialized fields within the medical sciences.

Graduate Students: The graduate program in Anatomy prepares students for careers in research, teaching, and professional practice. The program offers opportunities for both full-time and part-time study. Students are required to complete a thesis or dissertation based on original research.

Graduate students may apply for the M.S. degree upon completion of the required coursework and successful completion of a comprehensive examination. The Ph.D. degree requires an original research project leading to the publication of a thesis or dissertation.
neurobiology; teaching experience in two of these areas; a thesis based upon an experimental study; and an oral defense of the thesis.

Admission to the graduate program follows the general Graduate
College requirements. Admission to the summer session is
strongly encouraged. (See Graduate College.)

As an applicant's undergraduate background should include ad-
vanced Biochemistry, one year of organic chemistry, at least two
biology courses and one year of general physics. Applicants are
considered for admission on a competitive basis, taking into
account each applicant's academic record, performance on the
Graduate Record Examination Aptitude and Advanced Tests,
layers of recommendation and expressed career goals. It is highly
desirable that applicants take the GRE Advanced Test in biology.
Financial support is available to some students selected for the
Ph.D. program. To be considered for financial aid, applications
should be complete by February 15.

All students in the Ph.D. program require an in-depth knowledge of
gross, microscopic and neuroanatomy by taking courses and
teaching in each of them. Since most students will complete the
Ph.D. program will find positions in which teaching constitutes a
significant part of the responsibility, the Department gives this
special consideration. During the first year in the program a
student chooses a research area and becomes affiliated with a
faculty member whose research is in that area. Early in the third
year the student takes a comprehensive examination assessing his
or her ability to analyze, organize and apply the information,
concepts and skills acquired in the first two years of the program.

The final examination for a Ph.D. candidate is a critical evalua-
tion of his or her research capability. It consists of a written
thesis and an oral thesis defense. The thesis is based on original
experimental study done with the guidance of the faculty adviser
and other four faculty members. Research support is currently
found in endocrinology and reproduction, neurobiology, and cell
and molecular biology.

Facilities

The Department occupies new quarters (over 35,000 square feet)
in a new, four-story building on the University's main campus.
The new building is equipped with modern laboratory facilities and
is designed to meet the needs of students and faculty. The building
houses the department's main offices, classrooms, studios, and
laboratories. The facilities include a large, well-equipped teaching
laboratory with microscopes, microscopes, microscopes, microscopes,
and microscopes for the study of microorganisms. The building is
equipped with modern, well-equipped teaching laboratories and
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with modern, well-equipped laboratories and classrooms. The building is
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Courses

001H Introduction to Anatomical Human Anatomy 4 s.h.
Lectures and laboratory demonstrations on human anatomy. Primary for students of
anatomy and related sciences. Falls and spring semesters.

002H Microscopic Anatomy 4 s.h.
Microscopic study of cells, primary tissues and their relationships. Includes histology, microsopic
microscopy of tissues, etc. Does not require elective. Fall and spring semesters.

010H Gross Anatomy for Dental Students 8 s.h.
Regional dissection, including dental structures with major emphasis on head and
neck. Includes neuroanatomy. Open to graduate students with consent of instructor.
Spring semester.

010H Principles of Human Anatomy 3 s.h.
An introduction to the structure of the human body with particular emphasis on normal
structures and functions involved in drug response and metabolism. Primarily for pharmacy
students. Fall and spring semesters.

0103 Gross Anatomy for Medical Students 8 s.h.
Specific dissection of the head and neck, limbs, and major organs. Includes neuroscience.
Registration required only to medical students. Fall and spring semesters.

0106 Microscopic Anatomy for Medical Students 4 s.h.
Microscopic study of cells, fundamental tissues and organ systems. This course is
mandatory for medical student registrants only. Graduate students are required to
complete this course to get permission to take the basic science courses. Fall and
spring semesters.

0108 Human Anatomy 4 s.h.
Regional dissection, lecture and demonstrations with emphasis on areas important to
physical therapy. Registration limited to physical therapy students or with consent of
instructor. Fall semester.

0109 Human Anatomy and Neuroanatomy 2, 4 s.h.
Concentration of 0108, which is prerequisite. Dissection of head and neck;
labatory and lectures emphasizing clinical anatomy, organization and function of CNS
system. Summer semester.

0110 Neuroanatomy and Behavior 4 s.h.
Emphasis on the application of functional knowledge of the structure and function of
the nervous system; interdisciplinary approach. Registration limited to graduate students
in anatomy and neuroscience medical students; consent of instructor required for others.
Same as co-requisites Medical 50115 and Physiology 721110. Fall semester.

0111 Gross Human Anatomy for Physician's Assistant Students 4 s.h.
Regional dissection, lecture and demonstrations with emphasis on adaptation of
anatomy to physical diagnosis. Prerequisite: consent in Physician's Assistant
Program or consent of instructor. Summer session.

0121 General Microscopic Anatomy for Dental Students 4 s.h.
Coh, primary tissues and organs. Graduate students must have consent of instructor.
Fall semester.

0114 Oral Microscopic Anatomy and Embryology 2, 3 s.h.
Rouse concurrently with 0102. Fall semester.

0115 Endodontology for Medical Students 5 s.h.
Core course in endodontics. Prerequisite for graduate students: consent of
instructor. Same as graduate Medical 50115 and Physiology 721110. Fall semester.

0122 Independent Study in Anatomy 1-6 s.h.
Prerequisite related to anatomy required with faculty member in Graduate.
Prerequisite: consent of instructor. Consent of instructor. Summer semester.

0128 Advanced Human Anatomy 4 s.h.
Specialized aspects of gross, microscopic or neuroanatomy. Teaching. Dissection and
anatomical study are elective aspects. Prerequisite: consent of Department of
Department of. Fall semester.

0130 Teaching Workshop to Anatomy 2-4 s.h.
Practical application of educational psychology and teaching theory in the teaching
of anatomy, including personal development, teaching methodology, learning re-
search, assessment evaluation and may include an independent project. Prerequisite:
consent of instructor. Fall semester.

0166 Microscopic Anatomy for Graduate Students 8 s.h.
Comparative anatomical and functional organization of the human body at the
molecular level. Prerequisite: consent of instructor. Summer semester.

0189 Problems 2 s.h.
Practical problems in anatomy assigned with consent of faculty member in
Department of Anatomy.

0215 Introduction to Research 2 s.h.
Lectures and demonstrations on basic principles of research methodologies. Topics
to include: research techniques, experimental design, use of statistics, laboratory
science, and communication skills. Fall semester.

0251 Electron Microscopy Theory and Technique 2 s.h.
Provides theoretical and practical knowledge for acquisition of biological transmission
microscopy and microstructural microscopy with introduction to scanning electron microscopy
and electron probe analysis. Prerequisite: consent of instructor. Same as course 20218 and
Microbiology 652110. Fall semester.
Biochemistry

Department Head: Edward C. Heath


Undergraduate programs
See "Biochemistry" in the Liberal Arts section of the Catalog.

Graduate Programs
The graduate program in biochemistry places dual emphasis on the major and minor programs. The Department offers the major program independently, but major's thesis are also presented by some Ph.D. candidates.

The Department also offers opportunities for qualified and interested students to pursue M.S.-M.D. or Ph.D.-M.D. combined programs.

The focus of the major's program is in the individual student, whose specific needs are met both in the conference-tutorial approach of the Semin courses and in the broad range of selection areas from which he or she may choose a thesis topic.

The formal first-year course students usually take is an intensive one-year offering in general biochemistry (Biochemistry-20:265 the first semester and 99:266 and 99:262 the second), stressing an interdisciplinary approach. The first-year student selects most of his or her time in association with one or two faculty laboratories (99:261 Research Techniques), learning research techniques in the context of ongoing projects.

The second-year student chooses a research laboratory for his or her Ph.D. thesis research, and takes various courses he or she and the advisory committee agrees upon for his or her program. The student may also take other courses, in or outside of the Department, to satisfy his or her other interests, apart from the program.

After passing the comprehensive examinations, toward the end of the second year, the student is formally admitted to candidacy and to independent work. The program continues in the completion of this work, and its successful defense before the thesis committee.

In addition to meeting these and the general requirements of the Graduate College, the student is expected to assume in the teaching of biochemistry for two or three semesters, as part of his or her training.

Throughout the program, the student is associated with small seminar groups and receives close personal attention from the biochemistry faculty member who serves as his or her research advisor.

Research Interests
The Department's current research interests include several aspects of physical biochemistry, effects of configuration on conformation and chemical and biochemical reactivity of the
carbohydrates, hormonal control mechanisms, structure and function of nucleic acids, gene control in higher organisms, biochemistry of glycoproteins and carbohydrate metabolism, mechanisms and control of protein synthesis, biochemistry of enzymes: characterization of liver and hepatic enzymes, clinical biochemistry, neurochemistry, lipid metabolism, thermodynamic mechanisms, conformational and allostERIC investigation of glycophytic enzymes, analysis of enzyme systems utilizing coenzymes and foli acid coenzymes, enzyme mechanisms, biochemistry of active peptides and biochemical changes during development.

Facilities
The University Health Center's current $180-million expansion program provided new quarters for biochemistry in the Basic Sciences Building in the spring of 1972. Biochemistry shares this new building with the departments of Anatomy, Microbiology, Pharmacology and Physiology-Biophysics. Research and teaching laboratories in each department are interlaced, and faculty members with common interests are grouped around cores of important research facilities and equipment, further helping to bring the various groups into a more intimate relationship with one another.

The individual staff research laboratories are large and uncrowded. The building also provides generous space for many common-use facilities, including instrument rooms, testing rooms, cold rooms, glassware bays and stockroom. Research is facilitated by good technical support in such areas as glassblowing, machine shop, animal quarters and electronics, and by services supplied by photographers, illustrators, a secretarial staff, stockroom supervisors, purchasing agents and technicians. The Department is well supplied with virtually all of the equipment used in modern biochemical research including analytical and preparative ultracentrifuges, fluorometers and nuclear magnetic resonance spectrometers. Infrared absorption and optical rotatory dispersion instruments, amino acid analyzers, gas chromatographs, liquid scintillation counters, tissue, plate and gel electrophoresis equipment, an electronic microscope, instrumentations for protein X-ray crystallography, a computer and a number of Cary spectrophotometers.

In addition to the departmental library, excellent resources are provided by the new Health Sciences Library and the various other departmental branches of the University Libraries system.

Financial Assistance
Financial assistance is available to all students admitted to the doctoral program in biochemistry.

Admission
The graduate program in biochemistry is sufficiently flexible to accommodate students with a relatively wide range of backgrounds. Students with bachelor's degrees in any of the biological, physical, and veterinary sciences are encouraged to apply. Required preparation includes advanced college-level coursework in physical chemistry, biology, physics and mathematics through calculus. Students of demonstrated ability may make up deficiencies after enrollment.

Beyond the general Graduate College admissions requirements (see the Graduate College section of the Catalog), minimum requirements of the Department include an undergraduate grade-point average of 3.0 (A=4), with a 3.0 average in science courses, and a score of 1250 on the combined verbal and quantitative parts of the Graduate Record Examination Aptitude Test.

Courses
99:102 General Undergraduates 3-1-3 This course requires 12 hour laboratory course in freshman chemistry. Required of all majors. No prerequisites.
99:150 Biochemistry 3-1-3 One-semester lecture course focusing on chemical and molecular dynamics of living cells. Required of all students to be used as such elective. Prerequisites: two semester general chemistry, one semester organic chemistry.
99:150 The Chemistry of Biological Materials 3-1-3 Chemistry of major functional groups in compounds in biological systems and factors which influence their metabolism, biochemistry, properties of biomolecules, role of water, energy and other solvants. Prerequisite: Chemistry 4-122.
99:150 Introduction to Biochemistry 3-1-3 Molecular dynamics of biological systems: how energy is obtained, stored and utilized by living systems; lower concepts of matter are altered and controlled, how level of cell is maintained, how molecular operations function and how pressure of differentiation are integrated. Prerequisite: 99:150.
99:201 Molecular Genetics 4-1-3 Selected classical genetic phenomena, meiosis, gene mapping, pathways and control of sex linkage inheritance, DNA as genetic material; primary and secondary structure of DNA and RNA; interference of DNA, RNA and protein; mutations of protein and nuclear post and transcriptional and translational control of protein synthesis; molecular biology of differentiation. Prerequisites: 99:150 and 99:150, Zoology 37:152 or equivalent, with consent of instructor. Same as Zoology 37:151.
99:152 Physical Biochemistry 4-4-4 In this course, students are exposed to the latest achievements in the field of physical biochemistry. Emphasis is on the theoretical and practical aspects of current research in biochemistry.
99:165 Analytical Biochemistry 2-4-2 For graduate students and advanced undergraduates in biochemistry and other sciences. quantitative and qualitative experiments on identification, titration and characterization of components of biochemical systems, use of modern instruments for spectrophotometry, fluorometry, spectroscopy, neutron activation and ultracentrifugation experiments. Prerequisite: 99:152 and Chemistry 4-56.
99:164 Physical Biochemical Techniques 4-3-4 A four-week laboratory course designed to acquaint the student with methods and techniques used in physical biochemical research. Emphasis on the selection of techniques and their applications, techniques of measurement and data analysis for biochemical problems. Prerequisites: Biochemistry 99:120, in addition biochemistry 99:150 is recommended.
99:165 Research, Independent Study 3-3-3 Development of the student's research skills and research in areas of interest to the student. Arrangements made by student with faculty member in advance of enrollment. May be taken for credit. Prerequisite: 99:150.
99:166 Biochemistry Tutorial 3-3-3 Tutorial in biochemistry. Arrangements made by student with faculty member in advance of enrollment. May be taken for credit. Prerequisite: 99:150.
99:161 Biochemistry for Dental Students 4-1-4 Designed for dental students who have not had basic biochemistry. Study of protein structure, function and metabolism; carbohydrates, lipids, proteins and nucleic acids; metabolism of amino acids, carbohydrates and fats; principles of genetics and heredity. Prerequisites: none.
99:162 Biochemistry for Pharmacy Students 4-1-4 Designed for pharmacy students. Study of proteins and nucleic acids; methods of analysis and monitoring; principles of genetics and heredity. Prerequisite: none.
99:163 Biochemistry for Medical Students 6-1-6 Designed for medical students. Study of proteins and nucleic acids; methods of analysis and monitoring. Prerequisites: none.
99:164 Biochemistry for Physician's Assistant Students 2-2-2 Aspects of general biochemistry necessary for understanding the biochemical basis of human disease, analysis of appropriate clinical cases. Tought primarily and
integrated with Physiology and Biophysics 72:164.

90:180 Macromolecules 1.5 h.
Description of cryo-electronographic and solution measurements of protein, cell biology, and function. Relevance of macromolecules to biological function. Properties of other large biological molecules.

90:181 Biochemistry of Macromolecular Structures 1.5 h.
Common themes of macromolecules, structure and functional roles of simple and complex macromolecules in particular and all bio-organic compounds of the cell, such as carbohydrates, proteins, lipids, vitamins, cofactors and enzymes. Prerequisites: 90:130, 131 or consent of instructor.

90:182 Enzyme Catalysis 1.5 h.
Chemical and physical nature of active sites of enzymes; relation of active site structure to enzyme mechanism; structural analysis of steady state reaction, transient state kinetics, and structure determination. Prerequisites: 90:181, 90:184.

90:183 Bio Organic Chemistry 1.5 h.
Organic chemical basis of enzyme-catalyzed transformations, such as transfer, nucleophilic, dehydrogenation, combinations, etc., structure of enzyme-active site, requirements for enzyme catalysis; roles of enantiomers and chirality in catalysis. Prerequisites: 90:130, Chemistry 132.

90:200 Clinical Biochemistry 3 h.
Biochemistry of disease; use of biochemical knowledge gained in clinical laboratories to serve patient monitoring and public health. Prerequisites: 90:180, 90:181 or consent of instructor.

90:202 Molecular Endocrinology 2 h.
Physical and chemical aspects of hormone biosynthesis, control of synthesis and of interactions of hormones with tissues and target components, mechanism of hormone transport and metabolism. Prerequisites: 90:135, 90:181 or consent of instructor. Zoology 71:150 nonmatriculated.

90:210 Clinical Seminar 2 h.
Topics in the care and management of clinical patients. May be repeated. Prerequisites: 37:128 or consent of instructor. Same as Microbiology 61:213, 90:184.

90:261 Research Techniques 2 h.
Topics in the care and management of clinical patients. May be repeated. Prerequisites: 37:128 or consent of instructor. Same as Microbiology 61:213, 90:184.

90:266 Biochemistry 2 h.
Continuation of 90:265, which is prerequisite. Lectures and discussions of clinical applications.

90:275 Seminar in Cellular and Molecular Biology 1 h.

90:292 Seminar 1 h.
Required of all entering students in biochemistry; students participate in small, annual student-faculty group.

90:296 Research Biochemistry 2 h.
Program arranged with individual faculty members. Open only to graduate students in biochemistry.

Dermatology and Syphillology
Department Head: Robert G. Carey

The scope of the Department of Dermatology is the teaching of medical students and training of dermatology residents, care of patients with skin disease and research in the field of dermatology. This is one of very few dermatology programs in the country with a required rotation for medical students; each third-year medical student spends two weeks in the clinic and attends about 10 one-hour lectures.

A good cross-section of patients is available, due to the mixture of private and clinic patients, including a large number referred from the Student Health Service.

Various electives are available for fourth-year medical students, including clinical experience, dermatologic research and special studies.

Courses
60:21 Clinical Dermatology 2 h.
Clinical practice in the dermatology clinic. First-year medical school year; lectures, independent study materials, clinical experience.

62:25 Dermatology Electives 2 h.
Fourth-year medical students spend four weeks in advanced clinical experience, dermatologic surgery and special assignments.

60:29 Research in Dermatology 1 h.
Readings in dermatology.

62:25 Dermatology Electives 2 h.
Clinical principles of medical research; clinical or laboratory projects; individual and group study.

62:28 Special Studies Off Campus 3 h.

Endocrinology
Faculty: professors Richard T. Tuttle (Anatomy and Physiology and Biophysics), Robert H. Doucet (Physiology and Biophysics), Daryl Gesser (Internal Medicine and Biophysics), Clarence Woolley (Obstetrics and Gynecology), Charles Redd (Pediatrics), Louis W. Orno (Pharmacology), assistant professor Jonathan Brown (Internal Medicine), Professors of Surgery, of Pediatrics, of Obstetrics and Gynecology, of Anatomy, of Anatomy and Physiology, of Anatomy and Physiology, and of Anatomy and Physiology, assistant professor of Anatomy, of Anatomy, of Anatomy and Physiology, and of Anatomy and Physiology.

Endocrinology is an interdisciplinary program involving faculty members from the departments of Anatomy, Biochemistry, Internal Medicine, Obstetrics and Gynecology, Pediatrics, Pharmacology, Physiology and Biophysics, and Zoology. The nomenclature of endocrinologic diseases and Ph.D. programs, in which students whose primary interest is in endocrinology may enroll. 

As a rule, the course of studies for endocrinology encompasses offerings from several departments, and students may often find it appropriate to avail themselves of facilities of departments outside their parent department. Also, several of the endocrinology courses are jointly offered with the teaching staff, which is often includes instructors from clinical departments. Since endocrinology involves microscopic anatomy, physiology and biochemistry, students are expected to be well grounded in these disciplines. Further, since the endocrine system is comprised of and interrelated with the other great integrative system of the body, the nervous system, familiarity with neurology is also highly desirable in students of endocrinology.

With the aid of a Biological Sciences Development Award from the National Science Foundation, the University has added to its faculty in endocrinology. Clinical departments have also substantially increased their strength in this area.

Courses
For course descriptions, see the appropriate department section.

Anatomy
60:118 Endocrinology for Medical Students 2 h.
Syllabus in Physiology and Biophysics 72:118 and Medicine Non-Departmental 50:118.
Family Practice

Department head: Robert E. Ralston

The family practice program was initiated in answer to the need for more primary-care physicians in Iowa and throughout the nation. Appropriate coursework in the Department is included throughout the four-year M.D. program. The Department's 18 elective resident rotations give students opportunities for exposure to various Iowa communities through work in affiliated hospitals and community facilities, in the Department's Oakdale, Williamsburg and University Hospital offices, and in preceptorships with selected family physicians throughout the state. There is ample opportunity for independent study during the senior year, and an inter-national health-care elective offers exposure to primary health-care systems of other countries.

Residency

The Department directs a three-year residency program, graduates of which are eligible for certification by the American Board of Family Practice. A fourth, or fellowship, year is also available. The residency trainees physicians to provide continuing and comprehensive care to the total family unit, utilizing a concept wherein the patient, allied health professionals and the physicians are integrated into an efficient and effective health-care team. The program is intentionally flexible to allow each resident freedom to tailor his or her training to individual interests and needs; it includes a broad spectrum of electives in internal medicine, pediatrics, obstetrics and gynecology, psychiatry, neurology, and surgical subspecialties and community medicine. The program currently offers 126 positions. The hospital-based clinical experience is a unique combination of exposure to practice in the University Hospitals, where the patients have been referred by physicians from all over the state, and in various community hospitals, where the internists care is of a nature more typical of family practice. During the first year, a large portion of the program is based at Mercy Hospital in Iowa City, where residents have the opportunity for total participation in the practice—both important and outpatient—of the private physician staff. Rotations are specifically designed to provide breadth of experience, and in the second and third years experience is available at Broadlawns Polk County, Iowa Lutheran and Blank Memorial hospitals in Des Moines, St. Joseph Mercy Hospital in Mason City, the Muscatine Community Health Center and the Red Oak Family Care Center and selected teaching practices.

Special Facilities

The Department office is located in Children's Hospital in the University Hospitals Complex and is the center of Department activities. It contains faculty offices, the University Hospitals Family Practice Office and an inpatient unit. The Department also maintains Family Practice Offices at the University's Oakdale Campus, four miles to the northwest, and at Williamsburg, 15 miles west of Iowa City. The Williamsburg office is the only medical office in that community. In all offices, patient families are assigned to a resident with faculty supervision and are seen by appointment. Responsibility remains with that resident for the period he or she is in the training program. Emphasis is placed on teaching the principles of patient management, including organizational and administrative decision making, patient record and bookkeeping procedures and chart auditing methodologies as required to manage a private practice.

Courses

109.201 Introduction to Family and Community Medicine 2 s.h.
110.601 Family Practice, Broadlawns 3 s.h. arr. Student participates in care of patients seen in Family Health Center; when hospital admission is required, student follows patient into appropriate inpatient service and participates in care under supervision of attending resident and staff. Primary care responsibility is Family Practice Health Center, under supervision of staff, will be provided on emergency preceptorship program. Course is designed to be of unique value in elective or vacation, and will follow student in specific specialty program; student participates in clinic and departmental rotations. Consent to enroll is required. Consent to enroll is required.
110.611 Family Practice, Oakdale 3 s.h. arr. Resident participates in care of patients seen in Oakdale Hospital. Student follows patient into appropriate inpatient service and participates in care under supervision of attending resident and staff. Primary care responsibility is Family Practice Health Center, under supervision of staff, will be provided on emergency preceptorship program. Course is designed to be of unique value in elective or vacation, and will follow student in specific specialty program; student participates in clinic and departmental rotations. Consent to enroll is required. Consent to enroll is required.
110.621 Family Practice, Red Oak 3 s.h. arr. Resident participates in care of patients seen in Red Oak Hospital. Student follows patient into appropriate inpatient service and participates in care under supervision of attending resident and staff. Primary care responsibility is Family Practice Health Center, under supervision of staff, will be provided on emergency preceptorship program. Course is designed to be of unique value in elective or vacation, and will follow student in specific specialty program; student participates in clinic and departmental rotations. Consent to enroll is required. Consent to enroll is required.
112.603 Correlating Clinical Sciences 2 s.h. arr. This course is designed to bring together the clinical sciences as they are applied to the fourth-year student. Concepts of disease will be reviewed and such basic sciences as anatomy, physiology, pharmacology, and biochemistry will be correlated with the major clinical disciplines.
112.605 Medical Specialties, Emergency Rooms 2 s.h. arr. Introduces students to the importance of the emergency rooms in the medical specialty field. The student will be required to follow patients from the emergency room to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the emergency room.
112.606 Medical Specialties, Outpatient Clinics 2 s.h. arr. Introduces students to the importance of the outpatient clinic in the medical specialty field. The student will be required to follow patients from the clinic to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the outpatient clinic.
112.607 Medical Specialties, Community Medicine 2 s.h. arr. Introduces students to the importance of the community medicine in the medical specialty field. The student will be required to follow patients from the community medicine to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the community medicine.
112.608 Medical Specialties, Home Health Care 2 s.h. arr. Introduces students to the importance of the home health care in the medical specialty field. The student will be required to follow patients from the home health care to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the home health care.
112.609 Medical Specialties, Pediatrics 2 s.h. arr. Introduces students to the importance of the pediatrics in the medical specialty field. The student will be required to follow patients from the pediatrics to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the pediatrics.
112.610 Medical Specialties, Obstetrics and Gynecology 2 s.h. arr. Introduces students to the importance of the obstetrics and gynecology in the medical specialty field. The student will be required to follow patients from the obstetrics and gynecology to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the obstetrics and gynecology.
112.611 Medical Specialties, Internal Medicine 2 s.h. arr. Introduces students to the importance of the internal medicine in the medical specialty field. The student will be required to follow patients from the internal medicine to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the internal medicine.
112.612 Medical Specialties, Neurology 2 s.h. arr. Introduces students to the importance of the neurology in the medical specialty field. The student will be required to follow patients from the neurology to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the neurology.
112.613 Medical Specialties, Psychiatry 2 s.h. arr. Introduces students to the importance of the psychiatry in the medical specialty field. The student will be required to follow patients from the psychiatry to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the psychiatry.
112.614 Medical Specialties, Surgery 2 s.h. arr. Introduces students to the importance of the surgery in the medical specialty field. The student will be required to follow patients from the surgery to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the surgery.
112.615 Medical Specialties, Radiology 2 s.h. arr. Introduces students to the importance of the radiology in the medical specialty field. The student will be required to follow patients from the radiology to the inpatient ward and back. The student will also be responsible for the management of the patients seen in the radiology.
Hospital and Health Administration

The Master of Arts degree program in hospital and health administration stresses the conceptual unity and generic nature of problem identification, problem-solving and the decision-making process. Courses are designed to familiarize the student with the institutional environment of contemporary hospital and health-related organizations through exploration of administrative problems unique to the hospital and health field and methods of solving them; approaches to achieving goal-directed human behavior; and organizational theory from both the macro and micro viewpoints. The interdisciplinary approach is a key element in the program. Typically, the student spends one-third of the required 60 semester hours of credit in environmental courses. Designed to give the student a frame of reference, the first-year curriculum emphasizes the history and evolution of health care and health care institutions. During the first year, and throughout the program, the student is expected to complete major written projects, and to defend his or her positions orally through individual presentations and in group discussions.

The emphasis in the second year is on individual study toward a strengthening of the student's understanding of health service planning and health care administration, and expansion of his or her knowledge of research methodology and application. Additionally, trends and developments on the international health scene are examined.

Direct involvement in administrative practice is also a key element of the program. During the first and second years, summer internships give students opportunities on a voluntary basis, to observe and participate actively in the administration of community, university and Veterans Administration hospitals, health planning agencies, health insurance companies and other health-related organizations. Arrangements with several health facilities in the University area provide opportunities for on-site inquiry and study beyond or in conjunction with coursework. Students also participate in the collection and analysis of data on actual community and manpower problems across the nation, and in recommending alternative solutions to these problems.

The program culminates in the preparation of a master's thesis.

During thesis preparation, the student is in close consultation with an interdisciplinary faculty committee, works on a tutorial basis with a doctoral student and has access to all University resources, including the Computer Center.

The following is a sample M.A. program:

First Year
First Semester
Administrative Aspects of Medicine 3 s.h.
Fundamentals of the Modern Hospital 3 s.h.
Health Economics* 3 s.h.
Statistics* 3 s.h.
Human Resources Management* 3 s.h.
Second Semester
Fundamentals of Modern Hospital and Health Administration 3 s.h.
Principles of Hospital and Health Administration 3 s.h.
Financial Management 3 s.h.
Medical Sociology* 3 s.h.
Management Information Systems* 3 s.h.

Second Year
First Semester
Advanced Hospital and Health Organization and Management 3 s.h.
Clinical Education in Hospital and Health Administration
Thesis 3 s.h.
Issues in Health Planning* 3 s.h.
Operations Research in Business 3 s.h.

Second Semester
Advanced Hospital and Health Organization and Management 3 s.h.
Seminar: Hospital and Health Administration 3 s.h.
Thesis 3 s.h.
Medical Jurisprudence* 3 s.h.
Group Behavior in Organizations 3 s.h.

(*interdisciplinary courses)

This is only one of many possible program sequences. Individual programs are determined by the student and his or her adviser, taking into consideration the student's educational background, present circumstances, particular areas of academic interest and career goals.

Admission

Admission to the Master of Arts degree program in hospital and health administration requires a bachelor's degree from an accredited college or university. The undergraduate major may be in any field, but the applicant should have a broad background in the liberal arts and sciences, and some work in business administration.
The general admission procedures and requirements of the Graduate College remain, except that the Department's standards are somewhat higher than the 2.5 minimum grade-point average generally required.

Applications must be submitted by April 1 for the following fall semester. Each application is reviewed by an admissions commit- tee consisting entirely of graduate students. The committee's recommendations are subject to final approval by the faculty. (Note: Admission to the M.A. program is closed for 1976-77, but applications will be accepted for 1977-78 and succeeding years.)

Doctor of Philosophy

The primary purpose of this program is to provide the field of hospital and health administration with scholars competent in teaching, high-level administration and research. To qualify for the degree, the candidate must have a highly developed under- standing of hospital and health administration, comprehensive knowledge of related fields and competence in research and independent study, demonstrated through a series of projects culminating in the dissertation. Throughout the program, doctoral students serve in advisory capacities with master's students on thesis investigations, com- munity and health manpower studies and related projects. In addition the specific requirements of the Department, the doctoral student must satisfy the general requirements of the Graduate College.

Admission

A student with a master's degree in hospital administration or public health from an accredited university, or with an advanced degree in a related field, such as public or business administration, economics, sociology, psychology, law or political science, may seek admission to the doctoral program in hospital and health administration. Some highly qualified students are admitted to doctoral work directly after completing undergraduate study. An option available to students already in the master's degree program permits the filling of a joint program for the master's degree and the doctorate.

Admission procedures and requirements are generally the same for the Ph.D. as for the master's program. (Note: Student entry into the Ph.D. program is temporarily suspended.)

Courses

08:101 Fundamentals of the Modern Hospital

4 s.h.

Economic perspective; health issues having an impact on the modern hospital; focused discussion, student presentation and seminars.

08:102 Fundamentals of Modern Hospital and Health Administration

4 s.h.

Evaluation of a broad range of health care institutions; student teams conduct community studies in determine health care needs and propose institutional changes to meet the needs identified; focused discussion, student presentations, seminars, field trips.

08:103 Principles of Hospital and Health Administration

4 s.h.

Rationale-managed approach to medical center; questions involving staffing, organization and delivery of health services are studied and evaluated within the framework of economic, technical and ethical considerations and their impact on service delivery systems. Problems and procedures in health service delivery.

08:106 Administrative Aspects of Medicine

2 s.h.

Survey of health systems of the United States and other selected nations; focuses on the nature of health services delivery and core issues relating to the delivery system; seminars and assignments.

08:106 Advanced Hospital and Health Administration

3 s.h.

08:107 Seminar: Problems of Administrative Behavior in the Modern Health Organization

3 s.h.

08:111 Study: Hospital and Health Administration

arr.

Original study, review and presentation of a problem area in health-care administra-

08:115 Personnel Administration and Labor Relations in Health-Care Facilities

3-5 s.h.

08:121 Financial Management of Health-Care Organizations

3 s.h.

Analysis of financial management problems indigenous to health-care facilities, with emphasis on current and long-range financial requirements, administrative evaluation of financial alternatives, examination of taxes, budgeting, rate establishment and financial aspects of third-party payers.

08:134 Health Care in America

3 s.h.

Evolution of government role in the health-care system, with focus on public policy-making process with regard to medical and health-care delivery.

08:156 Contemporary Health-Care Issues

arr.

08:157 Seminar: Hospital and Health Administration

4 s.h.

08:158 Seminar: Faculty Orientation and Behavior

arr.

Practices on academic policy issues, Ph.D. students only.

08:220 Advanced Hospital and Health Organization and Management

arr.

08:220 Seminar: Hospital and Health Administration

arr.

08:220 Seminar: Faculty Orientation and Behavior

arr.

Practices on academic policy issues, Ph.D. students only.

08:225 Advanced Hospital and Health Organization and Management

arr.

08:226 Research: Hospital Administration

arr.

08:228 Research: Hospital Health Administration

arr.

08:227 Individual Study

arr.

08:228 Clinical Education in Hospital Administration

arr.

Situation-solving and problem-solving exercises for students in second year of master's resident; international health services and medical care comprises the domi-

08:229 Clinical Education in Hospital and Health Administration

arr.

08:230 Seminar: Hospital and Health Administration

arr.

08:231 Seminar: Faculty Orientation and Behavior

arr.

Practices on academic policy issues, Ph.D. students only.

Human Nutrition

Administrator and chairman, Nutrition Advisory Committee: Thomas A. Adelson.

Active Director of Dietetics (using) Rose Ann Bopp.

Graduate Program

The graduate program in human nutrition is administered by the Nutrition Advisory Committee, with members appointed jointly by the College of Medicine and the Graduate College.

The Dietetic Internship

The dietetic internship prepares the student for membership in the American Dietetic Association. Applicants to the internship program must meet the requirements of the American Dietetic Association and the Graduate College.

The intern earns graduate credit in nutrition seminar, clinical nutrition and hospital dietary administration.

University Hospitals pay interns a stipend which partially covers educational and living expenses.

The Dietary Department of University Hospitals issues a certificate to graduates of the dietetic internship program.

Courses

08:251 Nutrition Seminar

1 s.h.

Presentation of current research findings in nutrition, therapeutic and administrative fields.

Medical Technology

See "Pathology."

Microbiology

Chairman: J.R. Powell

Faculty: professors John Carle, Jr., Louis G. Hoffmann, Allen T. Matherow, J.R. Peters; Erick W. Siers; assistant professors George L. Bender, John G. Bailey, Thomas L. Poitras (Linguistics), Ronald P. Gubat (Microbiology and Immunology), William Johnson, Robert R. Winkelman, Joa S. Babcock, Donald P. Farkas, Donald M. Weller; assistant professors Charles C. Geis, Noreen A. Crenshaw, Michael G. Pessl, David M. Lautner (Linguistics), Mark S. Staski

Degrees offered: B.S., M.S., Ph.D.

Undergraduate Program

See "College of Liberal Arts."

Graduate Degrees

The objectives of the graduate program are to help students become highly qualified in research and in the teaching of microbiology. These six areas are included in the program: pathogenic bacteriology, microbial genetics, immunology, microbial physiology, medical mycology and animal virology. Several of these specialized fields involve interdisciplinary training within and outside the Department, so students receive broad experience during their course of study.

Usually the Department accepts only candidates for a Ph.D. degree, but a few students desiring a terminal M.S. degree may be accepted. Students working for the Ph.D. degree may obtain an M.S. degree during their graduate work, or proceed directly toward the Ph.D.

All students admitted as candidates for advanced degrees are expected to assist in teaching in the Department during their course of study.

In coming years students choose a research supervisor who serves as chairman of the student's advisory committee. This committee assists the student in planning a program of study and reviews from time to time the progress in research.

The Department cooperates with other departments in the various colleges on the campus, affording some opportunity for students to avail themselves of the University's diverse course offerings, seminars and research programs. For example, courses and seminars in clinical laboratory microbiology, genetics, cellular and molecular biology, and electron microscopy are taught on an interdepartmental basis.

M.S. Program

The course requirements for the M.S. student are the same as those for the Ph.D. program. A thesis based on the student's own research is required.

Ph.D. Program

Candidates for the Ph.D. must satisfy the department's course requirements as determined by the student's advisory committee (minimum requirements: one course in each of four of the six subdisciplines available in the Department, or 15 semester hours of coursework in two different areas; pass a comprehensive examination and write a thesis and defend it satisfactorily in an oral examination.

Facilities

The Department is housed in the Basic Sciences Building together with the departments of Anatomy, Biochemistry, Pharmacology, Physiology and Biophysics. Adequate space and excellent equipment are available for teaching and research.

Graduate Admission

Prospective graduate students should become familiar with the general admission requirements of the Graduate College. Departmental requirements include a review and formal vote by the faculty before a student is admitted. Before beginning graduate work, the student must have completed courses in biology, chemistry (inorganic, organic, quantitative analysis), mathematics (up to calculus) and physics. Exceptions may be allowed, but students admitted without the above coursework must take it during the first year of graduate school. The student should have a grade-point average of 3.7 or better to be admitted to the graduate program in microbiology.

Courses

61:100 Medical Microbiology

Principles and various aspects of study of microorganisms, their isolation and identification, microorganisms involved in infectious diseases, clinical and laboratory procedures and current concepts of virology. Prerequisites: registration in College of Medicine.

61:104 Microbiology Elective

For fourth-year medical students wishing to take additional coursework or research in medical microbiology, medical virology, immunology, virology or other areas of disciplines.

61:110 Microbiology for Physician's Assistant Students

Two-hour introductory course in medical microbiology with emphasis given to the more commonly encountered pathogenic microorganisms and procedures useful in a physician's office. Prerequisites: registration as physician's assistant.

61:147 Survey of Immunology

Three-hour interdisciplinary survey of fundamentals of cellular and molecular immunology and applications to clinical problems: appreciation of field as whole; review and faculty from the departments of Microbiology, Immunology, Pharmacology and other. Prerequisites: an understanding of basic microbiology or immunology, or consent of course coordinator. Section 74-7421.

61:157 General Microbiology

Fundamental principles of microbial physiology, microbial genetics, virology, immunology and parasitic microbiology. Laboratory includes methods used for identifying and classifying microorganisms. Computation: Chemistry 4123.

4 hours

Discussion of pathogenic bacteria with emphasis on mechanisms of pathogenicity and
Neurology

Neurology Department: Marvne W. Van Alten
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Nuclear Medicine Technology

Director: James V. Chilcote
Program coordinator: Guna A. Israelevitz

Nuclear medicine technology is the portion of the allied health professions field which encompasses the techniques of using radionuclides in medicine. New techniques for studying body processes and imaging organs and disease sites have generated the dynamic growth of this discipline. Simultaneously, a wider variety of sophisticated equipment unique to the field has come into use, along with an increasing variety of radionuclides and a greater variety of radiopharmaceuticals. The breadth of these specialized procedures, in addition to volume demands, led to the development of this new health occupation.

Nuclear medical technologists work predominantly in hospitals and clinics in all phases of radiopharmaceutical use in medicine: daily preparation of radiopharmaceuticals for use in patients; preparation of patients for organ imaging, blood flow studies, metabolic absorption and utilization studies, or quantification of total body content of a variety of substances, carrying out any of the above in phases, including preparing image or data records for physician review; using reagents tagged with radionuclides in a variety of highly specific and sensitive assays of hormones, drugs in blood, urine.

The Program at Iowa

The program in nuclear medicine technology at Iowa is accredited by the Council on Medical Education of the American Medical Association. Fulfillment of the requirements established by the AMA Accreditation Board involves three years of practical work in the College of Liberal Arts and a minimum of 12 months of professional clinical experience, available in the University of Iowa Medical Center.

In the completion of the entire four-year program, the student receives the Bachelor of Science degree with a major in general science and nuclear medical technology, and is eligible for national certification as a nuclear medicine technologist.

Preclinical Program

The required preclinical courses emphasize the physical and biological sciences, which provide a basic background into which are prerequisites for the subjects and activities of the clinical year. Following is a summary of the prerequisites for acceptance into the nuclear medicine technology program:

- Satisfaction of the College of Liberal Arts general requirements, and the requirements for a general science major;
- A minimum of 36 semester hours distributed 16-12-8 among chemistry, biology and physics;
- A minimum of 6 semester hours in mathematics;
- A minimum of 96 semester hours in all coursework with a 2.0 minimum cumulative grade point average.

Clinical Program

The clinical year is centered in the University of Iowa Medical Center. In terms of time allocation, both classroom and clinical experiences are emphasized. The classroom portion covers in depth the clinical or technical specialties of physics of nuclear medicine, basic instrumentation, scanning instrumentation, radiopharmaceuticals, clinical techniques, principles of nuclear medicine technology, preparation of patients for organ imaging, blood flow studies, metabolic absorption and utilization studies, or quantification of total body content of a variety of substances, carrying out any of the above in phases, including preparing image or data records for physician review; using reagents tagged with radionuclides in a variety of highly specific and sensitive assays of hormones, drugs in blood, urine.

Admission

Prospective students in nuclear medicine technology are encouraged to apply for study and to provide a transcript of previous work as early as possible in the preclinical program, since the class time is at present limited to six students, and prerequisites are increasing in importance. Personal interviews are required. Successful applicants for the clinical training program are notified of their selection at least three months before the beginning of the next clinical class. At present, the 12-month clinical training program starts in September of each year.

Nuclear Science and Technology

Chairman: J. O. C. Hebben
Faculty: William H. Leonard (Managing), Richard R. Culver (Physics), James O. Pember (Materials Engineering), J. M. Tronard (Materials Engineering), Arthur F. Heron (Materials Engineering)

Degree offered: M.S.

Nuclear science and technology is an interdepartmental program offered through the cooperation of the Graduate College, the College of Engineering, the departments of Mathematics, Chemistry and Physics in the College of Liberal Arts, and the Radiation Research Laboratory of the College of Medicine.
The program is for students interested in applying nuclear processes to scientific and engineering problems, such as the production of electrical power, the application of radiotopes and the use of irradiation devices.

Prerequisites:
A student who has not taken the following courses, or their equivalents, before entering the program must take them during the program, without credit toward the M.S. degree:

- 22M:28 Calculus III
- 25:2 College Physics
- 4:4 Principles of Chemistry II
- 550:16 Thermodynamics I
- 563:42 Chemical Engineering Thermodynamics

Program Requirements
The Master of Science degree in nuclear science and technology requires 36 semester hours of credit, with thesis, 38 without thesis. The program is intended to be flexible while conforming as nearly as possible to the following:

Nuclear Physics
6 s.h.
Recommended: 29:191-192 Atomic Physics-Nuclear Physics

Nuclear technology
6 s.h.
Recommended: 562:150 Introduction to Nuclear Science and Engineering; 528:147 Nuclear Reactor Heat Extraction; and 562:156 Process Dynamics

Chemistry
3 s.h.
Recommended: 4:170 Advanced Inorganic Chemistry or 4:201 Special Topics in Inorganic Chemistry

Mathematics
6 s.h.

Radiation biology
4 s.h.
Recommended: 77:103 Introductory Radiobiology (lectures only); or 77:106 Environmental Radiological Health Physics

Electives
11 s.h.
Advanced courses in chemistry, physics, mathematics, engineering, radiation biology, computers

Total (without thesis)
38 s.h.

Admission
To enter the program, a student must have a B.S. degree in engineering, chemistry, physics, mathematics or general science and must satisfy the admission requirements of the Graduate College.

Obstetrics and Gynecology

Department head: W.C. Kettel

Coursework for M.D. Students
The courses in obstetrics and gynecology are designed to give M.D. students a comprehensive survey of female reproductive problems. This is done through a series of didactic lectures, inpatient and outpatient assignments, ward rounds, teaching seminars and special elective courses.

The third-year clerkship (664:4 Clinical Obstetrics and Gynecology) gives the students care of information he or she will need to be prepared to care for women no matter what his or her career choice. In the fourth year a variety of electives is available, intended to train the student in the skills of obstetrics and gynecology in a private hospital setting or in a specialty clinic. These electives include rotations at Broadlawns Polyclinic Hospital, Des Moines; Des Moines Obstetric Clinic and Conway Maternity Hospital, Moline; Louisiana; Medical Associates, Dubuque; Methodist Hospital, Des Moines; and The Gundersen Clinic, LaCrosse, Wisconsin.

Residency Program
The Department offers a four-year residency. After passing a written and oral examination, graduates are eligible to be certified as specialists by the American Board of Obstetrics and Gynecology.

During the fourth year, the resident rotates through the various divisions of the Department and works on both hospital inpatient and outpatient. Additional training is obtained in four general clinical and two weeks, Grant Rapids and Davenport. During the final year, the resident spends time at Methodist and Broadlawns Hospitals in Des Moines and at St. Luke's Hospital in Davenport. In the first four rotation, the resident is trained in normal and abnormal obstetrics, advanced gynecologic surgery, office gynecology, endocrinology, oncology, family planning and oncologic procedures. Advanced specialty training after the completion of the residency is available in endocrinology and oncology.

Fellowship Program
Gynecologic Oncology
The Department offers a two-year fellowship in gynecologic oncology. This involves clinical and research activities. After passing the written and oral examinations, fellows are eligible to be certified by the American Board of Obstetrics and Gynecology for Special Competence in Gynecologic Oncology.

Endocrinology
The Department offers a two-year fellowship in endocrinology. This involves clinical and research activities. Fellows are eligible, after passing the written and oral examinations, to be certified by the American Board of Obstetrics and Gynecology for Special Competence in Endocrinology.
Otolaryngology and Maxillofacial Surgery

The Clinical Program

Trainees enter this program through the National Internship Matching Plan directly out of medical school. This program consists of a one-year categorical diversified orthopaedic internship and four years in orthopaedic residency. During the internship year, the trainee gains experience not only in clinical orthopaedics, but in medicine, pediatrics, urology, surgical specialties, intensive care, and anesthesiology. During the following years, residents gain expertise in trauma, children's orthopaedics, adult orthopaedics, musculoskeletal disorders, rehabilitation, prosthetics and orthotics, rheumatology and basic science as related to orthopaedics. The residents take specialized courses in anatomy, bone histology, biochemistry, physiology and pathology. A weekly seminar covers biomechanics, kinematics and selected clinical subjects. Residents also attend the Northwestern University courses on lower extremity impingements and prosthesis.

Program for Full Time Academic Orthopaedists

This program includes the usual training described under the clinical program above. In addition to this, the resident devotes one or two years to research. This research may be in any field in which the resident is interested provided it is related to the musculoskeletal system. This research may be done in one of the five orthopaedic laboratories or in a basic science department.

Departmental Laboratories

The orthopaedic laboratories deal with problems in these major subject areas:

- Biochemistry: The biochemistry of mucopolysaccharides and collagen, both normal and those altered in epithelial dysplasias and scoliosis.
- Biomechanics: In conjunction with The College of Engineering, biomechanical problems of the upper extremity and bio-mechanics of the hip and the talo, and total joint replacement.
- Cell biology and pathology: Ultrastructural studies on normal bone, cartilage, tendons and muscles, and on those altered by experiment and disease.
- Tissue transplantation and metabolic bone disease: Skin, bone and cartilage transplantation and various aspects of mineral composition and bone density in metabolic bone disease.

Facilities

The Department is housed in Children's Hospital, and has an active service to the nearby Iowa City Veterans Administration Hospital. The program includes 120 beds, an outpatient clinic, a specialty library, a specialty radiology unit, a brace shop and physical therapy facilities. Physicians in the outpatient clinic see approximately 100 patients a day.

Specialty of pain deal with such problems as scoliosis, club feet, congenital dislocated hips, neumovascular stenosis, metastatic diseases, amputees, hips, knees, hands, necks, and trauma. Approximately 1,500 major operations are performed each year under the direction of the Department.

The Department provides consulting service to the Hospital School for Handicapped Children, State Services for Crippled Children and two state schools for the mentally retarded.

Courses

- 795 Clinical Orthopaedics
- 797 Fundamentals of Orthopaedics
- 797C Orthopaedics for Physician's Assistant Students
- 797D Advanced Clinical Orthopaedics
- Open to senior medical students only
- 797E Biomechanical Trauma
- Open to junior medical students only
- 797F Burn Care of the Hand
- Open to senior medical students only
- 797G1 Otolaryngology
- 2 h.s.
- 797H1 Laboratory Experience
- Open to senior medical students only
- 797I Special Studies on Campus
- Open to senior medical students only
- 797J Special Studies off Campus
- Open to senior medical students only

Otolaryngology and Maxillofacial Surgery

Department head: Brian P. Colton.

Faculty: professors James Bendit, Charles Krause, Charles Kneeland, Brian McConkey, Hugh Paul, William Huffman, D.C. Sprague, David Van Den—are professor; Dennis Luebke, Edward Koger, associate professor; Neal Johnson, Charlie Andrews, Lee Travler, William Lusk, James J. Martin; assistant professors Donald Van, Robert Farnum, Marcus Mathew, Jo Hj, Rosemary

Degree offered: M.S.

The Department provides one of the oldest and largest otolaryngology and maxillofacial surgery training programs in the world. Currently there is a full-time faculty of 20, including several members from the radiology, dentistry and speech pathology professions. The Department's main objective is to provide a high level instructional program in otolaryngology and maxillofacial surgery. This program is available for medical students and residents. To maintain a broad and in-depth teaching program, a large patient load is borne by the Department's faculty and staff in these clinical areas: head and neck oncology; maxillofacial trauma; craniofacial defects, such as cleft palate; disorders of the vestibular mechanism; facial plastic surgery; pediatric and geriatric hearing problems; voice problems; general endoscopy; surgery of deafness; and all the areas usually considered otolaryngology.

In addition to the major otolaryngology and maxillofacial medical-surgical service, there are four other divisions in the Department which make this program comprehensive: facial plastic surgery, craniofacial defect, hearing and research, and research. Another major objective of the Department is to foster research programs designed in order to provide roles for faculty and resident research training. All residents have to participate in research and all residents are required, as part of the resident training program, to

358
design, conduct and report on a research project during their program of study. In addition, there are several large-scale research programs within the Department in vestibular neurophysiology, oto- pathology, cleft palate, otolaryngology in temporal bone disease, os- tologic immunology of the head and neck, anatomy of the tem- poral bone, electroencephalography, audiology, pathology of the temporal bone and neurophysiology of the outer ear.

The majority of these research programs receive federal sup- port.

Graduate Course In Otolaryngology

The program in otolaryngology is in accordance with the require- ments of the American Board of Otolaryngology. The program consists of a four-year course of basic and clinical science.

The basic science group consists of a series of lecture-turas and laboratory studies preparatory to actual clinical work. It is conducted during the first three and one-half months of residence, usually July 1 to October 15 of each year.

After passing an oral and/or written examination, the student enters the clinical phase of the course, which includes supervised clinical and operative work. Clinical conferences and seminars pertinent to the practice of otolaryngology and its related fields. Upon successful completion of the four-year course, which must include an acceptable thesis, candidates are awarded the Master of Science degree. To complete the requirements, the student must earn at least 30 semester hours of credit, one-third of which must come from the basic science group.

Elective courses of study to broaden the individual's cultural knowledge may be taken by students capable of attracting work. A limited number of resident physicians can be scheduled each year. Applicants must be graduates of a recognized college of medicine and must have completed one year of general surgical training in an approved program.

Courses

66:3 Clinical Otolaryngology

66:106 Clinical Internship in Otolaryngology

66:107 Head and Neck Oncology

66:108 Otolaryngeal Disease

66:109 Oto-Psychology

66:110 Basic Principles of Facial Plastic and Reconstructive Surgery

66:111 Basic Otolaryngology Science

66:112 Research in Otolaryngology

66:210 Clinical Conference in Otolaryngology, Rhinology and Maxillo- facial Surgery

66:211 Clinical Otolaryngology, Rhinology and Maxillofacial Surgery
to certification in anatomic and clinical pathology by the American Board of Pathology. A postdoctoral training program in clinical chemistry is also offered.

Undergraduate Programs

The Medical Technology Program at Iowa is sponsored through the cooperation of the College of Medicine, College of Liberal Arts, University of Iowa Hospitals and Clinics, and the Iowa City Veterans Administration Hospital. The program is approved by the Council on Medical Education of the American Medical Association and by the National Accrediting Agency for Clinical Laboratory Sciences. Satisfactory completion of the program qualifies the student for the Board of Registry of Medical Technologists registry exam for designation as a Medical Technologist (American Society of Clinical Pathologists).

A new class is admitted each July and January. Students may enter the program either following their junior year of college or after having earned a baccalaureate degree. A student entering the program after his or her junior year of undergraduate study must be able to satisfy all requirements for the baccalaureate of Science degree in general science from The University of Iowa by successfully completing the Medical Technology Program. Undergraduate students who complete their pre-clinical year work at other colleges or universities must note the general admission and graduation requirements of the College of Liberal Arts. They should consult with the University to plan their pre-clinical year studies to meet the requirements of the Medical Technology Program.

To be considered for admission the applicant should have completed 64 semester hours of college study including general chemistry, qualitative analysis, organic chemistry and quantitative analysis (16 s.h.), general zoology, microbiology, parasitology (16 s.h.), mathematics (6 s.h.). Coursework in general physics, human physiology, histology and biochemistry, and genetics is strongly recommended.

A cumulative grade-point of 3.0 (A=4.0) is required. A minimum science grade-point average of 3.5 is highly recommended. Admission to the clinical year program is on a competitive basis. Applications must be received by December 31 of the year preceding admission.

The clinical year program consists of 12 consecutive months of didactic and practical instruction.

The clinical course consists of 30 units of activity distributed between both the academic professional curriculum and the clinical laboratory rotation. The academic professional curriculum is divided into theoretical instruction in clinical laboratory services which include lectures, student laboratory experiences, demonstrations, and seminars. During the last six months of the clinical program, the student rotates through the clinical laboratory facilities of both University of Iowa Hospitals and Clinics and the Iowa City Veterans Administration Hospital, and has additional lectures. Total hospital bed capacity of the Medical College is 1,100 and clinical laboratories perform tests on more than 2.5 million patients per year. The clinical rotation gives students additional experience and the opportunity to implement the theory and techniques previously acquired through the Program in the teaching laboratories.

Because the University of Iowa clinical program is limited to 32 students, a student completing premedical technology studies at Iowa may satisfy degree requirements by completing clinical studies in another approved hospital medical technology program, with prior written approval from the University's College of Liberal Arts.

Graduate Program

The graduate program is sufficiently flexible to accommodate students with varied backgrounds. Students with a B.S. degree in chemistry, biochemistry, biology, zoology and medical technology, as well as medical and dental degrees, are encouraged to apply.

In addition to Graduate College requirements the Pathology Department requires: 3.000 total in science courses (a combined; verbal and quantitative GRE score above 1200). A personal interview is required before final acceptance into the program.

All programs involve components of wetting, patient care and research. These activities are structured in the teaching programs of the Department, the service laboratories of the Department and the University Hospitals, and the research laboratories of selected faculty members. All degree requires a thesis.

Although the M.S. program is flexible and open to students with varied backgrounds, two structured degree programs have been emphasized. Medical or dental students may take a leave from their professional school programs to pursue graduate training in pathology. Medical technologists may advance their training, usually by specialization in laboratory medicine, and with a M.S. in pathology.

Special Programs

The Department is approved for 16 training positions in pathology, covering a training span of up to five years. The programs are designed to utilize the patient population of both University Hospitals and Clinics, and the Iowa City Veterans Administration Hospital.

There is systematic rotation through the various laboratory services, including surgical pathology, autopsy pathology, cyto
genetics, clinical biochemistry, medical microbiology, hematology and blood banking. Adequate opportunity is afforded for concentrated study in such sub-specialties as neopathology, hematopathology and genotyping, and special pathology of the head and neck region.

To provide these special experiences, the faculty includes members who have special interests in blood coagulation and its disorders, and diseases of the nervous system, gastrointestinal tract, skin, breast, bone, bone cancer, heart and renal units, etc., as well as medical microbiology, clinical biochemistry, hemato
genetics and blood banking.

A postdoctoral training program in clinical biochemistry is offered. This program is approved by the American Board of Clinical Chemistry and is open to Ph.D. biochemists or chemists.

In addition, a limited number of externships and clerkships are available to postdoctoral students.

Facilities

The Department has laboratories equipped for histopathology, histochromometry, electron microscopy, tissue culture, special chemistry, virology and blood coagulation, as well as the usual facilities for anatomic and clinical pathology. Our recently remodeled Pathology Learning Center has areas for seminars, independent study, multimedia learning activities and small group discussions.

Courses

1. Introduction to Medical Technology 3 s.h.

The above program is designed for diagnostic laboratory personnel, medical technologists, medical technicians and medical laboratory assistants. 

Required fall and spring.
Pharmacology

Department head: J.P. Long

Pharmacology: graduates in pharmacology, the science of drugs and their effects on living systems. They study the chemical structure, pharmacological properties, and therapeutic applications of drugs. Pharmacologists work in a variety of settings, including hospitals, pharmaceutical companies, government agencies, and research institutions.

Graduate Study

Prerequisites for graduate study include undergraduate coursework in chemistry, biology, and mathematics, along with a high level of past performance. Interested students are encouraged to apply.

M.S. Program

In cooperation with clinical departments within the College of Medicine, a Master of Science degree program in clinical phar-
Physical Therapy

Program director: Gary L. Scott
Associate director: Gary L. Sobelberg

Physical therapy offers a wide variety of opportunities for professionals in general or specialized hospitals, programs for crippled children, physicians' offices and physical therapy clinics, extended care facilities, nursing homes, community and governmental agencies, rehabilitation centers, the armed forces, foreign service and athletic departments. Additional career opportunities are available for those interested in educational programs of physical therapy and related professions.

Physical therapists participate in the evaluation of the capabilities and disabilities of patients. They administer treatment to alleviate pain, correct or minimize deformity and improve the general health and well-being of the patient. They instruct the patient, the patient's family or other personnel in the appropriate procedures for the patient's continuing care. They are also involved in the administration of physical therapy facilities, the supervision of support personnel and consultation with other health professionals.

Professional Program

The physical therapy program at The University of Iowa is fully accredited by the American Physical Therapy Association and the Council on Medical Education of the American Medical Association. Satisfactory completion of the curriculum qualifies candidates for the Professional Examination Service (P.B.S.) test for licensure in several states and the District of Columbia.

The two-year professional certification program consists of:

Semester I
60:109 Human Anatomy and Neuroanatomy 4 s.h.
101:115 Kinesiology 3 s.h.
101:131 Therapeutic Physical Agents 3 s.h.
101:141 Introduction to Physical Therapy 3 s.h.
69:203 Principles of Human Pathology 2 s.h.
63:161 Introduction to Biostatistics 1 s.h.

Semester II
60:110 Neurophysiology and Behavior 4 s.h.
72:150 Intermediate Physiology 5 s.h.
101:110 Therapeutic Exercise I 4 s.h.
101:118 Clinical Observation 3 s.h.
101:122 Emotional Aspects of Disability 2 s.h.
101:190 Electrotherapy 2 s.h.

Semester III
101:101 Introduction to Clinical Medicine and Clinical Sciences 4 s.h.
101:102 Fundamentals of Orthopaedics and Clinical Sciences 4 s.h.
101:111 Therapeutic Exercise II 4 s.h.
101:113 Principles of Neurology and Clinical Sciences 4 s.h.
101:119 Clinical Education and Rehabilitation 3 s.h.
101:103 Scientific Inquiry 1 s.h.
101:121 Physical Therapy Administration 1 s.h.
101:116 Radiology for Physical Therapists 1 s.h.

Semester IV
101:120 Clinical Internship 4 s.h.

Admission to the Professional Program

A new class is admitted each fall. Students may enter the program either following their junior year of college or after having earned a baccalaureate degree. A student entering the program after his or her junior year of undergraduate study must be able to satisfy all requirements for the Bachelor of Science degree in general science by successfully completing the first year of the physical therapy program.

Undergraduate students who complete their professional work at other colleges or universities must meet the general admission and graduation requirements of the College of Liberal Arts. They should consult with the University to plan their pre-professional studies to meet the requirements of the physical therapy program.

Regardless of academic preparation prior to admission, all students are enrolled in the same two-year professional curriculum leading to certification in physical therapy. To be considered for admission, the applicant should have:

Completed at least 94 semester hours of college work, including a complete introductory course in one advanced course in biology (12 s.h.), a complete introductory course in chemistry (eight s.h.), a complete introductory course in physics (eight s.h.), and a complete introductory course in psychology (six s.h.) and one college-level mathematics course (three s.h.); all science courses must be completed in the major department offering the course, and must include at least one-fourth laboratory instruction.

A minimum overall grade-point average of 2.7 (A-4).

A minimum grade-point of 3.0 in all courses in biology, chemistry, physics and psychology.

Graduate applicants must take the national Graduate Record Examination prior to admission. Undergraduates must take the GRE during the first year of professional training. Results of this
nicians, public health nurses, clinical nursing staff and social service personnel.

The physician's assistant program is an integral part of the College of Medicine. The first year of the program is taken at the University of Iowa Health Center. A major portion of the second-year clinical work occurs throughout the state in settings where primary care is practiced.

The program is 24 months in length and is broadly divided into three phases. The initial, didactic, phase consists of seven months of course and laboratory work in a number of basic science areas. Whenever appropriate, related subjects are integrated to provide sequential lectures, laboratory and clinical experience. A seminar course specifically directed to the behavioral sciences and analysis of health care systems is also offered during this session.

The second phase, Introduction to Clinical Medicine for Physician's Assistant Students, is an information bridge to clinical medicine, and develops the skills of history-taking, physical diagnosis and interviewing techniques.

The third, clinical, phase consists of supervised rotations in required and elective specialties. These rotations of four or eight weeks' duration allow the students to apply the knowledge gained in the didactic and pre-clinical phase of the program and to develop additional skills through individual, supervised instruction. The rotations are designed to provide opportunities for each student to become proficient in the history-taking and physical examination that may be peculiar to patients with various conditions. Inpatient clinical training is provided by the University of Iowa Medical Center and affiliated hospitals, as well as the model health care clinics at Oakdale and Muscatine. Students gain additional clinical experience through placement with selected preceptors involved in clinical work in private practice or in community hospitals.

The didactic and clinical phases of the program emphasize primary health care delivery and the use of physician's assistants on the part of the practice team. The program is integrated into the teaching of the College of Medicine, thus permitting a symbiosis to develop between various medical and health care professional students.

Professional Curriculum

First Year
71:125 Pharmacology for Health Sciences: Physician's Assistant 5 s.h.
50:105 Law and Medicine for Physician's Assistant Students 1 s.h.
66:111 Gross Human Anatomy for Physician's Assistant Students 6 s.h.
61:110 Microbiology for Physician's Assistant Students 3 s.h.
69:203 Principles of Human Pathology 5 s.h.
69:130 Clinical Pathology for Physician's Assistant Students 3 s.h.
72:164 Human Physiology for Physician's Assistant Students 4 s.h.
99:164 Biochemistry for Physician's Assistant Students 3 s.h.
50:121 Introduction to Clinical Medicine for Physician's Assistant Students 3 s.h.
117:101 Seminar for Physician's Assistant Students 0.3 s.h.

Second Year
Required clinical rotations:
70:555 Pediatrics for Physician's Assistant Students 6 s.h.
75:555 General Surgery for Physician's Assistant Students 6 s.h.
76:555 Internal Medicine for Physician's Assistant Students 6 s.h.
115:555 Family Practice for Physician's Assistant Students 6 s.h.

Elective clinical rotations: four to be selected from the following, to include, if available, the first two:
66:100 Obstetrics and Gynecology for Physician's Assistant Students 6 s.h.
73:100 Psychiatry for Physician's Assistant Students 3-6 s.h.
70:101 Child Health Care for Physician's Assistant Students 6 s.h.
70:102 Pediatric Elective for Physician's Assistant Students arr.
75:100 Emergency Room for Physician's Assistant Students arr.
76:102 Orthopaedics for the Physician's Assistant Students arr.
115:200 Family Practice Elective for Physician's Assistant Students arr.
78:100 Internal Medicine Elective for Physician's Assistant Students arr.

Faculty
All courses in the physician's assistant professional program are taught by College of Medicine departmental faculty members. The program is administered with advisory assistance from a committee appointed by the dean of the College and including medical faculty members, practicing physicians in private practice, health care administrative personnel and students currently enrolled in the program.

Expenses
In addition to tuition, room, board, books, supplies and other general University student expenses, students in the physician's assistant program are responsible for the purchase of their uniform and diagnostic equipment. Microropes are not required.

Financial Aid
In addition to the various forms of financial aid available to undergraduate students University-wide, a limited number of special tuition scholarships are available to students in the physician's assistant program, on the basis of need. These stipends will not be available after July 1977.

Admission Requirements
To be eligible for admission to the physician's assistant program, the applicant must have completed 60 semester hours of college study, including...

College of Liberal Arts general education requirements in the-
oric, physical education, and the historical-cultural, literature and social sciences core.

A complete introductory course in organic chemistry, which would ordinarily follow a course in general biology or in physical chemistry, is strongly recommended; and

A complete introductory and one advanced course in zoology or animal biology.

It is also strongly recommended, although not required, that the student's high school background include algebra, trigonometry and physics. Students who have already completed an associate of arts or a baccalaureate program at an accredited college of university automatically meet the Liberal Arts general education requirements.

The student must achieve at least a 2.5 grade-point average on the last 60 semester hours of college coursework undertaken. The admissions committee gives special attention to the applicant's performance in science courses.

Satisfaction of the basic admission requirements does not ensure acceptance into the physician's assistant program. The admissions committee selects the applicants it considers best qualified. Applicants with previous health-care experience involving direct patient contact receive preferential consideration. The committee may request interviews with selected applicants.

Admission Procedures

A new class begins each June. Applications are accepted beginning one year in advance, and close January 15. In addition to completing the general University admission application procedures, the physician's assistant applicant should present a detailed description of the applicant's medical training and experience, and at least three letters of recommendation.

Course

177/179 Seminar for Physician's Assistant Students 0-2 a.h.

Lectures, readings and group sessions dealing with topics of specific interest in physical medicine will be presented in the clinical program. Open only to students in the physician's assistant program.

Physiology and Biophysics

Department head: R.R. Pethick


Degree offered: M.S., Ph.D.

The Department offers advanced study leading to the doctorate in physiology and biophysics in preparation for professional careers in basic and applied biomedical research and teaching. It also participates in the professional education of medical, dental, pharmacy, physical therapy, nursing and physician's assistant students.

Graduate Study

The Department does not normally prescribe the undergraduate background for advanced study although candidates are expected to have strong backgrounds in basic biological and quantitative sciences, including calculus, physical chemistry and physics. Its students generally have backgrounds in biology, chemistry, physics, mathematics or engineering.

With the help of an advisory committee, the student develops a plan of study suitable to his or her particular background, needs and interests. Required courses are 72:212 Medical Physiology, 72:118 Endocrinology for Medical Students, 72:210 Neurobiology and Behavior. In addition, students take at least three advanced courses in physiology and biophysics, a course in advanced course in physical chemistry, if this requirement is not satisfied at the time of admission.

The usual time sequence for completion of requirements for the doctoral degree includes two years of coursework, including the comprehensive examination, and at least two years of original research, including preparation of a dissertation and its defense in a final examination.

Postdoctoral graduates are provided with tuition and stipend support as long as progress remains satisfactory. The Department also offers the Master of Science degree with thesis.

Facilities

The Department is housed on the top two floors of the Basic Sciences Building, a new facility providing outstanding space for research and teaching. In addition, a unit for research in neurophysiology is located at Oakdale Campus.

Faculty

Department members are active in many different areas of research. Current interests include cardiovascular physiology, membrane physiology, cellular and molecular endocrinology, neurophysiology, developmental physiology, respiratory physiology, renal physiology, gastrointestinal physiology, environmental physiology, exercise physiology, biophysics of excitation and conduction, biophysics of growth and biomedical engineering.

Admission

In addition to the University's general graduate admission requirements (see the Graduate College section of the Catalog), minimum requirements for admission to the graduate program in physiology include a 3.0 undergraduate grade-point average, two semesters of undergraduate coursework in life science subjects, a combined total of six semester hours in chemistry (through physical chemistry) and physics, and mathematics through calculus. An applicant deficient in the prerequisites may be admitted if he or she can make up the deficiency during his or her first year in the graduate program.

Course

72:13 Introduction to Human Physiology 4 a.h.

Basic concepts of human physiology. Prerequisites: Zoology 71:3, Chemistry 47:6 or equivalent, six credits of junior-year science.

72:101 Introduction to Biophysics 3 a.h.

Physical interpretation of biomechanical observations, topics in biodynamics, biomechanics, and flow and diffusion in living systems; discussions. Recommended prerequisites: one year of biology, six semester hours in mathematics and six credits of junior-year science.

72:102 Exercise Physiology 4 a.h.

Basic concepts of training and adapted adaptations to vigorous muscular activity. Prerequisites: 72:13, graduate standing or consent of instructor.

72:110 Neurobiology and Behavior 4 a.h.

Interdisciplinary study of organization and function of nervous system. Some as
Preventive Medicine and Environmental Health 369

Preventive Medicine and Environmental Health 370

Non-Departmental Medicine 50:18, Anatomy 60:15, who appropriate, assign-
ments modified for graduate students in physiology. Prerequisites: consent of course
director.

72:116 Endocrinology for Medical Students 3 a.h.
For graduate students, core course in endocrinology. Same as Non-Departmental Medicine 50:18 and Anatomy 60:18.

72:141 Analytical Study of Physiology 2 a.h.
Description of methods of physical and engineering sciences to provide a background
basic in appreciation of their training in biological systems; includes basic concepts
of physiology and their use in concepts depending upon physical theory. Prerequisites:
two years of physics + engineering coursework and introduction to differential equations.

Continuation of 72:141. Unless student requires particularly strong background,
72:141 will be a prerequisite to 72:142, but other as we have previously specified is
required.

72:150 Intermediate Physiology 3 a.h.
Prerequisites: consent of instructor and graduate students with background in biology, chemistry and
mechanics. Prerequisites: consent of instructor.

72:154 Intermediate Physiology 3 a.h.
Principles of physiology and detailed treatment of organ systems and cell types.
Prerequisites: consent of instructor and graduate students with background in biology, chemistry and
mechanics. Prerequisites: consent of instructor.

72:164 Human Physiology for Physicist's Assistant Students 4 a.h.
Prerequisites: consent of instructor and graduate students with background in biology, chemistry and
mechanics. Prerequisites: consent of instructor.

72:186 Research in Physiology and Biophysics 3 a.h.
Prerequisites: consent of instructor and graduate students with background in biology, chemistry and
mechanics. Prerequisites: consent of instructor.

72:203 Advanced Excretion Physiology 3 a.h.
Prerequisites: consent of instructor and graduate students with background in biology, chemistry and
mechanics. Prerequisites: consent of instructor.

72:211 General Physiology 3 a.h.
Prerequisites: consent of instructor and graduate students with background in biology, chemistry and
mechanics. Prerequisites: consent of instructor.

72:212 Advanced Excretion Physiology 3 a.h.
Prerequisites: consent of instructor and graduate students with background in biology, chemistry and
mechanics. Prerequisites: consent of instructor.

72:213 General Physiology 3 a.h.
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72:213 General Physiology 3 a.h.
Prerequisites: consent of instructor and graduate students with background in biology, chemistry and
mechanics. Prerequisites: consent of instructor.
A limited amount of financial assistance is available within the department.

Admission
Application deadlines for the fall and spring sessions are April 1 and October 1, respectively. No entering students are accepted for the summer session.

Minimum GPA requirements are 2.7 for the Master's, 3.0 for the Ph.D. A minimum combined GRE score 1500 is needed.

Undergraduate or major coursework required for graduate admission is science in mathematics, depending on graduate program of study.

Whether possible, a personal interview with the prospective student is desirable. Always required, however, are three letters of recommendation.

Courses
301 Health Science I
302 Health Science II
303 Public Health Assessment of Food and Housing
304 Preventive Epidemiology
305 Design and Analysis of Experiments in the Biomedical Sciences
306 Introduction to the Design of Sampling Surveys
307 Epidemiology
308 Medical and Preventive Biostatistics
309 Controls and Experiments
310 Introduction to the Design of Sampling Surveys
311 Experimental Design
312 Introduction to Biostatistics
313 Probability and Statistics for Biologists
314 Introduction to Biostatistics
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370 Introduction to Biostatistics

Physical, biological and social factors of the environment and the manner in which they influence the health of the individual or groups of individuals. The teaching of preventive medicine and environmental health at Iowa began in 1885, when a course in sanitary science and public health was introduced. The present Department was established in 1921.

Since its inception, the Department has continued to offer courses in many areas of preventive medicine and public health, including epidemiology and communicable disease control, institutional and food sanitation, industrial hygiene, biometry, health services research, comparative medicine, agricultural medicine, and many other areas related to the health of communities. Many graduates of the Department have gone on to national and international achievement in public health work.

In 1955 the Department sponsored the development of the Iowa College of Agriculture, the first in the western hemisphere dedicated to the study of the occupational health problems of the agricultural worker. The varied programs of the Institute provide practical training for students of the health professions as well as for medical students at the graduate and postgraduate levels, and reflect a special interest in our rural environment.

The Department has an expanding and comprehensive biostatistics program, which offers both graduate and undergraduate instruction. Besides individual research in statistical methodology, extensive collaborative research is done with other departments, particularly in the College of Medicine. Departmental programs are enhanced through affiliations with the State Hygienic Laboratory, the University Environmental Health Service, Student Health Service, College of Engineering, the Health Services Research Center, and many regional health care delivery programs.

Medical epidemiology, while also linked to the clinical activities in the University Hospitals, is primarily oriented toward the community. Teaching and research are concerned with basic epidemiologic methods, but the emphasis is on application to community health problems. Areas of specific interest include the organization and developping of local descriptive and analytic epidemiology and control of both acute communicable and chronic diseases as well as clinical epidemiology. There is a special emphasis within the Department on the epidemiology of cardiovascular diseases and cancer.

Sampling and specific control programs include assistance in the development of evaluation of new primary care health centers, conduct of a summer medical student primary care program for migrant farm workers, survey of health service utilization behavior in Iowa communities, cardiovascular disease and hyperten- sion across generations, cancer epidemiology through the Iowa State Cancer Registry and the Iowa Cancer Epidemiology Research Center (both based within the Department), the epidemiology of acquired disease associated with encephalopathic E. coli, major participation in evaluation of health services research activities on a university-wide basis, the study of health effects of pesticides, the study of agricultural worker accidents and trauma, and many others. Consultation on epidemiologic problems is given widely in diverse areas of research and applied clinical and community activities.

The master's program offers a degree with an emphasis on environmental health, biometry, epidemiology, or a general track for those who are already health professionals. The Ph.D. program is available with an emphasis in epidemiology, biometry, environmental health, or health services research.
students with a background of study in physics, chemistry, math-
ematics, biology, health sciences, veterinary medicine or engi-
neering. Obviously, the M.S. in this or a related field is required
for admission to the Ph.D. program, but consideration will be
given to other modes of qualifying.

After completion of the introductory course, the student may
emphasize a particular aspect of the field. The details of the
program are built around previous training, interests, abilities and
career objectives. Some students elect to emphasize training in
physical aspects, such as radiological physics or health physics.
Others major in biological aspects. In either case, a broad base
rather than complete specialization is the goal. In addition to
formal lectures, the programs involve small group conferences and
discussions. Laboratory exercises are emphasized, and the student
has the opportunity to become familiar with many types of
instruments and techniques. It is recommended that a candidate
for the Ph.D. have a reading knowledge of scientific French or
German and competence in biological statistics or computer pro-
gramming before taking the final examinations. Students will have
at least one semester of experience as a teaching assistant and at
least one as a research assistant.

Special Programs
Postdoctoral training is available by arrangement with the program
chairman and individual faculty members.

Special Facilities
The Radiation Research Laboratory has an X-ray generator and
other radiation sources. Students and staff members also have
access to other radiation sources, such as the Co-60 gamma source
in the Department of Radiology and the reactor of the Biology
Division at Argonne National Laboratory.

The Radiation Research Laboratory has a variety of radiation
detectors and counters, including liquid scintillation counters and
small animal whole-body counter, and it has access to the human
whole-body counter at the Iowa City Veterans Administration
Hospital.

The laboratory also has an electron spin resonance spectro-
cometer, a scanning electron microscope, an automatic cell counter
and particle size, an electron microscope and shadow casters, and
facilities for preparing histological sections of tissues—fixed or
fresh—and autoradiographs.

Three air-conditioned rooms provide convenient housing for the
small laboratory animals used in research and teaching.

Departmental Financial Aides
Graduate students are supported as research assistants when pos-
sible from funds available through research grants or contracts as
well as teaching assistantships from departmental funds. Some awards
are also available to graduate students and postdoctoral students
through the U.S.P.H.S. Research Service Award program to
support training in biomedical radiation research. Individual pos-
doctoral awards are also possible and are applied for jointly by a
candidate and the faculty sponsor.

Courses
77F01 Introduction to Radiation Biology 4 sch.
Characteristics of biological effects of ionizing radiation, properties and use of
radiation in biology, some basic biology for protection problems. Every
fall and every other summer or odd years. Prerequisite: consent of instructor.
77F06 Environmental and Radiological Health Physics 3 sch.
Radiation hazards, control regulations, problems of design and use of radiation
facilities in medical, academic and industrial situations; exposure and dose mea-
surements in radiation environments. Fall, even years. Prerequisite: 77F01 or
knowledge of physics or chemistry.
77F07 Seminar: Radiation Research 1 sch.
77F08 Seminar: Radiation Research 1 sch.
77F09 Seminar: Radiation Research 1 sch.
77F11 Physical of Radiation 4 sch.
Radiation physics, physical characteristics of nuclear radiations and philosophy
development of radionuclides of elements and the nuclear properties of X-rays and
gamma rays and their interaction with matter; radiation exposure and
protection; instrumentation; radiological target density. Fall, even years.
Prerequisite: 82 sch. of physics and consent of instructor.
77F12 Physical of Radiation 4 sch.
Properties of radioprotection, mechanisms of radiation injury, dose fractiona-
tion and survival, radionuclides, electron and proton radiobiology and radiobiology.
Spring, even years. Prerequisite: 82 sch. of physics and consent of instructor.
77F14 Radiobiological Research 4 sch.
Radiobiology of organ systems in mammals, spleen and bone marrow transplan-
tation, organs which modify radiation response, radiation environment. Spring,
odd years. Prerequisite 77F12 and consent of instructor.
77F15 Cellular Radiobiology 4 sch.
Radiobiology and cell growth, mutagenesis, differentiation and function; modification
of radiation effects on immune system; cell lineages of tumor and host tissue.
Spring, even years. Prerequisite: 77F14 and consent of instructor.
77F16 Radioisotopes in Clinical Investigation 4 sch.
Radioisotopes in number of biological systems; eight-week emphasis on beta
emission, especially bone scintillation scanning; second eight weeks deal with doses of
gamma emitters. Spring, even years.
77F17 Radioisotopes in Clinical Investigation 4 sch.
Practical and use of function lamps (including 131I, 32P, 90Sr, 141Ce, 67Ga,
investigation. Summer, even years. Prerequisite: 77F16 or consent of instructor.
77F18 Research: Radiobiology 4 sch.
77F22 Special Topics 4 sch.
77F24 Special Topics 4 sch.
77F28 Thesis 4 sch.
77F30 Thesis 4 sch.

Radiology
Department head: James H. Christie
Faculty: professors Robert C. Bowen, James H. Christie, William N. Cohen,
Steven T. Correll, Kenneth D. Dobson, Herbert A. Jackson, Howard S. Lassuere,
James W. Whalen; clinical instructors David N. Alagona, Christopher E. Bicker, William
P. Cermak, C. L. Cleaves, C. J. Cullen, J. O. H. Diamant, Stephen T. Fennell, Michael
J. Freedman, Charles E. Gidal, Robert R. Silbert, Charles A. Staub, Scott T. Swanson,
Wallace H. Symes. Associate professors M. K. Reilly, J. R. deB. Stromski, J. J. M. D. van
Emden, Elinor F. Weil, Donald J. W. Williams, Andrew R. Zuckerman.

The Radiology Department’s teaching program is designed to meet the
variable needs and interests of fourth year medical students in diagnostic
radiology, nuclear medicine and radiation therapy.

Rotations through the various subdivisions of radiology—chest,
gastrointestinal, gynecological, head and neck, nuclear medicine,
orthopedic, pediatric, special procedures and therapy—will be
designed according to the area of interest of each student who
chooses this rotation.

Courses
74F01 Clinical Radiology 4 sch.
Clinical rotation in radiology of chest, bowel, abdomen, head and neck, pediatrics,
angiography, neuroradiology, otolaryngology, surgery, and inclusion of radiation therapy.
Students work four, weeks, offered June through July, one week of each of the
following rotations: chest, abdominal, head and neck, pediatrics.
74F05 Research for Physicians’ Assistants 4 sch.
74F06 Nuclear Medicine Prerequisites 4 sch.
Clinical rotation in nuclear and special imaging in vitro laboratory. Offered first
Physical Therapy

examination must be mailed to The University of Iowa. Applications must be made to the Director of Admissions, The University of Iowa. Personal interviews may be required. Applicants will be contacted for appointment if interviews are desired. The physical therapy admissions committee selects the applicants who appear to be best qualified for the study and practice of the profession.

Applications are accepted beginning September 1 for the following year. Prospective students are urged to apply as early as possible. The closing date is February 1.

Master of Arts

The purpose of the Master of Arts degree program in physical therapy is to provide opportunities for advanced learning experiences in the research, teaching and clinical care areas. Biological, mechanical and psychological bases and associated applications to physical therapy (prevention, evaluation and treatment) are emphasized for movement disorders of the musculoskeletal, neuro-muscular and cardio-pulmonary areas. The program is sufficiently flexible to accommodate elective pursuits commensurate with the student's ability and interest.

Program Requirements

The program requires 30 semester hours of graduate work beyond the professional certification. A thesis is required.

Required Courses

101:301 Thesis Physical Therapy 6 s.h.
101:361 Introduction to Biostatistics 3 s.h.
72:102 Exercise Physiology 4 s.h.
27:241 Scientific Principles of Physical Conditioning 3 s.h.
101:213 Principles of Human Motion I 4 s.h.
101:275 Evaluation of Neurological Disorders 3 s.h.
101:326 Analysis of Scientific Literature 3 s.h.

Recommended Courses

101:212 Medical Instrumentation 2 s.h.
101:303 Principles of Human Pathology 3 s.h.
101:305 Electromyography in Kinesiology and Biomechanics 3 s.h.
71:161 Designing Learning Programs for Health Careers Education 3 s.h.
71:162 Learning Strategies for Career and Educational Counseling 3 s.h.
78:248 Data Processing 3 s.h.
78:150 Educational Measurement for the Classroom Teacher 3 s.h.
63:171 Problems in Preventive Medicine 3 s.h.
75:105 Selection and Utilization of Educational Media 3 s.h.
27:312 Selected Issues in Information Processing and in Motor Control 3 s.h.
31:123 Psychology of Learning 3 s.h.
101:280 Practicum: Teaching Methods and Design 3 s.h.
101:281 Teaching Practicum 3 s.h.
101:290 Advanced Electrotherapy and Electrodiagnosis 2 s.h.
101:325 Independent Study 3 s.h.
101:327 Research in Therapeutics 3 s.h.

Elective Courses

Students are encouraged to seek out appropriate elective courses.

Admission

To be considered for admission to the master's degree program, the applicant must be a graduate of an approved professional program of physical therapy, meet the admission requirements of the University of Iowa Graduate College and pass the professional licenses examination for physical therapists.

Facilities

Perm-mold associated with the program have access to the physical therapy and orthopedic-biomechanics laboratories, and to the biomechanics laboratory in the College of Engineering. These laboratories are equipped with instrumentation—computers, oscilloscopes, electromyographs, electromyostressors, force plate, high-speed camera, motion analyzer, accelerometers and force plate—needed to solve problems of forces and motion associated with the human in the normal and abnormal states.

The master's degree program in physical therapy is an integral part of collaborative studies of medical problems with orthopedics, engineering, cardiology, physiology, anatomy, pediatrics and osteopathy; the master's degree program and the Physical Therapy Clinic interact in terms of conferences, teaching, patient care and research.

Financial Support

The program strives to provide financial assistance for all full-time students.

Doctor of Philosophy Program

The physical therapy program coordinates a Ph.D. program for physical therapists. Prerequisites to the program are calculus, licensure as a physical therapist and a master's degree. The purpose of the program is similar to the master's degree program except that greater breadth and depth in research, teaching and clinical capabilities are emphasized for one area of physical therapy specialization—musculoskeletal, neuromuscular or cardio-pulmonary. The program consists of the Department of Physical Education for Men (see College of Liberal Arts). The program is designed to produce professionals with advanced training for positions of leadership in physical therapy to include graduate and professional educational programs in physical therapy.

Courses

(May be taken only by students in the professional program.)
101:161 Introduction to Clinical Medicine and Clinical Reference 3 s.h.
101:162 Fundamentals of Orthopaedics and Clinical Reference 3 s.h.
101:163 Fundamentals of Orthopaedics and Clinical Reference 3 s.h.
101:164 Fundamentals of Orthopaedics and Clinical Reference 3 s.h.
101:165 Fundamentals of Orthopaedics and Clinical Reference 3 s.h.
101:166 Fundamentals of Orthopaedics and Clinical Reference 3 s.h.
101:167 Scientific Inquiry 1 s.h.

Formal lecture and reading assignments are used to develop and maintain the concepts of the scientific method. Students are required to write and present a paper which...
The Faculty

Special faculty strengths are centered in the fields of pathophysi- ology and problems of acute burns, organ transplantation, the surgical control of morbid obesity, inflammatory bowel disease, the pathophysiology of biliary tract disease, pediatric surgery and thoracic surgery. The combine of cardiovascular and neurological sur- gery have particular expertise in the clinical management of the spectrum of diseases in their specializations.

Courses

7:25 Basic Emergency Skills

8 a.m.
Supervised patient care in emergency medical techniques; emphasis on practical exercises and application of lecture material.

7:05 Clinical Surgery

6:50 a.m.
Six-week course in clinical surgery; required of junior medical students.

7:15-160 Principles of Surgery

[ ]

7:25 Principles of Surgery

6:50 a.m.
Lectures on Trendelenburg.

7:15-160 Principles of Surgery

[ ]

7:25 Principles of Surgery

6:50 a.m.
Lectures on Trendelenburg.

7:15-160 Principles of Surgery

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7:25 Principles of Surgery

6:50 a.m.
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7:15-160 Principles of Surgery

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7:25 Principles of Surgery

6:50 a.m.
Lectures on Trendelenburg.

7:15-160 Principles of Surgery

[ ]

7:25 Principles of Surgery

6:50 a.m.
Lectures on Trendelenburg.

Courses in surgery provide opportunities for a unique combination of patient-care-oriented experience and basic surgical research designed to give the interested student an awareness of the place of surgery among the physician's skills.

Courses are available only to medical students and qualified

students in associated health sciences.

The student in surgery develops awareness of surgical therapy's place in the treatment of disease. Emphasis is placed upon basic
equipment techniques; traumaology; oncology; burns; gastrointestinal
problems; thoracic, thoraco-abdominal and vascular tract disease; endocrine disease; transplantation processes; vascular surgery; thoracic and cardiovascular surgery; and neurosurgery. Emphasis is placed upon patient-oriented care and practical exercises correlated with operating room experi-
egnences. Lectures and conferences are regularly scheduled on specific

topics. Courses in selected topics of surgical research, inde-

pendent study and clinical experiences are available to individual

four-year students by special arrangement with the faculty.

Facilities

The Department has adequate surgical patients for training. Spe-
cific areas include the Burn Unit, the only one of its kind in the
state, which provides adequate patient material for both clinical and basic science research.

Laboratories provide equipment, space and technical expertise necessary to support teaching and a wide spectrum of clinical and

scientific research. Included are two laboratories: Animal Operating; Tissue Culture; Gastroenterology; Microbiology; Pe-

ripheral Vascular; Transplantation; Organ Preservation; Cardio-

vascular; and Neurosurgery (Stomatocles).
student expected to write report on end of task or for project. See Department head for ongoing project. Precise purpose of internates.

72:522 Clinical Cardiovascular Surgery... prec. Students may come to认识en to caseload or cardiac surgery, examine at all scheduled conferences of Directors, attend weekly morbidity and mortality meetings; time on service expected to be equal to time spent in lecture classes, weekly journal club meetings, and postgraduate conferences.
Preceptors: 75-7.5 and consent of instructor.

72:523 Research Cardiology Fellowship.
Short or long-term research project assigned with Instructor may involve clinical material or laboratory investigations of pathophysiological mechanisms.
Preceptors: consent of instructor.

72:524 Surgical Extremity of Veterans Administration Hospitals, New Orleans.
Consent on genetics, thoracic or vascular surgery; participates in conferences, ward work, operating room and research laboratory. Evaluation by examination. Rooms, board and laundry provided. Precursors: 75-2.5 and consent of instructor.

72:558 General Surgery for Physicists Assistant Students.
Aranged by student with approval of Department.

72:590 Special Studies on Campus
Aranged by student with approval of Department.

72:590 Special Studies off Campus
Aranged by student with approval of Department.

Urology

Department Head: David A. Cole

Fellows: Associate Professor Raymond Tregge, David A. Cole: associate professor William Xerey, Charles Xerey; associate professor Stella Lawrenz; associate Bernard Fouts

Modern urology is concerned with diseases of the male urinary tract of the male and female, and with the male genital tract. It includes urologic pathology, diathermy, transplantation, the very broad area of urological oncology, urologic endocrinology and the broad area of pediatric urology. In addition to the areas of general urology, such as urologic stone, urinary tract infections, diagnostic urology and the urology of urinary tract cancer.

The Department offers courses in all these fields, at the undergraduate and graduate level and in continuing education for the delivery of care in the field of urology.

In the first part of the year, the Department participates with several of the basic science departments in cooperative endeavors to teach the relationship of urology to the basic sciences. This is especially true in anatomy and pathology. In urology, as it relates to transplantation and to cancer, the Department participates actively with the Department of Microbiology.

The Department participates very actively in introduction to Medicine, which involves the entire second semester of second-year medicine. The Department offers courses which are intended to introduce the diagnosis and treatment of diseases involving the genitourinary tract in the male and the urinary tract in the female as well.

In the third and fourth years of the curriculum in medicine, the Department offers courses in diagnostic urology, radiologic urology, urologic oncology and the entire field of urology. In the required third-year clerkship, the Department offers the basics of this material, and in the fourth year it offers advanced elective courses of intensive study in these areas.

Continued education is offered throughout the year for urologic and family practitioners.

These activities are conducted by many well-trained staff members in the various areas, whose members have intense interest in certain areas, including pediatric urology, reproductive physiology, urologic oncology, and transplant urology.

A special area, in which the Department has extended interna-
Urology

urine specimens; or withdrawal of course, thesis prepared on some aspect of one of
these topics, written examination.

78/116 Basic Endocrinology and Reproduction

78/151 Basic Endocrinology and Reproduction

78/166 Laboratory and Reproduction

78/177 Transplantation Seminar Effective

Collaborative course in medicine, general surgery, pediatrics and urology, pro-
viding introduction to genetics and immunology of transplantation at the level of
clinical application, possibly in chronic renal failure; each course is an
individualized program of guided literature review, clinical exposure and research
laboratory participation. By special arrangement with the Department of Urology, there
may be experience in chronic renal failure and dialysis, surgical and medical management
of transplant patients, transplantation and immunology research; detailed plans
should be made at least two quarters in advance of course.

79/897 Special Studies on Campus

Individually arranged by student with the approval of the Department.

79-T Special Studies on Campus

Individualized program of study arranged by student and departmental
representatives of the medical school staff, provided the project is a
research project. Project may not be started without permission of Department head; upon
completion of project, thesis prepared followed by oral examination.
College of Nursing

Dean: Beth A. Bartlett
Deans' Office, Graduate Programs: Lisa H. Roche
Assistant dean, undergraduate programs: Patricia A. Oster

Nursing offers the advantages--hardly less important--of full participation in the social, cultural and recreational activities of a highly diversified campus community. In nursing no less than in other pursuits, a college or university background enables many young people not only to realize their highest career potentialities, but to achieve the greater measure of self-fulfillment in life.

The baccalaureate program is designed to provide both liberal and professional education. The basic 28-semester-hour program consists of 35 semester hours of general education courses, 40 semester hours of supportive pre-nursing courses and 53 semester hours of coursework in nursing. The program is designed to be flexible, so that the student may complete it in less than four academic years, or may take longer. Enrollment in nursing courses during one summer session is required of all students. Therefore, most students complete the program in four academic years and one summer session.

Course offerings are based on the concepts of health, deviations from health and nursing intervention, and are presented in progressive levels of complexity from the sophomore through the senior year.

The curriculum reflects the current trend in health care delivery toward greater emphasis on nursing as a service rendered outside hospitals and to other than the acutely ill. The curriculum provides for nursing electives and permits the selection of an area for beginning concentration in the senior year.

With the first nursing course, the student will have the opportunity to apply his or her learning by caring for individuals in a variety of settings.

Approaches to the College of Nursing

The student may complete the entire program at Iowa, enrolling the first year in the University's College of Liberal Arts, or transfer from an institution offering a two-year sequence of specific courses approved by the College of Nursing.

Cooperating state institutions in the two-year transfer plan include: Iowa State University, the University of Northern Iowa, and Upper Iowa University. Each of these institutions has approved the curriculum offered to the Iowa College of Nursing.

Contact the College of Nursing for more information on this cooperative arrangement.

Registrar's Office

With some modifications, registrars of colleges in the baccalaureate program in nursing at Iowa complete the same liberal arts and science courses as students with no previous nursing preparation.

Registered nurses planning to enter the
baccalaureate program at Iowa should obtain special information and advice from the College of Nursing.

Admission

High School Background

There are no specific high school course requirements for admission to the College of Nursing, but the College strongly recommends four years of English, two years of history, two and a half years of mathematics and one year each of biology, chemistry and physics, plus other college preparatory courses selected with the help of the high school counselor.

College Background

Applicants for admission to the undergraduate program in nursing must present a minimum of 30 semester hours completed in an accredited college, including three of the five required biological science courses and satisfaction of the following general education requirements:

- Rhetoric—Eight semester hours (may be satisfied by testing for advanced standing, and if the student has earned six semester hours of credit in English composition, the speech component may be completed after admission). Mathematics—Two and one-half years of high school mathematics, a satisfactory score on the mathematics battery of the American College Test, or completion of a college course in mathematics comparable to or higher than intermediate algebra (Mathematics 22M:1); Chemistry—High school chemistry or its equivalent (if taken at the college level it may be included in the 30 semester hours required for graduation); Mathematics—High school physics or its equivalent (if taken at the college level it may be included in the 30 semester hours required for graduation).

Four semester hours in the historical-cultural core area and four semester hours in literature are required for graduation in nursing, and may be included in the 30 semester hours presented for admission.

Pre-Clinical Background

Including the biological science courses required for admission to the College, the student must satisfy the following requirements before beginning clinical nursing coursework:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Biology</td>
<td>5 s.h.</td>
</tr>
<tr>
<td>Chemistry (Organic and Biochemistry)</td>
<td>5 s.h.</td>
</tr>
<tr>
<td>Anatomy</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>Physiology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>Microbiology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>Nutrition</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>Psychology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>Sociology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>Anthropology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>Human Development and Behavior</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

Standards

To be considered for admission to the College of Nursing, the applicant should have satisfactorily completed college coursework taken.

The American College Test

All applicants for admission to The University of Iowa must complete the American College Test. For information on the test, write to the American College Testing Service, Box 451, Iowa City, Iowa 52240.

Selection Factors

Fulfillment of minimum admission requirements does not guarantee admission to the College of Nursing. From applicants who meet minimum requirements, the College’s admission committee selects those who appear to be best qualified. The committee may require personal interviews. A physical examination is required prior to final admission.

Application Deadlines

Applications must be received by March 15 for the fall semester, June 15 for the spring semester and January 15 for the summer session. Early application is urged.

Faculty Advisors

Advisors from the College are available to help prospective nursing students plan their programs, and each student in the College works with a faculty advisor.

Expenses

Students pay the general University fees throughout the program, and purchase their own uniforms. The cost of a uniform order currently is about $60. Students must also purchase white shoes, a stethoscope and a watch with a full-sweep second hand. Students may need to provide their own transportation once enrolled in clinical nursing courses.

Financial Aid

In addition to the assistance available to University students generally, there are assistance programs specifically for nursing students. For further information about financial assistance, write to the University Office of Student Financial Aid.

Student Organizations

College of Nursing students have their own Associated Nursing Students and are also eligible for membership in the state and national associations of nursing students.

Master of Arts

Accredited by the National League of Nursing, this program offers majors in medical-surgical nursing, nursing of children, mental health nursing and nursing service administration. It provides preparation for positions in nursing as clinical specialists, teachers, supervisors or administrators. Curricula are designed in three semesters, or two semesters and a summer session.

Degree Requirements

Thirty-two semester hours are required in each major for the master’s degree.

Research Core, required of all degree candidates

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Methods of Nursing Research</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>Nursing Research</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>


Medical-Surgical Nursing
96:232-233 Advanced Medical-Surgical Nursing 1-II 12 s.h.
96:299 Thesis 6 s.h.
Electives from one related area (physiological or behavioral sciences) 9 s.h.

Nursing of Children
96:206 Perspectives in Nursing 2 s.h.
Electives (from relevant areas) 11 s.h.
Thesis 6 s.h.

Mental Health Nursing
96:706 Perspectives in Nursing 2 s.h.
96:250-254 Required Advanced Mental Health Nursing Courses 13 s.h.
96:255-259 Mental Health Nursing Electives 6 s.h.
96:299 Thesis 6 s.h.

Nursing Service Administration
96:206 Perspectives in Nursing 2 s.h.
96:260-262 Nursing Service Administration I-III 3 s.h.
96:268-269 Clinical Nursing I-II 6 s.h.
Electives 6 s.h.

Admission
Graduate students in nursing register in the Graduate College and degrees are conferred by that college. The general admission requirements of the Graduate College apply (see "Graduate College"), with the following special requirements:

A baccalaureate degree in nursing from a program accredited by the National League for Nursing (other applicants will be considered on an individual basis);

Completion of a basic statistics course prior to admission or in the first semester.

It is also recommended that one of the three required letters of recommendation pertain to the candidate's nursing competency. Registration for elective requirements is possible in any term, but initial enrollment in advanced nursing courses which are offered sequentially is usually in the fall semester.

All regulations of the Graduate College pertaining to academic standing, probation and dismissal are applicable to graduate students in nursing. Transfer credit applicable to the degree is limited to eight semester hours, and must be approved by the dean and advisor. A thesis is required of students in the medical-surgical nursing major, and may be selected by others. A major paper or project is included in the final course in all other majors for non-thesis students. A written general examination is required of all degree candidates.

Continuing Education
The College offers non-academic, short-term programs and special projects for registered nurses. They are scheduled both on and off campus. Continuing education units (CEU) are awarded for each offering on the basis of one unit per ten hours of instruction.

Pediatric Nurse Practitioner Training Program
This four-month certificate program jointly offered by the Department of Pediatrics of the College of Medicine and the College of Nursing prepares registered nurses to function as pediatric nurse practitioners in an expanded role on child health care teams, in clinics and in pediatrician's offices. Program requirements:

96:142 Seminar for Pediatric Nurse Practitioners 6 s.h.
70:100 Practicum for Pediatric Nurse Practitioners 3 s.h.

Clinical experience in the care of children is provided in the University of Iowa Hospitals and Clinics and other preceptorships in the local area. The program can be completed in one semester.

Admission
Applicants must be registered to practice professional nursing in Iowa (or be eligible for licensure by endorsement) and have one year of experience in child health care delivery. The general requirements for admission to the College of Nursing apply. Graduate students may enroll for the program as described either prior to or following the required courses in advanced nursing for children.

Facilities
The Nursing Building is centrally located on the University's main campus in close proximity to the colleges of Medicine, Pharmacy and Dentistry, University Hospitals, the Basic Science Building and the Health Sciences Library.

Completed in 1971, the Nursing Building consists of five floors with varied and specialized facilities. Administrative offices are located on the first floor. Faculty offices and core classrooms are on every floor except the second, which is utilized entirely for classrooms, laboratories and the Learning Resource Center. Additional classrooms and laboratories are located throughout the building.
College of Nursing

Courses

Undergraduate

96:00 Introduction to Health and Health Care Services 3 s.h.
Overview of health and health care services, with emphasis on concept and philosophy of health, various factors affecting health, current health care systems and trends in health delivery services.

96:00 Human Development and Behavior 3 s.h.
Developmental stages of human organism from conception through senescence, physiological, intellectual, emotional and social aspects. Prerequisite: Psychology 31:1 or 31:2.

96:01 Nursing I 5 s.h.
Course in the nursing process with primary emphasis on the assessment phase. Skills with measurement tools, observation and observation, establishment of effective nurse-patient relationships, increased self-assessment, and ability expected to make inferences concerning individuals' or family's view of health, based on data obtained; learning experiences in a variety of settings with families and individuals of varying ages and of differing stages of development and health.

96:05 Pathology
Introduction to common physiological and psychological disorders of humans; emphasis on causes that either to the body's response during illness and the methods used to correct these changes.

96:05 Nursing II 5 s.h.
Health maintenance and disease prevention in individuals, families and groups; initiation and maintenance of health throughout life cycle considered in terms of home health care; emphasis on beginning interventions and evaluation skills for initial problem, counseling and continued assessment in a variety of settings. Prerequisite: Nursing I.

96:05 Nursing III 5 s.h.
Nursing interventions in crisis situations of acute illness; emphasis on understanding of stress, coping, loss, homeostatic imbalance and other significant factors upon individuals whose psychological condition precipitates crisis situations. Prerequisite: Nursing II.

96:04 Nursing IV 5 s.h.
Anxiety and children in coping with health crises which have long-term implications; particular focus on nursing intervention and evaluation, working with individuals, families and groups in adapting life-stages to chronic health situations. Prerequisite: Nursing III.

96:08 Nursing V 5 s.h.
Leadership related to independent nursing practice and interprofessional collaboration; group process, decision-making, teaching, strategies of persuasion; professional roles, orientation for creativity and professionalism in planning for professional growth.

96:08 Nursing in the Social Order 5 s.h.
Variety of factors, including individual and social role and role in relation to current nursing issues and trends; professional nursing's heritage and responsibilities.

96:10 Individual Study
Supervised study and/or clinical practice assigned to needs of student.

96:10 Human Sexuality 3 s.h.
Psychological and physiological systems of human sexuality presented in physical, social, and emotional development, and their implications for individual counseling. Prerequisites: Psychology 31:1 or 31:2.

96:11 Family Dynamics 3 s.h.
Interactive patterns that occur within "normal" and "pathological" families; emphasis upon identification and improvement of family dynamics to help the family deal with a selected health problem. Prerequisites: Psychology 31:1, 31:2.

96:11 Family Planning and Dynamics 3 s.h.
Family planning and contraception with emphasis on concepts and socio-economic influences, psychological aspects, communication skills and teaching-learning processes.

96:10 Loss and Death in Clinical Nursing Practice 3 s.h.
Exploration of feelings and thoughts clinical in dealing with loss and death in the clinical nursing practice. Prerequisites: Nursing 31:2.

96:10 Leadership in Groups 3 s.h.
Identification of various types and levels of groups, exposure of observational and integrative skills of group members' behaviors and interactions, recognition and utilization of popular group dynamics, development of leadership skills in helping groups, utilization and evaluation of helpful group leader operations and assessment of leader's own role functioning within a group. Prerequisite: Psychology 31:1.

96:13 Institute Gerontology 3 s.h.
Analysis of the many of institutionalized gerontological client and community factors in assessing and planning for the institutionalized aged. Prerequisite: Psychology 31:1.

96:12 Nursing Care of the Hospitalized Orthopedic Patient 3 s.h.
Pathological, remedial, and rehabilitation problems in special hospitalization of orthopedically impaired, primarily in surgical patients, and in patients with severe injuries requiring hospitalization and family care with the existing health potential. Prerequisite: Psychology 31:1.

96:12 Nursing Care of the Adult Experiencing Surgery 3 s.h.
In-depth study of knowledge and skills needed in planning and caring for patients who are experiencing surgical interventions, with focus on the preoperative, therapeutic and postoperative periods. Prerequisite: Psychology 31:1.

96:13 Sensory Deprivation 3 s.h.
Termination of the concept of sensory deprivation with applications to clinical areas in situations to prevent or decrease effects of sensory deprivation. Prerequisite: Psychology 31:1.

96:13 Acute Care of the Patient 3 s.h.
In-depth study of the knowledge and skills needed for care for patients who have experienced acute or critical illness with emphasis on assessment of critical status, medical treatment, and psychiatric care in critical patient situations. Prerequisite: Psychology 31:1.

96:13 Interpretation of Care for the Aged 1 s.h.
Introduction to the knowledge and skills necessary for anticipating, recognizing and meeting various elderly anticipations. Prerequisite: Psychology 31:1.

96:10 Gerontology Nursing 3 s.h.
Development of knowledge and skills in caring for the elderly with emphasis on incidence, etiology and the psychological processes of aging, the diagnosed and undiagnosed illness and prevention of complications. Prerequisite: Psychology 31:1.

96:10 Nursing Care of Adult Patients with Altered Levels of Awareness 3 s.h.
In-depth study of knowledge and skills needed in assessing and caring for patients with altered levels of awareness due to physiological processes. Prerequisite: Psychology 31:1.

96:10 Geriatrics or Other Developmental Disabilities 3 s.h.
Study of aging related to genetic and birth defects, utilization of knowledge along with knowledge of family dynamics, growth and development, counseling, and psychiatric care and measures in working with families who have a genetic or congenital disorder. Prerequisite: Psychology 31:1.

96:10 The Mental Health-Vital Health Development and Care 3 s.h.
In-depth study of the knowledge and skills needed for the care of the newborn from birth to hospitalization on the high risk newborn. Prerequisite: Psychology 31:1, 31:2.

96:05 Care of the Experiential Family 5 s.h.
Focus on personal family and the borderline and needs of anticipations and problems for individuals.

96:10 Intensive Nursing 5 s.h.
In-depth study of knowledge and skills needed for caring for management of a patient during the intensive period. Prerequisites: Psychology 31:1, 31:2.

96:10 Use of Literature in Psychiatric Nursing Intervention 3 s.h.
Familiarization with a variety of psychiatric, emotional and related problems and psychiatric nursing and evaluation of these presentations as "out patient" care with emphasis on using literature in the emotional care of patients. Prerequisites: Psychology 31:1.

96:14 Theory and Nursing Intervention for Individuals with Depression Including Suicide Intoxication and Attempted Suicide 3 s.h.
Theoretical orientation and clinical care of depression and suicide and how these relate to the management of suicide. Prerequisites: Psychology 31:1, 31:2.

96:10 Nursing Care of Adult Individuals Exhibiting Biologic Behavior 3 s.h.
Theoretical background on personal dynamics as they are impacted in clinical experiences through behavior and development of nursing interventions with the discrepant behavior of the patient. Prerequisites: Psychology 31:1, 31:2.

96:10 Public Health Nursing 3 s.h.
Knowledge and skills needed to provide nursing care in a community agency or setting with emphasis on epidemiology, family service and community resources. Prerequisites: Psychology 31:1.
Graduate

96/101 Primary Care Nursing 2 a.h.  
Theory and guided clinical practice in primary care nursing. Health screening of adults and children. Prerequisite: consent of instructor.

96/102 Introduction to Methods of Nursing Research 1 a.h.  
Development of scientific approach to knowledge and problem-solving relationships among theory, research and practice considered. Specific research methodologies, methods of data collection and problems of measurement of variables; development of research proposals.

96/296 Perspectives in Nursing 2 a.h.  
Identifies and explores of contemporary issues and trends in nursing.

96/145 Nursing Seminar for Pediatric Nurse Practitioners 2 a.h.  
96/290 Nursing Research 2 a.h.  
Analysis and critical appraisal of nursing theories and research; completion of research proposal. Prerequisite: 96/310 and statistics.

96/293 Biophysical Concepts in Advanced Nursing 3 a.h.  
Concepts of the normal human cell relating cellular function and structure to other systems operating in human.

96/294 Biophysical Concepts in Advanced Nursing 3 a.h.  
Completion and expansion of 96/230 to include physiologic concepts operating in the behavioral, cognitive and psychosocial systems. Prerequisite: 96/230.

96/223 Advanced Medical-Surgical Nursing I 6 a.h.  
A case, concept based approach in care of medical-surgical patients utilizing findings from normal, behavioral, and applied sciences; clinical experience in nursing interventions.

96/223 Advanced Medical-Surgical Nursing II 6 a.h.  
Continuation of 96/223, which is prerequisite.

96/242 Advanced Nursing of Children I 6 a.h.  
Growth and development of child; philosophical aspects of child care; health promotion and anticipatory guidance; experience provided with well children in a variety of settings. Fall.

96/243 Advanced Nursing of Children II 4 a.h.  
Child health problems as they relate to the family and community; care of Ill child in a variety of settings; surviving responsibilities in facilitating optimum health care for children. Spring semester only after 1977. Prerequisite: 96/342.

96/244 Advanced Nursing of Children III 2-4 a.h.  
Individually tailored experiences requiring application of knowledge in a selected functional area. Fall. Prerequisite: 96/243.

96/245 Special Project Nursing of Children 2 a.h.  
Project in a substantive area in nursing of children. Prerequisite: 96/342.

96/246 Theoretical Foundations of Mental Health Nursing 5 a.h.  
Theory and concepts of mental health and mental illness, treatment modalities and applications of these in nursing practice. Prerequisite: consent of instructor. Offered each fall and occasional summers.

96/251 Nursing Intervention with Individual Adjective Behavior 3 a.h.  
Psychomotor assessment, nursing intervention and evaluation of intervention processes focusing on individuals exhibiting maladaptive or psychomotor behaviors. Prerequisite: consent of instructor. Offered each fall and occasional summers.

96/252 Nursing Intervention and Families 3 a.h.  
Assessment of family dynamics, nursing intervention and evaluation of intervention in detailed family networks. Prerequisite: consent of instructor. Fall, Spring, Summer.

96/253 Nursing Intervention in Groups 3 a.h.  
Group dynamics, group process and psychological in nursing intervention with groups of people. Prerequisite: consent of instructor. Fall, Spring.

96/254 Seminar Issues in Mental Health Nursing 1 a.h.  
Exploration of trends and issues related to nursing practice. Prerequisite: 96/251. Offered each fall and occasional semesters.

96/255 Mental Health Nursing Practicum--Select Population 4 a.h.  
Study and selected practicum experience relating to nursing interventions with selected age groups, institutional groups or communities. Prerequisite: 96/251. Offered each fall and occasional semesters.

96/256 Consultation in Mental Health Nursing 1 a.h.  
Study of consultation dynamics and process. Application in crisis intervention, consultation and application for advanced population areas and settings. Prerequisite: consent of instructor.

96/257 Mental Health Nursing Practicum--Intensive Modalities 4 a.h.  
Selected study upon application of nursing theory utilizing a specific intervention technique with individuals, families or groups. Prerequisite: introductory course related to the proposed experiences and consent of instructor. Fall, Spring, Summer.

96/258 Practicum in Teaching Mental Health Nursing 1 a.h.  
Study and application of learning, teaching theory and teaching strategies applied to mental health concepts. Prerequisite: 96/251. Offered each summer.

96/259 Nursing Intervention, Community Social Systems 2 a.h.  
Study of community development, social systems, selected problems and mental health service models; their effects upon adaptive behavior. Prerequisite: 96/251. Offered each summer.

96/260 Nursing Services Administration I 3 a.h.  
Administrative concepts and organizational theory central to understanding administration in a complex modern community hospital; small group discussions using case method of analyzing nursing administration.

96/261 Nursing Services Administration II 3 a.h.  
Fundamentals of nursing department and nursing director in complex health care setting; group discussions as the tool for analysis of action plans. Prerequisite: 96/250.

96/262 Clinical Nursing Services Administration 3 a.h.  
Continuation of 96/261.

96/280 Clinical Nursing I 2 a.h.  
Designed for nursing care generalists; explores aspects of nursing knowledge and provides opportunity for synthesis of nursing problems in clinical settings.

96/281 Clinical Nursing II 2 a.h.  
Continuation of 96/280. Prerequisite: 96/280.

96/290 Thesis 6 a.h.
Dear: Dale, E. Waters
Deans, Samuel: Lucas C. Zegel

Associate Dean, Director of Pharmaceutical Services: John L. Lach
Assistant Dean for graduate affairs: Joseph O. Covace
Assistant Dean for undergraduate affairs: David P. Carne
Head, Division of Medicinal Chemistry-Natural Products: Charles F. Brown
Head, Division of Pharmacology: Eugene L. Parmet
Head, Pharmaceutical Pharmacology and Continuing Education: G. Joseph Norwood
Coordinator, Pharmacy Continuing Education: Woods L. Kerr
Head, Division of Clinical Hospital Pharmacy: Dennis K. Holberg
Coordinator, Clinical Pharmacy Education: Leslie S. Hatkins
Coordinator, Hospital Pharmacy Education: C. Douglas Hayter

Degree offered: B.S., M.S., Ph.D.

The pharmaceutical sciences are concerned with the preparation and dispensing of medicinal products and stimulating their activity. The pharmacist is also trained to identify, analyze, select, combine and standardize these medicines, and serves as a community pharmacy in the source of information on health topics.

Although he or she performs a variety of tasks in and out of the community pharmacy, the pharmacist is basically a specialist in the science of drugs. He or she must understand their composition, chemical and physical properties, manufacture and uses, and activity in the normal individual as well as in the ill patient, and must be familiar with these for the strength, purity and efficacy of drug products. The pharmacist is prepared to compound and dispense prescriptions written by health practitioners, who rely on the pharmacist for information about various drugs, their availability, activity, toxicity, contraindication, etc.

Nearly everyone is familiar with the community pharmacist and the pharmacy in which he or she practices. The size and type of practice may vary; community pharmacies may be large or small, operated by individuals or by corporations. The pharmacist who staffs these pharmacies make up the majority of practitioners. Over 100,000 men and women practice in community pharmacies.

Another smaller group of pharmacists is employed in hospital pharmacy work. The government also employs pharmacists in the Public Health Service and the armed forces.

Pharmaceutical industry is also an area where numerous pharmacists are employed. This includes pharmaceutical manufacturing, where pharmacists are found in various areas of research, development, manufacturing, control, marketing and advertising. In addition to these pharmacists, numerous others are employed in pharmaceutical sales. Pharmacy training is especially valuable to these men and women who are responsible for acquiring physicians, dentists, veterinarians and other pharmacists with drug products.

In the United States more people are receiving total health care than ever before. This expansion of health care will continue. Young men and women in pharmacy will face new challenges, expanded responsibilities and an ever-increasing growth in opportunities.

Undergraduate Program

Students in the College of Pharmacy are in a Bachelor of Science program, and they receive professional training and education in a number of areas. These include pharmacy technology, biopharmaceutics, medicinal chemistry and natural products, pharmacological sciences, clinical and hospital pharmacy.

The colleges of Liberal Arts, Business Administration, Law and Medicine contribute to the education of pharmacy students by providing instruction in the physical sciences, basic medical sciences, business, law and humanities.

Basically, the Bachelor of Science program in pharmacy consists of one year of pre-pharmacy study, taken in the College of Liberal Arts at Iowa or in any accredited community or liberal arts college, and four years of pharmacy studies.

It is possible to transfer into the College of Pharmacy after two years of college-level work at an approved institution. A student entering the College of Pharmacy after two years of preprofessional study can complete the professional program in three years if the preprofessional study includes, in addition to the basic preprofessional requirements, at least eight semester hours of organic chemistry, from five to eight semester hours of biology or zoology, three or four semester hours of anatomy and three to four semester hours in quantitative analysis.

The professional curriculum includes a minimum of 18 semester hours of electives; of these must be taken in the fourth professional year. By choosing appropriate electives, the student may focus on such special areas as clinical or hospital pharmacy or pregraduate study.

The Professional Curriculum

First Year

<table>
<thead>
<tr>
<th>First Semester</th>
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</thead>
<tbody>
<tr>
<td>46:13 Pharmacy Math</td>
<td>3 h.</td>
</tr>
<tr>
<td>37:3 Principles of Animal Biology</td>
<td>5 h.</td>
</tr>
<tr>
<td>4:121 Organic Chemistry I</td>
<td>5 h.</td>
</tr>
<tr>
<td>4:111 Elementary Quantitative Analysis</td>
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<tr>
<td>Total semester hours</td>
<td>18 h.</td>
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Second Semester

<table>
<thead>
<tr>
<th>Second Semester</th>
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</tr>
</thead>
<tbody>
<tr>
<td>46:14 Pharmacy: Orientation</td>
<td>2 h.</td>
</tr>
<tr>
<td>62:1 Principles of Economics</td>
<td>4 h.</td>
</tr>
<tr>
<td>4:122 Organic Chemistry II</td>
<td>3 h.</td>
</tr>
<tr>
<td>4:141 Intermediate Chemistry Lab</td>
<td>2 h.</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
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<td>--------------------------------------------------</td>
</tr>
<tr>
<td>46:102</td>
<td>Principles of Human Anatomy*</td>
</tr>
<tr>
<td>99:102</td>
<td>Elective**</td>
</tr>
<tr>
<td></td>
<td>Total semester hours</td>
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</table>

*Also offered first semester for students on a 2-3 program only. **Minimum semester hours of electives are required. At least eight semester hours of this total must be taken in the P-4 year.

<table>
<thead>
<tr>
<th>Second Year</th>
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<tbody>
<tr>
<td>First Semester</td>
<td></td>
</tr>
<tr>
<td>46:23</td>
<td>Pharmacology I</td>
</tr>
<tr>
<td>99:102</td>
<td>Biochemistry for Pharmacy Students</td>
</tr>
<tr>
<td>61:157</td>
<td>General Microbiology</td>
</tr>
<tr>
<td>60:102</td>
<td>Principles of Human Anatomy*</td>
</tr>
<tr>
<td></td>
<td>Total semester hours</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>46:24</td>
<td>Pharmacology II</td>
</tr>
<tr>
<td>46:22</td>
<td>Pharmacological Socioeconomics</td>
</tr>
<tr>
<td>46:128</td>
<td>Medicinal Chemistry: Natural Products I</td>
</tr>
<tr>
<td>72:150</td>
<td>Intermediate Physiology (Human)</td>
</tr>
<tr>
<td></td>
<td>Total semester hours</td>
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</table>

*This may be taken in second semester of first year.

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<thead>
<tr>
<th>Third Year</th>
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<tbody>
<tr>
<td>First Semester</td>
<td></td>
</tr>
<tr>
<td>46:131</td>
<td>Medicinal Chemistry: Natural Products II</td>
</tr>
<tr>
<td>69:203-4</td>
<td>Principles of Human Pathology</td>
</tr>
<tr>
<td>71:101</td>
<td>Pharmacology for Health Sciences: Pharmacy</td>
</tr>
<tr>
<td>46:35</td>
<td>Pharmacological Socioeconomics</td>
</tr>
<tr>
<td></td>
<td>Total semester hours</td>
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<tr>
<th>Second Semester</th>
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</thead>
<tbody>
<tr>
<td>46:152</td>
<td>Medicinal Chemistry: Natural Products III</td>
</tr>
<tr>
<td>71:103</td>
<td>Pharmacology and Toxicology</td>
</tr>
<tr>
<td>46:38</td>
<td>Pharmacology III</td>
</tr>
<tr>
<td>46:110</td>
<td>Clinical Pharmacy: Case Study</td>
</tr>
<tr>
<td>46:11</td>
<td>Elective</td>
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<tr>
<td></td>
<td>Total semester hours</td>
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<tr>
<th>Fourth Year</th>
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<tbody>
<tr>
<td>First Semester</td>
<td></td>
</tr>
<tr>
<td>46:111</td>
<td>Clinical Pharmacy: Therapeutics I</td>
</tr>
<tr>
<td>46:117</td>
<td>Clinical Pharmacy: Clerkship I</td>
</tr>
<tr>
<td>46:43</td>
<td>Pharmacology IV</td>
</tr>
<tr>
<td>46:44</td>
<td>Jurisprudence</td>
</tr>
<tr>
<td>46:114</td>
<td>Electives*</td>
</tr>
<tr>
<td></td>
<td>Total semester hours</td>
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Second Semester |                                                   |
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<tbody>
<tr>
<td>46:112</td>
<td>Clinical Pharmacy: Therapeutics II</td>
</tr>
<tr>
<td>46:118</td>
<td>Clinical Pharmacy: Clerkship II</td>
</tr>
<tr>
<td>46:114</td>
<td>Electives*</td>
</tr>
<tr>
<td></td>
<td>Total semester hours</td>
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</tbody>
</table>

*A minimum of 8 s.h. of electives must be taken in the P-4 year.

<table>
<thead>
<tr>
<th>Professional Electives</th>
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<tbody>
<tr>
<td>46:26</td>
<td>Institutional Practice</td>
</tr>
<tr>
<td>46:48</td>
<td>Community Pharmacy Operations</td>
</tr>
<tr>
<td>46:50</td>
<td>Pharmaceutical Chemistry: Drug Analysis</td>
</tr>
<tr>
<td>46:52</td>
<td>Senior Seminar</td>
</tr>
<tr>
<td>46:56</td>
<td>Non-Prescription Drugs</td>
</tr>
<tr>
<td>46:101</td>
<td>Pharmacy: Projects</td>
</tr>
<tr>
<td>46:103</td>
<td>Physical Pharmacy</td>
</tr>
<tr>
<td>46:104</td>
<td>Biopharmaceuticals</td>
</tr>
<tr>
<td>46:105</td>
<td>Industrial Pharmacy Survey</td>
</tr>
<tr>
<td>46:107</td>
<td>Hospital Pharmacy: Survey</td>
</tr>
<tr>
<td>46:108</td>
<td>Hospital Pharmacy: Survey</td>
</tr>
<tr>
<td>46:114</td>
<td>Advanced Clinical Pharmacy</td>
</tr>
<tr>
<td>46:119</td>
<td>Clinical Pharmacy: Elective Clerkship</td>
</tr>
<tr>
<td>46:120</td>
<td>Clinical Pharmacy: Psychopharmacology</td>
</tr>
<tr>
<td>46:138</td>
<td>Introduction to Natural Product Research</td>
</tr>
</tbody>
</table>

Graduation from the baccalaureate program in pharmacy requires the student to complete satisfactorily the required courses in addition to 18 semester hours of electives, and to achieve a minimum grade-point average of 2.0 for all work undertaken.

For rules and regulations concerning academic probation, pass-fail, credit by examination, second-semester-only option, waiver or substitution of courses, cancellation of registration, drop date and correspondence study, see the "College of Pharmacy" section in the current Schedule of Courses.

Admission
The college-level work outlined below is the minimum academic requirement for admission to the College of Pharmacy:

Rhetoric: eight semester hours, or six hours of transfer credit in English composition and rhetoric, and two hours in speech;

General chemistry: eight semester hours;

Mathematics: three semester hours equivalent to analytic geometry or a higher mathematics course;

Physics: a one- or two-semester course in basic physics (at Iowa, 29:3 Basic Physics). A suitable biology or zoology course may be taken instead; physics will then be taken in the first professional year.

Students who have minor deficiencies in meeting the above requirements may be admitted to the College upon recommendation of the Chairmen of the Admissions Committee and the approval of the Dean.
The applicant must have earned a 2.0 (A=4) cumulative grade-point average on all college work attempted.

Transfer Students

Students who transfer into the College after two years in a community or liberal arts college can complete the pharmacy program in three years if they have satisfactorily completed courses in organic chemistry, biology, or zoology, economics and quantitative analysis. Students who plan to remain in a community college for two years before transferring to the College should consult the Dean of the College concerning course requirements.

Transfer with Advanced Standing

Students transferring from other colleges of pharmacy accredited by the American Council on Pharmaceutical Education receive credit toward the Bachelor of Science degree in pharmacy for satisfactorily completed coursework required in this curriculum. However, at least one academic year (30 semester hours) of residence in The University of Iowa College of Pharmacy is required for the degree. Students transferring from nonpharmacy colleges may receive credit for work required in the Bachelor of Science curriculum in pharmacy, but are still subject to the licensure requirement of at least three years in an accredited college of pharmacy. A minimum grade of C is required for work applied by transfer toward the pharmacy degree.

Graduate Programs

The College has active graduate programs in several areas. Masters of Science and Doctor of Philosophy programs are available in pharmacokinetics, medicinal chemistry-natural products, and pharmaceutical economics. A Master of Science degree is available in clinical-pharmacy hospital pharmacy.

Advanced study in the pharmaceutical sciences prepares the student for opportunities in research, teaching and/or administrative positions in the pharmaceutical, chemical and agricultural chemical industries, in colleges and universities, in government agencies and in a number of health-related institutions and organizations.

The application deadlines and the requirements for grade-point average, GRE score and necessary letters of recommendation are the same as those established by the Graduate College.

Facilities

The Pharmacy Building is located in the Health Center complex on the University’s main campus, in close proximity to the colleges of Medicine, Nursing and Dentistry, University Hospitals, the Basic Sciences Building and the Health Sciences Library.

The Pharmacy Building is a five-story structure especially designed to provide modern facilities for a comprehensive program of pharmacy education. In addition to classrooms, as auditorium and library, the building houses well-equipped research laboratories and a greenhouse for instruction at the undergraduate and graduate levels.

The College’s extensive industrial pharmacy laboratory serves as a teaching unit as well as a service division of the College. Here undergraduate and graduate students have the opportunity to learn methods of large-scale pharmaceutical product development.

In the Clinical Pharmacy program, students work with other health professionals and have the opportunity to monitor drug therapy in hospitalized and non-hospitalized patients, under the supervision of clinical instructors in pharmacy and medicine. Among the various rotations in which the students are involved are many areas of the University and Veteran Administration hospitals, the Outpatient Family Practice Clinic, the Iowa Medical Security Facility, Iowa City Mercy Hospital, Cedar Rapids Mercy Hospital, selected community pharmacies and nursing homes, the Iowa Drug Information Service and the College of Pharmacy’s Department of Pharmaceutical Services.

Courses

Undergraduate Pharmaceutics

46:13 Pharmacy: Math 3 a.h.
Application of systems of weights and measures and mathematical calculations involved in pharmaceutical procedures and problems; includes introductory lecture in statistics and applications to pharmaceutical problems.

46:14 Pharmacy: Orientation 3 a.h.
Skills, organization and development of the science and profession of pharmacy.

46:28 Pharmaceutics I 4 a.h.
Lecture and laboratory on particle size measurements, characterization of small particles, properties of solids, formulation, preparation and evaluation of solid dosage forms. Prerequisites: 46:13, Chemistry 4:122, Physics 95:3.

46:29 Pharmaceutics II 4 a.h.
Lecture and laboratory on application of physical and chemical laws to the formulation and preparation of liquid dosage forms, including solutions, ointments and emulsions. Prerequisite: 46:28.

46:29 Pharmaceutics III 3 a.h.

46:43 Pharmacology I 3 a.h.
Lecture and laboratory on availability of drugs, various dosage forms such as pills, solutions and spray systems with emphasis on synthetics, natural and semi-synthetic on and the side effects of drugs through the large laboratory experiments patient record systems, techniques of compounding and dispensing and recognition of drug intoxication. Prerequisite: 46:36.

Graduate Pharmaceutics

46:101 Pharmacy: Projects 1-3 a.h.
Basic and applied research problems of pharmaceutical significance. Prerequisite: F-2 or above standing, open to graduate students.

46:199 Physical Pharmacy 3 a.h.
Surface and interfacial phenomena, adsorption and stabilization in pharmaceutical systems.

46:79 Biopharmaceutics 2 a.h.
Mechanisms of drug absorption and interrelationships among properties of pharmaceuticals, dosage forms and pharmaceutical effects. Prerequisite: graduate standing or consent of instructor.

46:105 Survey of the Pharmaceutical Sciences 2 a.h.
Organization, control and quality assurance in pharmaceutical organizations. Prerequisite: 46:34.

46:239 Pharmacy: Selected Topics 2 a.h.
Review and application of current topics in pharmacy. May be repeated for credit.

46:259 Stability of Pharmaceuticals 3 a.h.
Mechanisms of degradation of pharmaceuticals; prediction of shelf life of pharmaceutical preparations, efficient storage systems and techniques. Prerequisite: Chemistry 4:122.

46:281 Quality Control 3 a.h.
Lecture and laboratory in instrumental analysis as applied to pharmaceutical quality control; theory and application of spectrophotometry, Karl Fisher titrations, compliance with United States Pharmacopeia and other requirements. Prerequisite: 46:105.

46:296 Product Development 3 a.h.
Application of pharmaceutical and physiological principles to formulation and design of pharmaceutical dosage forms.

46:396 Product Development 3 a.h.
Continuation of 46:296.
Undergraduate Clinical-Hospital Pharmacy

46/106 Institutional Practice 2 a.h.
Planning, organization and administration of pharmaceutical services in hospitals and other health care facilities. Prerequisites: junior or senior standing.

46/110 Clinical Pharmacy: Case Study 3 a.h.
Introduction to selected diseases and their treatment; clinical methadology, principles of drug therapy, laboratory use, medical terminology, abbreviations and use of referral services. Prerequisites: Physiology 70:128, 46:111, Pharmacology 71:101.

46/111 Clinical Pharmacy: Therapeutics I 2 a.h.
Pharmacotherapeutics of disorders encountered primarily in internal medicine; clinical significance of treatment regimens, analyzed by utilizing clinical case histories. Prerequisite: 46:110.

46/113 Clinical Pharmacy: Therapeutics II 2 a.h.
Pharmacotherapeutics of disorders more commonly encountered in surgery; clinical significance of treatment regimens. Prerequisite: 46:110.

46/117 Clinical Pharmacy: Geriatrics I 2 a.h.
Application of therapeutic principles to patient care through supervised clinical and professional practice experiences in a variety of health care facilities. Prerequisite: 46:110.

46/118 Clinical Pharmacy: Geriatrics II 2 a.h.

46/119 Clinical Pharmacy: Creative Therapeutics 1 a.h.
Selected methods in health care facilities. An electives course which may be repeated for credit. Prerequisites: 46:110 and consent of instructor.

46/120 Clinical Pharmacy: Psychotropics 4 a.h.
Lecture and laboratory courses concerned with rational use of psychotropic drugs in treatment of psychiatric disorders. Prerequisites: 74-4 or grade equivalent.

Graduate Clinical-Hospital Pharmacy

46/107 Hospital Pharmacy: Survey 3 a.h.
Hospital as part of American health care system: dissecting, planning, monitoring, organization and management, with particular attention to pharmacy: organizing, staffing and operating hospital pharmacy; particular emphasis on supervision of professionals, referral issues and antitrust law. Prerequisites: consent of instructor.

46/108 Hospital Pharmacy: Survey 3 a.h.
Continuation of 46:107. Medical self-pharmacy selection; pharmacy operations; hospital policies, special effects of hospital drug procurement; duty and practice of pharmacy on pharmacy and pharmaceutical services, and pharmacy service systems; drug utilization review; drug information services; planning and design; budgeting and reporting. Prerequisite: consent of instructor.

46/114 Advanced Clinical Pharmacy 4 a.h.
Application of principles of pharmacology and pharmacodynamics to the management of hospital patients; student participates in ward rounds and conferences with medical staff, and serves patients on various types of drug therapy; emphasis on drug selection, adverse effects of drugs and disease modification of therapy in medical patients. Prerequisite: 46:110 and consent of instructor.

46/115 Clinical Pharmacy: Drug Literature Review and Evaluation 5 a.h.
Acquaints the pharmacists with the literature of hospital pharmacy practice, including clinical practice emphasis on techniques of improving therapeutic literate; criteria, evaluation, methodology, critical analysis, etc. Elective. Prerequisite: consent of instructor. An understanding of statistics is necessary.

46/126 Hospital Pharmacy: Paper-Rating 3 a.h.
Theory and application in paper-rating, weighing and testing of parenteral dosage forms.

46/250 Hospital Profession: Research 3 a.h.
Topics of current interest in the specialty of hospital pharmacy may be repeated for credit.

46/401 Hospital Pharmacy: Directed Study in Administrative Problems 1-3 a.h.
Application of basic organizational and administrative theory to practical problems in hospital pharmacy administration: materials and personnel management, budgeting and forecasting, systems and physical plant design. Prerequisites: 46:108, Introductory Medicine 65:110 or equivalent.
Continuing Education

The Division of Continuing Education was established by special appropriation of the General Assembly of Iowa to render a larger service to the Commonwealth and to the people of Iowa by carrying out every part of the State's knowledge, the thought, the ideals and the spirit of the several departments and colleges of the University and by bringing the University generally into direct contact with the citizen. The Division's organization and services include:

Credit Programs

Correspondence Courses
Correspondence courses are available for credit toward a degree, for preparation for special occupations or for self-improvement. Resident students at the University of Iowa must obtain the permission of the dean of their college to enroll in correspondence courses for degree credit.

Correspondence study is offered in accounting, anthropology, art, business administration, chemistry, Latin, economics, education, English, French, geography, history, home economics, journalism, library science, mathematics, music, physical education, police science, political science, psychology, religion, social work, sociology, Spanish and speech pathology.

There is a $3 enrollment fee. The course fee is $20 per semester hour. Fees are payable at the time of registration. A catalog including procedure and enrollment forms may be obtained from Correspondence Study, The University of Iowa, Iowa City, Iowa 52242.

The University, in cooperation with the Department of Defense, offers many correspondence courses to men and women in the armed services. Personnel should visit their Education officer.

Veterans Administration Courses
Veterans may enroll in correspondence courses concurrently with other academic study under Public Law 90-340. Veterans are referred to Veterans Affairs Office of the University.

Extension Classes
The Division offers a limited number of off-campus extension classes in liberal arts, business administration, education and engineering. Classes are scheduled at the request of public school officials, or where professional groups and industry indicate a specific need for educational services. Courses offered in business administration and engineering are scheduled on a contractual basis. Courses in liberal arts and education require a minimum of 20 enrolees. For information write Center for Credit Programs, The University of Iowa.

External Studies Program
Credit coursework for students who wish to study abroad is available. See "Office of International Education and Services."

The Saturday and Evening Class Program
This program provides credit course offerings for part-time undergraduate, graduate or unclassified students. Courses are offered from all schools and departments of the University. Through this program a selection of women's studies courses are offered. For a Saturday and Evening Class catalog, write to the office.

Education Tests
Standardized tests and scales developed through research by staff members and graduate students at The University of Iowa are published and distributed on a nonprofit basis to schools, public agencies and industrial firms in Iowa and throughout the nation. In addition, many other widely-used, commercially-produced standardized tests and scales with established national norms are carried in stock for distribution, in most cases at the publisher's list price. Orders received for items regularly carried in stock are usually shipped within 24 hours. Catalogs are available.

Center for Conferences and Institutes
The Center serves as the principal agency of the University for developing, coordinating and conducting noncredit continuing education programs for nonresident adults and for administering the University's Continuing Education Unit (CEU) program. The Center's primary goal is to enhance the usefulness of the University as a center of learning and to provide educational opportunities for people who are not full-time students but who seek new knowledge related to their jobs, professions or special interests.

Each year more than 30,000 adults receive training in the Center's varied programs, which represent a cooperative endeavor between the Center and the various colleges, departments and disciplines within the University. The marshaling of appropriate resources, coupled with the professional planning and execution of conferences and other short-term training programs, help to ensure the achievement of the educational objectives specified for each training meeting.

The Director of Conferences is responsible for approving and conducting or coordinating all conferences, institutes, short courses and similar noncredit programs held in the Iowa Memorial Union for other than on-campus student groups. All members of the faculty and staff of the University are encouraged, and other University-related group functions to be held on campus (or in the Iowa City-Coralville community) are expected to schedule those activities through the Conference Center office and to utilize the conference facilities, dining services and lodging accommodations at the Iowa Memorial Union, to the extent they are available and appropriate.
Adult Education Mini-Course Program

This open enrollment program provides a wide variety of non-credit, short-course offerings of special interest to adults. Courses are normally conducted at the Iowa Memorial Union during evening hours by University affiliated instructors. Continuing Education Units are awarded for course completion. For current catalog offerings contact the Center for Conferences and Institutes.

Radio Broadcasting Services

WSUI and KSUI-FM serve the needs and interests of the people of eastern Iowa with an 18 hours/day, 365 days/year broadcasting service which extends the resources and activities of the University. The broadcast schedule consists of educational, cultural and informative programming not available elsewhere. As an affiliate of National Public Radio (NPR), WSUI contributes program materials to a national network of more than 180 non-commercial radio stations. The main studios and offices are located in 3300 Engineering Building and a free copy of the Program Guide may be obtained by writing to that address.

Institute of Public Affairs

The mission of the Institute is to help improve state, city and county governments in Iowa by serving as the primary research and continuing education link between the University and those governments. Services of the Institute are available to state and local government agencies and to citizen groups interested in civic affairs.

The Institute has a full-time research and training staff. Through the Institute, other resources of the University are applied to problems faced by Iowa public officials. The Institute also works to close cooperation with organizations of public officials such as the League of Iowa Municipalities and the Iowa State Association of Counties.

The Institute provides:

- In-service training and continuing education services to public personnel, primarily managers and supervisors, offering a wide variety of courses and programs aimed at meeting individual and organizational needs as well as professional goals.
- Research services, informational resources and publications ranging from practical handbooks to issue papers; and
- Consultation services, ranging from answering "how-to" questions to serving on state-wide government committees dealing with major issues of state and local governments.

Bureau of Police Science

The Bureau offers a series of law enforcement courses through correspondence study. In addition, the Bureau offers a variety of services to law enforcement agencies, including entrance and promotional examinations, general administrative or specialized surveys, and specialized training programs. It also carries out research programs in areas of public safety. Upon request by law enforcement agencies, the Bureau conducts personnel examinations, administrative surveys and record surveys.

Iowa Center for Education in Politics

Supported by gifts from foundations and others and headquartered in the Division of Continuing Education, the Iowa Center for Education in Politics coordinates activities at all colleges and universities in Iowa in an effort to encourage students in the study of political science and to improve their teaching about politics at the high school level. These programs are planned in cooperation with leaders of the locally-recognized political parties of the state and college professors and administrators.

Iowa Program IMPACT

The Division serves as administrative and fiscal agent for Iowa Program IMPACT, a cooperative state-federal program to expand the continuing education services of colleges and universities toward solving community problems. A state advisory council assists in identifying community problems, recommends appropriate institutional activities which would assist in solving these problems and approves proposed projects submitted by colleges and universities in Iowa. The program was authorized by the C.S. Congress in Title I of the Higher Education Act of 1965.

Office of Community College Affairs

The Office of Community College Affairs is closely aligned with the College of Education. The Office's purpose is to promote articulation between Iowa's area community colleges and technical institutions and the University of Iowa. In these activities involving discipline articulation, the Office assists community colleges in the planning and development of programs which will help students transfer between community colleges and comprehensive institutions.

Iowa Lakeside Laboratory

The Division has general administrative supervision of the Iowa Lakeside Laboratory, a summer laboratory for the biological sciences on Lake Okoboji. A cooperative program is teaching and research on campus, and student research on campus. Iowa State University of Northern Iowa and the University of Iowa. Two terms of five weeks each are held during June, July and August. Facilities for year-round research are available. For information, write to the Division of Continuing Education.

Macbride Field Campus

The University holds a lease from the U.S. Army Corps of Engineers on two tracts of land in the Coralville Reservoir area north of Iowa City. The two tracts total approximately 620 acres. One tract is reserved for biological research, the other for University-wide activities. The campus includes the three facilities provision of an access road, water supply, electric power, maintenance storage facilities, a boathouse and sailing facilities, field archery course, facilities for handicapped persons and picnic area.

Auditorial Center

The mission of the Auditorial Center is to assist in the improvement of the teaching-learning process through the effective use of educational media. Services and facilities include:

- Media Development

The Auditorial Center staff is available to assist clients in the solution of their instructional problems related to the planning and design of learning systems, facilities and media. Short-term
assignment to the Audiovisual Center of faculty and/or graduate assistants is encouraged.

**Media Library**

Major collections of 16mm motion pictures and magnetic tape recordings are available through the Media Library. Catalogs of materials are published periodically. Systematic additions to these collections are made according to requests and funds available. No charge is made for films used in classroom and other curriculum-related activities. A rental fee is charged for off-campus use of these films. Tapes are obtained at a nominal charge for materials and duplication.

**Campus Services**

Audiovisual equipment available for use includes film, slide, filmstrip, opaque and overhead projectors; audio tape recorders; record players; portable videotape recorders; portable public address systems; and display devices (exhibits, easels, boards). For classroom and other curriculum-related activities equipment is provided at no charge. There is a nominal charge for off-campus equipment and projectionist service.

**Media Production**

Production specialists, professional facilities and equipment are available to produce graphs, charts, maps, slides, layouts, posters, illustrations, models, exhibits and overhead transparencies; black and white and color photographs, negatives, microfilm, slides, portraits, specialized photography; sound and silent motion pictures, videotapes, filmstrips, sound-slide presentations; production scripts, narration and audio tapes. Still photographic and motion picture printing and processing laboratory services are available. Certain equipment is available for loan. Reasonable charges are made for production materials and service.

**Satellite Centers**

Satellite centers are established as needs arise through cooperative arrangements between the Audiovisual Center and departments, schools, colleges and other service agencies. Currently they include the Medical Audiovisual Center, Dental Audiovisual Center, Nursing Audiovisual Center, the Educational Media Laboratory and the Music Audiovisual Center.
Education through Service
The University of Iowa Health Center is the largest provider of academic, clinical, and service programs in the region. Through its College of Medicine and College of Dentistry, the University's Health Center offers a wide range of educational opportunities for students and practitioners to serve the community. Its mission is to provide excellent patient care, education, and research, while maintaining a focus on community service and public health.

University Hospitals and Clinics

General Administrative Staff

Director and associate executive vice president for health services: John W. Collins

Associate director: Stephen L. Steiner

Special assistant to the director: Douglas R. Williams

Assistant director of finance: John S. Siler

Assistant director for planning: Greg L. Pletcher

Assistant director for legal services: Robert D. Miller

Clinical service heads: anesthesia, Dr. Jack Meyer; surgery, Dr. Mark R. Lewis; family practice, Dr. Robert B. Bevans; general medicine, Dr. James A. Blumberg; orthopedics, Dr. Charles C. LaFleur; pathology, Dr. Paul S. K phường; radiology, Dr. George W. Burch; radiology, Dr. James H. Carr; otolaryngology, Dr. John L. O'Brien; urology, Dr. Robert B. Bevans.

The University of Iowa Hospitals and Clinics is the largest provider of academic, clinical, and service programs in the region. Through its College of Medicine and College of Dentistry, the University's Health Center offers a wide range of educational opportunities for students and practitioners to serve the community. Its mission is to provide excellent patient care, education, and research, while maintaining a focus on community service and public health.

The University of Iowa Health Center is a part of the University of Iowa, which is a land-grant university located in Iowa City, Iowa. The University of Iowa Health Center is one of the largest providers of academic, clinical, and service programs in the region. Through its College of Medicine and College of Dentistry, the University's Health Center offers a wide range of educational opportunities for students and practitioners to serve the community. Its mission is to provide excellent patient care, education, and research, while maintaining a focus on community service and public health.

University of Iowa Hospitals and Clinics

nursing, pharmacy, hospital administration, physical therapy, occupational therapy, and social work.

For more than 400 physicians, dentists and pharmacists, University Hospitals and Clinics sponsors residency programs in which they gain advanced clinical knowledge and skills in the health care specialties they have chosen to pursue. More than 60 other physicians in training at University Hospitals and Clinics are fellows—experienced clinicians who have advanced to subspecialty positions and work.

As a part of The University of Iowa, University Hospitals and Clinics is governed by the Iowa State Board of Regents. Through the University of Iowa Board of Regents, the Regents delegate the responsibility for the operation of the hospitals to the director of University Hospitals, who also serves as associate executive vice president for health services of the University.

The hospitals' operational policies are established by the Hospital Advisory Committee, a group comprising the chiefs of the hospitals' clinical services, the hospital directors, the dean and an associate dean of the College of Medicine, and two at-large clinical faculty members. The hospital is organized into 16 clinical services, 18 administrative departments, and 47 specialty clinics.

Each of the clinical services of University Hospitals is directed by a chief of service who leads the corresponding academic department in the College of Medicine or the College of Dentistry. Each of these clinical areas has its own patient care and outpatient services and, where appropriate, clinical and diagnostic treatment units. The hospital and its clinical programs are fully accredited.

Hospital services and facilities have evolved since the establishment of the University's first medical school in 1870. By 1900, the State of Iowa had built and opened its own University Hospital, a facility which by 1914 had grown to 260 beds.

Progressive legislation passed by the Iowa General Assembly between 1913 and 1950 has supported the establishment and expansion of the University of Iowa Hospitals and Clinics, which has provided health care services to nearly 1,000,000 individuals since the existing hospital facility was completed in 1932. Eighty percent of the patients who come to the hospital's 3,000-bed general hospitals that have grown into the present University Hospitals and Clinics.

A study conducted in conjunction with the hospitals' 55th anniversary in 1975 revealed that the University of Iowa Hospitals and Clinics had provided health care services to nearly 1,000,000 individuals since the existing facility was completed in 1932. Eighty percent of the patients seen were women of 537,000 different Iowa families—more than half of all Iowa families in existence during those years.

The programs of the University of Iowa Hospitals and Clinics, including the University of Iowa Hospitals and Clinics, are geared to serve the University of Iowa Hospitals and Clinics, which have grown into the present University Hospitals and Clinics.

Today, there are 1,341 beds within the hospital complex, accommodating more than 1,000,000 patients each year. Nearly 15,000 major and 25,000 minor surgical procedures are performed annually in the hospital's 24 major operating rooms. Three major operating–delivery rooms are located in the labor and delivery suite, and approximately 2,100 infants are delivered every year.
Highly specialized health services—e.g., the heart unit, center for cardiovascular facilities, surgical intensive care units—are easily accessible to lowows who reside in communities without such resources. To facilitate use of these and other specialized services, the hospitals operate a unique patient transportation service, with a fleet of 15 vehicles which travel nearly two million passenger-miles each year transporting 5,000 lowows, and from University Hospitals and Clinics.

More than 2,450 hospital staff members are involved each day in providing professional and support services necessary to care for approximately 2,000 patients. The hospital's clinical staff is comprised of more than 225 full-time physicians and dentists assigned to the 16 clinical services. The Hoste Staff of University Hospitals numbers over 470 resident physicians and dentists. The hospital's Department of Nursing comprises some 1,000 persons, more than half of whom are professional nurses.

Other hospital staff members annually provide 155,000 x-ray examinations and treatments, conduct over two million laboratory tests, fill about one million prescription orders, render more than 25,000 physical therapy treatments and prepare nearly 34,000 blood and component transfusions.

New intensive care, cardiopulmonary and orthopedic units have resulted from recent modernization efforts. A seven-story, $5 million North Tower Addition went into service in 1976, providing expanded and replacement facilities for a variety of inpatient and outpatient medical and dental services. Made possible in part by a $2 million contribution from Macera Medical Industries Roy J. Carver, the $5 million Carver Pavilion will open in late 1977 to provide replacement facilities for a multi-specialty trauma and emergency treatment center, a physical therapy department, orthopedic inpatient and clinic facilities, and nursing units totaling 148 beds, to replace outdated facilities in Children's Hospital and Oskaloosa Hospital. University Hospitals and Clinics also collaborates in conducting eight accredited health professional education programs: a nine-month Diagnostic Internship Program; two-year Radiologic Technology, Medical Technology and Nuclear Medicine Technology programs; a two-year Physician's Assistant Program; a two-year Hospital Pharmacy Residency Program; a two-year Physical Therapy Program; and (in conjunction with Mercy Hospital in Des Moines) a three-year Cytotechnology Training Program.

University Hospitals and Clinics also provide a clinical setting where students in four health education programs offered by the Colleges of Medicine, Dental, Nursing, Pharmacy, and Education, Engineering, Business Administration, several social science departments in the College of Liberal Arts, University Hospitals and Clinics, and the Veterans Administration Hospital. These individuals have a unique interest in improving the health services delivery system in Iowa, the Midwest, and the nation as a whole.

Iowa Mental Health Authority

Authorized by Congress under Public Law 79-487 in 1946 and placed at the Psychiatric Hospital by the Iowa General Assembly in 1947, the Authority is the central administrative arm for Iowa's 35 community mental health centers, which are private nonprofit corporations. The Authority provides consultation, staff development, recruitment, standards evaluation, and research for services for these centers. The Authority consults with communities about developing local services; performs liaison and planning activities with other local, state and federal programs in the mental health delivery system; and provides consultation on federal mental health construction and staffing grants through the National Institute of Mental Health.
Oakdale Campus
Located seven miles northwest of the Health Center, the 525-acre Oakdale campus includes hospital facilities for tubercular patients, an alcoholism treatment unit, neuropsychiatry and pediatrics research laboratories, the accident prevention laboratory of the Institute of Agricultural Medicine, research animal-care facilities, a Model Clinic for Family Practitioners, and a Model Rural Health Center.

Psychiatric Hospital
Part of the University Hospitals system, Psychiatric Hospital contains clinical and research laboratories in neurophysiology, biochemistry and psychology. The electroencephalographic laboratories serve the entire University of Iowa Health Center.

State Hygienic Laboratory
Laboratory staff members perform a variety of diagnostic, surveillantce, training and consulting functions in such areas as bacteriology, parasitology, industrial hygiene, serology, virology, health physics, radionuclide chemistry, water and air pollution, drinking water analysis, pesticides and herbicides, toxicology, minerals analysis and disease surveillance. The Laboratory provides virological and serological diagnostic services for University Hospitals and Clinics and for the UI of 1 Student Health Service.

State Services for Crippled Children
Crippled children's services are supported by federal appropriations through the United States Department of Health, Education and Welfare and by state appropriation through the University Hospital. The purpose of SSCC is to provide a state-wide program of services for Iowa children with special health problems and multiple handicaps. Health services are available to any person under the age of 21.

Diagnostic and evaluation services are offered at child health clinics conducted annually in communities throughout the state and at clinics of the University of Iowa Hospitals. Medical examiners at the clinic are staff members in the departments of Pediatrics, Orthopedic Surgery and Otolaryngology. Diagnostic services are also provided in the areas of speech pathology, audiology and clinical psychology.

SSCC patient services staff assist the children's families in making arrangements to obtain the care and treatment recommended at clinics and make certain that the plan is implemented.

To support its program at the local level, SSCC appoints regional liaison officers whose staffs participate in the development and improvement of community resources for delivery of child health services.

The agency conducts research in the cause and treatment of special health problems related to handicaps, such as rheumatic fever, cystic fibrosis, juvenile diabetes, muscular dystrophy, mental retardation and high-risk conditions of the newborn.

SSCC supports a graduate training program in audiology and speech pathology within the University.

University Hospital School
A University-affiliated facility dealing with the problems of physically handicapped and mentally retarded children and young adults, the University Hospital School is located in the Health Center complex on the University's west campus. The Hospital School's interdisciplinary team approach provides services involving the fields of medicine, dentistry, nursing, nutrition, speech and auditory, physical and occupational therapy, recreational therapy, psychology, social work, special education, physical education, homemaking-family living, music and vocational and vocational activities.

Through the daily operation clinic many of the handicapped individuals are followed periodically to monitor their progress and to provide guidance to parents or others for management at home. Recommendational and educational and admission facilities providing programs for these people is an equally important service.

The model program provides a variety of educational and therapeutic services for Iowa children and young people whose physical handicaps make it impossible for them to attend their local schools or to achieve adequate progress in their home communities. Since an important goal is to return these individuals to their local communities as long as practicable, the duration of stay in the School varies according to the needs of the enrollees.

The day program provides special education, therapy and functional training for selected children and young people who are mentally retarded and who reside nearby.

Professional training at the School is largely for prospective workers in some aspect of programs for the handicapped.

It is designed to provide learning experiences for college, junior college and university students, for clinic staff center, either in or outside the University, and for professional people interested in this field. Furthermore, many other training opportunities are arranged for those already engaged in work with the developmentally disabled. Over 900 college and university students at graduate and undergraduate levels are involved in significant training activities at this facility each year.

The Hospital School's research objective is to increase knowledge about the onset of developmental disabilities, handicapping conditions and related problems, and to provide for the dissemination of pertinent findings.

University Speech and Hearing Clinic
Located in the Wendell Johnson Speech and Hearing Center, the Speech and Hearing Clinic provides training for students of the Department of Speech and Hearing Sciences in Audiology and Speech Pathology, the staff includes a psychologist, and evaluators and collaborators by physicians and other health care professionals can be arranged when appropriate.

The Clinic provides clinical evaluation and consultation services for individuals with speech, language and hearing problems; day-clinic habilitation or rehabilitation service programs for persons who can come to the Clinic on a regular basis; and a Summer Residential Program for children with speech, language, hearing and/or reading problems.

The Veterans Administration Hospital
Medical students and residents may receive much of their clinical training at this 300-bed hospital, in which are based several of the major facilities of the UI of 1 Health Care. These include laboratories for the transplantation program, highly specialized laboratories in nuclear medicine, and special units for the study of metabolic and gastrointestinal diseases. The VA Hospital also offers unique training opportunities in the fields of clinical pharmacology, immunology, radiology, pathology, and applied immunology.
General Services

Iowa Center for the Arts
Located along the west bank of the Iowa River, the Iowa Center for the Arts is a major cultural resource, not only for the University community but for the people of the state and region. The Center comprises many of the academic units of the Division of Fine Arts in the College of Liberal Arts, together with the Museum of Art, E.C. Mabee Theatre, Clark Recital Hall and Harper Hall in the School of Music, and Hancher Auditorium, the Center’s newest and largest showcase.

Hancher Auditorium
Virgil M. Hancher Auditorium is one of the nation’s finest facilities for a full range of programs in music, dance and theater. Although its 2,864 seats make it one of the United States’ largest modern theaters, its design, coordinating functional with audiovisual excellence, achieves unusual intimacy. The Auditorium is named after Virgil M. Hancher, president of the University 1940-64.

Museum of Art
Impeccable for the construction of the University’s Museum of Art came from Owen and Leoni Elliott, when they offered their superb art collection to the University. Opened in 1969, the Museum is located immediately north of the School of Art and Art History in the Center for the Arts complex along the west bank of the Iowa River. The Museum provides an architecturally unique setting for the widely representative works of the Elliott collection and the University’s permanent collection, and for important touring exhibits. Addition of the Carver Galleries in 1976 significantly increases the Museum’s display capacity.

Museum of Natural History
To meet the needs of the general public and the various departments of the University, the Museum provides a repository and the public with an opportunity to observe the University’s natural resources. The Museum is open to the public on special occasions, gift or through the efforts of its own collectors. It designs and executes new exhibits of educational value and offers instruction in the conceptual and technical phases of exhibit preparation and the general operational procedures of small science museums.

Habitat exhibits of Nova American mammals include the American bison, the antelope, the mountain lion, the American moose and the beaver.

A large and well-known bird habitat exhibit is the Luanan Island Bird Habitat, a recreation of a bird island of the Hawaiian group. Other habitat exhibits include The Boring Sea, the Louisiana Swamp, the Fall Migration and Cranes on Snowy Lake Prairie. The crane exhibit shows the scolopacid crane and the whooping crane, as they appear on the prairie during migration.

The major invertebrate phyla are represented in several exhibits and include such familiar groups as the arthropods, mollusks, echinoderms and coelenterates.

Ethological exhibits in the Museum present materials from many parts of the world. Indian and Eskimo materials, including beadwork and carved ivory received in the late nineteenth century, are exhibited. The ancestry of humans through 17 million years of time is portrayed in a display featuring replica of fossil remains from Africa, Asia and Europe.

Several displays related to the geology of Iowa and include typical fossil speciments.

Office of International Education and Services (OIES)
The OIES is the focal point for University international education activities. It works in the areas of international studies, international educational exchange and technical assistance.

The OIES seeks to promote the development of and cooperation among the various aspects of international studies—foreign language and area studies, comparative and topical studies, and foreign language departments. It also assists faculty and students seeking grants or fellowships for study or research that have an international perspective.

The OIES works to encourage the development of formal linkages between University of Iowa departments and programs and their counterparts in foreign institutions by means of technical assistance and faculty exchange programs.

Regarding international educational exchange, the Foreign Student Adviser in the OIES provides assistance to foreign students, faculty and professionals on immigration and other matters. The Overseas Opportunities Center provides information to American students and faculty who wish to study, travel and work abroad. It also helps faculty members arrange study-abroad programs, and provides information on travel ahead for the University community.

The International Center is open to all University and Iowa City community members who have international interests. Facilities and programs are designed to encourage the interaction between people of all cultures.

Additional OIES activities involving students are described in the Center section "Student Activities."

Public Information and University Relations, University News Service
The Office of Public Information and University Relations seeks to foster understanding, within the University and among the general public, of the University’s aims and activities.

Units within Public Information and University Relations are the University News Service, the Health Center Information and Communication Office, the Sports Information Service and the media relations personnel of the Iowa Center for the Arts. These units supply news and information to mass media, gather and prepare informative material for special and general interest periods, help prepare special University publications, answer requests for information and assist writers, photographers and broadcasters who visit the campus.
Public Information/University Relations publishes Spectator, Faculty Newsletter, Staff Newsletter, Campus Correspondent, Calendar of Events and Programmes; provides campus tours and other services for University guests; manages the Old Capitol National Historic Landmark; prepares displays and exhibits; provides copy and photos for publications; assists groups seeking University speaker, and serves as the executive office of the Parents Association.

Publications and Printing Services
The Department is responsible for the production of all printed material prepared for the University. The Publications staff provides assistance to departments and campus organizations in planning, editing and designing copy. Printing Service is the production agency of the Department, with a printing plant and five Copy Centers located strategically about the campus for quick, inexpensive reproduction service. The Department also operates Campus Stores, an on-campus distribution agency which sells manuals, lab notebooks and other special instructional materials.

University Press
The University of Iowa Press is the agency of the University established to publish the significant results of scholarly research. The imprint is controlled by the University Editorial Board, composed of faculty members and students appointed by the vice-president for research and dean of the Graduate College. The University director of publications directs the operation of the Press.

Reading Clinic
The Children's Reading Clinic in The University of Iowa College of Education exists for the purpose of training classroom teachers, supervisors and consultants, school psychologists and counselors to assess the reading abilities of school-age children, and to recommend and use instructional materials that are suited to their needs.

The Clinic teaching program is located in Iowa City elementary schools during the academic year. Here the staff provides diagnostic instruction for children at all reading ability levels. During the summer the Clinic is in Wendell Johnson Speech and Hearing Clinic where the staff provides instruction for children who attend the Summer Residential Program for therapy in speech, hearing and reading. All the teaching that is under the supervision of the Clinic is conducted by staff and clinicians under the close supervision of Clinic staff members.

Recreational Services
The Division of Recreational Services administers a program of more than 20 intramural sports and recreational activities for all interested University students; offers a wide range of non-critical lesson programs in such activities as karate, tennis, golf, yoga, aerobics, judo and gymnastics; and provides informal activities for students, faculty and staff members, and their spouses and families. Activities include basketball, badminton, volleyball, table tennis, swimming, handball, paddleball, squash, canoeing, golf, archery, weight training, billiards, spaceball, tennis, fencing and juggling. Bicycles, in-line skates and cross-country skiing equipment are also available for a minimal renting fee.

The University of Iowa Alumni Association
The principal agency through which Iowa students continue their identity with the University also keep Iowa campus is the University of Iowa Alumni Association. Organized in 1867, the Association's current membership includes graduates and former students throughout the world.

The Association's continuing objectives are to identify alumni with the University; to strengthen public recognition of the University as an institution vital to the stability and welfare of the state and nation; and, through organized alumni effort, to serve the University in strengthening its programs in teaching, research and public service. The Association publishes the Iowa Alumni Review, a bimonthly magazine for Association members.

The University of Iowa Foundation
The University of Iowa Foundation was organized to help the University obtain the greatest possible educational benefit from private giving. It raises funds for this objective through three major programs: annual giving, capital campaigns and planned or deferred giving.

Organized in 1956, the Foundation is empowered to solicit and receive gifts and legacies, to accept trusts subject to the conditions imposed on them, and to hold, administer, manage, use or distribute gifts, bequests and trusts, all for the benefit of the University of Iowa. As it is a private, nonprofit corporation, its investment policies are less restrictive than the public policies which govern the University itself. The Foundation is constantly at work to provide more funds for student financial aid, faculty support, library acquisitions and other needs throughout the University.

University Personnel Service
The University Personnel Service is responsible for meeting the employment needs of individuals and departments for the entire University campus. The office functions in the areas of recruitment, interviewing, screening, testing, placement and salary and fringe benefits administration for full-time and part-time, permanent and temporary, non-teaching and nonstudent employees of the University. The University Personnel Office is responsible to the administration of the Board of Regents Merit System and the Unemployment Compensation Act. It also participates in certain aspects of the academic personnel program and in payroll record-keeping and collecting personal record data for both faculty and staff employees.
The University recognizes that creative activity is an indispensable function if its mission is to have the relevance, freshness and effectiveness expected of a distinguished institution of higher learning.

The University holds that the term "research" applies to creativity in all fields. Imaginative originality, whether in the fine arts or in the sciences, is of a common character and significance in the overall intellectual life of the institution.

The Office of the Vice-President for Educational Development and Research maintains an overview of the many individual research commitments of the institution and initiates and coordinates studies of the nature, extent, requirements and results of the University's research effort. This office has an interlocking relationship with the Graduate College, because of the all-University character of the College and the close connection between the graduate programs and research and creative activity.

The University Research Council assists the Vice-President for Educational Development and Research in a regular advisory capacity. The Council consists of ten senior faculty members with widely recognized personal involvements in basic research or creative activity, one representative of the University staff, and two student members. Faculty members include two each from the physical, biological and social sciences and the humanities, and two from the faculty at large. The Council gives regular consideration to matters as the establishment of general policies with respect to the University's research and creative efforts, the review of policies and procedures concerned with securing and allocating funds for support of research and creative activity, and additional matters related to the general research and creative functions of the University and the health of basic scholarship on the campus.

Programs
With the advice of the University Research Council and other appropriately involved officers and committees of the University, the Office of the Vice-President for Educational Development and Research currently supports the following programs:

Junior Faculty Research Support
A limited amount of money is available each year from the National Science Foundation to support the initial research efforts of junior faculty members who are engaged in research at the University, either in the College of Arts and Sciences or in the Colleges of Medicine and Dentistry and who work in departments or programs engaged in research activities. The funds may be used for any purpose which is consistent with the foundation's objectives. The following are expenses which may be incurred:

1. Tuition and fees
2. Research assistants
3. Research equipment
4. Professional travel
5. Conference registration
6. Professional publications
7. Research supplies
8. Research-related costs
9. Research-related travel
10. Research-related publications

Incidental Grants
Limited funds are also available in the Office of the Vice-President for Educational Development and Research for small grants to faculty members to cover the costs of materials, supplies, equipment and incidental and related assistance for specific research projects; or faculty travel related to specific research project or for the purpose of acquiring skills, knowledge or techniques which will enhance research at the University; and for honoraria and expenses of visiting scholars.

Services
The Office of the Vice-President for Educational Development and Research also provides support for several University-wide services required by the research and creative activity of the faculty. They include:

Computer Center
The University Computer Center provides large-scale, general-purpose computing facilities to all faculty members and students of the University for instruction and research purposes. The Center has a system capable of an extremely wide variety of applications. The computer is used in remote batch processing in connection with a regional computer activity involving several colleges in Iowa and Illinois. Conversational programming by way of typed-in terminals is also available. Although the Center is an entity distinct from the Computer Science Department, there is an interchange of students, faculty and ideas between the two staffs. The Center provides educational and consultative services, compatible with its resources, to help users prepare projects for computer analysis.

Institute of Child Behavior and Development
The Institute advises students on progress of study and assists in the coordination of curricula in areas related to children, advises faculty of their colleagues to contact or organize inter-degree training programs in interdisciplinary research projects in child-related fields, and advises those outside the University who wish to obtain consultation, dinners programs of continuing education or seek assistance in the performance of sponsored projects in this area. The Institute keeps abreast of federal, state, and foundation sources of support, and acts itself as a "lead agency" role in the development of projects bridging the relevant disciplines.

Research Services and Administration
This office maintains a resource center of information on public and private agencies which provide funds for research and study. Included are references to pre- and post-doctoral fellowship awards, as well as application forms when available. After a potential funding agency is located, staff is available to assist in the preparation of budget and cover material, and to give technical assistance to achieve effective organization and technical correctness in an application. The staff also assists in processing an application through the University and in locating the appropriate contact in the prospective donor's office. Once an award is made, monitoring and advisory services are provided for matters other than expenditure accounting.
Scanning Electron Microscope Laboratory
The Laboratory was established in September, 1971, to provide facilities and technical assistance for research programs involving the use of a scanning electron microscope. Located in the Zoology Building, the Laboratory is equipped with a Cambridge Stereoscan S4 having a resolution of 150 angstroms and a useful magnification range of 20 to 50,000 diameters. In 1974, the scanning electron microscope was modified to improve performance, by the addition of a built-in hexobarbital-gas-ion pump system. The microscope is also capable of being interfaced with an energy dispersive x-ray spectrometer system for elemental analysis. There is a vacuum evaporator for specimen coating and a critical point drying apparatus for biological tissue preparation. These facilities are available to all interested graduate students and faculty in the University.

Related Units
Although not directly connected with the Office of the Vice-President for Educational Development and Research, these units have a special role in the conduct of research at the University:

- **Agriculture Law Center**
  See "College of Law."

- **Center for Communication Study**
  See "Journalism" in "College of Liberal Arts."

- **Center for Labor and Management**
  See "College of Business Administration."

- **Center for Research in Interpersonal Behavior**
  See "Sociology" in "College of Liberal Arts."

- **Center for World Order Studies**
  The Center for World Order Studies (formerly a project of The Stanley Foundation, Monticello, Iowa) was established in June, 1977, at the University of Iowa's Midwest Center for Education and Research in the causes of and potential cures for existing and future world order problems, particularly those related to the use of military power across national boundaries. In cooperation with public and private schools, colleges and universities, and civic and business organizations throughout the country and especially in the Iowa-Illinois area, the major function of the Center was to promote increased understanding of these world order problems through curriculum innovation and revision. Now an integral part of the University, the Center coordinates a multidisciplinary non-degree program in World Order Studies at the University.

- **Child Development Clinic**
  The Child Development Clinic is an out-patient facility and is a division of the Department of Pediatrics in the University Hospital. The Clinic is primarily a diagnostic clinic for developmental problems in children. The Clinic will provide a comprehensive study of any child under 18 years of age who has problems in development, speech and language, poor school performance or learning disability, hyperactivity, mild behavior problems, or psychological problems associated with medical conditions.

Clinical Research Center
The Clinical Research Center is a 17-bed unit in University Hospitals. Its functions are to provide the setting for patient-oriented research of disease processes important in medical practice, and to permit studies of normal human physiology, biochemistry and pharmacology. The Center is supported completely by the Division of Research Resources of the National Institutes of Health, on a semi-permanent basis, for five-year grants-in-aid.

Comparative Legislative Research Center
The Comparative Legislative Research Center conducts programs of research on legislative behavior with special emphasis on the role of legislatures in political development. It provides research service for graduate students and foreign research associates and facilitates collaborative research projects jointly undertaken by faculty at The University of Iowa and by foreign scholars.

Health Services Research Center
The purpose of the Center is to foster research, scholarship, continuing education, and demonstration projects relevant to the health needs of rural areas and smaller communities. The Center complements the University's programs in health sciences education and pilot demonstration projects in the delivery of health services.

Institute of Agricultural Medicine and Environmental Health
The Institute of Agricultural Medicine and Environmental Health, housed in the Agricultural Medicine Research Facility on the Oxidale Campus, is a part of the Department of Preventive Medicine and Environmental Health, College of Medicine. Research, teaching and extension activities are centered on the safety and health problems of those who live in rural Iowa by occupation or choice. Areas of study include environmental toxicology, comparative medicine, occupational health, the Accident Prevention Laboratory and the Iowa Pesticides Epidemiology Studies Center.

Institute of Hydraulics Research
See "College of Engineering."

Institute of Public Affairs
The mission of the Institute is to improve state and local government and administration in Iowa. To fulfill this mission, the research and publication activities of the Institute seek to promote citizens' understanding of and appreciation for their governments, help public officials better understand their roles and responsibilities, assist government in the development of public safety, and help public officials and citizens in their efforts to implement change. (See "Extension and University Services."

Institute of Urban and Regional Research
Primary objectives of the Institute are to broaden knowledge in the area of urban and regional studies, to enrich the teaching programs in participating departments, and to initiate and carry out interdisciplinary research projects. Through the acquisition of grants and contracts and other on-campus activities, the Institute pursues these goals and provides an interface between faculty and students in their related discipline orientations in both basic and applied urban and regional research activities.
Two interdisciplinary graduate programs have been established within the Institute (see "Urban Transportation" and "Urban Growth in Developing Countries," in the "College of Liberal Arts" section of the Catalog). In addition, the Institute's Center for Locational Analysis provides a focus for investigating the spatial efficiency of public services.

Iowa Center for Research in School Administration
See "College of Education."

Iowa Lakeside Laboratory
See "Extension and University Services."

Iowa Urban Community Research Center
The Iowa Urban Community Research Center was established in 1958 as a permanent interdisciplinary research and training agency. It has been disseminated in scholarly journals and in a reprint series and a monograph series. The Center's community surveys are on tape in its data bank and are readily available for secondary analysis by graduate students and faculty. The staff is currently engaged in a study of the relationship between juvenile delinquency and adult criminal careers in an industrial community.

Laboratory for Political Research
The Laboratory for Political Research is a research and training facility for the Department of Political Science. It provides technical assistance to faculty members engaged in research. This assistance includes both the data collection and analysis phases of research. It is involved in graduate education, directly training students to utilize the computer in their own research. It also provides empirical data that can be used in graduate courses and seminars. For undergraduate education, the Laboratory works with professors in developing curriculum materials which utilize empirical data and the computer for instructional purposes.

Radiation Research Laboratory (Radiation Biology)
See "College of Medicine."

Toxicology Center
The Iowa Center for Toxicology and Biocatalytic Pharmacology is an integral part of the Department of Pharmacology and is devoted to research in biochemical toxicology and pharmacology. Broadly, these fields include research on the disposition of drugs and poisons, their metabolic rates, the biological adaptation and regulation associated with their use, studies on their teratologic and toxic effects and their mechanisms of action at the molecular level. Doctoral degrees in pharmacology are offered.

Social Science Data Archive
The Social Science Data Archive is a library of empirical data that can be re-analyzed by both faculty and students in their research and training. Approximately 450 studies are now included in the Archive, covering most of the social science disciplines. In addition, the Archive supports a large number of computer programs that can be used for data analysis. Individuals wishing assistance in utilizing the data of the Archive or the computer programs supported by the Archive can call on the personnel of the Laboratory in the Department of Political Science.
Financial Aids

All financial assistance available to University of Iowa students from general University sources is administered by the Office of Student Financial Aids. Assistance is provided through scholarships, grants, loans, and part-time job placements.

A student seeking assistance must first complete University admission procedures, including the American College Test, and submit a parent's financial statement through ACT Financial Aid Services, Box 1000, Iowa City, Iowa 52240, or the College Scholarship Service. Box 300, Northfield, California 92401. When it receives a copy of the parent's statement, the Office of Student Financial Aids will supply forms and instructions for applying for aid at Iowa.

Only one application is necessary each year for all forms of assistance administered by the Office of Student Financial Aids. Application deadline is February 1st.

Eligibility for Scholarships
To qualify for scholarship assistance, an entering freshman must have graduated in the upper 10 percent of his or her high school class or have achieved a 28 or above composite ACT score, an upperclassman must have a 2.75 cumulative grade-point average, and a transfer student must have at least a 3.0 transfer GPA.

Freshman Honors Awards
Entering freshmen eligible for invitation to participate in the University of Iowa Honors Program are recognized in Freshman Honors Scholarships and receive the University’s $100 Freshman Honors Award.

Basic Educational Opportunity Grants
The maximum BEOG is $1,200 minus the amount of comparable family contribution. Application forms can be obtained from high school counselors, colleges and public offices.

Supplemental Educational Opportunity Grants
Available to a limited number of undergraduate students unable to attend college or university without such assistance. SEDOG grants range from $200 to $1,500 per year but cannot exceed one-half of the recipient’s total assistance.

National Direct Loan Fund
This is the University’s largest source for long-term education loans. Undergraduate students may borrow up to $1,000 per year and $5,000 overall; graduate students may borrow up to $2,500 a year and $10,000 overall. Applicants must be citizens or permanent residents of the United States. Freshmen have preference. An upperclassman must be in good academic standing and be making normal progress toward a degree. No interest is charged while the borrower is at least a half-time student. Loans are repayable at three percent interest beginning nine months after the borrower concludes his course of study.

Health Professions Scholarship and Loan Program
Students are eligible to apply for a Health Professions Scholarship and Loan at a school which participates in the program if the student is a citizen or national of the U.S., is enrolled or accepted for enrollment as a full-time student pursuing a course of study leading to degrees of doctor of medicine, dentistry, osteopathy, optometry, podiatry, veterinary medicine or a degree in pharmacy and/or nursing, and is in need of such financial assistance to pursue the course of study.

Law Enforcement Education Program
This program consists of federally-funded loans and grants. Loans can be up to $2,200 per year, and grants can be for a maximum of $400 per semester to be used for school costs of tuition and books. To be eligible for the loan program, a participating school must have more than 15 hours of course directly related to law enforcement. All participating schools are eligible for grants. The program is available to pre-service and in-service law enforcement personnel. A recipient can be either a full- or part-time student.

Guaranteed Loans
Students participating in this program may borrow a maximum of $2,500 per year. Money may be borrowed through commercial banks, credit unions, savings and loan associations and other eligible lending institutions.

University Loan Funds
Short-term loans of up to $500 are available for school-year expenses. To qualify, the applicant must have at least a 2.0 high school and transfer grade-point average and a 1.8 University average.

Part-Time Jobs
Most University students who take part-time jobs secure them through the Office of Student Financial Aids. The most numerous opportunities are in University food service and hospitals.

Work-Study
Part-time work available through the Office of Student Financial Aids is provided under the federal Work-Study Program, the purpose of which is to enable college-qualified members of low-income families to earn college expenses not covered by other assistance. Work-study employment cannot work more than 15 hours a week. As far as possible, work-study jobs are arranged to give employers work experience related to their educational goals. (A separate publication listing scholarships, loans, awards and prizes available to students in the several colleges of the University is available upon request from the Office of Admissions, 107 Calvin Hall.)
Administrative Officers

State Board of Regents
The University of Iowa, Iowa State University of Science and Technology, the University of Northern Iowa, the Iowa Braille and Sight-Saving School and the Iowa School for the Deaf are governed by the State Board of Regents, consisting of nine members. The Board membership is as follows:

President: Ms. H. Reed Parson, Cedar
Vice President: Dr. W. W. Anderson, Iowa City
Special Assistant: Dr. J. K. McCleary, Cedar

Central Administration
President: William L. Boyd
Vice-president for Academic Affairs and Dean of the Faculties: May Brandt
Vice-president for Administrative Services: Robert A. Shackleton
Vice-president for Business and Finance: Bruce T. Allensworth
Vice-president for Educational Development and Research: Dean of the Graduate College: Duane C. Spindelkramer
Vice-president for Student Services and Dean of Academic Affairs: Philip G. Hubbert
Coordinator of Research: Edward H. Jennings

Academic Affairs
Vice-president and Dean of the Faculties: May Brandt

College of Business Administration
Dean: W. L. James
Center for Labor and Management: Duane Thompson

College of Dentistry
Dean: James H. McLellan

College of Education
Dean: Howard R. Jones

College of Engineering
Dean: Robert G. Weingartner
Institute of Hydraulic Research: Director: John F. Leonard

Graduate College
Dean: Dean C. Spronk

College of Liberal Arts
Dean: Donald B. Smith
School of Art and Art History: Director: Donald L. Turner
School of Journalism: Director: Donald L. Turner
School of Letters: Director: Donald L. Turner
School of Library Science: Director: Frederick Wurman

School of Music
Dean: Wilbur F. Towner
School of Fine Arts
Director: James C. Spaulding
School of Social Work
Director: Thomas H. Walls

College of Law
Dean: N. William Myers

College of Medicine
Dean: John W. Elkins

College of Nursing
Dean: Evelyn Bartki

College of Pharmacy
Dean: Dale E. Watten

Division of Continuing Education
Dean: Robert P. Ray

Advisory Group
Director: William Ogden

Bureau of Public Service
Director: Richard Nienhaus

Center for Computing and Information Technology
Director: J. W. Horst

Center for Career Development
Director: Center for Career Development

Institute of Public Affairs
Director: Center for Public Affairs

Iowa Lakeside Laboratory
Director: Richard V. Borking

Radio Station WHO-KILF
Director: Hugh V. Carrier

Libraries
Dean of Library Administration: Leslie W. Despain

Summer Session
Director: Ray A. Hines

Educational Development and Research
Vice-president: Dean C. Spronk

Office of Research Services and Administration
Director: Margaret B. Hagen

Office of Project Development
Director: John D. McKee

Office of International Education and Services
Director: Stephen M. Aron
Computer Center
Director: Howard L. Dockery

Public Information and University Relations
Director: Thomas L. Teets

Institute of Urban and Regional Research
Director: Kenneth J. Duster

Student Services
Vice-president: Philip G. Huthwel

Admissions
Director: John D. Marte

Registrar
University Registrar and Dean of Ceremonies: W. Abbott Cox

Iowa Center for the Arts
Coordinator: James H. Winckelmann

Macier Auditorium
Director: James H. Winckelmann

Iowa Memorial Union
Manager: James M. Baillie

Dean of Students
Dean: Marion L. Hallock

Student Activities
Director: Scott G. Whis

Career Services and Placement
Coordinator: Corinne Hamilton

University Counseling Service
Director: David L. Murray

Student Financial Aids
Director: John E. Moors

University Examination and Evaluation Services
Director: Douglas K. Whitney

Recreational Services
Director: Hyett R. Oxendine

University Health Services
Assistant to the President for Health Services: John W. Colhoun

University Hospitals and Clinics
Director: John W. Colhoun

Psychiatric Hospital
Director: George W. Mulvey

State Hygienic Laboratory
Director: William J. Hauer

University Hospital School
Dean: Raymond Rodeheer

Student Health
Director: Harley G. Pfaff

State Services for Crippled Children
Director: John C. McQueen

Administrative Services
Vice-president: William M. Stockman

University Personnel Service
Director: Fred H. Dobson

Residence Services
Director: Milton D. Livingston

Facilities Planning and Utilization
Director: Richard G. Gibson

Museum of Art
Director: Jan K. Mahan

University Architect
Robert R. Rustin

Environmental Health Services
Director: Paul J. Kilpatrick

Business and Finance
Vice-president: Elvin T. Jettles

Business Office
Business Manager and Treasurer: Ray E. Minneman
Controller and Secretary: Leonard E. Hink
Director of Purchasing: to be named

Physical Plant
Director: Dean A. Nallagh

General University
Alumni Association
Executive Director: Joseph W. Meyer

Intercollegiate Athletics for Men
Director: Charles W. Glass

Intercollegiate Athletics for Women
Director: Christian Grace

University of Iowa Foundation
Executive Director: Donald D. Wyrick
Residence

726-1 (2862) Classification of residents and nonresidents for admission and fees purposes.

1.4(1) General.

Residences as one of the three ways in which the student shall be classified as resident or nonresident for admission, fee and tuition purposes by the registrar. The classification shall be based upon information furnished by the student and all other available information. The registrar is authorized to require such written documents, affidavits, verification or other evidence necessary to establish the domicile of a student, including proof of registration, adoption, proof of custody or appointment of a guardian. A copy of establishing that a student is exempt from paying the nonresident fee is on the student.

For purposes of resident and nonresident classification, the word "parents" as herein used shall include legal guardians or other persons in loco parentis to all students with whose living arrangements the registrar shall have furnished himself. In cases where legal or other parent or parents of any applicant for admission has been provided to other than actual parents.

1.4(2) Residence for tuition purposes.

Residences for tuition purposes are generally divided into four categories; those that apply to students who are not residents of Iowa and those who are residents of Iowa or the United States, the latter being subdivided into those that apply to residents of the United States who are Iowa residents and those who are nonresidents of Iowa who are residents of the United States. The four categories are discussed in more detail below.

1.4(3) Students who are milagros.

The term “milagro” shall be applied to the residence of the state or the United States, the latter being subdivided into those that apply to residents of the United States who are Iowa residents and those who are nonresidents of Iowa who are residents of the United States. The four categories are discussed in more detail below.

1.4(4) Students over eighteen years of age and married students under eighteen years of age.

1.4(5) General facts.

The student must be admitted for resident status for purposes of classification of the student. Married students over eighteen years of age shall be considered to have resided in the state for the purpose of payment of tuition fees.

1.4(6) Guidelines.

The following guidelines are used in determining the residence classification of a student, residence classification of a student.

a. An external source stating that the student has been living in the state for the purpose of payment of tuition fees.

b. A copy of a student's residence classification certificate that has been issued to the student, residence classification of a student.
Supplemental Specific Rules for The University of Iowa

The following requirements are in addition to those given in the Board of Regents:

720—1.32662 Admission of undergraduate students by transfer from other colleges.

1.21) Students from accredited colleges and universities.

Transfers of record are given full credit to students from colleges or universities accredited by the North Central Association of Colleges and Secondary Schools or similar regional accreditors. The student must be certified by an official of the government in accordance with the regulations of the school attended. Students must be prepared by the registrar of the college or university attended by the student. The student must have been enrolled in an accredited college or university for at least two years.

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2.23 Review. A student approved by one or more deans with respect to the administration of the policies and requirements of the admission of students. The student shall be in accordance with the established procedures. Appointments are made in writing and shall be made with particularity in the manner thereof. Pending administrative review, the determination of the University shall not be delayed or canceled. After the review, the decision of the University is final, subject to the option of the student's right to request a review by the Board of Regents in accordance with procedures established by the Board. Unless otherwise notified by the Board, a student must be in compliance with the policies and procedures of the University pending final action on the request for review.

2.24 Definitions. As used herein, the following words shall mean:

a. "University" means the state University of Iowa or the appropriate university department of the University at the time of the policy or practice to which the policy applies.

b. "Student" means any individual who is enrolled or has previously enrolled on the University at the University at the time of the policy or practice to which the policy applies.

c. "Freshman" means any undergraduate student registered in the University or has previously attended the University.

2.20 (continued)

2.29 Activities for admission. Applications for admission to the College of Business Administration shall be submitted to the director of admissions.

Applications are urged to apply as early as possible, since this will give the administration an opportunity to директор in the department. Closing dates for the application process shall be announced in advance of the opening day of any session.

2.30 Requirements for admission.

a. In the College of Business Administration, applications must be submitted to the director of admissions.

b. Applications must be submitted to the director of admissions.

c. The director of admissions shall be in accordance with the policies and procedures of the University at the time of the policy or practice to which the policy applies.

2.31 Application for admission. Appointments are made in writing and shall be in accordance with the policies and procedures of the University pending final action on the request for review.

2.41 Application for admission. Address of inquiries regarding admissions to the director of admissions, University of Iowa.

2.51 Admission of freshmen. The student shall be a resident of the state and have completed the high school graduation requirements. The student must have completed and submitted all the required courses and have demonstrated satisfactory performance in the required coursework. The student must also have a cumulative grade point average of at least 3.0 on a four-point scale. Each student must have a cumulative grade point average of at least 3.0 with no failures.

2.60 (continued)

2.62 Application for admission. Appointments are made in writing and shall be in accordance with the opening day of any session.

2.63 Admission of freshmen. The student shall be a resident of the state and have completed the high school graduation requirements. The student must have completed and submitted all the required courses and have demonstrated satisfactory performance in the required coursework. The student must also have a cumulative grade point average of at least 3.0 on a four-point scale. Each student must have a cumulative grade point average of at least 3.0 with no failures.
admissions examinations, maintained a satisfactory cumulative grade-point average, achieved satisfactory standing in graduate class and successfully completed all pre- quired courses. The University with the approval of the Board of Regents shall establish and periodically review specific minimum requirements for admission to the College of Engineering. Among the items to be so determined are test scores, grade-point average, the status of the pre- required courses. These specific determinations will be published in the University catalog.

Applicants who meet the minimum admission requirements, the Director of Admissions may review the application of the applicant's record. (c) Admit unconditionally:

For which it is determined, (b) require remedial work for a period not exceeding.

2.5.2 Admission of undergraduate students by transfer.

The applicant must submit a formal application and official transcript of college work. Each applicant should have:

a. Maintained satisfactory grades in mathematics.

b. Achieved satisfactory scores on the University's required admission examinations.

c. Maintained a satisfactory cumulative grade-point average in all college work undertaken.

Applicants who do not meet the above requirements, the Director of Admissions will review individual records and may offer probationary admission.

[Final March 21, 1964 amended March 15, 1965]

7.5.2-7.5.2(3) Graduate College.

Graduation of any college or university accredited by regional accrediting associations may, if the student is in residence of University of Iowa. Graduation of the student's major department at the rank of 1.00 or above after the completion of study at the University of Iowa, and upon recommendation of the major department, shall be approved by the dean of the Graduate College. The examination of a graduate as a degree candidate is determined upon the merits of each individual case.

A student who is within four semester hours of having satisfied all the requirements for the bachelor's degree at The University of Iowa may be given a tentative 

5.2.1 Application for admission.

All applicants for admission to the College of Medicine, University of Iowa, Iowa City, Iowa, beginning summer may enter the College of Medicine only in the summer session of the fall semester. Students in good academic standing, applications for admission must be filed by May 1 for the fall semester in which the applicant wishes to enter.

To be considered for admission, an applicant should have attended a comprehensive graduate medical education program and have graduated from an approved medical school. The grade-point average is based upon the University of Iowa's rank system for which a grade of 'S' is equivalent to four points. Other ranking systems will be evaluated by the Office of Admissions.

Applications for admission must present a baccalaureate degree from an approved college or university prior to commencement of work in the College of Medicine.

The applicant must submit the Law School Admission Test administered by the Educational Testing Service, Princeton, New Jersey, and have been passed in the General Law Examines. The exam is given several times per year and may be taken at numerous locations in the United States and throughout the world. Applicants who are accepted to take the bar exam will receive the final admission for which they are applying. Students who are not accepted to the College of Law will not be considered for admission to the College of Medicine. Applicants who are not accepted to the College of Law may apply to the College of Medicine upon recommendation of the Office of Admissions. The degree candidate to graduate in medicine, and may be considered for admission to the College of Medicine.

Applications will be accepted for admission to the College of Medicine. Applicants who are accepted for admission to the College of Medicine will be notified of their acceptance.

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7.10(2) College work.

The college work as outlined below will meet the minimum academic requirements for admission to the College of Pharmacy. The minimum will include thirty-two semester hours of college-level work in science in chemical and physical education. The thirty-two semester hours must include:

Chemistry, 15-16 hours

Pharmacology and Chemistry, 4-5 hours

Pharmacology and Physiological Chemistry, 4-5 hours

Bacteriology, 2 hours

Microbiology, 2 hours

Medical, physical, and physical chemistry, 1-2 hours

Student may meet credit requirement 1-2 hours by completing all required courses in a regular college and transferring an approved 4-credit hour of college credit for an equivalent course in a regular college.

7.10(3) Scholarship and application deadline.

To be considered for admission to the College of Pharmacy, students must have earned a 2.0 or "B" average on all college work undertaken. The minimum grade point average of 2.0 is based on the entire University of Iowa's entrance requirements for the degree in pharmaceutical education. Applications for admission and the required official transcripts must be filed before March 1 for the class to enter Pharmacy in September.

7.10(4) Required courses.

Applicants for admission are required to take the American College Testing Program:

7.10(5) Current requirements.

Applicants who have completed work in a College of Pharmacy accredited by the American Council on Pharmaceutical Education may, if their college average is acceptable, be admitted and granted advanced standing into the degree of Bachelor of Science in pharmacy.

7.2.11(262) College of Liberal Arts.

Applicants for admission to Liberal Arts must meet the requirements that are common to the state institutions in Iowa and should have graduated from an approved high school or have an equivalent amount of training.

7.2.12(262) College of Education.

Students at the University during preceding work in education are registered in the College of Liberal Arts at the University. Requirements for permission to take teacher-training courses are found in the University Catalog.
Index

A
Academic advisory offices: 12
Academic records: 7
Accounting: 226
Accreditations and associations: 4
Action Studies Program: 12
Administrative Code (Iowa Board of Regents): 401
Administrative officers (University): 399
Admission (general University requirements and procedures): 5
Admissions, Office of: 12
Adult Education Mini-Course Program: 388
African-American Studies: 23
Agricultural Medicine and Environmental Health, Institute of: 396
American Civilization: 26
Anatomy: 342
Anesthesiology: 344
Anthropology: 38
Applied Mathematical Sciences: 116
Art and Art History: 32
Auditorial Center: 388

B
Biochemistry (graduate): 344
Biochemistry (undergraduate): 40
Biomedical Engineering: 294
Botany: 41
Broadcasting and Film: 199
Business Administration, College of: 223
Business Administration, Department of: 227
Business Education: 232

C
Career Services and Placement Center: 12
Chemical Engineering: 295
Chemistry: 44
Child Development and Development, Institute of: 396
Child Development Clinic: 396
Children's Reading Clinic: 394
Civil Engineering: 297
Classics: 47
Clinical Management Concepts (Dentistry): 343
Clinical Research Center: 396
Code of Student Life: 5
Communication Research: 197
Communication Studies: 51
Community College Affairs, Office of: 388
Comparative Legal Studies Research Center: 396
Comparative Literature: 51
Comprehensive Care (Dentistry): 345
Computer Center: 366
Computer Science: 115
Conferences and Institutes, Center for: 367
Continuing Education, Division of: 367
Correspondence courses: 287
Counseling Service: 12
Counselor Education: 283

D
Dance: 141
Dental Health Education, Bureau of: 391
Dental Hygiene: 245
Dental Service: 12
Dentistry, College of: 241
Dermatology and Dermatology: 346
Dramatic Art (Speech and): 291

E
Early Childhood and Elementary Education: 308
East Asian Languages and Literature: 53
Economics (Business Administration): 235
Economics (Liberal Arts): 67
Economic Research, Institute for: 225
Education, College of: 257
Educational Administration: 272
Educational Opportunities Program: 12
Educational Psychology, Measurement and Statistics: 273
Education Tests: 387
Elementary Education (Early Childhood and): 398
Endocrinology: 346
Energy Engineering: 307
Electrical Engineering: 296
Engineering, College of: 290
Engineering (B.S. program): 300
English: 58
Environmental Engineering: 301
Evaluation and Examination Service: 12
Extension classes: 387

F
Fell housing policy: 6
Family Practice: 347
Financial Aid: 396
Food Producitiveness: 244
French: 10
French and Italian: 65

G
General Information: 4
General Science: 68
Geography: 71
Geology: 78
German: 82
Graduate College: 351
Greek (Classical): 47

H
Hancher Auditorium: 398
Health Occupations Education: 391
Health Sciences Library: 391
Health Service Research Center: 391, 396
Health Service (Student): 13
High School-College Relations: 13
History: 87
Home Economics: 91
Hospital and Health Administration: 349
Hospital School, University: 392
Housing: 9
Human Nutrition: 350
Hydraulic Research, Institute of: 290

I
IMPACT, Iowa Program: 388
Industrial and Management Engineering: 305
Industrial Relations Institute: 305
Information Engineering: 311
Instructional Design and Technology: 277
Insurance Education and Research, Institute for: 325
Internal Medicine: 351
International Education and Services: 13, 393
Intramural Sports and Recreational Activities: 13
Iowa Advocates: 334
Iowa Center for the Arts: 393
Iowa Center for Education in Politics: 388
Iowa Lakeside Laboratory: 388
Iowa Law Review: 394
Social Science Data Archive: 387
Social Studies: 180
Social Work: 192
Sociology: 186
Spanish: 10
Spanish and Portuguese: 189
Special Education: 286
Special Support Services: 14
Speech and Dramatic Art, Broadcasting and Film: 196
Speech and Hearing Clinic: 14, 382
Speech Pathology: 198
Speech Pathology and Audiology, Department of: 193
Speech Pathology and Audiology, Council on: 291
State Hygienic Laboratory: 382
State Services for Crippled Children: 392
Statistics: 123
Surgery: 374
Systems Engineering: 317

T
Toxicology Center: 397
Tuition and Fees: 6

U
University Hospitals and Clinics: 390
University of Iowa Alumni Association: 394
University of Iowa Foundation: 394
Up-to-date marking system: 7
University of Iowa Health Center: 390
University Press: 394
University residence halls: 9
Urban and Regional Planning: 209
Urban and Regional Research: 396
Urban Community Research Center: 397
Urban Growth in Developing Countries: 212
Urban Transportation: 212
Urology: 375

V
Veterans Administration courses: 347
Veterans Administration Hospital: 392
Veterans’ services: 14

W
Women’s Studies: 213
World Order Studies: 215, 334, 388
Writing Laboratory: 14

Z
Zoology: 217