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 changes 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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## 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>
</tr>
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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>
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<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>
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<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>
The University of Iowa received its charter from the first Iowa General Assembly on February 25, 1847, just two months after Iowa's admission to statehood. The University has been in continuous operation since March, 1848.

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. Its 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 82.5 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 their 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 of 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 upholding the University's standards of excellence in teaching. 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 Conference. 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 semesters 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 Students 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 rightful 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 Liberal Arts
Ten days before Registration begins—all sessions

College of Business Administration
May 1–Summer Session June 1–Fall Semester November 15–Spring Semester

College of Dentistry
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 underprepared seniors to complete the American College Tests
The University of Iowa uses ACT scores for:

- Admission: As a criterion for admitting some students unconditionally or on probation; for requiring some students to attend a probationary summer session; and for denying admission to applicants who do not meet minimal standards.
- Placement: As a basis for excusing some students from certain basic course 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-administered scholarships and loans.

Scholastic Aptitude Test (SAT) scores may be submitted with freshman 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 undergraduate admission at Iowa complete the American College Tests 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 this information through the College Board, Inc., or ETS.

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 Administration 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 into the University, 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 exclusively for the use of Student Health Service as necessary background 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>
<th>Graduate</th>
<th>Denesity</th>
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</thead>
<tbody>
<tr>
<td>hours</td>
<td>reg. res. nonres.</td>
<td>res. nonres.</td>
</tr>
<tr>
<td>0</td>
<td>$66 $66</td>
<td>$77 $77</td>
</tr>
<tr>
<td>1</td>
<td>$66 $66</td>
<td>$77 $77</td>
</tr>
<tr>
<td>2</td>
<td>$66 $66</td>
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<td>3</td>
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<td>$116 $116</td>
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<td>8</td>
<td>$240 $519</td>
<td>$313 $680</td>
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<tr>
<td>9</td>
<td>$269 $583</td>
<td>$390 $825</td>
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</table>

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>hours</td>
<td>reg. res. nonres.</td>
</tr>
<tr>
<td>0-4</td>
<td>$318 $318</td>
</tr>
<tr>
<td>5-8</td>
<td>$371 $825</td>
</tr>
<tr>
<td>9</td>
<td>$600 $1350</td>
</tr>
</tbody>
</table>

*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 admission to minor sports events and to student-faculty concerts and plays; admittance 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 finest 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 University 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 reduction of fees assessed as follows: during the first week of classes—90%; during the second week—75%; 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           below average but passing 1
D           failing               0
E           audit                 0
I*          incomplete             -
W*          withdrawn             -
V*          passing               -
H*          honors                -
S*          satisfactory           -
U*          unsatisfactory (Graduate College only) -
0*           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 3.80 + GPA highest 2%
High distinction 3.50-3.79 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 "8-11" is the code for the course numbered 11 in the Department of Chemistry (8), entitled "Elementary Quantitative Analysis.

College 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
6S Business Education

College of Dentistry
81 Fixed Prosthodontics
82 Operative Dentistry and Pedodontics
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 Interdisciplinary

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
55x Energy Engineering
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
0 n/a
1 Biomedical Engineering
2 Chemical Engineering
3 Civil Engineering
4 Environmental Engineering
5 Electrical Engineering
6 Industrial and Management Engineering
8 Mechanical Engineering
9 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>Department</th>
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</thead>
<tbody>
<tr>
<td>1F</td>
<td>Drawing</td>
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<tr>
<td>1G</td>
<td>Metalworking</td>
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<tr>
<td>1H</td>
<td>Art History</td>
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<tr>
<td>1I</td>
<td>Multimedia</td>
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<tr>
<td>1K</td>
<td>Painting</td>
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<tr>
<td>1L</td>
<td>Photography</td>
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<tr>
<td>1M</td>
<td>Print Making</td>
</tr>
<tr>
<td>1N</td>
<td>Sculpture</td>
</tr>
<tr>
<td>1P</td>
<td>Cross-reference with courses which originated in other departments</td>
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<td>2</td>
<td>Botany</td>
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<tr>
<td>3</td>
<td>Speech Pathology and Audiology</td>
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<td>4</td>
<td>Chemistry</td>
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<td>8</td>
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<td>English Language and Linguistics</td>
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<td>8P</td>
<td>English Professional</td>
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<tr>
<td>8W</td>
<td>English Writing</td>
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<td>9</td>
<td>French</td>
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<td>10</td>
<td>Basic Skills Courses</td>
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<td>11</td>
<td>Core Courses</td>
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<td>14</td>
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<td>16</td>
<td>History</td>
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<td>Home Economics</td>
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<td>18</td>
<td>Italian</td>
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<tr>
<td>19</td>
<td>Journalism</td>
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<td>20</td>
<td>Latin</td>
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<tr>
<td>21</td>
<td>Library Science</td>
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<td>22C</td>
<td>Computer Science</td>
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<tr>
<td>22M</td>
<td>Mathematics</td>
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<td>22S</td>
<td>Statistics</td>
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<td>23</td>
<td>Military Science</td>
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<td>23A</td>
<td>Astronautal Military Studies</td>
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<td>24</td>
<td>Museum Training</td>
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<td>Music</td>
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<td>26</td>
<td>Philosophy</td>
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<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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<td>Political Science</td>
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<td>30A</td>
<td>Public Affairs</td>
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<td>Psychology</td>
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<td>Religion</td>
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<td>European Literature and Thought</td>
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<td>Sociology</td>
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<td>35</td>
<td>Spanish</td>
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<td>36</td>
<td>Speech and Dramatic Art</td>
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<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>
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<td>Zoology</td>
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<td>Portuguese</td>
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<td>39</td>
<td>East Asian Languages and Literature</td>
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<td>American Civilization</td>
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<td>Comparative Literature</td>
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<td>50</td>
<td>Medicine, Nondepartmental</td>
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<td>60</td>
<td>Anatomy</td>
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<td>61</td>
<td>Microbiology</td>
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<td>62</td>
<td>Dermatology and Syphilology</td>
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<td>Preventive Medicine and Environmental Health</td>
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<td>64</td>
<td>Neurology</td>
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<td>Human Nutrition</td>
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<td>Obstetrics and Gynaecology</td>
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<td>67</td>
<td>Ophthalmology</td>
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<td>68</td>
<td>Otolaryngology and Maxillofacial Surgery</td>
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Housing

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 perusal 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 households 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-operator dwelling 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, Rockway and Slater halls, and in the Clinton Street Residence Halls (east campus), which include Barge Hall, Carrier 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 halls 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 roommates. 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 learns 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 $1,300 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-owned apartments available to married students in the Hawkeye Drive, Hawkeye Court and Parlawin 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-
Phone. 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 Epilson 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 Epilson, Sigma Chi, Sigma Nu, Sigma Phi Epilson, Sigma Pi and Tau Kappa Epsilon.

Professional fraternities operating chapter houses include Alpha Chi Sigma (chemistry), Alpha Kappa Kappa (medicine), Delta Sigma Delta (dentistry), Phi Beta Pi (medicine), Phi Rho Sigma (medicine) and Psi 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 Kappa Gamma, Pi Beta Phi and Zeta Tau Alpha.
The Lehigh Haunt Collection, brought together by Luther A. Brewer of Cedar Rapids, Iowa, is considered one of the most comprehensive in existence. It contains nearly 2,000 manuscripts and manuscript letters written by Hunter or to him by his many famous friends, 100 association volumes, and 600 editions of Hunter's writings.

The Mark Ryken Memorial Collection of approximately 3,700 volumes is particularly rich in deluxe editions, including many rare bindings made especially for Mrs. Ryken. The Finch Sewing 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 John Springer Collection on typography, given to the University by a long-time Iowa City printer, includes 2,850 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 cartoonists which for more than 40 years Ding recorded and commented on the economic, political and diplomatic affairs of the United States. His cartoons 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 LincolnIA in the United States. A number of items in it concern John Wilkes Booth and the trial of his fellow conspirators. Another large group contains reminiscences of people who knew Lincoln. Lastly, broadsides relating to war and the Civil War Period have been added.

The "Y" Collection is a gathering of early, rare or special works on diverse subjects, including books of the 15th and 16th centuries, manuscripts, early club publications, private great books and selected modern first editions.

The Manuscript Collection includes more than 6,600 individually catalogued letters or manuscript items of English and American authors or historical figures, principally of the 19th and 20th centuries. It includes 115 private collections of letters, 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 Indian; the Levi G. Leonard Collection of manuscripts and documents dealing with railroad in the Midwest; the History of Hydraulics Collection; the Edwards Food Piper Collection of ballads and folk songs; the Chauncey Collection, which contains several thousand letters and business documents descriptive of the Chauncey movement; the Rhonda 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 deans 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
Patterned after the "free university" concept, the Action Studies Program provides a vehicle for immediate response to student demand for courses that are current or too experimental for inclusion 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, 503 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 paid 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 and does not render service under the Student Health hospitalization fund. Fees are established for all treatment rendered and patients are to pay cash or use their Master Charge cards.

Educational Opportunity Program
This program identifies students from educationally disadvantaged backgrounds and arranges financial and academic assistance according to individual need for those admitted to the University. All inquiries 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 analysis 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 institutional research projects and provides consulting services on questionnaire and survey design.

The administration of 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 Admission Test (GMAT), Graduate School Foreign Language Test, Law School Admission Test, Test of English as a Foreign Language (TOEFL), and College-Level Examination Program (CLEP).

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 and services in the Student Health Clinic, which provides complete 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 policy, a University-approved group plan insurance is available for individual students or as a family plan covering students and dependents.

High School-College Relations
Admissions 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. The University is a member of the Big Ten Conference. Intercollegiate Athletics, which is composed of 13 members from the University’s teaching and administrative staff, two University alumni, one representative of the University Staff Council and two students.

Intramural Sports and Recreational Activities
Through the University’s Division of Recreational Services, all students have opportunities to participate in 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 harbor steet, a creative crafts center, a bookstore, a sundries shop, a television room, lounges, meeting rooms, auditory for lectures and concerts, art and sculpture display areas, and, in the adjoining Iowa House, 105 guest rooms for parents, 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 advisor. The Center has extensive information about hundreds of study abroad programs (including several jointly sponsored by The University of Iowa), foreign universities, travel opportunities, hosting, camping, treking, 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 can be obtained at the OIES.

The Foreign Student Advisers in the OIES promote and facilitate interaction between Americans and foreign students and professionals. They also provide information, advice and counseling for the over 1500 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 Rhetoric 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, locational skills, test-taking abilities, command of vocabulary, comprehension, critical reading and increased rate of reading.

The Reading Lab offers two service courses:

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 an open lab, and assigns no grade; ordinarily no outside assignments are given; work is restricted to Lab handouts, and excludes extensive use of Lab materials and the students’ own texts in other courses.

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, 108 Rhetoric, for students who need exceptional help preparing for college-level reading, and 80:370 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 Ministers 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 requests for letters, 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 Veterans Affairs Office provides assistance, information and tutorial programs for veteran 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 taking Individual Instruction in Writing for credit (10:5) before registering for the required course. Noncredit students may enroll throughout the semester.
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 competence 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 faculty 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., B.S.
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 department 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 Letters, the International Writing, Translation and Writers Workshop; and the Windover Press. There are also schools of Journalism, Library Science, Religion and Social Work.

Basic Program

Except 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 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 major 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.

Graduation requires a minimum grade point average of 2.0 in all coursework applied toward the degree, in all coursework completed 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 specific approval for the appropriate departmental executive officer and the dean of the College for courses numbered above 199 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
Freshmen: 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 1-Baccalaureate Arts Advisory Office.

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 enrolled 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 physical education courses, mathematics (325H-3) and/or elective 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 36 semester hours of transfer credit, the “pass” credit limit is eight.
- Students enrolled as beginning freshmen before May, 1974, who graduate 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 55 semester hours of transfer credit, a maximum of 24 semester hours of “pass” credit; with 56 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.

Auditting 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 reevaluation 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 filing of a completed approval form.

Incomplete and No Report

A mark of "I" (incomplete) or "O" (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 3 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 have taken 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 or 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 preparation sponsored by the Advanced Standing Program in English qualifies to attempt to meet the College of Liberal Arts rhetoric requirement with credit by taking the rhetoric proficiency examination offered before the course begins. At least two weeks before he or she registers at the University, the student must submit a petition to the Dean of Admissions or the Registrar. The student must satisfactorily complete the examination to receive credit. 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 credit, in the general education program of the College, 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 Advising 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 students of the various language departments serve as advisors to students in preparing for the certificate. After selecting an area of interest, students wishing to earn the certificate will be guided by the appropriate chairperson in choosing a country of study designed to provide a basic understanding of the area or nation. Courses may include work in geography, history, anthropology, art, literature, political science or other fields offering international studies. Programs leading to the certificate will include at least 16 semester hours completed 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 chairperson receives the Foreign Studies Certificate with his or her degree.

Interested students should consult the chairperson of the appropriate department:

- Classics (Ancient Greece or Rome)
- East Asian Languages and Literatures (India, China or Japan)
- French and Italian (France or Italy)
- German (German-speaking countries)
- 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 departments offer honors curricula have opportunities to continue their studies in Honors seminars, independent research and other special activities, and to earn the baccalaureate degree "with Honors." Entering freshmen whose records indicate that 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 programs, for which a bachelor's degree is not an admission requirement, to obtain a bachelor's degree 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 advisor, selected from the faculty, to help the student with registration and the progressive development of the educational program which will best prepare the student to pursue his or her life goals. Faculty advisors are assigned by the Advisory Office. Students who have declared majors are assigned advisors from their major departments; those who have not declared majors are assigned advisors from the Liberal Arts faculty at large; those in preprofessional programs are assigned special advisors from the appropriate professional areas.

Students should go to the Advisory Office to change faculty advisors, 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 Bachelor of General Studies degree program; and concerning probation, dismissal, re-enrollment, academic discipline and any other academic matter.

Requirements

(No more than 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 must satisfy the core requirements by earning in each core area 8 semester hours of credit in core courses offered in that area, or in departmental courses approved for core purposes.

With the approval of the Department, a student may be excused from the core requirement in the area of his or her major. Exception 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:
Historical-Cultural Core

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21:10-23:10 Problems in Human History</td>
<td>3-4 h. Introduction to the study of human history, emphasizing the evolution of human societies and cultures.</td>
</tr>
<tr>
<td>21:11-23:11 Western Civilization</td>
<td>4 h. An introduction to the history of Western civilization, focusing on its political, social, economic, and cultural developments.</td>
</tr>
<tr>
<td>21:12-23:12 Western Civilization</td>
<td>4 h. Continuation of 21:11, emphasizing the development of Western civilization in the modern era.</td>
</tr>
<tr>
<td>21:33-23:33 Philosophy of Man</td>
<td>4 h. An introduction to the philosophical concepts of mind, body, and society, focusing on the works of major philosophers.</td>
</tr>
<tr>
<td>21:51-23:51 Drama in Western Culture</td>
<td>4 h. An introduction to the history of drama, focusing on the major playwrights and plays.</td>
</tr>
<tr>
<td>21:52-23:52 Drama in Western Culture</td>
<td>4 h. Continuation of 21:51, focusing on the contemporary playwrights and plays.</td>
</tr>
<tr>
<td>21:55-23:55 Civilizations of Asia</td>
<td>4 h. An introduction to the history and culture of Asia, focusing on the major civilizations and their impact on world history.</td>
</tr>
<tr>
<td>21:56-23:56 Civilizations of Asia</td>
<td>4 h. Continuation of 21:55, focusing on the contemporary civilizations and their impact on world history.</td>
</tr>
</tbody>
</table>

(Transfer students may meet the literature core requirement with six semester hours of transfer credit in core-equivalent courses in history, philosophy, religion, American civilization, or art, music, or drama. For specific course descriptions, please consult the catalog. Exploratory material available in print, video, and audio formats. Some courses may be taken for credit, others for pass/fail. In all cases, the student must have completed the course with a grade of B or better.)

(For transfer students, the literature core requirement may be satisfied with six semester hours of transfer credit in core-equivalent courses in literature, or with three semester hours of transfer credit and four semester hours of University credit in literature.)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>29:3</td>
<td>Basic Physics (may not be combined with any other physics core option)</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>29:50</td>
<td>Moders Astronomy</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>29:61-62</td>
<td>General Astronomy</td>
<td>3-4 s.h.</td>
</tr>
<tr>
<td>29:105</td>
<td>General Astronomy</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

**Zoology**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>37:3</td>
<td>Principles of Animal Biology</td>
<td>5 s.h.</td>
</tr>
</tbody>
</table>

**Sociology Core**

The social science core requirement may be met with any combination of the departmental courses listed below. For course descriptions, see the appropriate departmental sections of the Catalog.

**Botany**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:1</td>
<td>Introduction to Botany</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>2:1*</td>
<td>Evolution of Land Plants</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>2:3</td>
<td>Biology of the Local Flora</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

**Chemistry**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:1</td>
<td>Principles of Chemistry I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>4:7</td>
<td>General Chemistry I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>4:4</td>
<td>Principles of Chemistry II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>4:6</td>
<td>Elementary Chemistry Laboratory</td>
<td>2 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>
</tbody>
</table>

**General Science**

(Open only to elementary and special education majors.)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>97:55</td>
<td>Science Foundation I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>97:56</td>
<td>Science Foundation II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>97:112</td>
<td>Advanced Science Foundations</td>
<td>3 cr.</td>
</tr>
</tbody>
</table>

**Geology**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:5</td>
<td>Introduction to Geology (may not be taken in combination with 11:23)</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

**Mathematics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>22M:10</td>
<td>Fundamentals of College Mathematics I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>or 22M:11</td>
<td>Fundamentals of College Mathematics II</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

**Physics and Astronomy**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>29:1</td>
<td>College Physics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>or 29:17</td>
<td>Introductory Physics I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>29:2</td>
<td>College Physics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>or 29:18</td>
<td>Introductory Physics II</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

**Anthropology**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>113:3</td>
<td>Introduction to the Study of Culture and Society</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>113:10</td>
<td>The World's Peoples</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

**Economics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>68:1</td>
<td>Principles of Economics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>68:2</td>
<td>Principles of Economics</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

**Geography**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>44:1</td>
<td>Introduction to Human Geography</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>44:2</td>
<td>Natural Environment and Man</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>44:11</td>
<td>Introduction to Social Geography</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>44:19</td>
<td>Natural Environmental Issues</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>44:30</td>
<td>Introduction to Economic Geography</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>44:35</td>
<td>Introduction to Urban Geography</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

**Linguistics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>105:11</td>
<td>Language and Society</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

**Political Science**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>30:1</td>
<td>Introduction to American Politics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>30:2</td>
<td>Introduction to Politics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>30:10</td>
<td>Introduction to Political Behavior</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>30:11</td>
<td>Introduction to Political Theory</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>30:12</td>
<td>Introduction to Comparative Politics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>30:13</td>
<td>Introduction to World Politics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>30:100</td>
<td>The American Political System</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>31:1</td>
<td>Elementary Psychology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>or 31:3</td>
<td>General Psychology</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

**Sociology**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>34:1</td>
<td>Introduction to Sociology: Principles</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>34:5</td>
<td>Introduction to Sociology: Problems</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>
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 educational 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.

Premed students who take the test but fail it must register for physical education skills for at least one semester before attempting the test again. Students who have not passed the test before the beginning of the sophomore year must register for physical education skills coursework at that time; those who wish to take the sophomore course for credit.

The instructional program in physical education skills provides for a wide variety of activities: archery, badminton, ballet, bowling, canoeing, curling and skating, fencing, field hockey, figure skating, flag football, folk and square dance, golf, gymnastics, handball, judo, jujitsu, karate, modern dance, paddleball, racquetball games, relaxation, riding, rhythmic gymnastics, rifle/rugby, self defense, soccer, skiing, softball, squash, swimming, table tennis, tennis, track and field, trampoline and tumbling, volleyball, water polo, water safety instruction, weight control, weight training, wrestling.

The program also gives the student an opportunity to correct physical defects which respond to therapeutic exercises.

(Students who have passed their 22nd birthday prior to admission are excused from the physical education skills requirement. Students who present evidence of having completed a basic training program in some branch of military service are excused from the requirement. Transfer students may meet the requirement with four semester hours of transfer credit in physical education or with two semester hours from a non-comprehensive physical education and two semester hours of University physical education skills credit. Transfer students admitted to the University with more than 40 semester hours of transfer credit are excused from the requirement.)

Rhetoric Skills Requirements
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, explaining 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 entering freshmen are assigned either to the two-semester, eight-credit sequence, 10.1, 2 Rhetoric, or to the accelerated one-semester, four-credit course, 10.3, Rhetoric.

Students initially assigned to one-semester and registered for 10.3, 10.4, 306.25 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 performances which serve as placement indication. Students in 10.1 who demonstrate above average reading speed and comprehension and above average writing skills may be advised to switch to 10.3, for example.

Students whose early work indicates a need for individualized instruction beyond their coursework may enroll for non-credit work in the Reading and/or Writing Labs offered by the Rhetoric Program. Some students may be advised to switch to 10.5, a one-semester, two-credit course of individualized instruction in reading, and/or to 10.9, 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 transfer credit in composition and two in speech. Students who partially satisfy the requirement with transfer credit may be assigned to 10.2, 10.3, 10.4 or 306.25. 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 certificat of high school credits, including a complete statement of high school record, class rank, scores on standardized tests and certification of graduation. An applicant may be tentatively admitted after he or she has completed the junior year in high school, but admission will not be final until receipt of the final transcript and certification of high school 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 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 must meet at least the same standards as a graduate of an Iowa high school. The option for admissions by probation or trial enroll-
ment may not be open to these students.

Program chairman: DAVIS T. T литератур, therefore the Afro-American Studies Program is interdisciplinary, it draws in Arts.

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 Associa-
tion of Colleges and Secondary Schools or similar regional asso-
ciations. The recommendations contained in the current issue of the Report of the Committee given by Educational Institutions published by the American Association of Collegiate 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 might require to support its or her application for admission. A transfer applicant is expected to have maintained a C average (2.0 on a 4-point scale) for all college work attempted and must not be under suspension from the last college attended. Transferrable applicants who are not residents of Iowa are expected to have maintained a 2.25 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.

A graduate of a nonaccredited college who is suspended from the last college attended will not be considered for admission during the period of suspension or, if suspended for an indefinite period, will not be considered until six months have passed since the date of attendance. When eligible for consideration the applicant must not have exceeded the basis of his or her performance on the entrance examinations.

A transfer applicant under disciplinary suspension will not be considered for admission until a clearance and a statement of the reason for suspension are filed from the previous college. When it becomes proper, to consider an application from a student under suspension, the College must take into account the fact of the previous suspension. An applicant granted admission under these circumstances will in each case be admitted on probation, and his or her admission will be subject to cancellation.

Students from Nonaccredited Colleges

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

Students from Nonaccredited Colleges

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

 Afro-American Studies Program

The Afro-American Studies Program focuses on the study of people of African ancestry in the North American context and the United States of America from the 17th century to the present. Although the program's history emphasizes the history and 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 continues to commit resources to expand its perspectives by involving other disciplines which will help students to gain a comprehensive understanding of the history and culture of African Americans.

The Afro-American Studies Program offers courses in African American History, the African Diaspora, African American Literature, and African American Culture. The program provides a comprehensive understanding of the history and culture of African Americans. It is designed to offer courses that are relevant to the study of African American culture and history. The program emphasizes the study of African American culture and history, and it is designed to provide students with a thorough understanding of the history and culture of African Americans.
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 intended primarily for individuals who expect to assume roles in universities and colleges, as well as for those who are interested in either the development of Afro-American Studies and as directors of Black Studies programs. 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 African 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 as 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 social 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 sixth semester of graduate study at the University, a doctoral candidate should have taken a comprehensive examination. This examination is given in both the written and oral forms 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 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 appro-

Co-Curricular Activities Related to Afro-American Studies

Black Kelidescope
Each year the Afro-American Studies Program attempts to pro-

Institute in Afro-American Culture
Since 1958 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 endowed visiting scholars and lecturers to the campus, have focused on such topics as the Harlem Renaissance, Richard Wright, W.E.B. Du Bois, black Americans in theater and dance, and the development of black thought. Although students in residence at the University are not eligible to be official members of the Institute, they are permitted to enroll in the 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 offers a forum for instruction and experience in the dramatic productions of plays by black authors.

Afro-American Cultural Center
The Afro-American Studies Program encourages participation in the facilities of the Afro-American Cultural Center. The Center serves as a museum and library for educational and cultural pursuits 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-

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

Courses

Afro-American Studies and Related Areas

46:10 Black Poetry Workshop
3 s.h.

46:11 Contemporary Black Experience
3 s.h.

46:20 Introduction to Afro-American History
3 s.h.

46:21 Black Drama
3 s.h.

46:22 Black American Drama
3 s.h.

46:23 African Drama
3 s.h.

46:24 African American Literature
3 s.h.
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.
113:120 Peoples of West Africa 3 s.h.

Art

Business Administration
68:205 Business and Society 3 s.h.
68:252 Employment Relations and Public Policy 3 s.h.

Economics
65:137 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
16:183 Introduction to the French-Speaking World 3 s.h.

History
16:61 American History, 1492-1877 3 s.h.
16:62 American History, 1877-1936 3 s.h.

Sociology

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

American Civilization

Program chairman (acting): John Barber
Member, professor: Lauri Marks (Philosophy); Robert Alexander (Art); Paul Bauer (English); Samuel Bider (Speech and Dramatic Art); Lane Davis (Political Science); Robert Dwyer (History); Elise Haring (History); John Nolan (Anthropology); Sidney James (History); Irving Kovach (Bureau Administration); Richard MacCren (Speech and Dramatic Art); Harry Quay (English); Norman P. Stoddard (English); Russell S. Stoddard (History); Robert Stoddard (English); Darwin T. Towner (English); Yvonne van Dyke (Political Science); marvin Vincent (Art); J. Richard Wilbur (Sociology); associate professors: Hugh Andrew (Speech and Dramatic Art); William D. Dyer (Education); Linda G. Etten (History); Joseph Keeler (Sociology); Edward J. Lewis (Sociology); Charles Leiter (English); Marshall F. Prince (Sociology); J. Leo Newton (History); James R. Shelly (History); J. Marvin Shelly II (History); J. William Yelton (Sociology); associate professors: William J. Fox (Geography); Wayne Fredrick (English); Mark Kohn (Sociology); Jamie Kohn (English); William M. Kohn (History); Mary S. Kohn (Social Science); Carol Williams (Economics); Vincent Young (Sociology); associate instructors: Douglas Haile (Anthropology); Lynn Willey (Sociology).

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

At both the undergraduate and graduate levels, the program in American Civilization provides a broad multidisciplinary knowledge of American culture. Our courses offer information on the distinctive features of American culture, literary and artistic developments of the United States, contributions of minority groups to American civilization, social and governmental organization of America and the manifestations of race 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 these in ways specific enough to make solutions possible. The major can also serve as partial preparation for secondary teaching in American literature, American history, and the social studies as 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 undergraduates majoring in American Civilization. These subject areas require:

Four semesters of coursework in American literature;

Four semesters of coursework in American history;

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

45:2 American Civilization II, Senior Colloquium (45:60), and at least two additional semesters of coursework in American civilization.

List 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 on areas as different as problems of poverty today, the impact of modern art on America in 1913, and the significance of contemporary sports heroes.

The Master of Arts Program

On the master’s level the program requires the study of a variety of materials, methods, and bibliography of American civilization (45:191). Introduction to American Civilization and 45:190 Introduction to American Civilization and 45:191) are required for students majoring in American Civilization. Students concentrate in two major fields. They elect either American literature or history, or they elect another 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 advisor and the comprehensive committee selected by the student, the doctoral candidate constructs a balanced and integrated program of courses and readings to a knowledge of significant portions of American civilization. Doc-
Qualification
As the end of his or her first year of graduate work at Iowa, the student requests qualification for admission to the Ph.D. program. The executive committee of the program, on examining the student's performance and recommendations by his professor, determines whether he is qualified to proceed.

Comprehensive Examinations
The written portion of the comprehensive examination covers materials and methods for the study of American civilization and the three other fields developed in conjunction with the student's comprehensive committee. In the oral portion of the examination, the student must also demonstrate sound knowledge of the topical culture of one chronological period of American civilization.

Thesis
The student must present a satisfactory thesis on a topic which concerns more than one of the above fields.

Final Oral Examination
This examination will be predominantly on the field of the thesis.

Languages
The written portion of the comprehensive examination covers materials and methods for the study of American civilization and the three other fields developed in conjunction with the student's comprehensive committee. In the oral portion of the examination, the student must also demonstrate sound knowledge of the topical culture of one chronological period of American civilization.

Thesis
The student must present a satisfactory thesis on a topic which concerns more than one of the above fields.

Final Oral Examination
This examination will be predominantly on the field of the thesis.

Languages
The written portion of the comprehensive examination covers materials and methods for the study of American civilization and the three other fields developed in conjunction with the student's comprehensive committee. In the oral portion of the examination, the student must also demonstrate sound knowledge of the topical culture of one chronological period of American civilization.

Thesis
The student must present a satisfactory thesis on a topic which concerns more than one of the above fields.

Final Oral Examination
This examination will be predominantly on the field of the thesis.
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.

Mayo's must take at least 30 semester hours of coursework in anthropology, including 112:3 Introduction to the Study of Culture and Society, 11:13 the World's Peoples and 11:13 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.

Anthropologists are a wide range of choices, including courses dealing with language and culture, social problems of undeveloped areas, religions activity in folk and local settings, primitive art, biological anthropology and urban anthropology. Specialization is discouraged in the undergraduate program, which is designed to give the student the breadth possible cross-cultural background. Courses are encouraged in such related areas as sociology, linguistics, politics, geography, psychology, sociology and statistics. Students are also encouraged to participate in archaeological field research.

Special Programs

Specializations are available for students to participate in archaeological field research either at a site near Mexico City or at a variety of sites in Costa Rica. Under the direction of an archaeologist, they spend the on-the-job knowledge of archaeological techniques and methods of interpreting artifacts.

Graduate Programs

Graduate programs are dedicated to the holistic view of anthropology, the Department's emphasis in archaeology, and social-cultural anthropology. The Department offers work leading to the degrees of Master of Arts and Doctor of Philosophy in anthropology.

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 32, depending upon the student's previous anthropological training. The non-thesis program requires

Anthropology

Department: Anthropology

Chairman: Richard Shostak, Jr.

quires at least 36 semester hours of graduate work. A 38-hour M.A. degree without thesis is available in conjunction with a minor concentration in musicology.

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 113:140 Social Anthropology, 113:158 Archaeology Theory and Method, 113:171 Anthropological Linguistics and 113:385 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 the subfields of anthropology covered at the M.A. level, and a professional level of specialization in one. There are no requirements for the Ph.D. degree in anthropology.

At least 72 semester hours of graduate coursework:

Demonstration of a working knowledge of one foreign language;

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

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 circumoceanic region;

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

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

Preparation and oral defense of a dissertation.

The comprehensive examination ordinarily will be taken when the student's coursework is completed or nearly completed, after the research skills 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 archaeological or ethnographic field research.

Graduate Admission.

Applicants for admission to the graduate program in anthropology will be considered regardless of the field of their previous training. An applicant with an M.A. degree in another discipline must seek admission as a first-year graduate student. Admission to the Department's graduate program may be at either the M.A. or Ph.D. level. However, full admission to the Ph.D. program depends on successful completion of departmental requirements.

Applicants must meet the general admission requirements of the Graduate College (see "Graduate College"). In addition, all applicants are required to submit at least one typewritten example of their previous work (e.g., a term paper or an original experiment). Applicants with an M.A. degree from another university are required to submit a copy of their master's thesis; in cases where an M.A. has been granted without thesis or where the master's thesis is not yet complete, typewritten copies of three papers completed in graduate school should be submitted.

It is desirable that the applicant have a 3.0 grade-point average or better. However, applicants with lower grade-point averages may be admitted with conditional status if other criteria indicate potential for graduate work.

Minor in Anthropology

A graduate student from another department of the University may obtain a minor in anthropology. The number of credit hours and the selection of courses which constitute the minor should be determined in consultation with members of the faculty of the Department of Anthropology, and with appropriate members of the student's major department.

Special Facilities

The Department of Anthropology houses the State of Iowa's Archaeological Collection and the University is a participant in Major Research Area Files. An extensively annotated bibliography of research materials on the peoples of the world—their environments, behavioral patterns, social lines and cultures. The BRAM and other Manus Library resources give anthropology students ready access to source materials on more than 400 cultures. A field laboratory and extensive anthropological research data are maintained in Mexico.

Financial Assistance

A limited number of financial awards are available in the form of teaching or research assistantships. Application for an award should be made directly to the Chairman, Department of Anthropology.

Faculty Strengths

Members of the anthropology faculty have studied and lived in Spain, Southeast Asia, Oceania, the Orient, Africa, Thailand, the Caribbean, Mexico and the American subarctic. Ongoing research in the Department includes work on such problems as precontact trade routes in the Yucatan Valley of Mexico, patterns of political development in contemporary countries, comparative ethnographic studies of hunting-gathering groups, archaeological investigations of prehistoric sites in Mexico, relation of alcohol and culture in Canada, and field-curing practices and beliefs among the Lahu of northern Thailand. During the past two years, faculty members have continued their field research in Mexico, Liberia, the Canadian subarctic, the Caribbean, Micronesia, and Thailand.
Applied Mathematical Science
See "Mathematical Sciences."

Art and Art History
School director: Walter J. Testa

The University of Iowa School of Art and Art History is recognized as one of the ten leading university-based art schools in the United States.  It pioneered the art-in-teacher concept, appointing its teachers on the quality of their work rather than the number of their degrees; it was one of the first university-based art schools to bring established professional artists to its permanent faculty.

The emphasis on the creative production of its faculty reflected an educational philosophy which made Iowa one of the first universities to accept creative work for academic credit.

The School early established a tradition and achieved national recognition for large exhibitions of contemporary American painting and sculpture.

Its national image and position are maintained not only through the University of Iowa Art Museum, its program of exhibitions, and its growing collection of art works of all periods and nations, but also through its continuing program of employing visiting artists and lecturers of both national and international prominence.

It was among the first schools of art to join studio art with art history studies, reflecting the concept that the young artist will benefit from a formal study of the traditions of art, and a personable historian from personal experience with the creative process.

The fluidity of its undergraduate and graduate programs in art history continue with the support of an outstanding art library and a large collection of visual materials.  The employment of visiting lecturers for short-term workshops in addition to the permanent faculty continues to keep students directly involved with current scholarship.

A number of the School's graduates enjoy success as practicing professional artists, art historians, art department administrators, museum directors and curators, museum designers and teachers.  Regardless of employment depression, Iowa graduates have traditionally continued in fields acceptable to them.  This condition continues, even though the emphasis has always been placed on the fine arts and the "commercial" art is offered in the program.

As far as possible the design of academic programs is arranged to meet the individual student's needs.  Courses as well as general programs in studio arts and art history can be developed.  The major requirements are broad and flexible, encouraging specialization.  The art history major requires at least one introduction to studio work.  The studio major requires development of a foundation in art history and in at least six areas of studio art.  The aim of the joint curriculum is to give students a basic understanding of art and aesthetics; it does not focus on particular short-term styles.

Bachelor of Arts
(For general requirements, see the "College of Liberal Arts" section of the Catalog.)

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 foreign language and at least 15 semester hours in at least three of these related areas:  anthropo-
genics, classics, drama, history, language, literature, music, philosoph-
y, 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
11:37 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.

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

Transfer studio majors, regardless of the number of hours being transferred in 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:

1A:001 8 s.h.

Art History
Art History
11:37 History and Appreciation of Art 4 s.h.
11:38 Art in the Western World 4 s.h.
or
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 adminis-
tered 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.
7E:105 Advanced Methods: Art 3 s.h.
7S:187 Seminar: Curriculum & Student Teach-
ing (Art Section) 1-3 s.h.
7E:197 Aesthetic Education (elective) 3-7 s.h.

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.
or
11:42 Art in East and West 4 s.h.
Two intermediate-level COURSES 6 s.h.

Studio
1A:041 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 (one 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 in 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 satis-
fied, 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 the B.F.A. program. Applica-
tion is made following completion of the basic courses. Stu-
dents 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 de-
scriptions for these 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 50 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) 4.5 s.h.
Additional art history courses 14.21 s.h.
Studio 6 s.h.
Courses outside the school 0.9 s.h.

Students with little or no undergraduate studio training are re-
quired 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 both in 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 (GSEFLT), 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-
ten 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 80 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 (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-hundred-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-
rian Art; Italian Renaissance Art; 19th-Century Art: Art of China.

Deficiencies

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 knowl-
dge of monuments, an understanding of artistic development and a knowledge of methods of research within certain specialized areas of world art to be selected by the student in conjunction with appropriate faculty members.

The degree requires a minimum of 72 semester hours of gradu-
ate-level coursework, including a maximum of 38 semester hours of work taken for the M.A. degree, and these minimum course requirements beyond the M.A. program:

Two art history seminars (with two different instructors) 4.5 s.h.
Additional art history courses 18-28 s.h.
Courses outside the school 0-12 s.h.

Students holding the M.A. from another institution are required to take the School’s M.A. comprehensive examination within the two first regularly-scheduled examination dates following admi-
nation.

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-European art, Russian, 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
Art and Art History

with an art historical period or area remote from the major field. One minor 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 in 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;

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 in 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, 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 coursework outside art and art history; and

Studio and written thesis.
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 may offer an art history minor of 15 semester hours, including 1H/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 1H/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:

The M.A. degree in art equivalent to that offered at The University of Iowa;

A minimum of 60 semester hours of graduate work, including 12 to 24 semester hours in a major studio subject, at least six
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 of the thesis, where such is assigned, by a member of the art history and theory faculty; 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-a.h. residence 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. Fine art students are admitted at the discretion of the department head. All applicants must submit a portfolio of ten original prints and original drawings. Photography majors must submit a selection of original photographs. Sculpture majors should send eight black-and-white photographs of work in their major field. Only applicants who are in residence at the University may submit original work in these areas.

While not a School of Art and Art History facility, the University's Center for New Performing Arts involves School of Art and Art History people in most of its activities. The Center was established by the Rockefeller Foundation to encourage collaboration among such areas as art, dance, writing, film, music, and theatre.

Assistantships and Scholarships

Assistantships paying approximately $3,800 per academic year for 20 hours of departmental duties are awarded to graduate students on a competitive basis. Half-scale assistantships are also available. The award of an assistantship entitles the recipient to the in-state tuition rate.

Scholarships paying partial or full tuition and enrolling no departmental duties require at least a 3.0 cumulative grade-point average.

These financial aids are generally awarded to students who have been in residence for at least one semester, so that faculty members have had an opportunity to observe their performance and potential.

General Information

Inquiries about programs, requirements, or financial aid should be addressed to the director of the School. Application forms for Graduate College admission and for financial aid are available from the School's admissions committee or the University Office of Admissions.

Courses

Art History

Primarily for Undergraduates

150C Introduction to Primitive Art 3 a.h.

1512 Introduction to Islamic Art 3 a.h.

1516 Introduction to Oriental Art 3 a.h.

1528 Introduction to Medieval Art 3 a.h.

1529 Introduction to Renaissance Art 3 a.h.

1597 Introduction to Modern Art 3 a.h.

1618 Introduction to Modern Art 3 a.h.

1619 Introduction to American Art 3 a.h.

1620 Visual Experience Through the Print Medium 3 a.h.
Art and Art History

1H:196 Theory and Criticism in Contemporary Art 3 s.h.
European and American relation and theory from World War II to the present.

1H: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

1H:201 Advanced Drawing and Composition 3 s.h.
Survey of painting and drawing techniques and ideas in current American and European Art 2-3 s.h.

1H:215 Advanced Oriental Art: India 3 s.h.

1H:218 Seminar: Problems in Oriental Art 2-3 s.h.
Same as Asian Art Program 215.

1H:228 Seminar: Problems in Ancient Art 3 s.h.
Same as Greek Art 215.

1H:235 Seminar: Problems in Early Christian art and Byzantine Art 3 s.h.
Same as Yale Art Program 215.

1H:244 Seminar: Problems in Northern Renaissance Art 2-3 s.h.

1H:247 Seminar: Problems in Italian Renaissance Art 2-3 s.h.

1H:255 Vanadian Painting 3 s.h.

1H:258 Seminar: Problems in 19th Century Art 3-2 s.h.

1H:282 Seminar: Problems in Modern Art 2-3 s.h.

1H:285 Seminar: Problems in American Art 2-3 s.h.

1H:289 Seminar: Methodology of Art History and Criticism 2-3 s.h.
Use of library and other investigative resources; different types of problems in art history and criticism and their varied research requirements; scholarly presentation of research findings.

1H:300 Directed Studies 3 s.h.

1H:305 M.A. Written Thesis 3 s.h.

1H:306 M.A.-Ph.D. Written Thesis 3 s.h.

1H:304 Ph.D. Thesis 3 s.h.

Studio

Note: Studio courses numbered between 1 and 99 are primarily for undergraduates and only those which are specified may be repeated.
Student courses numbered between 100 and 199 are offered both semesters; credit may be repeated except when specified. Registration for one-four-odd-hour credit sections is for three semester hours of credit and requires five class-hours per week of assignments to be completed outside of class. With permission of their advisors and the course instructors, students may take more than one section of any multiple course section numbered above 100.

1A:1 1st year seminar 1 s.h.
Basic critical problems in the visual arts. Offered fall semester.

1A:2 2nd year seminar 1 s.h.

1A:3 Basic Drawing 2 s.h.
Two-dimensional design in language and media; examination of space and form; color. Prerequisite: 1A:2 or equivalent.

1A:4 Basic Design 2 s.h.
Two-dimensional design in language and media; examination of space and form; color. Prerequisite: 1A:2 or equivalent.

1A:5 Elements of Art 2 s.h.
Group and individual projects in two- and three-dimensional media, ideas, and principles. Prerequisite: Open to art majors only. May not be repeated.

1A:6 Interdisciplinary Concepts 3 s.h.
Group and individual projects in two- and three-dimensional media, ideas, and principles. Prerequisite: Open to art majors only. May not be repeated.

1A:7 Interdisciplinary Concepts 3 s.h.
For those who have little or no previous experience; drawing and composition, often very relaxed setting. Not open to studio majors. Prerequisite: 1A:1.

1A:8 Elements of Art 2 s.h.
Compositions of 1A:1, emphasis on color. Not open to studio majors. Prerequisite: 1A:1.

1B:101 Individual Instruction in Elements of Art 3 s.h.

1B:107 Ceramics 2-3 s.h.
Basic methods of modeling, forming, and glazing clay. May not be repeated. Prerequisite: 1A:5 or permission of instructor.

1B:108 Ceramics III 2-3 s.h.
Intermediate techniques; clay and glaze formulation and preparation in kilns. May not be repeated. Prerequisite: 1B:40 or equivalent.

1B:109 Design & Sculpture 3 s.h.
Sculptural problems in clay and bones. Prerequisites: 1B:15, 1C:50, and permission of instructor.

1B:170 Ceramics III 2-3 s.h.
Individual projects as approved by the instructor. Prerequisites: 1B:45, 1B:51 taken concurrently or permission of instructor.

1B:171 Ceramics Workshop 1-2 s.h.
Prerequisites: 1B:170 and permission of instructor.

1B:172 Shield Calculations 1-2 s.h.
Empirical and practical methods of shield formulation; effects of various types of shots, firing armatures and glazes. Prerequisites: 1B:170 or equivalent permission of instructor.

1B:174 16th Century 1-2 s.h.
Theory and construction of shields. Prerequisite: 1B:170 or equivalent permission of instructor.

1B:176 Individual Instruction in Ceramics 1-2 s.h.

1B:201 Problems in Design I-Form and Structure 3 s.h.
Materials and their formal and structural possibilities. Prerequisite: 1A:5.

1B:202 Problems in Design II-Form and Function 3 s.h.
Problems of individual student project, development of models and original concepts; development of a final project and presentation. Prerequisite: 1B:201 or permission of instructor.

1B:255 Vanadian Painting 3 s.h.

1B:277 Lettering I 2 s.h.
Develops the letter form and develops the design of the letter form. Prerequisite: 1B:201.

1B:281 Graphic Design I 2 s.h.
Exploration of commercial graphic and typographic design, including the use of printed and graphical media; development of a final project and presentation. Prerequisite: 1B:201.

1B:300 Directed Studies 3 s.h.

1B:305 M.A. Written Thesis 3 s.h.

1B:306 M.A.-Ph.D. Written Thesis 3 s.h.

1B:304 Ph.D. Thesis 3 s.h.

1B:308 Graphic Design II 3 s.h.
Exploration of commercial graphic and typographic design, including the use of printed and graphical media; development of a final project and presentation. Prerequisite: 1B:201.

1B:309 Interdisciplinary Concepts 3 s.h.
Group and individual projects in two- and three-dimensional media, ideas, and principles. Prerequisite: Open to art majors only. May not be repeated.

1B:310 Design Seminar 1 s.h.
Projects and related studies. Prerequisite: Open to second-year studio students. Prerequisite: 1B:30.

1B:312 Modern Design Seminar 3 s.h.
Projects and related studies. Prerequisite: Open to second-year studio students. Prerequisite: 1B:30.

1B:313 Design Seminar 3 s.h.
Projects and related studies. Prerequisite: Open to second-year studio students. Prerequisite: 1B:30.

1B:314 Design Seminar 3 s.h.
Projects and related studies. Prerequisite: Open to second-year studio students. Prerequisite: 1B:30.

1B:315 Design Seminar 3 s.h.
Projects and related studies. Prerequisite: Open to second-year studio students. Prerequisite: 1B:30.

1B:316 Design Seminar 3 s.h.
Projects and related studies. Prerequisite: Open to second-year studio students. Prerequisite: 1B:30.

1B:317 Environmental Design 1 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:318 Environmental Design 2 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:321 Environmental Design 3 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:322 Environmental Design 4 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:323 Environmental Design 5 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:324 Environmental Design 6 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:325 Environmental Design 7 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:326 Environmental Design 8 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:327 Environmental Design 9 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:328 Environmental Design 10 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:329 Environmental Design 11 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:330 Environmental Design 12 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:331 Environmental Design 13 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:332 Environmental Design 14 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.

1B:333 Environmental Design 15 s.h.
Design in relation to human factors—psychological and physiological—and to physical environment and architecture; awareness of environmental and social responsibilities. Prerequisites: 1A:44, 1B:30, 1B:31.
Biological sciences 9:10 s.h.
37:3 Principles of Animal Biology and either 2:1 Introduction to Therapy 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 4:120 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.
99:190-200 Advanced courses 2-3 s.h.
Advanced science courses 19 s.h.

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)
Physiology and Cell Biology (2:109, 2:110, 2:114, 2:125, 2:120)
Botany of Vascular Plants (2:11, 2:13, 2:13, 2:120, 2:121)
Botany of Non-Vascular Plants (2:103, 2:106, 2:107)
Two (12-hour 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.

Honors 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 must be presented to the Department as a written report and an oral presentation in 99:100 Seminar Undergraduate.

Teacher Certification
Biochemistry students planning to qualify for teacher certification should include 78:100 Introduction to Secondary School Teaching, 75:151 Methods: Physical Sciences 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 Chair: Robert L. Hubley

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)
Physiology and Cell Biology (2:109, 2:110, 2:114, 2:125, 2:120)
Botany of Vascular Plants (2:11, 2:13, 2:13, 2:120, 2:121)
Botany of Non-Vascular Plants (2:103, 2:106, 2:107)
Two (12-hour 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.

Recommended electives in related fields include: 22M:25 Calculus, 29:1.2 College Physics, 12:3.4 Principles of Physical Geology and Principles of Historical Geology, 61:157 General Microbiology, and 99:120 The Chemistry of Biological Materials. Botany majors are advised to obtain a strong 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 work in any field of botany.
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 as teachers or research assistants.

The Master's Degree in Botany
Advanced study may be undertaken with emphasis in anatomy, histology, cell biology, ecology, genetics, development, and morphology, mycology, paleobotany, physiology, and 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 preparation 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 courses 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 program 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 6 semester hours. 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 will provide the curriculum required for the degree. The student's guidance committee will provide the curriculum required for the degree. The committee will be made up of faculty members in the student's field of concentration.

At least 27 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 1,000 is recommended but is an absolute requirement. For those applying for financial support, a score on the biology 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
exceptional department library in the 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 Conard herbarium of mycorrhizas and the
Martin collection of fungi 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

Primarily for Undergraduates

2101 Introduction to Botany 4 a.h.
Cultural experience 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 repeated by 2111 or 2112 to satisfy the
general science core requirement.

2112 Foundations of Plant Taxonomy 3 a.h.
Lecture and laboratory study of flowering plants representative of habitats
common to Iowa region; field reproductive biology and identification.
2113 Evolution of Land Plants 3 a.h.
A survey of plant life emphasizing the structure, reproductive biology, ecological
adaptations and evolution of major plant groups. Prerequisite: 2111 or
equivalent.

2114 Botany of the Local Environment 3 a.h.
Identification, recognition and reproduction of angiosperms and gymnosperms of
Midwest emphasized; ecology of woodland and prairie communities stressed;
Field work when feasible. Prerequisite: 2111 or equivalent.

2121 Plant Reproduction 3 a.h.
Lecture and laboratory relating basic plant biology to sexual and asexual
reproduction. Topics covered include meiosis, mitosis and meiotic development,
cellular growth, nutrition, disease control and reproductive processes.

2122 Introductory Genetics 3 a.h.
Basic principles of Mendelian and modern genetics; mechanism of heredity with
examples in plants, animals and humans.

For Undergraduates and Graduates

2130 Plants and Human Affairs 3 a.h.
Study of the ways plants are useful to man; food, clothing and shelter. The
social economic and ecological significance of plants is considered.

2131 Plant Taxonomy 4 a.h.
Principles of plant taxonomy as illustrated by study of variation within and
between selected families and orders of angiosperms. Prerequisite: 2111 or
equivalent.

2132 Cytogenetics 3-4 a.h.
Structural, behavior and function of hereditary materials; inheritance illustrates
basic patterns of interrelations. Prerequisite: 2111 or 3735, Biology or equivalent.

2136 Cytopathology 3 a.h.
The study of viruses and their action on the body. Emphasis on the study of the
problems of oncology, methods of infectious diseases; distribution of infectious
agents; methods of control. Prerequisite: 2102 or 2128.

2163 Physiology 4 a.h.
Stress responses of algae, freshwater and marine, including endocrine and
physiology of representatives of major taxonomic groups. Prerequisite: 211 or
equivalent.

2169 Biometry 4 a.h.
Lectures, laboratory and field work dealing with development, structure and evolu-
tion of organisms and systems. Prerequisite: 211 or equivalent.

2171 Histology 3 a.h.
Microscopic, cytological, and systemic anatomy of animals and plants. Prerequisites:
211 and 2112 or equivalent.

2172 Plant Physiology 4 a.h.
Experimental study of functional processes in plants; cell physiology, water relations,
and chemical synthesis. Prerequisites: 211 and organic chemistry.

2178 Plant Biophysics 4 a.h.
Experimental study of mineral nutrition, metabolism, growth and development of
seed plants. Prerequisites: 211 and organic chemistry.

2179 Plant Ecology 3 a.h.
Adaptations and interactions between organisms and their environment; topics
include communities, succession, climax, history of geology; concepts differentiation,
breeding systems, population systems. Prerequisite: 211 or equivalent; a
course in genetics is helpful.

2181 Plant-Animal Interactions 3 a.h.
Ecology and evolution of plant-pest associations, effect of animals, especially
herbivores, on individual plants or communities, invasion of plants in native
stocks; population ecology. Prerequisite: 2131 or 2132 or consent of instructor.

2182 Plant Anatomy 3 a.h.
Structures and organization of fundamental tissue systems of plants including
development and differentiation of soft tissues comprising these tissues; relationships
between structure and function. Prerequisite: 211 or equivalent.

2184 Structure and Physiology of Plant Cells 3 a.h.
Lectures and laboratory work on plant cells and cellular organelles with emphasis on
the relationship of their structure to their function; behavior of cellular components
and evaluation of morphological evidence obtained by light and electron microscopy.
Prerequisite: 211 or equivalent.

2185 Botanical Microtechnique 3 a.h.
Lectures and practical instruction in preparation of permanent microscopic slides;
methods of labeling, mounting and staining plant materials; standard cytopathological
techniques; necessary for research in various fields of botany. Prerequisite: 211 or
equivalent.

2186 Field Biology 3 a.h.
Correlation of vegetation and environmental factors; derivation of plant communities
from a stand of observed characteristics; population dynamics and analysis of field data;
methods for describing vegetation in quantitative terms. Prerequisite: 2111 or 2132 or
consent of instructor.

2171 Experimental Techniques 3 a.h.
Lectures and laboratory work with plant materials; photoperiod, xerophytes, xerophytes
chromosomes, and related sections. Prerequisite: consent of instructor.

2181 Experimental Techniques 3 a.h.
Laboratory course on unaided and instrument-assisted chemical and dyestuff
analysis and measurement of photochemistry and of inspiration. Prerequisite:
211 or equivalent.

2191 Pecos Botany 3 a.h.
Lecture and laboratory study of groups of plant fossil; their structure, evolution, physiological
relationships and geological distribution. Prerequisite: 2111 or equivalent or consent of
instructor. Same as Biology 3172.

2191 Pecos Botany 3 a.h.
Botany, study of the order of plant and animal species; field and laboratory study of plant
flora and the relationships of plants in the field to plants in the lab. Prerequisite: 2111 or
equivalent or consent of instructor.

2191 Pecos Botany 3 a.h.
Study of benthic flora and fauna. Prerequisite: 2111 or equivalent or consent of
instructor. Same as Biology 3212.

2191 Pecos Botany 3 a.h.
Study of the effects of environmental conditions on plant physiology, particularly
photosynthetic responses. Prerequisite: 2111 or equivalent. Same as Biology 3212.

2191 Pecos Botany 3 a.h.
Study of the effects of environmental conditions on plant physiology, particularly
photosynthetic responses. Prerequisite: 2111 or equivalent. Same as Biology 3212.

2191 Pecos Botany 3 a.h.
Study of the effects of environmental conditions on plant physiology, particularly
photosynthetic responses. Prerequisite: 2111 or equivalent. Same as Biology 3212.

2191 Pecos Botany 3 a.h.
Study of the effects of environmental conditions on plant physiology, particularly
photosynthetic responses. Prerequisite: 2111 or equivalent. Same as Biology 3212.
in such fields as biochemistry, microbiology, pharmacology, physiology, medicinal chemistry, oceanography, geochemistry, 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 (4.411) 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

4.1.4-4 Principles of Chemistry I-II
4.6 Elementary Chemistry Laboratory
4.121-122 Organic Chemistry I-II
4.121-122 Analytical Chemistry I-II
4.121-122 Physical Chemistry I-II
4.141-142 Inorganic Chemistry Laboratory I-II
4.141-142 Analytical Chemistry Laboratory I-II
4.157 Advanced Inorganic Chemistry
4.401 Introduction to Senior Research
4.602 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, forestry, 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 wide 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 those professions and also obtain the B.A. degree.

Chemistry Courses

4.1.4 Principles of Chemistry I-II
4.6 Elementary Chemistry Laboratory
4.121-122 Organic Chemistry I-II
4.121-122 Analytical Chemistry I-II
4.121-122 Physical Chemistry I-II
4.141 Intermediate Chemistry Laboratory I
4.143 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 departmental 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
Advanced Physical Chemistry

The Department offers the M.S. degree, with or without thesis, in the areas represented above. Both programs require at least 30 semester hours. In the thesis program, this may include no more than eight hours in research.

For the M.S. degree with thesis consist of a defense of the written thesis. A minimum grade-point index of 2.5 is required in admission for the Master's examination. The examination for the M.S. degree without thesis covers graduate coursework.

Doctor of Philosophy Program

Doctoral candidates in the Ph.D. degree in the areas previously listed must complete a minimum of 72 semester hours of graduate work. The program of study includes the previously specified courses and courses in the major field of interest. The student must present a thesis covering the research.

The oral comprehensive examination is an examination to prepare a proposed research proposal is required to candidate for the Ph.D. degree. Students who have demonstrated the required competence in the four areas of chemistry and who have maintained a minimum grade-point index of 2.75 are admitted to the oral examination upon presentation and prior approval of their research proposal.

A final oral examination is required of all candidates for the Ph.D. degree. The dissertation is a manuscript of the publishable portion of the thesis must be defended satisfactorily before an examination committee.

Interdisciplinary Programs

The Department of Chemistry cooperates in interdisciplinary programs in applied mathematical sciences and in chemical physics. (See "Graduate College.") Students with undergraduate degrees in chemistry, physics, mathematics or engineering are eligible.

Languages

The Department does not require proficiency in foreign languages as a part of their training for an advanced degree. However, students majoring in organic chemistry are required to demonstrate competence in the reading of German.

Teaching

The Department requires all graduate students in chemistry to teach as part of their training for an advanced degree.

Graduate Admission

Applicants for graduate admission should have a bachelor’s degree in chemistry with a grade-point average above 3.5. Most of the graduate students admitted receive financial support, and application forms may be obtained by writing to the Chairman, Department of Chemistry. Most assistantships and other appointments for the following academic year are filled by April 1, but there are occasional openings at the beginning of the next semester.

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 take more than one year of chemistry should take 4.1, 4.2 and 4.4. 4.5. Students requiring only one year of chemistry may take 4.1, 4.3 and 4.5. Students requiring 8-9 h. of organic chemistry should take 4.12, 4.13 and 4.14.)

4.1 Principles of Chemistry I

Continuation of 4.1. Prerequisite: 4.1 or 4.7.

4.2 Elementary Chemistry Laboratory

Introduction to laboratory techniques for students using Principles of Chemistry. Prerequisite: 4.1.

4.3 General Chemistry I

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

4.4 General Chemistry II

Introduction to advanced concepts for students who do not plan to take more advanced courses in chemistry.

4.5 General Chemistry Laboratory

Introduction to laboratory techniques for students taking General Chemistry II. Taught by graduate students.

4.6 Analytical Chemistry I

A course in spectrophotometry. Prerequisites: 4.1 and 4.7.

4.7 Analytical Chemistry II

Principles of quantitative analysis. Two lectures and two laboratory analyses weekly. Prerequisite: 4.6.

4.06 Chemical Thermodynamics

Thermodynamics, concepts of chemical equilibrium. Prerequisites: 4.1, 4.2, and knowledge of chemistry in chemistry core courses. One meeting per week as assigned. No prerequisite.

4.07 Chemistry in Our Lives

Contemporary issues involving chemistry, pedagogy major in which chemical development affect our way of life.

4.102 Inorganic Symposium

Presenation of a variety of inorganics compounds. Prerequisite: 4.110.

4.111 Analytical Chemistry I

Principles of modern analytical chemistry with emphasis on instrumental methods of analysis. Prerequisite or concurrent: 4.112.

4.112 Analytical Chemistry II

Continuation of 4.111, which is prerequisite.

4.121 Organic Chemistry I

General principles of structure and properties of organic molecules. Prerequisites: 4.1 and 4.2.

4.122 Organic Chemistry II

Corequisite with 4.121, which is prerequisite.

4.127 Introduction to Polymer Chemistry

3 h.

4.130 Physical Chemistry for the Life Sciences

Principles and applications of thermodynamics, transport phenomenon, diffusion, autoradiography and the chromatographic methods, hyphenation, characterization of large biological molecules. Prerequisite: 4.122.

4.131 Physical Chemistry I

Applications of wave mechanics, modern statistical mechanics. Prerequisites: Physics 29.10, Mathematics 114.05 or 224.56.

4.132 Physical Chemistry II

Continuation of 4.131, which is prerequisite.
4:138 Introduction to Symmetry in Quantum Chemistry 3 s.h.
Elementary symmetry arguments applied to quantum chemistry problems. Prereq.
size: 4132.
4:151 Intermediate Chemistry Laboratory I 3 s.h.
Preparation, purification, identification and analysis of chemical compounds; princi-
pally organic compounds. Prerequisites: 4121 and 4122 or 421.
4:142 Intermediate Chemistry Laboratory II 3 s.h.
Continuation of 4:151, is prerequisite.
4:152 Advanced Chemistry Laboratory I 2-3 s.h.
Physical and analytical measurements. Prerequisites: 4:111 and 4:131.
4:154 Advanced Chemistry Laboratory II 3 s.h.
Continuation of 4:152. Prerequisites: 4:111 and 4:131.
4:151 Introduction to Senior Research 1 s.h.
Information retrieval from chemical literature and papers, presentation and analy-
ysis of chemical research problems. May be repeated once for credit. Prerequisites: junior standing in chemistry.
4:152 Senior Research 1-4 s.h.
May be repeated for credit. Prerequisites: junior standing in chemistry.
4:170 Advanced Inorganic Chemistry 3 s.h.
Advanced topics in inorganic chemistry. Prerequisites: 4:132.
4:171 Advanced Analytical Chemistry 3 s.h.
Discussions of selected topics in modern analytical techniques. Prerequisites: 4:112 and 4:152.
4:172 Advanced Organic Chemistry 3 s.h.
General organic chemistry for advanced students. Prerequisites: 4:122 or 4:142.
4:172 Advanced Physical Chemistry 3 s.h.
Physical chemistry for advanced study. Prerequisites: 4:122 or 4:152.
4:191 Chemical Pedagogy 0-1 s.h.
Teach and practice of presenting chemical principles and principles of self-
learning in students. Prerequisites: senior standing.

Primarily for Graduates
4:201 Special Topics in Inorganic Chemistry 3 s.h.
Intensive study of selected area of specialties within field of inorganic chemistry. Topic change annually. May be repeated for credit. Prerequisite: 4:170.
4:202 Coordination Compounds 3 s.h.
P. Dynamic and static structures of molecular systems by combination of donor molecules with acceptor elements. Prerequisite: 4:170.
4:203 Physical Methods in Inorganic Chemistry 3 s.h.
Applications of physical methods to problems in inorganic chemistry, with emphasis on current developments. Prerequisite: 4:170.
4:210 Introduction to Analytical Research 3 s.h.
Laboratory procedures and techniques for fundamental and applied problems in analy-
sical chemistry. Prerequisites: 4:144.
4:211 Analytical Emission and Absorption Spectrometry 3 s.h.
Theory and practice of qualitative and quantitative analysis by means of emission spectrometry, atomic, atomic and molecular absorption spectrometry, and of emission and absorption; spectrometry and chemical structure. Prerequisites: 4:171.
4:213 Electroanalytical Chemistry 3 s.h.
Theory and practice of some techniques of analytical electrochemistry, electrode, electrode systems, polarography, square wave polarography, controlled potential electrolysis, etc. Prerequisites: 4:171.
4:215 Advanced Topics in Analytical Chemistry 3 s.h.
Topic change annually. May be repeated for credit. Prerequisites: 4:171.
4:231 Introduction to Organic Research 3 s.h.
Synthesis of organic compounds; methods and techniques of struc-
ture determination. Prerequisites: 4:132, 4:142.
4:232 Introduction to Spectroscopy 3 s.h.
Interpretation of electronic, ultraviolet, infrared, and mass spectra of complex molecules. Prerequisites: 4:112, 4:172.
4:235 Special Topics in Organic Chemistry 3 s.h.
Topic change annually. Prerequisites: 4:172.
4:236 Physical Organic Chemistry 3 s.h.
Fundamentals of physical chemical concepts of molecular structure, spectroscopy, equilibrium and reaction rates applied to organic compounds. Prerequisites: 4:132 and 4:172.
4:238 Mechanisms of Organic Reactions 3 s.h.
Applications of physical and chemical experiments to organic reactions. Prerequisites: 4:232.
4:239 Advanced Organic Preparations 3 s.h.
Discourse of preparation of complex organic compounds. Prerequisites: 4:172.

4:351 Statistical Thermodynamics 3 s.h.
Fundamental principles of statistical thermodynamics and elementary chemical ki-
netics. Prerequisites: 4:132.
4:352 Statistical Thermodynamics 3 s.h.
Advanced topics in statistical thermodynamics. Continuation of 4:231, which is prerequisite.
4:353 Quantum Chemistry 3 s.h.
Quantum mechanics of chemical systems; time-independent and time-dependent perturbation theory; variational theory; Hartree-Fock theory; atomic structure and spectra. Prerequisites: 4:125.
4:354 Quantum Chemistry 3 s.h.
Group theory; molecular orbital and valence bond theories and the Molecular
procedures; electronic, vibrational, rotational, and spin resonance spectroscopy; quantum mechanics; current topics. Continuation of 4:233, which is prerequisite.
4:356 Chemical Kinetics 1-2 s.h.
Classical kinetic and mechanism of chemical reactions from a more chemical view-
point. Prerequisite: 4:125 or consent of instructor.
4:358 Physical Chemistry Topics 1-2 s.h.
Selected of topics, physical chemistry, or modern topics; an elective topic to be selected each course is offered; may be repeated for credit with topic varies. Prerequisites: 4:125.
4:430 Diffusion Analysis 3 s.h.
Theory and methods of diffusion of electrons, neutrons and X-rays by gases, liquids and solids; structure determination and computational methods. Prerequisites: consent of instructor.

Seminars
The following courses present discussions of latest advances in the various fields of chemistry. Prerequisite: consent of instructor.
4:451 Seminar: Analytical Chemistry 0-1 s.h.
4:453 Seminar: Inorganic Chemistry 0-1 s.h.
4:456 Seminar: Organic Chemistry 0-1 s.h.
4:458 Seminar: Physical Chemistry 0-1 s.h.

Research
The following courses present thesis work for advanced degrees; conferences and
laboratory work arranged. Prerequisite: consent of head of Department and major professor.
4:421 Research: Analytical Chemistry 0-1 s.h.
4:425 Research: Inorganic Chemistry 0-1 s.h.
4:428 Research: Organic Chemistry 0-1 s.h.
4:488 Research: Physical Chemistry 0-1 s.h.

Classes
Department chairman: Roger A. Horaty
Degrees offered: B.A., M.A., Ph.D.

In its broadest sense, classics is the study of ancient languages, literature, and cultures of the area surrounding the Mediterranean basin from approximately 2000 B.C. to 545 A.D. It embraces three civilizations: the Minoan-Mycenean, Greek, and Roman; two languages: Greek and Latin; and a geographical area including Europe, North Africa, Egypt, and the Near East. The site of the Classics Department is to understand and interpret the contribution of the ancient world to life in the present and the future.

Undergraduate Program
A training in classics is primarily humanistic, for it concentrates upon the aspects of human achievement which are the foundation of civilization. An undergraduate degree in classics gives a solid foundation for law, history, art, philosophy, and religion, as well
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 hour minimum are required, of which 24 must be in Greek-language courses. The following or 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, " Homer and Hesiod," and fourth-year Greek, "Greece and Persia," and "Fifth Century Athens." A student majoring in Greek studies knowing not only how to read the Greek language, but also learning some of the major works of Greek literature, and some- thing of the history of ancient Greece and the Near East of the sevenths through the fifth centuries B.C., when most of the modern notions of political, artistic, and social life began.

Major in Latin

Thirty semester hour minimum are required, of which 24 must be in Latin-language courses above 20:15 Latin Review, and which include 20:171 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 153 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 (six semester hours) and three hours of composition. The classics major humanities, 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 University. 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

Undergraduates who major in Greek, Latin, classics or ancient civilization are required to choose from the following in the literature core requirement for the College of Liberal Arts, but must complete 11 of 13.

- The Interpretation of Literature. Ancient civilization major, core requirements in the historical-cultural sequence are limited to four semester hours.

Honors

For exceptional seniors who attain 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 Presentations: Introduction to 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 tested 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 thesis reading knowledge of Greek and Latin; 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 interpreta- tion 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 examination) 3 s.h.
Advanced Latin composition (may be satisfied by examination) 3 s.h.
A three-hour course in ancient art above the 200 level 3 s.h.
A three-hour course in classical linguistics or Sanskrit: 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 facsimiles in bronze from Mycenae, Paros, and Hierakonpolis. The University is also supporting an Institute of the American School of Classical Studies at Athens and the American Academy in Rome, thereby enabling the facilities of those schools available to its faculty and graduate students.

The Department is also a member of an international group which is sponsoring the uncovering and publication of information about the art of ancient mosaics of Turkey. Annually a team from the University goes to Turkey 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 14:121 and 14:112.

14:111 Elementary Greek 4 s.h.
First-course in Greek. Some elementary grammar.

14:112 Elementary Greek 4 s.h.
Second-course in Greek. Some grammar.

14:131 Elementary Greek 4 s.h.
Continuation of 14:111, selection from Greek authors read.

14:132 Second-Year Greek 3 s.h.
Advanced reading of selections from the New Testament.

14:151 Second-Year Greek 3 s.h.
Advanced reading of selections from Greek prose and poetry. Prerequisite: 14:132 or equivalent.

14:152 Second-Year Greek 3 s.h.
Continuation of 14:131, which is a prerequisite.

For Undergraduates and Graduates

14:131 Homer and Hesiod I 3 s.h.
For third-year Greek students; selections from Homer’s Iliad and Odyssey and from Hesiod’s Works and Days and Theogony, read in Greek; complete works read in English as supplemental readings.

14:132 Homer and Hesiod II 3 s.h.
Selections from Iliad and Odyssey, which is a prerequisite.

14:133 Greek Prose 3 s.h.
For students in the junior year in Greek; emphasis leading to the Persian war, during the war, and in its aftermath; precursors of Hesiod read in Greek; supplementary readings in English.

14:134 Fifth-Century Athens 3 s.h.
Covering intellectual climate of late 5th-century Athens and inroads of Athenian democracy; selections from Thucydides, Sophocles’ Antigone, Euripides’ Suppliants, and Xenophon’s Helen, supplementary readings in English. Conservation of 14:134, which is a prerequisite.

14:141 Elementary Greek Composition 3 s.h.
Review of morphology and syntax and Greek sentence structure; composition of short passages in Greek.

14:142 Advanced Greek Composition 3 s.h.
Practice in writing extensive Greek prose with styles of Lyric and Demosthenes as models.

14:143 Hellenistic Greek Historical Texts 3 s.h.
Readings in Polybius and Mommsen.

14:151 Horace Reading 3 s.h.
Supervised reading on selected author or topic leading to several short essays in first semester, a long paper in second semester. Both 14:191 and 14:192 required for Horace reading.

14:152 Horace Reading 3 s.h.

14:153 Pindar, Tuathal 1-3 s.h.
For classics majors who have completed four years of Greek or equivalent.

14:154 Private Assignments 1-3 s.h.
Supervised individual study. For advanced students who are not majors in the Department. May be repeated.

For Graduates

14:211 Preparation: Introduction to Advanced Study 3 s.h.
Advanced methods and disciplines: historiography, textual criticism, paleography, history of classical scholarship. Required of all graduate students.

14:232 Advanced Reading 3 s.h.
Open only to graduate students in the Department.

14:233 Indo-European Philology 3 s.h.
Investigations of comparative method as applied specifically to Greek and Latin, and study of phonological and morphological laws.

14:245 Rapid Readings in Greek 3 s.h.
Advanced reading with a speed of 200 words per minute. Special topics.

14:251 Rapid Readings in Greek 3 s.h.
Continuation of 14:245. Special topics in ancient literature.

14:255 Greek Palaeography 3 s.h.
Study of Greek papyri, manuscripts, early printed books, and printed documents.

14:261 Seminar: Problems of Ancient Art 3 s.h.
Same as Art 432.

14:262 Seminar: Problems of Ancient Art 3 s.h.
Continuation of 14:261.

14:263 Seminar: Problems in Early Christian and Byzantine Art 3 s.h.
Same as Art 433.

14:264 Pindar 3 s.h.
Greek Lyric Poetry 3 s.h.

14:267 Homer 3 s.h.
Greek Tragedy 3 s.h.

14:268 Greek Tragedy 3 s.h.
Dramatic and critical reading of comedies from Greek lyric poetry.

14:271 Greek Drama 3 s.h.
Critical reading of selected plays of Euripides.

14:272 Sophocles 3 s.h.
Critical reading of selected plays.

14:273 Antiquities 3 s.h.

14:274 Hesiod 3 s.h.
Critical reading of selected plays.

14:275 Plato’s Republic 3 s.h.
Examination of Plato’s presentation of justice.

14:276 Aristotle’s Politics 3 s.h.
Aristotle’s Politics 3 s.h.

14:277 Aristotle’s Politics 3 s.h.
Study of Greek society and critical reading of selected works.

14:291 Homer 3 s.h.
Critical reading of the history.

14:292 Homeric Studies 3 s.h.
Analyzing and critical study emphasizing Thucydides’ intellectual background and the aims of his history.
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
Symbolic poetics and modern literature
Post-Kantian philosophy and literature
Satire, rhetoric, and the theory of verbal interaction
Literature, history and criticism
Literary-critical and psychoanalytic 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, preceded 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 chairwoman 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

48100 European Literature of the 19th Century 3 s.h.

48110 European Literature of the 20th Century 3 s.h.

48197 Romanoff and Rover around 1600 3 s.h.

48110 Literature and Drama in European Literature I 3 s.h.

48115 Literature and Drama in European Literature II 3 s.h.

48187 Contemporary Scene in Poetry 3 s.h.

48188 Selected Modern Poets 3 s.h.

48189 Contemporary Scene in Fiction 3 s.h.

48190 Literature and Society 3 s.h.

48191 Literature and Anthropology 3 s.h.

48192 Roman Studies 3 s.h.

48193 Roman Drama in Translation 3 s.h.

48195 Russian Drama and Revolution 3 s.h.

48196 Italian Language and Literature 3 s.h.

48197 Literature and Anthropology 3 s.h.

48198 Renaissance and Modern Poetry 3 s.h.

48199 Individual Study 3 s.h.

48200 Comparative Approaches I 3 s.h.

48201 Comparative Approaches II 3 s.h.

48202 Comparative Approaches III 3 s.h.

48203 Comparative Approaches IV 3 s.h.

48204 Comparative Approaches V 3 s.h.

48205 Comparative Approaches VI 3 s.h.

48206 Comparative Approaches VII 3 s.h.

48207 Comparative Approaches VIII 3 s.h.

48208 Comparative Approaches IX 3 s.h.

48209 Comparative Approaches X 3 s.h.
Dental Hygiene
See "College of Dentistry."

East Asian Languages and Literature

Department chairperson: Matsunori Yama

Fellows: professor of Chinese, Matsunori Yama; professor emeritus Ken-ichiroho Funakoshi; Y. P. M. Mo, associate professor Masami Robertson, adjunct professor W. South

Supporting faculty: David Adams (History), Robert Biedel (Religion), Wayne Biehler (Art and Art History), Paul Coss (History), Cheng Lin (Science), Weng Peho (Religious), Michael Reifs (Art and Art History), Richard Seiber (Anthropology), Stephen White (History)

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

Undergraduate Programs

The major purpose of the Department of East Asian Languages and Literature is to provide general courses through which all Iowa students have the opportunity to acquire knowledge and understand 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 or Sanskrit, 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 India.

Graduates of the baccalaureate program will find careers available in government, banking and commerce. The undergraduate programs also provide a background for further study in such areas as literature, history, art, religion, political science, geography, anthropology and sociology. Career opportunities are plentiful at present and there is every indication that they will improve 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 India, both ancient and modern, and to give students competence in reading, writing, and speaking Chinese or Japanese, or in reading Sanskrit. The requirements for the major include:

Satisfaction of the historical-cultural core requirement by completion of 39-55-56 Civilizations of Asia, eight semester hours.

Satisfaction of the literature core requirement by completion of 19-19-20 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 asked before registration. 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
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 in other institutions may be applied to the 36 semester hours required of majors.

Program in Asian Studies
Central to the major in the Program in Asian Studies are three two-semester courses 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 12 s.h.
39:103-104 Second Year Chinese or 12 s.h.
39:101-102 Elementary Japanese and 12 s.h.
39:103-104 Second Year Japanese or 12 s.h.
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.)

Honor 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 39:192 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 civilization. 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 a 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 microfilms. 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.
Handbook and cognate study of Chinese civilization, considering background, found- ation, history, characteristics. Slides, models and demonstrations of artistic works.
Economics Department chair-Prof: Calvin D. Sabett
Professor: Anthony Cooke, James Jaram, Victor Kroes (Chairman Professor), Charles Murphy, David Price, James Price, Thomas Rogers, Calvin Stenger, S.V. W. professor emeritus Paul Ochol; associate professor William Allendorf, Norman Batch, Myrdal Larson, Howard Joseph, Larry Jennings, several instructors; associate professor T. Frank O'Conor, Andrew M. Ferguson, James R. Swanson.

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, government expenditure and taxation, energy, crime, productivity and depressions, 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 insights in the 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 choice 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. Economics is 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 baccalaureate 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 college requirements differ. The B.A. program is designed to allow the student maximum flexibility in attaining 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 has more quantitative content than the B.A. program, and is designed to prepare the student for graduate work in economics or related business and technical fields. The B.B.S. program requires one year of foreign language, the B.A., two years.
The Undergraduate Program

The English Major

The broad purpose of the major in English is to provide a program of humane 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 realizing the forces and limitations of language.

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 liminal genre 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 absolutely required 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 advisors, 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, playwriting) technical, reporting, writing for social action) and/or the theory of rhetoric and stylistics. To become a study in the Department, English majors are encouraged to take as much work as possible in such fields as history, classical and modern foreign literature, 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, 338 EPH, who will assign them permanent advisors. In 308 EPH, too, they may get a pamphlet on Designing Your English Major, and other leaflets explaining departmental programs.

The Literature Semesters

Available to Iowa in all undergraduate years, the two literature semesters presently offered are English Literature Before 1800, and American and Contemporary Literature. The latter covers American literature from its beginnings through the present day as well as British Literature Since 1900. Each literature semester carries
12 hours of credit and involves as much reading as would be contained 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 historical 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 write parodies, imitations and other exercises as means of increasing their sensitivity to literary styles.

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 substitution of advanced work for 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 course in this program. However, admission to the undergraduate workshops in fiction and poetry (SW: 85-86 Undergraduate Writers Workshop, Fiction-Poetry) is only by permission of the instructors. Manuscripts 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 students planning to teach English in elementary and secondary schools. Aside from the necessary prerequisite 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 exposition 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 they should be familiar with the tools 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 teachers, so they should choose a program which will permit graduate study at a later time.

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 elementary education. Those interested in such a program should consult their advisor 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 Stratford-on-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 wishing 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 program, 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 department seminar will count as part of the graduate course load. Students must complete a research paper in a four-hour written examination covering a prescribed 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 an additional 45 semester hours of graduate coursework 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 teaching 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 ensure that the objectives 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 an extended piece of expository writing: must pass an oral examination in defense of the project and must receive the committee's approval of the complete work. Work on the thesis may not be counted toward the required 30 hours of graduate 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 teaching in a community college, each to Date (Miami), Forest Park (St. Louis), Kirkwood (Cedar Rapids) or Muscogee.

**Master of Fine Arts**

The purpose of the Master of Fine Arts program is to provide professional guidance and a stimulating environment for students with previous achievement or notable promise in translating, poetry, fiction or plays. The requirements are flexible, but usually include 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 on 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. Student programs are individually structured, and are designed to develop skills in source and target language and cultures. The course work is to develop awareness of the tradition of translation and the history of the translation theory. The program normally requires 48 semester hours of graduate credit, including a minimum of 12 hours of Translation Workshop, a selection of translated poetry, fiction, or drama, and an examination in practical criticism involving problems of translation.

**Doctor of Philosophy**

Since most doctoral graduates go to college and university teaching, the Department attempts to prepare Ph.D. candidates for the teaching, publication and service required of faculty members. The doctorate requires 72 semester hours of graduate credit, of which at least 30 must be earned in residence at Iowa. With specified limits, the program may be accommodated to the student's special needs and interests. For example, concentrations are possible in areas of literary history, literary criticism, writing, rhetorical theory and stylistics, folklore, bibliography, pedagogy, comparative literature and linguistics. The requirements specified by the English Graduate include formal admission to candidacy by a vote of the full faculty; demonstration of a high level of competence in two foreign languages and their literatures; distribution coursework depending upon needs in historical areas, criticism and linguistics; three seminars; a written part of an doctoral comprehensive examination in three areas, two of which are usually historical period 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 English 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 need, race, sex or other non-qualifying criteria. Since sources are limited, normally fewer than half the applicants for aid receive it. New students are at something of a disadvantage, and should expect to support themselves through the first year. Applications 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 a applicant 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 of reference in support of their application. In addition, M.F.A. applicants should submit samples of their poetry or fiction to the director of the Creative Writing Program, and 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 established at that time to accept creative dissertations for advanced degree programs. Founded in 1938, the Writers Workshop was a pioneer venture in the field of creative writing and multimedia scores 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 about thirty foreign writers to campus each year, and has added a unique dimension to the opportunities available 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 conveniently located. Among the major areas are English and American literature, it is operated by members for the collection of American periodicals and its 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 Junta Review, the Philological Quarterly and the Windhover Press; and in proctoring the Cuit Ziminsky Me-
orial 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. Writing visitors and lecturers are on the
 campus almost every week, and occasional conferences and liter-
 ary "festivals" enliven the routine of classroom.

**Courses**

**For Undergraduates**

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:1 Modern Fiction</td>
<td>3-4 h.</td>
</tr>
<tr>
<td>8:2 Modern Poetry</td>
<td>3-4 h.</td>
</tr>
<tr>
<td>8:3 Modern Drama</td>
<td>3-4 h.</td>
</tr>
<tr>
<td>Same as Speech and Dramatic Art M-761</td>
<td></td>
</tr>
<tr>
<td>8:68 Classical and Biblical Literature</td>
<td>3-4 h.</td>
</tr>
<tr>
<td>8:6 Shakespeare</td>
<td>3-4 h.</td>
</tr>
<tr>
<td>Same as Speech and Dramatic Art M-761</td>
<td></td>
</tr>
</tbody>
</table>

Introductory Courses in Close Reading of Texts

Limited-enrollment discussion courses in which a small number of texts are read carefully to illustrate representative problems in interpreting and evaluating literature:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:20 Critical Approaches to Literary Works</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:21 Selected Prose</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:22 Selected Plays</td>
<td>3 h.</td>
</tr>
<tr>
<td>Same as Speech and Dramatic Art M-761</td>
<td></td>
</tr>
<tr>
<td>8:54 Selected Fiction</td>
<td>3 h.</td>
</tr>
<tr>
<td>Same as Speech and Dramatic Art M-308:54</td>
<td></td>
</tr>
<tr>
<td>8:56 Selected Essays</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:58 American Literary Classics</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:50 Selected Works of the Middle Ages</td>
<td>3 h.</td>
</tr>
<tr>
<td>Same as Speech and Dramatic Art M-761</td>
<td></td>
</tr>
<tr>
<td>8:60 Selected Works of the Renaissance</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:62 Selected Works of the 18th Century</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:63 Selected Works of the 19th Century</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:64 Selected American Works Before 1900</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:65 Selected British and American Works</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:66 Selected Works of the 20th Century</td>
<td>3 h.</td>
</tr>
</tbody>
</table>

Major Authors Courses

Limited-enrollment discussion courses. Each author is represented by several major works. Combinations of authors are changed regularly. By permission of the instructor, a student may repeat a course even if the course number it is in is the same.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:71 Chaucer</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:72 Shakespeare</td>
<td>3 h.</td>
</tr>
<tr>
<td>Same as Speech and Dramatic Art M-761</td>
<td></td>
</tr>
<tr>
<td>8:73 Selected English Authors</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:74 Selected American Authors</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:75 Selected English and American Authors</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:76 Selected Modern Authors</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:77 Selected Special Authors</td>
<td>3-5 h.</td>
</tr>
</tbody>
</table>

Literature Seminar Courses

Limited-enrollment, term-long discussion courses emphasizing the reading of whole works (no separate departmental assignments). Literature Seminar I (8:50-52) satisfies requirements of the major for literature before 1850. Students should begin their at least one college-level literature course before registering for either of these courses. Preregistration is required.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:50:52 English Literature Before 1850</td>
<td>12 h.</td>
</tr>
<tr>
<td>8:56:57 American and Contemporary Literature</td>
<td>12 h.</td>
</tr>
</tbody>
</table>

Honors Courses

Enrolled in this course are students in the undergraduate Honors program and to others by special permission of the instructor:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:56 Honors Proseminar</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:61 Honors Proseminar</td>
<td>3 h.</td>
</tr>
</tbody>
</table>

For Undergraduate and Graduate Students

Literature and Culture Courses

Primarily for undergraduates and beginning graduate students, these lecture courses are designed to exhibit major works and authors within the context of the social, political, economic, and religious stresses of their time. Major historical events are highlighted as part of the work, but the main goal is to show how the art, existing in the period, reflects the culture and society of the time. Undergraduate majors in English are urged to include at least one course of this type in the senior half of their majors:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:100 Introduction to Critical Problems</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:101 Literature and Culture of the Middle Ages</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:102 Literature and Culture of the Renaissance</td>
<td>3-5 h.</td>
</tr>
<tr>
<td>8:103 Literature and Culture of 18th-Century England</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:104 Literature and Culture of 19th-Century America</td>
<td>3-5 h.</td>
</tr>
<tr>
<td>8:105 Literature and Culture of 20th-Century America</td>
<td>3-5 h.</td>
</tr>
<tr>
<td>8:106 Western Civilization and the American Novel</td>
<td>3-5 h.</td>
</tr>
<tr>
<td>8:107 Augustan Civilization and Culture 1800 to Present</td>
<td>3-5 h.</td>
</tr>
<tr>
<td>Same as American Civilization</td>
<td></td>
</tr>
<tr>
<td>8:108 American Literature and Civilization</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:109 European Literature of the 19th Century</td>
<td>3-5 h.</td>
</tr>
<tr>
<td>Same as Comparative Literature 48:109</td>
<td></td>
</tr>
<tr>
<td>8:110 Selected Authors</td>
<td>3 h.</td>
</tr>
<tr>
<td>8:111 American Folk Literature</td>
<td>3 h.</td>
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<tr>
<td>Same as American Civilization</td>
<td>3 h.</td>
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<tr>
<td>8:112 American Jewish Writers</td>
<td>3 h.</td>
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<tr>
<td>8:113 American Indian Literature</td>
<td>3 h.</td>
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<tr>
<td>8:114 American Regional Literatures</td>
<td>3 h.</td>
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<tr>
<td>8:116 Literature of Jews</td>
<td>3 h.</td>
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<tr>
<td>8:117 Afro-American Literature</td>
<td>3 h.</td>
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<tr>
<td>Same as American Civilization</td>
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<td>8:118 Chinese Literature</td>
<td>3 h.</td>
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<tr>
<td>Same as Special 61:17:17: American Civilization 61:127: Letters 186:127</td>
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<td>8:119 African Literature</td>
<td>3 h.</td>
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<tr>
<td>Same as American Civilization</td>
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<td>8:120 German Literature</td>
<td>3 h.</td>
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<tr>
<td>8:121 Latin Literature</td>
<td>3 h.</td>
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<td>8:122 Italian Literature</td>
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<td>8:123 French Literature</td>
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<tr>
<td>8:124 Spanish Literature</td>
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<td>8:125 Swedish Literature</td>
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<td>8:126 Danish Literature</td>
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<td>8:127 Norwegian Literature</td>
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<td>8:128 Russian Literature</td>
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<td>8:129 Polish Literature</td>
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<td>8:130 Slavonic Literature</td>
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<td>8:131 Coptic Literature</td>
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<td>8:132 Egyptian Literature</td>
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<td>8:133 Jewish Literature</td>
<td>3 h.</td>
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<td>8:134 Hebrew Literature</td>
<td>3 h.</td>
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<tr>
<td>8:135 Islamic Literature</td>
<td>3 h.</td>
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<td>8:136 Arabic Literature</td>
<td>3 h.</td>
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<td>8:137 Persian Literature</td>
<td>3 h.</td>
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<td>8:138 Turkish Literature</td>
<td>3 h.</td>
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<td>8:139 Armenian Literature</td>
<td>3 h.</td>
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<td>8:141 Greek Literature</td>
<td>3 h.</td>
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<tr>
<td>8:142 Byzantine Literature</td>
<td>3 h.</td>
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</tbody>
</table>

Library Genre Courses

Limited to discussion of specific genres and, usually further restricted to a limited six and studies. These lecture or large discussion courses are appropriate for any appreciate or graduate student interested in the area.
64

English

8414 Seminar: 17th-Century Dramatic Literature
8415 Seminar: Elizabethan Theatre History
8416 Seminar: Milton
8417 Seminar: Neoclassical Prose
8422 Seminar: Neoclassical Poetry
8423 Seminar: English Romanticism
8424 Seminar: Victorian Literature
8433 Seminar: 19th-Century British Literature
8434 Seminar: 20th-Century British Literature
8439 Seminar: 20th-Century British and American Literature
8439 Seminar: 20th-Century British and American Literature
8441 Seminar: American Colonial Literature
8442 Seminar: American Transcendentalism
8445 Seminar: American Romantic Literature of the 19th Century
8446 Seminar: 19th-Century American Literature
8447 Seminar: American Realistic Literature of the 19th Century
8450 Seminar: Modern Letters
Same as Letters 108.450.
8457 Seminar: Social Factors in American Literature
Same as American Civilization 45.457.
8458 Seminar: American Writers of the 20th Century
8460 Seminar: Problems in Aesthetics and Literary Theory
Same as Comparative Literature 40.460.
8461 Seminar: Studies in the History of Criticism
8462 Seminar: Studies in Literary History
8463 Seminar: Literary Relations
Same as Comparative Literature 48.463.
8464 Seminar: Types of Modern Criticism
Same as American Civilization 45.464.
8465 Seminar: Literature and Other Intellectual Disciplines
Same as Literacy Science 21/193 and Education 70.193.
8466 Seminar: American Criticism and Culture
8468 Seminar: Analytical Bibliography and Textual Criticism

Independent Study

Advanced Studies
(Courses for one or several students reading under the guidance of a faculty member)
8500 Advanced Studies in an Author
8505 Advanced Studies in a Literary Period
8510 Advanced Studies in a Literary Genre
8520 Advanced Studies in a Literary Mode
8525 Advanced Studies in a Literary Movement
8530 Advanced Studies in a Literary Theme
8556 Advanced Studies in Literary Criticism
8565 Advanced Studies in Rhetoric
8565 Advanced Studies in an Interdisciplinary Subject
8580 Special Project for Graduate Students

Disertation
8595 Ph.D. Thesis

Linguistics and Language Courses

6L120 Elements of Linguistics
Same as Linguistics 105.25.
6L130 Introduction to Linguistics
Same as Linguistics 105.35 and 132.101.
6L114 Language Data Processing
Same as Linguistics 102.114.
6L115 Language Data Programming
Same as Linguistics 103/115.

6L120 Historical and Comparative Linguistics
Same as Linguistics 102.120.
6L131 History of the English Language
Same as Linguistics 105.131.
6L132 Elementary Old English
6L133 Elements of Comparative Literature
6L141 The Structure of English
Same as Linguistics 101.141.
6L142 Modern English Grammar
Same as Linguistics 102.142.
6L169 Language, Society, and Education
Same as Linguistics 101.169.
6L164 Historical Backgrounds of Modern English
6L181 Linguistic Perspectives
Same as Linguistics 101.181.
6L166 Celtic
6L186 Old Norse
6L314 Middle English Language and Literature
Same as Linguistics 102.340.
6L350 Advanced Studies in Linguistics

Professional Courses

Although open to all graduate students, the primary purpose of these courses is to offer advanced and practical training to those who plan to teach:

8P191 Methods English
Same as Education 70.115.
8P192 Methods in Education
Same as Education 70.115.
8P209 Literature for Adolescents
Same as Literacy Science 21/193 and Education 70.193.
8P316 Teaching Literature in the Two-Year College
8P320 Colloquium: English in the Two-Year College
8P323 Seminar: English in the Two-Year College
8P375 Teaching in a Reading Laboratory
8P378 Teaching in a Writing Laboratory
8P360 M.A. Seminar: English Education
Same as Education 70.215.
8P362 Ph.D. Seminar: English Education

Expository Writing Courses

General Interest Courses

These courses are designed to serve the general interests and needs of undergraduates and graduates in all areas of the University. They offer practice in various areas of composition and various kinds of alternative, persuasive, and expressive writing.

8W10 Expository Writing
8W11 Technical and Scientific Writing
8W106 Advanced Expository Writing

Special Interest 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 specialized purposes and audiences.

8W111 Writing for the Humanities

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Independent Study

SW:185 Undergraduate Projects in Creative Writing

SW:556 Graduate Projects in Creative Writing

SW:280 APA Thesis

SW:110 Correction and Evaluation of High School Writing 3 s.h.

French and Italian

Department chairman: John T. Noguera, 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:

9:27-28 Second-Year Composition and Conversation 8 s.h.
9:111-112 Third-Year Composition 6 s.h.
9:126 French Conversation: Third Level 2 s.h.
9:136 French Conversation: Fourth Level 2 s.h.
9:157 Advanced French Pronunciation 2 s.h.
9:25 French Pronunciation 2 s.h.

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:

9:27-28 Second-Year Composition and Conversation 8 s.h.
9:111 Third-Year Composition 3 s.h.
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 seminar 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 or
c. 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. Centered 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 36 semester hours at the advanced level, of which eight may be taken in education or related fields and at least nine must be in education or related fields and at least nine must be in graduate courses in French literature.


Candidates must pass a final written and oral examination.

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 completion 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 also offer other Teaching/Research Fellow positions. 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.

93 Elementary French 4 a.h.
Prerequisite: 91 or equivalent.

95 Elementary French Intensive Course 4 a.h.
First-year French as an intensive course.

97 French for Travellers 3 a.h.
Best-conversational French for the traveller. Given in Summer and Evening Class Program.

919 French Literature of Government 4 a.h.
Course optimal in English. Same as Core Literature 11;02; may be taken as part of other literature requirements.

9111 Intermediate French 3 a.h.
Recommended for students who plan to enroll in their study of French with second year. Prerequisite: 9:12 or equivalent.

9113 Intermediate French 3 a.h.
Continuation of 9:11. Prerequisite: 9:11 or equivalent.

9226 French Pronunciation 2 a.h.

9226 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.

9226 French Conversation: Second Year--Composition and Conversation 4 a.h.
Recommended for students who want to continue study of French or who wish to improve their active and passive vocabulary. Prerequisite: 9:2 or equivalent. 9:22 Second-Year Conversation and Composition 4 a.h.
Carries credit of 9:27. Prerequisite: 9:27 or equivalent. 9:26 French Conversation Second Level 2 a.h.
Prerequisite: 9:26 or equivalent.

9511 Phil. French I 0 a.h.
For candidates for degrees in other departments who want reading ability for purposes of major or minor.

9512 Phil. French II 0 a.h.

953 Phil. French III 0 a.h.

966 Phil. French IV 0 a.h.

9519 French and Indian 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 intended primarily for advanced undergraduates; a graduate student should consult with his or her advisor before registering for these courses.

9100 Regents' Summer Abroad Program 6-9 a.h.

9100 Introduction to French Literature 17th-18th Centuries 3 a.h.
Prerequisite: 9:12, 9:26, or equivalent.

9109 Introduction to French Literature 19th Century 3 a.h.
Prerequisite: 9:12, 9:26, or equivalent.

6108 Themas in French Literature 3 a.h.
Prerequisite: 9:12, 9:26, or equivalent.

5108 Introduction to French Literature 20th Century 3 a.h.
Prerequisite: 9:12 or equivalent.

5109 Introduction to French Civilization 3 a.h.
Prerequisite: 9:26 or equivalent.

512 Third-Year Composition 3 a.h.
Continuation of 9:111. Prerequisite: 9:111 or equivalent.

512 Third-Year Composition Continuation of 9:111. Prerequisite: 9:111 or equivalent.

519 French Civilization: A survey of social history from Middle Ages to 1789. Prerequisite: 9:12, 9:26, or equivalent.

514 French Civilization: A survey of social history from 1789 to the present. Prerequisite: 9:12, 9:26, or equivalent.

5120 French Composition: Third Level 3 a.h.
Prerequisite: 9:26 or equivalent.

5130 Methods: Foreign Language 3 a.h.

5130 Methods: Foreign Language 3 a.h.

5130 Methods: Foreign Language 3 a.h.

5130 Methods: Foreign Language 3 a.h.

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5130 Methods: Foreign Language 3 a.h.
For Undergraduates and Graduates

18:101 Literature of the 19th Century
Prerequisites: 18:107

18:109 Literature of the 20th Century
Prerequisites: 18:109

18:102 Italian Literature: Renaissance
Prerequisites: 18:102

18:103 Italian Literature: Baroque
Prerequisites: 18:103

18:104 Italian Literature: Romantic
Prerequisites: 18:104

18:105 Italian Literature: 19th Century
Prerequisites: 18:105

18:106 Italian Literature: 20th Century
Prerequisites: 18:106

18:107 Italian Culture and History

18:108 Italian Culture and History

18:109 Italian Culture and History

18:110 Italian Culture and History

18:111 Advanced Composition and Conversation
Prerequisites: 18:110

18:112 Advanced Composition and Conversation
Prerequisites: 18:111

Italian Courses

Primarily for Undergraduates

18:101 Elementary Italian
Prerequisites: None

6 a.h.

18:102 French Drama
Prerequisites: 18:111 or equivalent.

3 a.h.

18:103 French Drama
Prerequisites: 18:111 or equivalent.

3 a.h.

18:104 French Drama
Prerequisites: 18:111 or equivalent.

3 a.h.

18:105 French Drama
Prerequisites: 18:111 or equivalent.

3 a.h.

18:106 French Drama
Prerequisites: 18:111 or equivalent.

3 a.h.
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 secon-
dary school teaching, health-related professions including medi-
cine, 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 Colleges of Liberal Arts (Biochemistry, Botany, Chemistry,
Mathematical Sciences, Geology, Microbiology, Physics-Astron-
omy, 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 mathe-
matics courses. Its equivalent, or a higher level mathematics
course at the college level:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>22S:8</td>
<td>Quantitative Methods II</td>
<td>4 s.h.</td>
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<tr>
<td>22M:11</td>
<td>Fundamentals of College Mathematics II</td>
<td>4 s.h.</td>
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<tr>
<td>22M:16</td>
<td>Calculus for the Biological Sciences</td>
<td>3 s.h.</td>
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<tr>
<td>22M:20</td>
<td>Elementary Functions</td>
<td>3 s.h.</td>
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<td>Any 22C course except 22C:1</td>
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</table>

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 Colleges of Liberal Arts (Biochemistry, Botany, Chemistry,
Mathematical Sciences, Geology, Microbiology, Physics-Astron-
omy, 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 Medi-
cal 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 profes-
sional and preprofessional programs. The description here per-
tains only to the Liberal Arts requirements for a bachelor’s degree
in general science, and should not imply anything further con-
cerning 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:

Biology Emphasis

<table>
<thead>
<tr>
<th>Advisor: John E. Penick</th>
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<td>2:1</td>
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Additional electives in botany or zoology, with at least
8 s.h. in botany and 5 s.h. in zoology | 19 s.h. |

| 4:1                      | Principles of Chemistry I-II | 6 s.h. |
| 4:6                      | Elementary Chemistry Laboratory | 2 s.h. |
| 4:121-122               | Organic Chemistry I-II | 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. |
| 97:128                  | Meaning of Science | 2 s.h. |
| 97:130                  | Science in Historical Perspective | 2 s.h. |

Chemistry Emphasis

<table>
<thead>
<tr>
<th>Advisor: Norman C. Baeniger, Vincent N. Lunetta</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:1 and 4:4</td>
</tr>
<tr>
<td>4:4</td>
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<tr>
<td>4:121-122</td>
</tr>
<tr>
<td>4:141</td>
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<tr>
<td>4:11</td>
</tr>
<tr>
<td>4:131-132</td>
</tr>
<tr>
<td>29:1</td>
</tr>
<tr>
<td>29:17</td>
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</table>

| 29:2                    | College Physics | 4 s.h. |
| 29:18                   | Introductory Physics II | 4 s.h. |
| 29:19                   | Introductory Physics III | 4 s.h. |
| Electives               | 3 s.h. |

<p>| 22M:35-36               | Engineering Calculus I-II | 8 s.h. |
| 22M:25-26               | Calculus I-II | 8 s.h. |</p>
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>97:128 Mean of Science</td>
<td>2 s.h.</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>97:130 Science in Historical Perspective</td>
<td>2 s.h.</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>524:155 Limnology</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>68:2 Principles of Economics</td>
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<tr>
<td>4:121-122 Organic Chemistry I-II</td>
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</table>

**Earth Science Emphasis**

**Advisors:** Keene Swett, Edward L. Fizzini

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:3 Principles of Physical Geology</td>
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<td></td>
</tr>
<tr>
<td>12:4 Principles of Historical Geology</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>12:5 Introduction to Geology</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>12:9 Geology of Iowa</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>12:41 Mineralogy</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>12:121 Principles of Paleontology</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>12:162 Regional Stratigraphy</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>12:171 Geomorphology</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>4:1 and 4:4 Principles of Chemistry I-II</td>
<td>6 s.h.</td>
<td></td>
</tr>
<tr>
<td>4:6 Elementary Chemistry/Laboratory</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>29:1-2 College Physics</td>
<td>8 s.h.</td>
<td></td>
</tr>
<tr>
<td>29:61-62 General Astronomy</td>
<td>8 s.h.</td>
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</tr>
<tr>
<td>44:123 Geography of Natural Resources</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>44:101 Introduction to Weather and Climate</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:128 Meaning of Science</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:130 Science in Historical Perspective</td>
<td>2 s.h.</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</tr>
</thead>
<tbody>
<tr>
<td>52-54</td>
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</table>

**Environmental Studies Emphasis**

**Advisor:** John E. Pennich

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:1 Introduction to Botany</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>2:13 Biology of the Local Flora</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>7:3 Principles of Animal Biology</td>
<td>5 s.h.</td>
<td></td>
</tr>
<tr>
<td>37:109 Genetics</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>37:131 Evolution</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>37:132 Ecology</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:128 Meaning of Science</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:130 Science in Historical Perspective</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>4:1 and 4:4 Principles of Chemistry I-II</td>
<td>6 s.h.</td>
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<tr>
<td>4:6 Elementary Chemistry/Laboratory</td>
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**At least nine semester hours from the following:**

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<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>12:5 Principles of Physical Geology</td>
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<td></td>
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<tr>
<td>12:9 Geology of Iowa</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>12:125 A Planet in Crisis</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>12:183 Principles of Mineral Economics</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>44:19 Natural Environmental Issues</td>
<td>1 s.h.</td>
<td></td>
</tr>
<tr>
<td>44:122 Natural Resources of the United States</td>
<td>3 s.h.</td>
<td></td>
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<tr>
<td>44:123 Geography of Natural Resources</td>
<td>3 s.h.</td>
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</table>

**At least eight semester hours from the following:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>527:102 Technology of Environmental Pollution Control</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>524:154 Environmental Microbiology</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>524:254 Environmental Toxicology</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>527:105 Environmental Health</td>
<td>3 s.h.</td>
<td></td>
</tr>
</tbody>
</table>

**Physics Emphasis**

**Advisors:** George W. Cosman, Edward B. Nelson, Vincent N. Lumnent

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>29:1 College Physics</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>29:17 Introductory Physics I</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>29:2 College Physics</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>29:8 Introductory Physics II</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>29:19 Introductory Physics III</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>29:128 Electronics</td>
<td>4 s.h.</td>
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</tr>
<tr>
<td>22M:35 Engineering Calculus I</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>22M:36 Engineering Calculus II</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>22C:7 Introduction to Computing with FORTRAN</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>4:1 and 4:4 Principles of Chemistry I-II</td>
<td>6 s.h.</td>
<td></td>
</tr>
<tr>
<td>4:6 Elementary Chemistry/Laboratory</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>4:8 General Chemistry II</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>4:9 General Chemistry Laboratory</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>4:131 Physical Chemistry</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:128 Meaning of Science</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:130 Science in Historical Perspective</td>
<td>2 s.h.</td>
<td></td>
</tr>
</tbody>
</table>

**Minors in Science Teaching**

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.

**Biology**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:1 Introduction to Botany</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>37:3 Principles of Animal Biology</td>
<td>5 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:128 Meaning of Science</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:130 Science in Historical Perspective</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>Electives in Botany and Zoology</td>
<td>8 s.h.</td>
<td></td>
</tr>
<tr>
<td>78:131 Methods: Physical Science</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>78:132 Methods: Biological Science</td>
<td>2 s.h.</td>
<td></td>
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</tbody>
</table>

**Chemistry**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>4:1 and 4:4 Principles of Chemistry I-II</td>
<td>6 s.h.</td>
<td></td>
</tr>
<tr>
<td>4:6 Introductory Chemistry/Laboratory</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:128 Meaning of Science</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>97:130 Science in Historical Perspective</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>Electives in Chemistry</td>
<td>9 s.h.</td>
<td></td>
</tr>
<tr>
<td>78:131 Methods: Physical Science</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>78:132 Methods: Biological Science</td>
<td>2 s.h.</td>
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</table>

**At least 25 semester hours from the following:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>527:102 Technology of Environmental Pollution Control</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>524:154 Environmental Microbiology</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>524:254 Environmental Toxicology</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>527:105 Environmental Health</td>
<td>3 s.h.</td>
<td></td>
</tr>
</tbody>
</table>
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 11th semester 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 student’s grade-point average in the major is at least 3.0. Science departments in the College of Liberal Arts 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 the necessary mathematics courses in both pure and applied mathematics (including statistics and computer science) in order that they may be qualified as a future date to do graduate work and quantitative research.

Genetics

Program chairperson: J. Dennis Mulder
Materials: Professor Roger Chabot (Biochemistry), Thomas Conley (Biochemistry), Joseph Prasad (Genetics), Vincent Massey (Biochemistry), George Miller (Genetics), Dennis Mulder (Genetics), John K. Diener (Biochemistry), George Miller (Genetics), Bernard Rall (Molecular Biology), Mark Trott (Genetic Counseling), John Diener (Biochemistry), Robert P. Williams (Genetics), Robert Rall (Molecular Biology).

Degree offered: Ph.D.

Interdepartmental Ph.D. Program in Genetics

The Interdepartmental Ph.D. Program in Genetics is designed to promote cooperative investigations and strong intellectual interactions among individuals and faculty participants who are formally affiliated with different departments. Students entering the program are encouraged to obtain a broad background in genetics, ranging from molecular to population genetics. Within this context, these requirements are not necessarily fixed 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 select 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 to 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 all conduct 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; developmental, 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 area can be made up during the first year of graduate study. 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. Though almost all of the students in genetics currently at Iowa have undergraduate grade-point averages (GPA's) greater than 2.5 and GRE totals (verbal plus quantitative) exceeding 1200, students with lower GPA's or GRE scores are granted access in part according to 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 pre-doctoral trainees. Traineeships include a stipend of $3,000 for 12 months, complete tuition scholarships and additional support for trainees' research. In addition, stipends can be supplemented by occasional teaching assignments at the trainee's option. (Trainees are encouraged to do 12 to 16 hours of 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 Departments 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>58:131 Molecular Genetics</td>
<td>4 a.h.</td>
<td></td>
</tr>
<tr>
<td>Some as Botany 2:215, Microbiology 6:215 and Zoology 71:213</td>
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</table>

Botany

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>5:102 Genetik</td>
<td>3-4 a.h.</td>
<td></td>
</tr>
<tr>
<td>Some as Zoology 71:190</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5:156 Genetik</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>5:188 Plant Systematics</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>5:192 Fundamental Genetics</td>
<td>2 a.h.</td>
<td></td>
</tr>
<tr>
<td>5:202 Fundamental Genetics</td>
<td>2-3 a.h.</td>
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<tr>
<td>Some as Zoology 71:129, 71:219</td>
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<tr>
<td>Some as Botany 2:215, Microbiology 6:215 and Zoology 71:213</td>
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Microbiology

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>61:170 Microbiological Genetics</td>
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<tr>
<td>61:175 Microbiological Laboratory</td>
<td>1 a.h.</td>
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<tr>
<td>61:270 Topics in Molecular Biology</td>
<td>3 a.h.</td>
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<tr>
<td>61:285 Genetics Seminar</td>
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Zoology

<table>
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<tr>
<th>Course</th>
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<tr>
<td>57:100 Genetics</td>
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<tr>
<td>Some as Botany 2:102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>57:125 Prenatal Genetics</td>
<td>3 a.h.</td>
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<tr>
<td>Some as Botany 2:128</td>
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<td></td>
</tr>
<tr>
<td>57:130 Genetics Laboratory</td>
<td>3 a.h.</td>
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</tr>
<tr>
<td>Some as Botany 2:129</td>
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<td></td>
</tr>
<tr>
<td>57:135 Advanced Genetics</td>
<td>4 a.h.</td>
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<tr>
<td>57:185 Parasitology and Evolutionary Genetics</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>57:188 Behavioral Genetics</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>57:189 Quantitative Genetics</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>57:197 Molecular Genetics</td>
<td>4 a.h.</td>
<td></td>
</tr>
<tr>
<td>Some as Zoology 61:213</td>
<td></td>
<td></td>
</tr>
<tr>
<td>57:172 Topics in Molecular Genetics</td>
<td>2 a.h.</td>
<td></td>
</tr>
<tr>
<td>57:173 Molecular Genetics Laboratory</td>
<td>1-2 a.h.</td>
<td></td>
</tr>
<tr>
<td>57:179 Molecular Genetics</td>
<td>1-2 a.h.</td>
<td></td>
</tr>
<tr>
<td>57:189 Tissue and Tissue Biology</td>
<td>2 a.h.</td>
<td></td>
</tr>
<tr>
<td>57:205 Genetic and Molecular Genetics</td>
<td>2 a.h.</td>
<td></td>
</tr>
<tr>
<td>57:225 Seminar: Behavioral Genetics</td>
<td>1 a.h.</td>
<td></td>
</tr>
<tr>
<td>57:215 Genetics Seminar</td>
<td>0-2 a.h.</td>
<td></td>
</tr>
</tbody>
</table>

For departmental sections for detailed descriptions of these and related courses.
Geography

Department chairmen: Clyde F. Kuehn
Faculty: professors: Kenneth J. Davis, Clyde P. Kuehn, James B. Linkberg, Michael L. Michals, David K. Rees, Gussi Runnels, Ned E. Salkeld; associate professors: John S. Assael, Ronald K. Benson, Erastus Kompaone;
Instructor: Donald E. Goetz
Degree offered: B.S., B.S.E., M.A., Ph.D.

Geography is concerned, mainly, with the spatial aspects of human geography and with man/environment relations. Students who elect 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 g各行 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 ever-increasing 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: (1) the best means to obtain accurate facts or data; and the tools and techniques necessary for analyzing these data in order to 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, urban 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 urban problems and subsequent interactions with the total environment. Courses in geography are commonly required of most planning and public administration 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) 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 a specific 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 challenging 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 interests, 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. Those 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), Water: Process and Resources (44:115), Natural Hazards of the United States (44:122), Geography of Natural Resources (44:123), Environmental Impact Studies (44:125) and Field Techniques in Natural Environmental Problems (44:100).

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 (44:135), The Inner City (44:136), Metropolitan Growth and Development (44:137) and Urban Problems (44:139).

Students in business may benefit from taking such location 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 to meet the special training needs of students in advanced training or seeking careers in geography should elect the Bachelor of Science degree. Those who wish to pursue a liberal arts objective are advised to elect the Bachelor of Arts degree.

All geography majors must complete a minimum of 26 semester hours of geography course work, at least 15 of which must be at the 100-level. Many students will find that they will need more than the minimum requirements for mastery of a specific subfield.

All majors must complete the course Introduction to Quantitative Methods in Geography (44:108), or its equivalent as approved by the departmental chairman and the academic advisor, and the Undergraduate Seminar for Geography Majors (44:150). Other than these two courses, the requirements vary with the specific program elected by the student.

Bachelors of Science students must complete either Introduction to Computing with FORTRAN (220:109) or Calculus I (220M:025).

Environmental Studies

The undergraduate program in environmental studies is designed for students with career expectations in personal or corporate careers 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 stresses the interrelationships among those processes and gives the
Under the direction of an advisor, students should select courses in related disciplines.

**Local Analysis**

The concentration in local 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 local 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 local decisions.

The required professional courses include Introduction to Quantitative Methods in Geography (44:108), Spatial Organization (44:138), Undergraduate Seminar for Geography Majors (44:150), Introduction to Computing with FORTRAN (22C:100) or Calculus I (22M:025).

Students concentrating in local analysis are advised to select substantive courses from the following:

44:001 Introduction to Human Geography
44:021 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
44:122 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 and contemporary cities. Required skills in quantitative analysis, cartography, and computer usage are developed. Opportunities for experience in working with real problems are included.

The required professional courses include Introduction to Quantitative Methods in Geography (44:108), Spatial Organization (44:138), Undergraduate Seminar for Geography Majors (44:150), 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 Nature 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
44:116 Urban Political Geography
44:130 Location of Services
44:132 Industrial Location
44:135 Urban Geography
44:136 The Inner City
44:137 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.

**General Program**

For those who do not wish to concentrate in any particular area of interest, a very general liberal arts program in geography may be designed to provide such majors with a broad understanding of the discipline. The student must elect Introduction to Quantitative Methods in Geography (44:108) and Undergraduate Seminar for Geography Majors (44:150). 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 (44:138), Undergraduate Seminar for Geography Majors (44:150), 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 positions 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 on 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 of 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 44-202 Geographical Analysis II. The remainder of their programs must be composed of graduate-level courses approved by the graduate study committee in consultation with the student's adviser. 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 its equivalent and 44-208 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 adviser. Students are advised that it is advisable 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 adviser 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 program requirements may be 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 electives 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.

In addition to the above, the student 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 44-330 Research Staff Seminar each semester while in residence. One semester hour of credit will be awarded each semester on a satisfactory/unsatisfactory 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 tool requirements. Students develop their programs with the advice and consent of their advisers.

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 adviser. 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 adviser 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 adviser. Students who have been admitted with advanced graduate credit of 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 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 44-309量itative 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 area of specialization.

Candidates for the Ph.D. degree are required to pass a comprehensive examination in the major field of specialization, 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

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Geography

a dissertation which must be defended in a final oral examination.

All doctoral candidates are expected to have supervised experiences 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 sets forth the 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 the 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 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 IMLAC-FIGS mini-computer with a CRT for on-line editing of digitizing work. It is expected that this system will be enlarged 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 CALCOMP plotter available to the Department. In addition an HP 2000 system with becchi terminals is available for instructional use. Housed on the third floor of the Main Library, the Map Library contains more than 75,000 maps, a total of 2030 atlases and reference maps, and about 80,000 aerial photographic maps, 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 Geology Library contains approximately 50,000 maps, including both geologic maps and U.S. Geological Survey topographic maps. The Department of Geography has its own collection of topographic maps, maps of large urban centers and aerial photographs for use in students 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 prerequisite. It is recommended, however, that majors take 44:108, 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 social science core credit.

44:1 Introduction to Human Geography

Application of geographic principles in contemporary social, economic and political problems. Analysis of problems of the urban environment, urbanization, and perception.

44:6 Natural Environment and Men

Social distribution of the world's natural resources including climate, water, fish, timber, soils, vegetation and minerals; human role in defining nature of resource base; regional conflicts in resource use, environmental pollution and natural hazards.

44:11 Introduction to Social Geography

Appraisal of physical conditions of occupation and distribution; inequalities within a population; poverty; housing; social organization and segregation; social systems including education, religion, recreation, medical, and social services; diffusion of ideas and styles over space.

44:14 Natural Environmental issues

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 versus quality of environment.

44:16 Introduction to Economic Geography

Location and spatial organization of world's major types of economic activities energy and minerals, manufacturing, transportation, trade and service centers.

44:18 Introduction to Transportation Geography

Basic concepts of transportation and their relationship to geography; special problems and spatial structures associated with transportation.

44:19 Introduction to Urban Geography

Processes of urbanization and city growth; spatial structure and pattern of urban activities; geographic considerations of contemporary urban problems; the city and its physical setting; comparative urban studies.

44:20 Readings for Undergraduates

Supervised readings in geography. Prerequisites: consent of instructor.

Courses for Undergraduates and Graduates

44:19 Introduction to Weather and Climate

Supplemental distribution of weather elements, wind circulation, air masses, storms and general world climate conditions including air pollution and climate change; laboratory work in study of weather maps and climatic data.

44:18 Geography in the School Curriculum

Concepts and awareness of geographic material in effective educational programs and methods of geography instruction; use of individual media in reaching geography.

44:17 Maps and Mapping

Qualities of a good map or diagram, types of maps or diagrams for particular use, major types of maps and diagrams, principles for the composition of maps and diagrams. Laboratory experiences with various mapping programs including ENMAP, CALCOMP and others.

44:16 Introduction to Quantitative Methods in Geography

Applications of mechanized systems to geographic problems.

44:15 Computer Methods in Geographical Analysis

Use of computer techniques and analysis, various mapping programs including ENMAP, CALCOMP and others.

44:11 Introduction to Urban Transportation

Urban transportation defining the land use transport system and the urban transport planning process; urban transportation problems; transportation in the city. Same as 102:111.

44:17 Urban Political Geography

Relationships between individual political behavior and the functional and geographical organization of urban political systems. U.S. metropolitan areas and the satisfactions of citizens for the public goods and services.

44:19 Natural Environmental Issues

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 versus quality of the environment.

44:20 Natural Hazards

Human-environment relationships under extreme environmental conditions; causes, characteristics and consequences of extreme events such as earthquakes, tornadoes, hurricanes, droughts and floods; human adjustments to these events, ranging from immediate responses to the total system responses to long-term responses like forecasting, flood control, mining, and insurance.

44:12 Streams and Water: Processes and Reuse

Water as a resource and an agent shaping the form of the land surface, characteristics of stream drainage basins and alluvial flood plains, floods and their interactions.

44:16 National Resources of the United States

Nature and pattern of regional differences in the nature resources base for agriculture and industry including land, water and mineral, environmental problems and conflicts arising from resource development.
Geology

Geology

Department Chairperson: Richard A. Hoppin

Faculty: professors William Funkhouser, Brian Gladek, Richard Hoppin, Gilbert Kopper, George R. McDonald, Helen Shand, Karen Swift, Stewart Tennis, adjunct professors Stanley Guest, George Halbach, Walter Skelton; associate professors Richard Baker, John Carson, Kathleen Clark, Lee Drew, Phil Hingel, Jeffrey Schallhorn; research associate Hannel Brinton

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

Geology is the theoretical and practical application of all scientific disciplines to study of the earth. How the earth was formed, what it looks like now, how man acquires 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 surveys, government and research organizations. The student's degree is regarded by many hiring agencies as the professional degree in geology. However, an undergraduate degree is fully satisfactory in certain teaching, legal 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, water resource education or oceanography 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, biology, chemistry and mathematics—in addition to a course in each major area of geology.

Each year more than 1,000 students enroll in Earth Science 11:23 Earth History and Resources and 11:24 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.

Other offerings for nonmajors include a lecture sequence for persons interested in a general survey of geology, and several advanced courses with few prerequisites—paleontology, geology of Iowa, history of the vertebrates, a planet in crisis, minerals and world affairs: geomorphology, oceanography, use of native materials and ornithology.

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 geology majors.

Geology Courses

12:5 Introduction to Geology 4 s.h.
12:6 Evolution of the Earth 4 s.h.
12:41 Mineralogy 4 s.h.
12:52 Elementary Petrology and Geochemistry 4 s.h.
12:112 Geologic Field Methods 1 s.h.
12:113 Summer Field Course 6 s.h.
12:121 Principles of Paleontology 3 s.h.
12:191 Structural Geology I 4 s.h.
12:198 Junior Seminar 1 s.h.
Two elective geology courses 6 s.h.

(11:23 and/or 11:24 may substitute for 12:5.)

Supporting Sciences

The geology major requires at least ten semesters hours of college-level mathematics, including either one semester of calculus or 22M:35 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 course work 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):

Geology Courses

12:5 Introduction to Geology 4 s.h.
12:6 Evolution of the Earth 4 s.h.
12:41 Mineralogy 4 s.h.
12:106 Geologic Map and Air Photo Interpretations 3 s.h.
12:121 Principles of Paleontology 3 s.h.
12:116 Field Trip (two sections) 4 s.h.
12:198 Junior Seminar 1 s.h.
Geology electives 12 s.h.

(35 s.h.)

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 preside each week, and student discussion is lively.

Joint Programs

Joint programs can 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 Iowa. Deficiencies may be remedied at the beginning of graduate study. Geologic 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.

Prospective graduate students in geology should consult the "Rules and Regulations" in the "Graduate College" section of the Catalog for general admission and graduate study requirements.

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 adviser 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 subdisciplines 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 ramifications and implications. No college credit is granted for this activity.

The M.S. degree without thesis requires at least 30 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 tools.

Courses in such related disciplines as botany, chemistry, physics and zoology are not regarded as satisfying tool requirements, although they may provide indispensible 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 concentrated 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

Petroleum-Mineralogy
Mineralogy
Igneous and Metamorphic Petrology Experimental Petrology

Structural Geology
Geotechnics Structural Analysis Remote Sensing

Sedimentary Petrology
Sedimentation Sandstone and Carbonate Petrology Physical Sedimentology

Paleontological Studies
Paleontological Geology Vertebrate Paleontology Paleobiology

Paleozoology Paleohexony Paleozoology Biostratigraphy

Geomorphology
General Geomorphology Glacial and Pleistocene Remote Sensing

Environmental Geology
Ground Water Remote Sensing Ecology

Other Minor Subjects
Botany Zoology Chemistry Physics Geography Hydraulics Archaeology-Antropology Science Education Others
Cooperative Activities
The Department has joint professorships with the Iowa Geological Survey and the Department of Botany for work on projects for the survey. There is also cooperation between the geology, geography, and zoology laboratories 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 Pliocene Outwash. 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.

Springroken provides time for longer trips which are available to all biology students. In recent years these have included the Grand Canyon, the Florida Keys, the southern Appalachians, the Big Bend Region of Texas and the Ozark. Advanced courses for seniors and graduate students visit Colorado, Ontario, Kansas, Oklahoma, and California.

Courses

Primarily for Undergraduates
121 Lecture in Earth History and Nature. 3 a.h.
Not open to those who have had Core 1120, 1121, 1125 or 124.

125 Lecture in Man and His Physical Environment. 3 a.h.
Not open to those who have had Core 1124. 120 and 125 assume earlier and modern environmental concerns on and within earth and processes by which they evolved. Observation of organisms and man's current use and misuse of present environments.

126 Principles of Physical Geology. 3 a.h.
Introductory course focusing on processes that have governed and currently are altering our physical environment, composition and lithogenesis of the earth's surface. Concepts in soil science and geologic time. Introduction to the science of geology. Nature and cause of earthquakes. Effects of man on the environment. Geology of Iowa. Emphasis on drift and drift deposits, climate change, and deposits.

128 Introduction to Geology. 3 a.h.

Lectures and laboratory studies of rocks and minerals, weathering, soils, erosion, bedsheets, glaciers, mountains, earthquake, and tension of earth; widespread field trips emphasized. Recommended for students majoring in non-science majors; not open to those who have had Core 1120, 1125 or 124.

128 Evolution of the Earth. 3 a.h.
Lectures, laboratory, discussions, and field trips, tracing the evolution and interrelated features of the earth is historical perspective. Topics include origin of the earth, history and evolution of the earth's structure, dating of geological events; nature and distribution of minerals and rocks; fossils and methods of geologic study. Not open to students who have had 124.

129 Geology and Geology Laboratory. 3 a.h.
Survey of geologic features in the state; for students who have had previous courses in geologic lectures and field trips.

1210 Honors Thesis in Geology. 3 a.h.

Prerequisite: consent of the Department.

1216 Field Trip. 3 a.h.

Seven to ten days during spring months in areas of geologic interest: carbonate rocks of Florida: northern Arizona; Big Bend, Texas; western Nebraska; and Wyoming. May be repeated. Prerequisite: consent of instructor.

1241 Microscopy. 3 a.h.
Instruction in study of microscopics, examining phylogeny, chemical properties, plant relations and identifications. Prerequisite: college earth science or geology. Corequisite: introductory chemistry.

1250 Elementary Petrology and Geochemistry. 4 a.h.
Lectures, laboratory and discussion focusing with principles of petrography, economic geology, and methods of geologic study. Prerequisite: Corequisite 1241.

1250A Elementary Petrology and Geochemistry. 4 a.h.
Lectures, laboratory and discussion focusing with principles of geochronology, based on isochrony and principles of relative time of formation of igneous rocks; sedimentary and metamorphic rocks. Prerequisite: Corequisite 1241.

For Undergraduates and Graduates
1230 Physical Geology. 3-3 a.h.
1236 Historical Geology. 3-3 a.h.
1285 Geologic Map and Air Photo Interpretation. 3 a.h.
Prerequisite: college geology or consent of instructor.

1257 Geology of Coal. 3-3 a.h.
Required course for all entering geology students. Comprehensive course in the principles and procedures involved in the study of coal deposits; the principles of geologic and stratigraphic studies, the applications of the information for the study of coal deposits.

1259 Introduction to Oceanography. 3 a.h.
Survey of descriptive, chemical, physical, and biological aspects of the world ocean. Background in basic principles of chemistry, biology, physics and earth science is desirable.

1260 Geology of Rocks. 3 a.h.
Survey of the igneous, sedimentary and metamorphic rocks of the earth. Corequisite: lecture 1255 or consent of instructor.

1261 Geologic Field Methods. 3 a.h.
Practicum with basic instruments and methods of geologic mapping. Prerequisite: 1235.

1213 Summer Field Course. 4 a.h.
Field study and techniques of field methods is scheduled for June and July at the University of Michigan, Michigan, and other appropriate sites. Prerequisite: consent of instructor.

1215 Introduction to Paleontology and Geology. Geology and geology and paleontology. 3 a.h.
Prerequisite: consent of the Department. May be repeated.

1217A Methods of Paleontological. 3 a.h.
Nature, origin and use of fossils; identification principles, species comparison, natural history; study of fossiliferous strata; field and laboratory techniques of use of fossil petrology. Prerequisite: college earth science or geology or consent of instructor. Open to graduates in geology or biology without prerequisites.

1232 Vertebrate Paleontology. 3 a.h.
Evolution of the vertebrates, evolution, and character of the vertebrates is studied. Corequisite: lecture 1231.

1234 Invertebrate Paleontology. 3 a.h.
Prerequisites: 1217A and 1217B. Laboratory: descriptive, paleoecological and paleontologic concepts is studied. Corequisite: lecture 1231.

1235 Invertebrate Paleontology. 3 a.h.
Lectures, laboratory and field work of microfossil analysis, evaluation and ecology of all significant microfossil inseparables. Prerequisite: 1232 or (by consent of instructor) for those who have taken 1217A and 1217B, and college zoology.

1236 A Planet in Crisis. 2-2 a.h.
Critical review, scientifically based, of the inferences of earth's current environment for human populations. Includes ecology, population, resources and pollution; directed toward general earth science students. Not open to graduate science majors. Corequisite: lecture 1235.

1237 Paleobiology. 3 a.h.
Prerequisites: lecture 1217A and 1217B. An in-depth investigation using fossil evidence; paleontological technology, evolutionary applications in fossil and present environments; lectures, laboratory, field trips. Prerequisite: introductory biology or geology. Corequisite: lecture 2120.
German

Department chairman: Steward Diversity

Field of study: German Language and Literature. Degrees offered: B.A., M.A., Ph.D.

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 (13:51 Second-Semester German); but if such a student is not sufficiently prepared for 13:51, he or she can secure permission to register for 13:52 Second-Semester German. 13:51 First-Semester German. Proficiency 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 course sequence or the equivalent is required of majors who have had no previous experience with the German language:

Basic Program

First and Second Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:11</td>
<td>First-Semester German</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:12</td>
<td>Second-Semester German</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:21</td>
<td>Third-Semester German</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:22</td>
<td>Fourth-Semester German: Reading</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:23</td>
<td>Fourth-Semester German: Elementary Composition and Conversation</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

(13:22 and 13:23 may be taken concurrently, if desired, or in sequence.)

Third Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:31</td>
<td>Introduction to Modern German Literature I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:32</td>
<td>Introduction to Modern German Literature II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:33</td>
<td>Intermediate Composition and Conversation I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:34</td>
<td>Intermediate Composition and Conversation II</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

(13:31 and 13:33, and 13:32 and 13:34 may be taken concurrently.)

Fourth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:101</td>
<td>German Syntax</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:105</td>
<td>German Cultural History</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:111</td>
<td>Survey of German Literature I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>13:112</td>
<td>Survey of German Literature II</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>
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 chairman 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 years, these courses or their equivalents constitute a teaching minor in German:

13:31 Introduction to Modern German Literature I
13:32 Introduction to Modern German Literature II
13:33 Intermediate Composition and Conversation I
13:34 Intermediate Composition and Conversation II
13:101 German Studies

Honors in German
German majors of junior or senior standing with a grade-point average of at least 3.0 overall and 3.5 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 to all participants.

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 16-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 adviser, choose those courses which will best prepare them.

Suggested Courses for the Master of Arts Degree

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:102</td>
<td>Advanced German Stylistics</td>
<td>3</td>
</tr>
<tr>
<td>13:103</td>
<td>German Phonology</td>
<td>3</td>
</tr>
<tr>
<td>13:201-2</td>
<td>German Proscean</td>
<td>6</td>
</tr>
<tr>
<td>13:285</td>
<td>Goethe</td>
<td>3</td>
</tr>
</tbody>
</table>

Any one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:241</td>
<td>History of the German Language</td>
<td>3</td>
</tr>
<tr>
<td>13:243</td>
<td>Middle High German</td>
<td>3</td>
</tr>
<tr>
<td>13:245</td>
<td>Old High German</td>
<td>3</td>
</tr>
</tbody>
</table>
Greek

See "Classics."

History

Department chairman: Lawrence Lefere

Faculty: professors W.O. Athanass, Robert Dolben, Lawrence Gilliard, Ralph Graue, Donald Oehlmann, Charles Hole, Ellis Hawley, John Housman, Henry Hurwit, Sydney James, Linda Korb, Lawrence Lefere, Tamara Peckarski, Sven Porse, Manolis Rotschnitz, David Schenkman, Alan Simpson, Donald Suben- leit; associate professor W. Brian Sattig, Sydney Most; assistant professors Theodore Douglas Bassany, Alan Magill, William Mode, Lynne Webber, Lorraine Winkler, Tamar Shavit, Michael Shavit, Alan Shavit, and James B. Shavit.

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

The purpose of the Department of History is to enlarge knowledge of the human experience and to provide students with opportunities to gain information and learn methods for understanding the world in the light of its past. In addition to offering these essential elements of liberal education, the department trains professional historians and teachers of history, serves those who require a knowledge of a period or aspect of history as background for their own specialized interests in other fields, and participates in several interdisciplinary programs such as American Civilization, Afro-American Studies, Asian Studies, and Women's Studies.

The Undergraduate Program

Baccalaureate graduates in history go into a variety of positions in business, public service, or journalism. Many plan further training in history, law, religion, library science, or social work.

A major in history includes work in other fields that will illuminate and expand the meaning of history courses as well as introduce the undergraduate to different bodies of information and approaches to understanding the ways societies and cultures work. It is, for example, strongly recommended that the college degree requirement in a foreign language be met by selecting one that fits in with the major student's history interests: someone studying French history will obviously find the French language a great enrichment of his general education than the pursuit of a language quite unrelated to his interests in his major.

General Major in History

The general major in history has students with a general interest in history.

The program requirements are:

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 11-29-30 Problems in Human History, 11-31-32 Western Civilization, or 11-35-36 Civilizations of Asia.

Prospective Teachers 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:

Satisfaction of the historical-cultural core requirements with either 11-29-30, 11-31-32, or 11-35-36.

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, or 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. Twice, 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 seminar 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 readings or seminar course. The program must also include at least six semester hours in each of two other divisions of the history, six hours in the 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 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 medical/dental 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
Europe, 1815 to Present
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 delineate 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. program, 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 study are reviewed every year. 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 political 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 200 and above are open to business provided they have already satisfied the history-culture core requirement.
Home Economics

Department Chairwoman: Sue C. Wallaces
Faculty: professors Andrew D. Hoffman, Margaret N. Koos, Elizabeth M. Cox, Paul Eugene Winkler, professor emeritus Margaret O. Osburn,ai, David Woodruff, associate professor Elizabeth A. Naesdd Schell, associate professor Mary I. Smith, associate professor Mary D. Rade, Elizabeth R. Rade, Carol K. Rade, Sanda S. Mohamed, Nada S. Paneva, W. Fred Bates, Sue C. Wallaces, assistant professor Mary B. Stevens, instructor Penny Burks, Mary Ann Czarnecki, Rachelle Crews, Lorraine T. Durham, Dorothy L. Rupe, Jerry McCollum, Helen L. Verge, N. Oweis Williams

Degrees offered: B.A., B.S., M.A., M.S., M.A.T.

Home economics is a career often a wide range of opportunities: teaching, dietetics, merchandising, interior and textile design, product development and quality control in textile and food industries, consumer relations, family-life education and services, food service management, and service with community or government agencies. The undergraduate program prepares students for immediate employment as professional home economists.

Concentration in design and housing, family development, food and nutrition, home economics education, or textiles and clothing makes it possible for undergraduate majors to develop specializations. The home economics core provides a basic understanding of relationships among the various areas of specialization within home economics. Joint programs may be arranged with other fields such as journalism, art, social work and education.

Undergraduate Requirements

In meeting the requirements for the B.A. or B.S. degree of the College of Liberal Arts, students majoring in home economics need to select courses in other departments which also are prerequisites for home economics courses. In addition, majors complete the home economics core made up of 17,190 Seminar: Home Economics, and one course from each of the following subject areas within the Department, design and housing, family development, food and nutrition, and textiles and clothing. The student selects all courses in consultation with his or her faculty advisor, developing a program of study based upon professional goals and interests.

The Bachelor of Arts

Design and Housing

Students concentrating in design and housing are prepared for careers in residential and contract interior design, space planning, design and graphics, merchandising, fabric design and wearing. Required were:

17.50 Design for the Home 3 s.h.
17.75 Principles of Building 2 s.h.
17.54 Interior Design: Principles and Practice 3 s.h.
17.80 Introduction to Textiles 3 s.h.
or 17.81 Textile Fibers 4 s.h.
Family Development

This program prepares students for careers with agencies and services concerned with the total family and its functioning, for family life education, and the extension service.

Required:
- 17:10 Growth and Development of the Young Child 3 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.
- 17:114 Parent-Child Relationships 3 s.h.
- 17:115 Direct Studies in Family Development 3 s.h.
- 17:122 Materials and Methods in Family Life Education 3 s.h.
- 17:190 Seminar: Home Economics 2 s.h.
- 21:1 Elementary Psychology 4 s.h.
- 34:1 Introduction to Sociology: Principles 4 s.h.
- One course from each of the following areas: Design and housing 3 s.h., Family and nutrition 3 s.h., Textiles and clothing 3 s.h.

Electives from education, social work, psychology and sociology are recommended.

Food and Nutrition

This program prepares students for careers in dietetics, in the food industry, and for service with community and government agencies.

Required:
- 17:131 Food Study 2 s.h.
- 17:132 Food Study Laboratory 2 s.h.
- 17:133 Meal Management 3 s.h.
- 17:134 Experimental Food I 3 s.h.
- 17:135 Experimental Food II 3 s.h.
- 17:145 Advanced Nutrition 3 s.h.
- 17:142 Nutrition 3 s.h.
- 17:190 Seminar: Home Economics 2 s.h.
- 4:1 Principles of Chemistry I 3 s.h.
- 4:4 Principles of Chemistry II 3 s.h.
- 4:8 Elementary Chemistry Laboratory 2 s.h.
- 4:121 Organic Chemistry I 3 s.h.
- 4:141 Intermediate Chemistry Lab I 2 s.h.
- 6:1 General Microbiology 4 s.h.
- 72:13 Introduction to Human Physiology 4 s.h.
- 99:120 The Chemistry of Biological Materials 3 s.h.
- 99:120 Metabolism 3 s.h.

One course from each of the following areas:
- Design and housing 3 s.h.
- Family development 3 s.h.
- Textiles and clothing 3 s.h.

Electives should be selected from home economics and the natural sciences.

Concentration in Nutrition with emphasis on dietetics requires:
- 17:131 Food Study 2 s.h.
- 17:132 Food Study Laboratory 2 s.h.
- 17:133 Meal Management 3 s.h.
- 17:134 Experimental Food I 3 s.h.
- 17:135 Experimental Food II 3 s.h.
- 17:145 Advanced Nutrition 3 s.h.
- 17:132 Nutrition 3 s.h.
- 17:190 Seminar: Home Economics 2 s.h.
- 4:1 Principles of Chemistry I 3 s.h.
- 4:8 Principles of Chemistry II 3 s.h.
- 4:121 Organic Chemistry I 3 s.h.
- 4:141 Intermediate Chemistry Lab I 2 s.h.
- 6:1 General Microbiology 4 s.h.
- 72:13 Introduction to Human Physiology 4 s.h.
- 99:120 The Chemistry of Biological Materials 3 s.h.
- 99:120 Metabolism 3 s.h.
- 6:8:1 Principles of Economics 4 s.h.
- 6:8:14 Employment Relations in the Public Sector 3 s.h.
- 79:75 Educational Psychology and Management 3 s.h.
- 79:131 Educational Psychology 3 s.h.
One course from each of the following areas:

- Design and Housing 3 s.h.
- Family Development 3 s.h.
- Textiles and Clothing 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.

**Home Economics Education**

This program leads to certification and vocational approval in home economics. Graduates 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.
- 17:31 Introductory Food Study 3 s.h.
- 17:131-132 Food Study/Food Study Laboratory 4 s.h.
- 17:233 Meal Management 3 s.h.
- 17:41 Contemporary Nutrition 3 s.h.
- 17:142 Nutrition 3 s.h.
- 17:50 Design for the Home 3 s.h.
- 17:265 Family Housing 3 s.h.
- 17:71 Intermediate Clothing Construction 3 s.h.
- 17:72 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.
- 17:114 Parent-Child Relationships 3 s.h.

**or**

- 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 3 s.h.
- 17:190 Seminar: Home Economics 2 s.h.
- 18:11 or 2 Elements of Art 3-5 s.h.
- 61:1 or 2 Principles of Economics 4 s.h.
- 79:75 Educational Psychology and Measurement 3 s.h.
- 75:91 Pre-Education Practice 2 s.h.
- 75:100 Introduction: Secondary School Teaching 2 s.h.
- 75:125 Methods: Home Economics 3 s.h.
- 75:187 Seminar: Curriculum and Student Teaching 3 s.h.
- 75:191 Observation and Laboratory Practice in the Secondary School 3 s.h.
- 75:192 Observation and Laboratory Practice in the Secondary School 3 s.h.
- 31:1 Elementary Psychology 4 s.h.
- 34:1 Introduction to Sociology: Principles 4 s.h.
- A course in American politics, American history, or American government 2-4 s.h.

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.

**or**

One course from each of the following areas:

- Design and housing 3 s.h.
- Family development 3 s.h.
- Food and nutrition 3 s.h.
- General Chemistry I 3 s.h.
- General Chemistry II 3 s.h.
- General Chemistry Laboratory 2 s.h.
- 61:1 or 2 Principles of Economics 4 s.h.
- 31:1 Elementary Psychology 4 s.h.
- 11:57 History and Appreciation of Art 3 s.h.

**Other required:**

- Textiles and clothing technology requirement 3 s.h.
- 17:81 Textile Fibers 4 s.h.
- 17:170 Advanced Clothing Construction and Tailoring 3 s.h.
- 17:81 Textile Dyers, Finishes and Detergents 4 s.h.
- 17:182 Textile Analysis 3 s.h.
- 17:183 Textile Economics 3 s.h.
- 17:184 Textile Quality Control 3 s.h.
- 17:190 Seminar: Home Economics 2 s.h.
- 4:7 General Chemistry I 3 s.h.
- 4:8 General Chemistry II 3 s.h.
- 4:9 General Chemistry Laboratory 2 s.h.
- 61:1 Principles of Economics 4 s.h.

**Design and housing 3 s.h.**

**Family development 3 s.h.**

**Food and nutrition 3 s.h.**

Electives from computer science, statistics, engineering, psychology, chemistry, economics, and design and housing are recommended.
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:

22M:2 Mathematical Techniques I 3 s.h.
22M:3 Mathematical Techniques II 3 s.h.
22M:20 Elementary Functions 3 s.h.
22M:25 Calculus I 4 s.h.
25:1 College Physics 4 s.h.
29:2 College Physics 4 s.h.
4:130 Elementary Physical Chemistry for the Life Sciences 3 s.h.
or 99:140 Experimental Biochemistry 3 s.h.

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:

4:7 General Chemistry I 3 s.h.
4:8 General Chemistry II 3 s.h.
4:9 General Chemistry Laboratory 2 s.h.
A course in statistics 3 s.h.
Two courses from the natural sciences and/or courses numbered 100 or above in anthropology, economics, psychology, or sociology 6-8 s.h.

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:

17:81 Textile Fibers 4 s.h.
17:181 Textile Dyes, Finishes and Detergents 4 s.h.
17:182 Textile Analysis 3 s.h.
17:183 Textile Economics 3 s.h.
17:184 Textile Quality Control 3 s.h.
17:190 Seminar: Home Economics 2 s.h.
4:11 Elementary Quantitative Analysis 4 s.h.
4:121 Organic Chemistry I 3 s.h.
4:122 Organic Chemistry II 3 s.h.
22M:3 Mathematical Techniques II 3 s.h.
22M:20 Elementary Functions 3 s.h.
22M:25 Calculus I 4 s.h.
29:1 College Physics 4 s.h.
29:2 College Physics 4 s.h.

One course from each of the following areas:

Design and Housing 3 s.h.

Family development 3 s.h.
Food and nutrition 3 s.h.

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 colleges, secondary schools, business, industry, and government.

The graduate program enables students to obtain depth through specialization in one of five master 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 for teaching 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 or 36 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):

17:156 Survey of Modern Interiors 2 s.h.
17:250 Seminar: Design and Housing 2 s.h.
17:269 Research: Problems in Design and Housing 2-4 s.h.
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:

17:211 Sexuality and the Family 3 s.h.
17:212 Seminar: Family Dynamics 3 s.h.
17:213 Theory in Family Development 3 s.h.
17:219 Research Problems in Family Studies 3 s.h.
17:290 Seminar: Home Economics Research 2 s.h.
17:910 A course in statistics 3 s.h.

Food and Nutrition
Graduates work to emphasize 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 s.h.
17:241 Seminar: Nutrition 2 s.h.
17:290 Seminar: Home Economics Research 2 s.h.
225:101 Bio-statistics 3 s.h.

or
17:143 Introduction to Statistical Methods 3 s.h.
99:120 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.
61:197 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.
17:541 Seminar: Nutrition 2 s.h.
17186 Directed Studies in Textile Design 3 a.h.
Advanced study in textile design. Prerequisite: senior or graduate standing, and consent of instructor.

17190 Advanced Clothing Construction and Tailoring 3 a.h.
Advanced construction techniques and selection of fabrics and designs for industrial garments. Prerequisites: 1706, 17015, or consent of instructor.

17193 Fashion Merchandising 3 a.h.
History and analysis of the fashion industry; production and distribution; parts of clothing consumption. Prerequisites: Economics 601 or 662.1, or consent of instructor.

17196 Directed Studies in Clothing 3 a.h.
Prerequisites: senior or graduate standing and consent of instructor.

17197 Textile Dyes, Finishes, and Dyeing 4 a.h.
Dyes, chemical fibres, dyes: their classification, methods of application and effect on reactivity of fibres. Prerequisites: 17018 and Chemistry 4.4 or 4.6 or consent of instructor.

17205 Textile Analysis 3 a.h.
Physical properties, yarn and fabric geometry; quantitative analysis and use of test equipment. Prerequisites: 17019 and Chemistry 4.9 or 4.6 or consent of instructor.

17208 Textile Economies 3 a.h.
Economic and industrial history of textiles; current developments and problems in production and marketing. Prerequisites: Economics 601 or 662.1 or consent of instructor.

17216 Textile Quality Control 2 a.h.
Quality control systems: analysis of data to identify sources of variation; design of performance tests. Prerequisites: 17018 and Education 7143 or consent of instructor.

17219 Directed Studies in Textiles 3 a.h.
Prerequisites: senior or graduate standing and consent of instructor.

17226 Seminar: Home Economics 2-4 a.h.
Examinations concerning professional scope of home economics; in original, development, philosophy, current factors influencing curricula in higher education, research, and the profession.

17228 Seminar: Home Economies 2-4 a.h.
Review of literature in area of interest; open to both majors and non-majors.

17229 Honors Problems: Home Economics 1-4 a.h.
Research project or creative work; open to both majors and non-majors.

17231 Seminar: Family Dynamics 3 a.h.
Discussion and discussion of families in family interaction.

17232 Theory in Family Development 3 a.h.
Relationship of developmental research to family interaction; current processes within families and their effects. Prerequisites: Sociology 24.167 or consent of instructor.

17236 Research: Problems in Family Studies 1-4 a.h.
Individual research problems of advanced students. Prerequisite or consent: 17260.

17237 Seminar: Readings in Home Economics Education 1-2 a.h.
Critical review of current literature in home economics education. Prerequisites: consent of instructor.

17239 Research: Problems in Home Economics Education 1-4 a.h.
Individual research problems of advanced students. Prerequisite or consent: 17260.

17242 Seminar: Food 1-2 a.h.
Readings, reports and discussions of current literature in food science. May be repeated for credit.

17259 Research: Problems in Food and Nutrition 1-4 a.h.
Individual research problems of advanced students. Prerequisite or consent: 17260.
17:284 Seminar: Nutrition 3 s.h. Critical review of current professional literature in nutrition. Prerequisite: 17:141, or consent of instructor.
17:290 Seminar: Design and Housing 2 s.h. History and philosophy of interior design, textile design, and lighting; readings, reports, and discussion of current literature. Prerequisite or corequisite: 17:290.
17:295 Seminar: Historic Housing and Interiors 2 s.h. Methodology and procedures in historic renovation and preservation; readings, reports, and discussion of current literature. Prerequisite: consent of instructor.
17:296 Studio Workshop in Fiber 4 s.h. Fiber projects in a specific medium; emphasis on aesthetic direction; related readings. Prerequisites: 17:186, 17:182, 17:166 and consent of instructor.
17:298 Research: Problems in Design and Housing arr. Individual research problems for advanced students. Prerequisite or corequisite: 17:290.
17:298 Clothing for the Physically Handicapped and the Aged 3-6 s.h. Problems in satisfying clothing needs; solutions to some problems; review of research; work of selected agencies; analysis of specially-designed clothing. Summer sessions only.
17:298 Readings: Clothing arr. Readings, reports and discussion of current literature in clothing.
17:299 Instrumental Analysis of Textile Materials 4 s.h. Comparative analysis of fibers and fabric properties and the study of methods for scientific evaluation of these properties.
17:299 Readings: Textiles arr. Readings, reports, and discussion of current literature in textiles.
17:299 Seminar: Home Economics Research arr. Methods and techniques of research in home economics and closely allied fields. Prerequisite or corequisite: a course in statistics, or consent of instructor.
17:291 Thesis Master's degree culminates.
17:295 Workshop on Aging: Social Gerontology for Home Economists 3-5 s.h. Characteristics, attitudes, and behavior of older people; physical, social, economic, and medical 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 Capps, Harold Heron, Kenneth Stack, Allen Tabor; professional research professors: Mildred Laidle D. Metzler; associate professors Joseph Aussett, John Erickson, William Price Pad, William Zoric; assistant professors Lory Baltes, Nancy Harper, Arthur Mallory, Earle Olson, James Woluck, Thomas Zende, Dorothy Zoldi; instructors Beth Garner, Richard Jothum, Jan Miller, Harley Smoe, Richard Woolward
Degrees offered: B.A., B.S., M.A., Ph.D. (in mass communications)

Undergraduate Programs
Whereas a journalism chooses to work, he or she will be in a vital role requiring extensive knowledge of the diversity of human experience. Competent journalism must understand themselves, their relationship to the events they report, the mechanics of their profession, and the effects of their work on the reader, viewer, 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 three-quarters 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 area of special professional competence. The School offers undergraduate students a choice of three emphases—journalism, mass communication, or communication. All have these common basic requirements, or foundations courses:

19:100 Communication and Communication Systems 3 s.h.
19:102 Legal and Ethical Foundations of Communication Systems 3 s.h.
19:106 Cultural and Historical Foundations of Communication Systems 3 s.h.
19:108 Communication Systems Theory and Research 3 s.h.
19:109 Introduction to Journalism and Mass Communication 3 s.h.

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 courses 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 selection 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 use 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, audiotape, 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 satisfaction and frustrations necessary to their own intellectual and professional growth.

The special requirements for this emphasis are:

| 19:122 | Mass Communication Laboratory II: Printemas and Media | 2 s.h. |
| 19:124 | Mass Communication Laboratory III: Media Production | 3 s.h. |
| 19:126 | Mass Communication Laboratory IV: Medias Production Management | 4 s.h. |

Approved communication skills/laboratory electives 7 s.h.

Maximum journalism credits 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 and mass communication emphasis, both requiring a minimum of 36 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 adviser | 7 or 8 s.h. |

Effective in mass communication, including courses in other departments, consent of adviser 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 adviser) 9 s.h.

Effective in other departments (consent of adviser) 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 | Master’s Practicum (two semesters) | 6 s.h. |

Electives in communication and mass communication and in other departments (consent of adviser) 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 others requiring ability to develop effective communication strategies. The program is designed around a small core of graduate work in mass 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 s.h.

Final examination, last enrollment period

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 others requiring ability to develop effective communication strategies. The program is designed around a small core of graduate work in mass communication, and encourages the student to work with his or her sponsor and committee in the development of an appropriate, individualized plan of study.

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Courses

19:251 Master’s Research (section 2, last period of enrollment, M.A. thesis) 3 s.h.

Final examination, last enrollment period

19:104 Technological and Economic Foundations of Communication Systems 3 s.h.

Traces the development of the technologies and economic benefits & handicaps that underlie the various communication systems of which modern societies are a part, and explores the major problems and opportunities involved in their further development, particularly with respect to the globalizing of communications systems.

19:108 Cultural and Historical Foundations of Communication Systems 3 s.h.

Traces the history of mass as a communication medium and as a designer of communication systems: how historical frameworks describe various social, political and cultural environments of communication and the functions of communication systems within those environments.

19:107 Visual Communication

Visual communication in media is considered as an interactive process shared by industrial producers and consumers of visual images, in which the codes and conventions of visual media are examined. The course is designed to help students develop the ability to understand and appreciate various forms of visual communication and to use visual communication in their own work.

19:109 Introduction to Journalism and Mass Communication 3-5 s.h.

Broad overview of journalism and mass communication with an emphasis on writing for news media. Students are introduced to writing for the three news media: newspapers, magazines and radio and television. Students also learn how to write for news media, how to conduct interviews, how to write articles and how to produce radio and television programs.

19:108 Communication Systems Theory and Research 3 s.h.

A description and critical examination of the development of research on the effects of mass communication will be pursued using the social studies in a variety of research approaches to illustrate some examples of "offensive" and "defensive" communication. The course will trace the historical and contemporary development of communication systems within their different environments.

19:114 News Processing

Basic techniques of copy reading and headline writing and their legal ramifications. Preparation of different media for publication, including writing design for printed media, public relations writing for nonprint media, and writing for radio and television news. Students also learn the history of news writing and the development of news writing techniques.

19:115 Advanced Reporting

In-depth course in journalism practice. Students develop skills in writing news stories, including writing for print and electronic media, developing story ideas, and writing for radio and television. Students also learn how to conduct interviews, write articles and produce radio and television programs.

19:113 News Reporting and Writing 3 s.h.

Basic techniques of copy reading and headline writing and their legal ramifications. Preparation of different media for publication, including writing design for printed media, public relations writing for nonprint media, and writing for radio and television news. Students also learn the history of news writing and the development of news writing techniques.

19:112 Mass Communication Laboratory II: Production 3 s.h.

19:114 Mass Communication Laboratory II: Media Production 3-5 s.h.

19:115 Media Production Management 3 s.h.

19:113 News Reporting and Writing 3 s.h.

Basic techniques of copy reading and headline writing and their legal ramifications. Preparation of different media for publication, including writing design for printed media, public relations writing for nonprint media, and writing for radio and television news. Students also learn the history of news writing and the development of news writing techniques.

19:112 Mass Communication Laboratory II: Production 3 s.h.

19:114 Mass Communication Laboratory II: Media Production 3-5 s.h.

19:115 Media Production Management 3 s.h.

19:113 News Reporting and Writing 3 s.h.

Basic techniques of copy reading and headline writing and their legal ramifications. Preparation of different media for publication, including writing design for printed media, public relations writing for nonprint media, and writing for radio and television news. Students also learn the history of news writing and the development of news writing techniques.

19:112 Mass Communication Laboratory II: Production 3 s.h.

19:114 Mass Communication Laboratory II: Media Production 3-5 s.h.

19:115 Media Production Management 3 s.h.
pursue graduate study in comparative or national literature may
choose the B.A. in letters. Future professionals in such fields as
medicine and law may find the major a satisfying concentration
among 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 painting 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 24 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
study 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.

<table>
<thead>
<tr>
<th>Courses</th>
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<tbody>
<tr>
<td>International or Comparative Themes and Problems</td>
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<tr>
<td>196:29 Crosscurrents in Western Literature</td>
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<tr>
<td>196:30 Crosscurrents in Modern Literature</td>
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| Introductory course is the international study of literature; specific topics selected for
each semester; includes works from several countries in a common theme or in a common range of literary forms; topics 1974-76 include Literature and Psychology, Literature and Death, Literature and Philosophy, and Poetry and Song; open to freshmen no language requirement. |
| 196:31 Shakespeare and Courtship | 3 h. |
| Same as English and Public Affairs 369:187. |
| 196:32 Modern Western Literature | 3 h. |
| Same as English Literature 236:187. |
| 196:33 Western Literature | 3 h. |
| Same as English Literature 236:187. |
| 196:34 Western Literature | 3 h. |
| Same as English Literature 236:187. |
| Team-teaching of the variety of western literatures; 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. novels,
or upon a literary period or periods. |
| 196:56 Literature and Society | 3 h. |
| Same as Comparative Literature 46:187 and English 8179. |
| 196:57 Literature and Anthropology | 3 h. |
| Same as Comparative Literature 46:187, English 8187. |
| 196:58 East-West Literary Reactions | 3 h. |
| Same as Comparative Literature 29:187, Comparative Literature 46:187. |
| 196:59 Literature and Revolution | 3 h. |
| Same as Comparative Literature 46:187. |
| 196:73 Changing Concepts of Women in Literature | 3 h. |
| Same as American Civilization 42:187, English 8199. |
| 196:77 Women in Literature | 3-6 h. |
| Same as American Civilization 42:187, English 8199. |
| 196:81 Literature and Psychology | 3 h. |
| Same as Comparative Literature 46:187, English 8175. |
| 196:82 Film and Art Movements | 3 h. |
| Same as American Civilization 42:187 and Speech and Dramatic Art 369:187. |
| 196:86 Non-Western Modern Letters | 3 h. |
| Same as English 8450. |

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Library Science

Director of School: Frederick Wimmer


Affiliated Faculty: Mary Ann Bower, July M. Beeler, Gabriel Cahill, Leslie W. Davis

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 and material; 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 in 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 Information 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 residence study, or, in the case of students attending summers only, a minimum of four summer sessions.

Public Library Work

Required courses:
Core courses
Bibliography course
21:231 The Public Library

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
21:282 Practices in Librarianship

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
21:126 Literature and Storytelling for Children
21:195 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
21:282 Practices in Librarianship
78:300 Elementary Curriculum
78:281 Junior High School and Middle School Curriculum
78:291 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
2:232 The College and University Library

Suggested electives:
21:256 Introduction to Information Science
21:251 Advanced Reference
21:252 Advanced Cataloging
21:254 Advanced Bibliography
21:263 Problems in Library Management
21:264 Medical Librarianship and Bibliography
21:282 Practicum in Libraries
Additional bibliography courses
22C:106 Introduction to Programming with PL/1
22C:107 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
21:330 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
21:264 Medical Librarianship and Bibliography
21:282 Practicum in Libraries
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
21:151 Reference I
21:152 Cataloging and Classification
21:153 Selection of Library Materials
21:233 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, 21:124 History of Children's Books, 21:126 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, 21:282 Practicum in Librarianship. With consent of his or her adviser, the student may select other library science courses.

Joint Program in Business Administration and Librarianship
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 is 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 (Teletypewriter) 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 Histrical Society Library in Iowa City; the Iowa City and Cedar Rapids public and school libraries; the Coe, 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-and 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 indications that such originating 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-structures. 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 any 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. Another may work with acoustic 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 analyzing 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 Chicano, 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 retain 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 emphasizes a liberal arts education.

High scores on verbal and quantitative aptitude tests are indicators of success in linguistics. Although few aspects of the field deal with numbers, it is very important to be able to reason logically and explicitly, and to be able to deal with formulae and abstract symbols.

From the standpoint of vocational goals, prospective linguistics students 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, anthropolo-

The Bachelor of Arts degree in linguistics prepares the student to do basic language analysis in syntax and semantics (sententce word patterns and their relation to meanings) and phonology (sound patterns). Elective courses in a variety of sub-specialties enable each student 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, semantics, 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 degree without 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 predesigned options (e.g. Teaching English as a Foreign Lan-

Linguistics and English

The Ph.D. in cultural anthropology and linguistics prepares the student for professional teaching and research in the linguistic and non-linguistic 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 anthropology-linguistics doctoral program may be adjusted to accommodate an emphasis either in anthropo-

Satisfactory completion of a series of interdisciplinary courses is language and culture, ethnolinguistic field methods, and ethnolinguistic 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 coursework—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 Shakespeare, 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 older Germanic language and at least one additional course in Germanic or one of the other old Indo-European languages.

The comprehensive examination for the degree includes the following areas: general linguistics, the structure of Modern English (including American dialects), the history of the English language, and the literary period elected.

The dissertation treats 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, consisting of a sound spectrograph, a studio-type tape recorder and an acousticometer chamber. There is also a remote typewriter terminal connected with the IBM 360/65 computer at the University computer center.

The departmental reading room functions 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 special 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 fellowships or aid and admission concurrently should submit their GRE scores.

Courses


101-119/105 English for Foreign Students

101-119 Language and Society

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101-111 Language and Society

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101-11 Language and Society

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102-21 Basic Phonetics

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Literature, Science, and the Arts

Courses in the interdisciplinary Program in Literature, Science and the Arts (LSA) are open to junior, senior and graduate students from any department. Courses are conducted by round-table discussion. Important issues of contemporary times are explored and evaluated, based on a reading list of outstanding works. Two or more instructors from various departments, such as literature, philosophy, history, fine arts and the sciences, guide the discussions.

Undergraduate Major

A major in the Interdisciplinary Program in Literature, Science, and the Arts (LSA) offers a basis for a liberal education and equips a student for further work in the special area of his or her choice. The major is set up to provide broader training than is ordinarily obtained under the specialized requirements of a single department.

A student can major in this area and earn teacher certification in one or more related departments, or satisfy the requirement for a double major in this program and another.

Specific requirements for the major in the Interdisciplinary Program in Literature, Science, and the Arts (LSA) are in addition to the general requirements of the College of Arts and Sciences:

- Natural sciences, social sciences
- Philosophy, religion, history
- Literature beyond core requirements
- Fine arts (excluding studio courses)
- Foreign language: one semester beyond the second year

Students considering a major in the Interdisciplinary Program in Literature, Science and the Arts (LSA) should consult with their advisor before the end of the sophomore year.

Honors

The degree of Bachelor of Arts with Honors may be conferred upon students who undertake a further program of independent study. To be admitted as a candidate for Honors, the student must have the approval of the chairman of the Interdepartmental Program in Literature, Science and the Arts.
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, a student 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. Credits 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 PL/I).

Requirements for a Major in Mathematical Sciences


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
22C: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:153-154 Introduction to Mathematical Statistics I-II
22M:177-178 Numerical Analysis for Actuaries, Graduation

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:25-26 and 22M:33-36) 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 Fundamentals of Spaces and Functions, or 22M:103 Foundations of Mathematics I, and it should include at least one semester's work in statistics and probability.

Additional work, in particular the required 100-level course, should be taken in whomever area of mathematical sciences is of most interest to the student. Students considering employment in government or industry upon completion of the B.A. degree
Division of Mathematical Sciences

should consider 22C:17 Programming with PL/I and courses in numerical analysis, applied statistics and operations research.

Actuarial Science

The student who plans to enter the actuarial profession should be guided in course selection by the program of education and examination credits offered by the principal actuarial organizations. Following a sequence in calculus and linear algebra, 22M:25-26, 28 Calculus I-II, and 22C:27 Introduction to Linear Algebra, the student should enroll on 22S:35-38 Engineering Calculus I-IV, the student should enroll in
mographic Tables, and 22S:184 Risk Theory.

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 actuaries science are also advised to take a least one course in computer science and to consider a substantial program of courses from among those offered by the College of Business Adminis-
tration.

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 Cal-
culus I-IV.

The courses 22M:100 Introduction to Ordinary Differential Equations, 22M:101 Introduction in Partial Differential Equa-
tions, 22M:118 Complex Variables, 22M:170 Numerical Anal-
ysis: Nonlinear Equations and Approximation Theory, and
22M:171 Numerical Analysis: Differential Equations and Linear Algebra, are recommended. Additional courses directly con-
cerned with applications (22M:153-154 Introduction to Theo-
retical Mechanics I-II, 22M:172 Fourier Series and Boundary Value Problems, 22M:173 Transform Calculus, and 22M:180:181 Applied Analysis) and other courses which may be of interest are 22S:50 Elements of Group Theory, 22C:105 Analy-

Students in applied mathematics should be familiar with computer programming (22C:7 Introduction to Computing with FOR-
TRAN can be taken early along with calculus) and with the basic ideas of probability and statistics (the courses 22S:153-154 In-
troduction to Mathematical Statistics I-II or 22S: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 signifi-
cant way, outside the Division of Mathematical Sciences. Stu-
dents who plan to go to graduate school 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:50 Elements of Group Theory, 22M:70 Euclidean Plane Geometry, and 22M:55 Foundations of Linear Algebra and Functions (to be taken before 76:135 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.

In 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 might select are 22M:120-121 Algebra I and II, 22M:115-116 Introduction to Analy-

Pure Mathematics

Students interested in this area of mathematics should take two of the following sequences: 22M:120-121 Algebra I and II, 22M:154-155 Introduction to Analysis I-II, 22M:103-104 Foundations of Mathematics I-II and 22M:110-111 Elementary Topology I-II. The student should also take at least two semesters of coursework outside this area for example: 22C:7 Introduction to Computing with FORTRAN, 22C:17 Programming with PL/I, 22M:100 Introduction to Ordinary Differential Equations, 22M:118 Complex Variables, 22S:153-154 Introduction to Mathemat-
ical Statistics I-II, or 22S:124 Introduction to Probability.

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 the sequence 22M:35-38 Engineering Calculus I-IV, together with one of these three sequences: 22S:153-154 Introduction to Mathematical Sta-
tistics I-II, 22S:124-127 Introduction to Probability, Introduction to Stochastic Processes, or 22S:151-152 Statistical Methods with Applications, Linear Statistical Models, with Applications. Students should also select: 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 Foundational Properties of Spaces 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 highly recommended. Further courses in probability and statistics may be selected from courses in the Department of Statistics numbered 102 and above excluding 22S:102. Additional courses may be selected from 22M:50 Elements of Group Theory, 22M:110 Elementary Topology I, 22M:110 Introduction to Analysis I, 22M:116 Complex Variables, 22M:150 Matrix Theory, 22M:170 Numeri-
Applied Mathematical Science

Committee chairman: John S. Kunkel
Degree offered: Ph.D.

Creative activities of an applied mathematical scientist include the formulation of scientific concepts and problems in mathematical models and the resultant mathematical problems; the discussion, interpretation and evaluation of the results of his or her analysis; the exploration of new ideas and areas of application; 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 totality of the discipline.

Each student will have a committee of one 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. 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.

Fellowships, graduate teaching scholarships and some research and teaching assistantships are available to qualified applicants. Applications for these appointments must be received before March 1. For application forms and further information about the academic program, write to the Chairman, Program in Applied Mathematical Science, Graduate College, The University of Iowa, Iowa City, Iowa 52242.

Computer Science

Department chairman: Donald L. Fretz
Faculty: professors Donald L. Fretz, Thomas C. Flah, Anne H. Hanks, Dr. Charles B. Meyer, professors Donald A. Alexa, Robert J. Bare, John P. Hage, William T. Hage, assistant professor Larry Hagen, Anne S. Yone, Computer Lab.

Degree 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

252-25 Calculus I 4 s.h.
252-26 Calculus II 4 s.h.
252-27 Introduction to Linear Algebra 4 s.h.

(Students interested in taking 22C-55 "Numerical Methods in Computing" should take 252-27. All students are urged to take both 252-25 and 252-27.)

Computer Science Core Requirements

22C-16 Introduction to Programming with PL/I 3 s.h.
22C-17 Programming with PL/I 3 s.h.
22C-18 Assembly Language Programming 3 s.h.
22C-21 Data Structures 3 s.h.
22C-22 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.)

20 s.h.

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 advisor maintains an academic record sheet (discussed in the Handbook) concerning the approved elective program.

Graduate Programs

To provide the broadest possible background for its students and to take advantage of courses offered in other fields, the normal curriculum 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 coordinates 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 computing 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 students 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:

- **22C:122** Advanced Computer Organization and Architecture 3 s.h.
- **22C:123** Advanced Programming Language Concepts 3 s.h.
- **22C:135** Introduction to Computation Theory 3 s.h.
- **22C:193** Programming Laboratory 2 s.h.
- Other 22C courses selected from 116, 118, 127, 144, 145, 178, 199, or any 200-level course 6 s.h.
- Mathematics and statistics courses 6 s.h.
- Additional courses selected by the student with the approval of the adviser 7 s.h.
- 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 Examinations**

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 an oral examination.

- A. Programming and Programming Languages
- B. Computer System 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 undergraduate 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; and
- 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 first two 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 areas 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 examination. In addition, he or she must be recommended by a member of the computer science faculty. The comprehensive examination will be normally taken only when the student has completed courses 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 languages;

Part II: On the principles of computer architecture and operating systems;

Part III: On the theoretical aspects of computer science, including automata theory, computability and formal languages.

All examinations are described in the Graduate Student's Handbook.

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 research 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:106 Assembly Language Programming or 22C:109 Programming with COBOL more appropriate. The one-semester PL/I course 22C:110 Computing with PL/I is recommended only for students with considerable programming experience using other languages.

Courses

Primary for Undergraduates

22C:1 Theory of Computing 3 s.h.
The nature, uses, and limitations of computers and computing are observed by a broad sample of computing topics including hardware and computer architecture, operating systems, non-numeric programming, computer assisted instruction, information retrieval, and file systems. A representative in computer technology on society, as appropriate.

22C:7 Introduction to Computing with FORTRAN 3 s.h.
Basic concepts of computer structure and programming techniques, elementary algorithmic-language programming, algorithms, data representation, subroutines, and subroutines, and disk storage; emphasis on programming with FORTRAN.

22C:9 Programming with COBOL 3 s.h.
Use of the business-oriented language COBOL; records, files, and main storage devices; programming techniques for file handling, sorting, generation of reports from files, and maintenance of sequential and indexed-access files. Prerequisites: 22C:7.

22C:16 Introduction to Programming with PL/I 3 s.h.
Introduction to computer programming using the language PL/I. Emphasis on programming techniques for high-level language programs, usage and applications of PL/I, and problem solving on PL/I. Prerequisites: 22C:7.

22C:17 Introduction to Programming with PL/I 3 s.h.
Introduction to computer programming using the language PL/I. Emphasis on programming techniques for high-level language programs, usage and applications of PL/I, and problem solving on PL/I. Prerequisites: 22C:7.

22C:18 Assembly Language Programming 3 s.h.
Representation of data and instructions, CPU architecture, addressing, reusability and the use of new registers, instruction set, program linkage and dumps, input/output, debugging, and handling errors relative to linkage conventions. Prerequisites: 22C:7.

22C:21 Data Structures 3 s.h.
Basic concepts of data representation, data structures, and file organization. Introduction to data structures and algorithms, and file handling and processing techniques; abstract storage allocation and garbage collection algorithms; programming techniques for file and string processing; storage allocation techniques; programming techniques for file and string processing. Prerequisites: 22C:7 or permission of the instructor.

22C:58 Programming Language Concepts 3 s.h.
Systems of programming languages; programming language structures (blocks, local variables, data types, declarations, and data structure facilities); control structures; operators and expressions including pointer matching, pass-by-reference; algorithms and data structures. Examples from ALGOL, W, BASIC, COBOL, PL/I, and LISPB. Prerequisites: 22C:17.

22C:59 Introduction to System Hardware and Software 3 s.h.
Basic hardware components: buses, memory, input/output devices, etc.; basic operating system: kernel; network components: interface, software and hardware. Prerequisites: 22C:7.

22C:60 Numerical Methods in Computing 3 s.h.
Numerical integration and differentiation, interpolation and curve fitting, numerical solution of simultaneous linear equations and matrix operations; least square curve fitting techniques, numerical analysis of ordinary differential equations; detailed error analysis of several of the techniques studied. Prerequisites: 22C:37 and programming experience.

22C:61 Topics in Computer Science 1-3 s.h.
Reading, research, or programming projects in computer science not available in other courses; must be approved by the area faculty member and must be pre-approved by the student's academic advisor.

For the following courses, students may enroll only if they have demonstrated competence in computer science.
Mathematics

119

SC/187 Formal Languages 3 s.h.
Characteristics, declarative problems, closure properties and operations of
structures, context sensitive, context free, and phrase languages; finite automata,
pushdown stacks, tree-automata, and Turing machine accepted; smallest family of
languages; lambda language and control grammars. Prerequisites: 22C:135.

SC/188 Seminar on Artificial Intelligence 1 s.h.
Topics from concept formation, pattern recognition, game playing, problem solving,
theorem proving, question answering, robotics, and neural modeling. Prerequisite:
consent of instructor.

SC/189 Seminar on Current Trends in Computer Science 1 s.h.
Recent advances in the field of Computer Science. Prerequisite: consent of instructor.

SC/189B Seminar on Automata 1 s.h.
Topics from algebraic automata theory, models of parallel computation, bizarre
computers, computability and complexity, computability and complexity,
formal grammars. Prerequisite: consent of instructor.

SC/190 Seminar on Programming Languages 1 s.h.
Topics from object-oriented translation, compilation, multiprocessing and inter
language, lexical definition and advanced programming language features; use of
current hardware facilities. Prerequisite: consent of instructor.

SC/190B Readings and Research 1 s.h.
Prerequisite: consent of instructor.

Mathematics

Department chairperson: Richard B. Goldberg

Faculty: professors: Kendall D. Adkins, Hogan F. Car, Kim H. Fuller, Richard
B. Goldberg, Eugene W. Johnson, William A. Kellner, Gerald Klarck, Paul J.
Kantor, Jon L. Leib, Paul E. Lucky, Robert H. Morin, Thomas M. Price, Paul E.
Whitbeck, Marilyn J. Zoog, professors emeriti: Edward W. Chittenden, Nelson B.
Cowdery, associate professors: Arevik J. Boh, George Burke, Victor Z. Cugliari,
Michael A. Grady, Harold B. Brick, Sami R. F. El-Sheikh, Robert G. Hamman,
Barry J. Kuhns, Margaret Kruhfield, Peter C. Kublos, Howard L. Landan, Alan F.
Leberre,

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 with 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 courses. In the case of prospective secondary school
teachers, material in required education courses is also examined. The remainder 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 are flexible, and are designed 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-I 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:123 Advanced Programming Language Concepts,
22C:155 Introduction to Computation Theory, 22C:145 Artificial Intelligence I, 22C:199 Topics in Finite Automata Theory,
or any 200-level course in computer science.

Stochastic Processes, or any statistics course having any of these as a prerequisite.

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:205-206.

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:123 Advanced Programming Language Concepts, 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. com-
prehensive examination for part of the master's examination.)

Program III (nondepartmental students en 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 cover 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 interdis-
clipinary doctoral programs with the program in Applied Mathem-
atical 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:
specialized, advanced, and foundational, 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 in February and early in April. Further information on
these examinations is available in the mathematics office. Begin-
ning

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 adviser's 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 fur-
ther information, consult the brochure "Advanced Studies in Educa-
tion," available from the College of Education.

Courses

Undergraduate: Lower Division
These courses are not open to graduate students except by special arrangement with
chairmen of the Department.

228E-1 Basic Mathematical Techniques 3 s.h.

Integration, functions, ratio and properties, algebraic expressions and operations, simple
products, linear and quadratic equations, simultaneous equations, exponents and
indices. Prerequisites: one year of high school algebra, one year of high school
geometry.

228E-2 Mathematical Techniques I 3 s.h.

Equations and inequalities, functions and graphs, exponential and logarithmic func-
tions, systems of equations and inequalities. Prerequisites: 228E-1 or one and one-
half years of high school algebra, one year of high school geometry.

228E-3 Mathematical Techniques II 3 s.h.

Trigonometric functions, solutions of right and oblique triangles, complex numbers,
trigonometric functions, exponential functions, polar coordinates, conic sections.
Prerequisites: 228E-2 or one and one-half years of high school algebra, one year of high school
geometry.

228E-4 Matrix Algebra 3 s.h.

Elementary exponential functions, matrices and determinants, real and complex
matrices, systems of linear equations, transformations in the plane, introduction to
eigenvalue theory; primarily for students who need some technical competence in use of
matrices. Prerequisites: 228E-1 or three years of high school mathematics.

228E-5 Quantitative Methods I 4 s.h.

Quantitative methods for solving problems arising in biological, management and
social sciences; computer programming, systems of linear equations, linear pro-
gression, discrete probability theory. Prerequisites: 228E-1 or three years of high school
mathematics. Corequisite: Statistics E-236. Prerequisites: two and one-half years of high school
mathematics.

228E-10 Fundamentals of College Mathematics I 4 s.h.

Introduction to finite sets and relations in some major concepts of mathematics: elemen-
tary set theory, various systems; logic using truth tables; probability using percen-
tages and combinations; conditional probability, independence, tricky, linear, vector
and matrix algebra. Prerequisites: two and one-half years of high school mathematics or
228E-1. May be used to satisfy four hours of General Arts core requirement in
natural sciences.

228E-11 Fundamentals of College Mathematics II 4 s.h.

Introduction to analytic geometry and trigonometry; introduction to ideas of calculus,
notations, integral, derivatives and composite functions in social and natural sciences; additional
elementary topics in number theory, geometry or topology, as time permits. This course or
228E-13 (but not both) may be used to satisfy four hours of core requirement in
natural sciences. Prerequisites: 228E-11 or 228E-13.

228E-15 Mathematics for the Biological Sciences 4 s.h.

Introductory analysis of quantitive and geometric information; relationship of ideas to
applications, matrices and rules operations, mathematics for biology and ecology, data
analysis; applications from the biological sciences. Prerequisites: three years of high
school mathematics or 228E-13.

228E-16 Calculus for the Biological Sciences 3 s.h.

Introduction to differential and integral calculus; topics in differential equations, multivariable
calculus, matrices and complex numbers; applications in the life sciences. Prerequi-
tives: four years of high school mathematics or 228E-15.
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**

225:115 Introduction to Analysis I
225:133-134 Introduction to Mathematical Statistics I-II
225:167 Introduction to Stochastic Processes

At least six semester hours from among:

225:146 Introduction to Analysis II
225:210-211 Analysis I-II
225:260 Applied Statistical Decision Theory
225:270 Introduction to Nonparametric Statistics
225:275 Topics in Statistics
225:280 Probability and Statistics I
225:285 Linear Models
225:286 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
225:133-134 Introduction to Mathematical Statistics I-II
225:180 Analysis and Design of Experiments
225:212 Regression Analysis
225:215 Statistical Computation and Consulting
225:100 Introduction to Computing with FORTRAN

The remaining courses may be selected from among:

225:145 Quality Control, Reliability and Engineering Statistics
225:148 Intermediate Statistical Methods
225:160 Applied Statistical Decision Theory
225:170 Application of Multivariate Statistical Techniques
225:279 Bayesian Statistics II
225:170 Numerical Analysis: Nonlinear Equations and Approximation Theory
560:160 Digital Systems Simulation I
560:161 Qualitative 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**

225:154 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
225:277 Seminar: Actuarial Theory

Plus at least one course from outside the Division of Mathematical Sciences; most students elect courses from the College of Business Administration.

**Operations Research**

225:154 Introduction to Mathematical Statistics I-II
225:160 Applied Statistical Design Theory
225:163 Quantitative Investment Analysis
225:170C2 Mathematical Programming I

225:164 Operations Research
225:170A2 Design of Experiments
225:170C2 Application of Multivariate Statistical Techniques
225:160 Introduction to the Design of Sample Surveys
225:170A2 Statistical Computation and Consulting

In addition, each student is expected to take 12 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 realize 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 225:137-138 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 given 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 225:210-211 Analytical I-II;

After passing the preliminary examination, the student should obtain a thesis advisor. They 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 the 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 chairman 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 allow 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 written 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, perform an extensive analysis of the factors relating to highway deaths in Iowa.

Courses

Primary for Undergraduates

Note: No student who has received credit for a course offered by the Department of Statistics numbered above 225:100 may receive credit for subsequently taking a course numbered below 225:100.

225:16 Quantitative Methods I 4 s.h.
Coverage includes: measures of central tendency, standard deviation, standard errors, regression and error of prediction, correlation, and tests of hypothesis. (Continuation of 225:157).

225:25 Elementary Probability and Statistics 3 s.h.
Set approach to probability, measurement of probability using permutations and combinations, distributions of random variables and statistics, descriptive statistics, large sample theory, introduction to estimation and test of significance. Prerequisite: college algebra or equivalent. Students with calculus should take 225:130, 225:131 and 225:25;

225:26 Probability and Statistics for Engineering and Physical Sciences 3 s.h.
Focuses on probability models, general probability models, random variables, functions of random variables, expectation, joint distributions, discrete distributions, continuous distributions, estimation, hypothesis testing, regression. Same as Engineering 360:09. Prerequisite: Mathematics 225:24 or equivalent. 225:40 Insurance Mathematics 3 s.h.
Inferences from probability and mathematics of finance developed and applied to problems in determination of insurance premiums, benefits and reserves. Same as Business Administration 68:21. Prerequisite: 225:16 or 225:18. Students with Mathematics 225:26 or 225:36 should take 225:18.

For Undergraduates and Graduates

225:18 Introduction to Modern Data Analysis 3 s.h.

225:19 Statistical Computing and Data Analysis 3 s.h.

225:20 Introduction to Statistical Methods 3 s.h.

225:213-214 Introduction to Statistical Methods I-II 3 s.h.

225:215-216 Study of Statistical Methods 3 s.h.

225:215-216 Introduction to the Design of Sample Surveys 3 s.h.

225:90 Statistical Computing and Data Analysis 3 s.h.

225:105 General Statistics 3 s.h.

225:105-110 General Statistics I-II 3 s.h.

225:110 Probability and Statistics 4 s.h.

225:110 Probability and Statistics I 4 s.h.

225:111 Probability and Statistics II 4 s.h.

99:10 Introduction to Probability 3 s.h.

225:150 Probability and Statistics 3 s.h.

225:150-151 Probability and Statistics I-II 3 s.h.

225:150 Mathematical Statistics with Applications 3 s.h.

complete sufficient statistics; minimum variance and empirical Bayes estimates.

Prerequisites: 225:264 or equivalent.

225:272 Statistical Inference II 3 s.h.

This course explores the advanced topics in experimental design, data analysis, and hypothesis testing. It covers the principles of maximum likelihood, conformability, and a review of the classical statistical methods.

Prerequisite: consent of instructor.

225:280 Seminar in Mathematical Statistics

225:280 Seminar in Probability

225:280 Seminar in Applied Statistics

225:280 Seminar in Actuarial Theory

225:280 Seminar in General Statistics

225:280 Reading Research

225:280 Seminar in Advanced Statistics

Prerequisite: consent of instructor.

Medical Technology

See "Pathology" in "College of Medicine" Section.

Microbiology

Department Chairman: J.R. Perry

Degree offered: B.S., M.S., Ph.D.

Undergraduate Study

Microbiology is a science concerned with identification, structure, and activities of bacteria, fungi, protozoa, algae, and viruses. It includes bacteriology, 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 expanding 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 lower grades, except under unusual circumstances with the consent of the advisor. This is a typical curriculum for undergraduate majors:

Freshman Year

First Semester

4:1 Principles of Chemistry I 3 s.h.

225:20 Elementary Functions 3 s.h.

225:15 Mathematics for the Biological Sciences 4 s.h.

10:1 or 10:3 Rhetoric 4 s.h.

Foreign language 3-4 s.h.

Physical education 2 s.h.

15-16 s.h.

Second Semester

4:4 Principles of Chemistry II 3 s.h.

4:6 Elementary Chemistry Laboratory 2 s.h.

Core course or 225:25 Calculus I 3 s.h.

225:16 Calculus for the Biological Sciences 3 s.h.

Foreign language 3-4 s.h.

10:2 Rhetoric (for those who took 10:1) 4 s.h.

13-17 s.h.

Sophomore Year

First Semester

4:121 Organic Chemistry I 3 s.h.

37:3 Principles of Animal Biology 5 s.h.

Core course or 225:35 Calculus II 4 s.h.

61:157 General Microbiology** 4 s.h.

16 s.h.

Second Semester

4:122 Organic Chemistry II 3 s.h.

4:141 Intermediate Chemistry Laboratory I 2 s.h.

4:11 Elementary Quantitative Analysis 4 s.h.

Core, elective or advanced microbiology courses 8 s.h.

17 s.h.
Junior Year

First Semester
99:120 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 4-6 s.h.
Total 15-17 s.h.

Second Semester
99:130 Metabolism 3 s.h.
29:2 College Physics 4 s.h.
Core, elective or advanced microbiology courses 8 s.h.
Total 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 or 223M or 224M is required.

**May be taken in 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 research, participation in a departmental 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.”

Museum Training

Department head: George D. Schüler
Faculty: assistant professor George D. Schüler

The Museum 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. 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, geological, biological 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 1-3 s.h.
Circling, preparing and exhibiting biological materials for museum, classroom teaching or research use.

24:102 Museum Techniques 1-3 s.h.
Conservation of 24:101, but may be taken as independent study.

24:103 Museum Administrative Work 1 s.h.
Techniques used in preparation of classroom teaching materials and museum exhibit automobiles. Instruct in various copying and modeling procedures used in reproduction of fossils, artifacts and biological specimens; applications to prehistoric, geological and anthropology students.

24:104 Museum Administrative Work 1 s.h.
Conservation of 24:103, but may be taken as independent study.

24:110 Principles of Exhibit Design and Theory 1-3 s.h.
Directed study presentation of conceptual and design considerations employed in planning and construction of modern exhibits. Prerequisites: 24:101 and 103, or consent of instructor.

24:111 Principles of Exhibit Design and Theory 1-3 s.h.
Conservation of 24:110, but may be taken as independent study. Prerequisites: 24:101 and 103, or consent of instructor.

Music

Ruth Morgan: Religion Volumes

A primary element in a fine arts community of international repute, the University of Iowa School of Music has long been recognized as one of the excellent university-based schools of music in the United States.

The School’s on-campus enrollment of 600 students majoring in music is large enough to sustain strong programs in all areas of specialization, yet small enough to sustain the individual attention essential to each student’s development.

The faculty consists of full-time and part-time faculty from all areas of specialization. Faculty ensembles in residence include the Stadivar String Quartet, Iowa Woodwind Quintet, Iowa Brass
Quintet, 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 section of the Catalog for these requirements), and the following requirements of the School:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>25:1-2 Literature and Theory I-II</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>25:3-4 Aural Skills I-II</td>
<td>1 s.h.</td>
<td></td>
</tr>
<tr>
<td>25:5-6 Literature and Theory III-IV</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>25:7-8 Aural Skills III-IV</td>
<td>1 s.h.</td>
<td></td>
</tr>
<tr>
<td>25:91-92 History of Music I-II</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>25:71-72 Group Piano Instruction I-II or adequate proficiency</td>
<td>1 s.h.</td>
<td></td>
</tr>
<tr>
<td>25:85 Recital Attendance (required of wind, percussion, string and voice majors for seven semesters)</td>
<td>0 s.h.</td>
<td></td>
</tr>
<tr>
<td>25:144 Senior Recital</td>
<td>0 s.h.</td>
<td></td>
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</tbody>
</table>

Four semester hours of electives from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>25:13 Undergraduate Composition</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>

25:118 Jazz Composition and Arranging | 1-2 s.h. |
25:145 Counterpoint Forms             | 3 s.h.  |
25:146 20th-Century Harmony and Counter-point | 3 s.h.  |
25:147 Vocal Forms                    | 3 s.h.  |
25:148 Analysis of Music Literature, 1600-1750 | 3 s.h.  |
25:149 Analysis of Music Literature, 1750-1825 | 3 s.h.  |
25:150 Analysis of Music Literature, 1825-1900 | 3 s.h.  |
25:151 Analysis of Music Literature, 1890-Present | 3 s.h.  |
25:152 Analysis of Music Literature, Special Topics | 3 s.h.  |
25:153 Thorough Bass Realization I    | 2 s.h.  |
25:157 Orchestration                  | 2 s.h.  |

Four years of participation in band, orchestra or chorus. As a minimum requirement, wind and percussion majors shall participate in the concert and marching band programs during the first two years in residence at the University. Keyboard majors may substitute accompanying in place of large ensemble participation for two semesters during their junior and/or senior year, with the consent of their advisor. Any requests for adjustment of the rules pertaining to performance in large ensembles must be submitted to a review committee.

Advanced electives in performance (including chamber music and piano accompanying), theory, composition, music education, music history and literature, orchestration and conducting.

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.

String Majors

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violin</td>
<td>2 s.h.</td>
<td></td>
</tr>
<tr>
<td>Cello</td>
<td>2 s.h.</td>
<td></td>
</tr>
</tbody>
</table>

Violin and viola majors take one year of cello instruction; cello and bass majors take one year of violin.

25:103 Class Sings | 1-2 s.h. |
Violinists take violin and bass; violists take violin and bass; cellists take violin and bass; bassists take violin and cello.

25:143 Instrumental Techniques (normally clerical and consort) | 2 s.h. |
25:107 Instrumental Conducting I | 2 s.h. |
25:108 Instrumental Conducting II | 1 s.h. |
75:130 String Techniques and Methods | 3 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:

- 7E:143 (25:105) Instrumental Techniques 8 s.h.
- 25:107 Instrumental Conducting I 2 s.h.
- 25:108 Instrumental Conducting II 1 s.h.
- 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.

Vocal and Keyboard Majors

- 7E:147 (25:109) Choral Methods and Conducting 3 s.h.
- 7E:148 (25:110) Choral Literature and Conducting 3 s.h.
- 25:151-16 Diction for Singers I-II 2 s.h. each
- 7E:145 Methods and Materials: Elementary School Music 3 s.h.
- 7E:142 Methods and Materials: Secondary School General Music 3 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.

Keyboard majors lacking satisfactory competence in voice also must register for 25:100 Class Voice for two semesters.

Music Teaching Minor for Elementary Education Majors

The minimum of 24 semester hours required in this program must include:

- 7E:119 Methods: Basic Skills and Techniques in Music Education 3 s.h.
- 7E:124 Methods: Music in the Elementary School 3 s.h.
- 7E:192 Laboratory Practice in the Elementary School 2 s.h.
- Applied music 2 s.h.
- Ensemble participation 2 s.h.

In addition, a minimum of 12 semester hours are to be selected from other music and advanced music education courses (7E and 7S 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:

- 25:114 Orientation to Music Therapy 2 s.h.
- 7E:144 Psychology of Music I 2 s.h.
- 7E:149 Laboratory: Psychology of Music 2 s.h.
- 25:138 Influence of Music on Behavior 2 s.h.
- 25:339 Principles and Procedures in Music Therapy 2 s.h.
- 25:140 Internship in Music Therapy 2 s.h.

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 choral) and performance (black invention or work of comparable difficulty).
Course requirements:
25:1-8 Literature and Theory I-IV 16 s.h.
25:91-2 History of Music I-II 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 averages 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/or ensemble; 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 (harmmony, ear training, forms and counterpoint), and history and literature, before his or her first registration. The Advisory Examination is given each session on the two days (excluding 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
The Master of Arts degree must include: 25:321 Introduction to Graduate Study in Music, and Theory. Two of the following: 25:146 Contrapuntal Forms 25:147 Tonal Forms One elective from the analytical study sequence (25:148-152) or equivalent.

If excluded from either 25:145 or 25:147 as a result of the Advisory Examination, the student shall take the one from which he or she was not excused, and the elective from the analytical series. If excluded from both 25:145 and 25:147, the student shall take only the unsupervised studies elective.

Any serious music theory and ear training deficiencies revealed in the Advisory Examination are to be removed through 25:11 Review Theory.

Music History
25:301-2 Advanced History and Literature of Music I-II, or equivalent, or satisfactory Advisory Examination score.

If excluded from 25:301 and/or 25:302 as a result of the Advisory Examination, the student may elect another course from the music history sequence (25:303-319). 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

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
Satisfy requirements 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
Music

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 admission 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 consists of three full-length recitals or two recitals and a concerto 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—analyses or commentaries on musical works
Music Education—research papers
Music History and Musicology—research papers

Graduate Awards

Qualified graduate students are invited to apply for teaching and research assistantships. Inquiries should be directed to the School of Music.

Opportunities for Performance

The following organizations provide many performing opportunities for qualified students:

Cammera Singers
Old Gold Singers
Kuusori
University Choir
Symphonic Choir
Opera Theater
College Musician
Chamber Opera
Symphony Orchestra
Symphony Band
Wind Ensemble
Concert Band
Marching Band
Jazz Workshop/Stage Band
Percussion Ensemble
Scottish Highlanders
Music for Non-Majors
Students who are not majoring in music but have an avocational 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 is for non-majors who have little or no experience with notation, theory and罩al skills.

With the instructor's approval, non-majors with an elementary background in music may register for 25:12 Literature and Theory I-1 and 25:22 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 interdisciplinary 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 35 teaching studios, 73 practice rooms, a large library, two electronic music laboratories, a soundproof car training and listening facilities with 30 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 general concerts, 2,400 for opera and other stage productions.

Library resources include more than 50,000 volumes in books and music—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 room, a typing room, a seminar and rare books room, a lending library area and a separate area for the Goldstein Band Library, one of the world's most famous collections of band music.

Courses
Courses for Undergraduates and Graduates
Music Education
Where dual credit may be indicated, students preparing for Music Teacher Certificate should register under education number.

2671 General Piano Instruction I 1 h.
2672 General Piano Instruction II 1 h.
2673 General Voice 1 h.
2678 General Instrumental Technique I 1 h.
2679 General Instrumental Technique II 1 h.
2681 General Instrumental Technique II 1 h.
2682 General Instrumental Technique II 1 h.
2683 General Instrumental Technique II 1 h.
2684 General Instrumental Technique II 1 h.
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2765 General Instrumental Technique II 1 h.
2766 General Instituteal Technique II 1 h.
2767 General Instrumental Technique II 1 h.
2768 General Instrumental Technique II 1 h.
25:208 Advanced Instrumental Methods and Literature I 3 a.h.
25:209 Advanced Instrumental Methods and Literature II 3 a.h.
Same as 75:261.
25:265 Brass Reading 1 a.h.
Same as 75:141.

Theory and Composition

25:254 Practice Teaching in Theory 3 a.h.
25:256 Methods and Techniques of Teaching Basic Literacy 3 a.h.
25:257 Seminar: Basic Theory Research 3 a.h.
25:241 History of Music Theory I 3 a.h.
25:242 History of Music Theory II 3 a.h.
25:250 Electronic Studio I 3 a.h.
Nature, care and use of equipment in electronic music studio. Prerequisite: 25:17 or consent of instructor.
25:251 Electronic Studio II 3 a.h.
Individual creative studies. Prerequisite: 25:250 and consent of instructor. May be repeated for credit.
25:260 Intermedia II 3 a.h.
Same as Art 21:601, Speech and Drama Art 367:134.

Musicology, Literature, and Research

25:261 Advanced Choral Literature I 3 a.h.
Choral music from Gregorian chant through Bach.
25:262 Advanced Choral Literature II 3 a.h.
Choral music from Beethoven through contemporary music.
25:201 Advanced Literature and Methodology of Music I 3 a.h.
Style and music literature.
25:202 Advanced Literature and Methodology of Music II 3 a.h.
Continuation of 25:201, but may be taken as independent units with permission of the instructor.

(Note: courses 25:201-314 are a series of intensive surveys of special areas in the history of music, with detailed analysis of representative works; offered in rotation approximately every two to three years.)

25:203 Medieval Music 3 a.h.
25:204 Renaissance Music 3 a.h.
25:205 15th-Century Music 3 a.h.
25:206 16th-Century Music 3 a.h.
25:207 The Classical Period 3 a.h.
25:208 19th-Century Music 3 a.h.
25:209 20th-Century Music 3 a.h.
25:312 Music of the Americas: Latin America 3 a.h.
34:313 Major Composers 3 a.h.
36:314 Music of France 3 a.h.
35:310 The History of Musical Instruments 3 a.h.
Classical and modern instruments of the world, with special emphasis on the influence of instruments in the Western tradition.
35:317 Principles of Construction and Maintenance of Historical Instruments 3 a.h.
Acoustic tuning, maintenance and repair of historical instruments.
25:318 primitive Music 3 a.h.
An introduction to the music of the indigenous peoples of sub-Saharan Africa, the Americas, Australia and Oceania.
25:319 Oriental Music 3 a.h.
Music of India, China, Korea, Japan, Indonesia, Iran and the Arab countries.

25:211 introduction to Graduate Study in Music 2 a.h.
Use of the music library; reference materials; bibliographic research problems and methods, with guest lectures from various musical subject areas; required of all graduate students.
Advanced bibliography, including additional materials in student's major field of concentration. Prerequisite: 25:211 or consent of instructor.
25:221 Advanced Bibliography and Reference Materials 4 a.h.
Musical bibliography; research and critical study of early vocal and instrumental sources and melodies. May be repeated for credit.
25:230 Seminar in Musicology 3-4 a.h.
Bibliographic materials, literary sources, style analysis and criticism and related topics. Study of special topics in groups and by individual investigation. Prerequisites: consent of instructor. May be repeated for credit.
Preparation for the performance of early music.
Performance practices of music of Baroque and Classical periods.
25:33 Seminar: Collegium Musicum Administration 1-2 a.h.
25:37 Music Research and the Computer 3 a.h.
Current applications of high-speed digital computers in research in music theory, history and composition.
25:38 Seminar: Opera Literature 3 a.h.
25:39 Seminar: Operetta Literature 3 a.h.
A study in detail of many important operatic scores from the stage of performances, directors and production problems.
25:34 Seminar: Brass Instrument Performance 3 a.h.
25:41 Seminar: Chamber Literature and Analysis III 3 a.h.
Choral works from the Renaissance.
25:42 Seminar: Chamber Literature and Analysis IV 3 a.h.
Choral works of the Baroque.
25:43 Seminar: Chamber Literature and Analysis V 3 a.h.
Choral works of the Classic-Romantic period.
25:44 Seminar: Chamber Literature and Analysis VI 3 a.h.
Contemporary choral works.
25:351 Survey of Song Literature I 2 a.h.
25:382 Survey of Song Literature II 2 a.h.
25:383 Survey of Song Literature III 2 a.h.
25:305 Survey of Song Literature IV 2 a.h.
25:384 Survey of Song Literature V 2 a.h.
25:385 Survey of Song Literature VI 2 a.h.
25:386 Survey of Song Literature VII 2 a.h.
25:387 Survey of Song Literature VIII 2 a.h.
25:388 Survey of Song Literature IX 2 a.h.
25:389 Survey of Song Literature X 2 a.h.
25:390 Survey of Song Literature XI 2 a.h.
25:391 Survey of Song Literature XII 2 a.h.
25:392 Survey of Song Literature XIII 2 a.h.
25:393 Survey of Song Literature XIV 2 a.h.
25:394 Survey of Song Literature XV 2 a.h.
25:395 Survey of Song Literature XVI 2 a.h.
25:396 Survey of Song Literature XVII 2 a.h.
25:397 Survey of Song Literature XVIII 2 a.h.
25:398 Survey of Song Literature XIX 2 a.h.
25:399 Survey of Song Literature XX 2 a.h.
25:400 A.M. thesis 2 a.h.
25:403 Master's Examination 2 a.h.
25:404 D.M.A. Examination 2 a.h.
25:405 D.M.A. Rehearsal 2 a.h.

Music Education

See "College of Education" for course descriptions.

75:101 Methods: Music Skills and Techniques in General Education 3 a.h.
75:130 Methods and Materials: Music for the Classroom Teacher 3 a.h.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>781136</td>
<td>Methods: Music in the Elementary School</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>781137</td>
<td>Methods and Materials: Elementary School Music</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>781138</td>
<td>Basic Workshop Elementary Music Teachers</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>781139</td>
<td>Laboratory Practice in Elementary School</td>
<td>arr.</td>
</tr>
<tr>
<td>781246</td>
<td>General Music in the Elementary School</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>781247</td>
<td>Methods and Materials: Secondary School</td>
<td>4 a.h.</td>
</tr>
<tr>
<td>781141</td>
<td>Seminar: Contemporary Issues in Music Education</td>
<td>arr.</td>
</tr>
<tr>
<td>781148</td>
<td>Methods and Materials: Secondary School</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>781144</td>
<td>Psychology of Music I</td>
<td>2 a.h.</td>
</tr>
<tr>
<td>781148</td>
<td>Laboratory: Psychology of Music</td>
<td>2 a.h.</td>
</tr>
<tr>
<td>781191</td>
<td>Observation and Laboratory Practice in Secondary School</td>
<td>arr.</td>
</tr>
<tr>
<td>781249</td>
<td>Supervision and Administration of Music</td>
<td>2-3 a.h.</td>
</tr>
<tr>
<td>781241</td>
<td>Music Education Workshop: Instrumental Music</td>
<td>1-2 a.h.</td>
</tr>
<tr>
<td>781245</td>
<td>Individual Projects in Music Education</td>
<td>2 a.h.</td>
</tr>
<tr>
<td>781248</td>
<td>The Psychology of Music II</td>
<td>2 a.h.</td>
</tr>
<tr>
<td>781244</td>
<td>General Music in Secondary Schools</td>
<td>2 a.h.</td>
</tr>
<tr>
<td>781342</td>
<td>Seminar: Special Topics in Music Education</td>
<td>arr.</td>
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<tr>
<td>781343</td>
<td>Music Education Workshop: Vocal Music</td>
<td>1 a.h.</td>
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<tr>
<td>781344</td>
<td>Music Education Workshop: General Music</td>
<td>1 a.h.</td>
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<tr>
<td>781442</td>
<td>Music Education, Advanced Observation and Laboratory Practice</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>781444</td>
<td>Research in Music Education</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>781445</td>
<td>social and Psychological Factors in Music Education</td>
<td>2 a.h.</td>
</tr>
</tbody>
</table>

### 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 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 $50 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 25:120-121 Piano. Non-majors must have had at least two years of previous piano instruction to register for applied piano.

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>25117</td>
<td>Voice</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25118</td>
<td>Piano</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25119</td>
<td>Organ</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25120</td>
<td>Harp</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25121</td>
<td>Violin</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25122</td>
<td>Cello</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25123</td>
<td>String bass</td>
<td>0-1 a.h.</td>
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<tr>
<td>25124</td>
<td>Flute</td>
<td>0-1 a.h.</td>
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<tr>
<td>25125</td>
<td>Oboe</td>
<td>0-1 a.h.</td>
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<tr>
<td>25126</td>
<td>Clarinet</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25127</td>
<td>Saxophone</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25128</td>
<td>French horn</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25129</td>
<td>Trumpet</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25130</td>
<td>Baritone</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25131</td>
<td>Tuba</td>
<td>0-1 a.h.</td>
</tr>
<tr>
<td>25132</td>
<td>Percussion</td>
<td>0-1 a.h.</td>
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<tr>
<td>25133</td>
<td>Senior Recital</td>
<td>0 a.h.</td>
</tr>
</tbody>
</table>

### Minor Field (open to non-majors)

Instruction in the student's minor field of performance or non-music majors is offered for a fee of $35 per course per semester. Each course consists of one half-hour lesson or two hours of class instruction weekly, at the option of instructor.

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<td>25123</td>
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Ensemble
No fee is charged for ensemble courses. Courses may be repeated for credit. Prerequisite for each: consent of instructor.

25:154 Baritone
1 s.h.
25:156 Tenor
1 s.h.
25:158 Tuba
1 s.h.
25:157 Percussion
1 s.h.

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 developed by the student in consultation with his or her advisor in the Department. A student who is eligible for and interested in the program should consult with his or her advisor 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 achievement 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 epistemology, 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 competence in French, German, Greek or Latin. The fourth year of graduate study is ordinarily spent in writing the doctoral dissertation.

Philosophy
Department chairman: Penrose Bachman

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

Freshmen and Sophomores Only
36:1 Problems of Moral Reasoning
2 s.h.
Philosophical study of ethical theories and their relation to decision-making.

36:2 Problems of Logical Reasoning
2 s.h.
Philosophical study of correct and incorrect reasoning.

36:3 Problems of Political Philosophy
2 s.h.
Philosophical study of the good society and the relations of the individual to the state.
Physical Education and Dance
The University offers instruction in physical education on the west campus (Field House) and on the east campus (Halsey Gymna- sium). 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 therapeutic uses. On the undergradu- ate 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 coaching. 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. Fox
Fellowship: Professor Margaret O. Fox; Professor Emeritus M. Gladye Scott; Associate Professor Emeritus L. Saville; Assistant Professor Judith N. Allen, Morris P. Beatty, Jane E. Clark, Christine A. Gross, Ann A. Luther, Joelle E. McCann, Kathleen E. Miller, Vincent S. Stater, Carol L. Swenson, Assistant L. Knudsen, Katherine M. Carlson, John Ann Doolittle, Constance J. Durkin, Shirley A. Flathers, Margaret E. Grohs, Jean A. Hagonen-Turner, Nancy H. Thomsen, Steve M. Henth, Patti A. Penney, Deborah L. Woodhead
Degrees 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, pro 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.

Theoretical background is provided through anatomical, kine- matical, physiological and health courses, with implications for the performance and teaching of activities. The emphasis is on preparation for teaching, but provision is made for entry in almost any graduate program of physical education if the student later wishes to undertake graduate work.

The student who plans to teach must meet certification require- ments (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 a 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 indi-vidually 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>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>28:1-4</td>
<td>Elective Physical Education</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>28:18</td>
<td>Senior Life Saving and Water Safety In-</td>
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<tr>
<td></td>
<td>structor's Course</td>
<td>1-2 s.</td>
</tr>
<tr>
<td>28:19</td>
<td>Orientation</td>
<td>1 s.</td>
</tr>
<tr>
<td>28:25-26</td>
<td>Teaching of Sports</td>
<td>4 s.</td>
</tr>
<tr>
<td>28:27</td>
<td>Teaching of Social Forms of Dance</td>
<td>1-2 s.</td>
</tr>
<tr>
<td>28:31-32</td>
<td>Officiating</td>
<td>2 s.</td>
</tr>
<tr>
<td>28:37</td>
<td>First Aid (or Red Cross Certification)</td>
<td>3 s.</td>
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<tr>
<td>28:40</td>
<td>Tennis</td>
<td>3 s.</td>
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<tr>
<td>28:41</td>
<td>Golf</td>
<td>1 s.</td>
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<tr>
<td>28:42</td>
<td>Badminton</td>
<td>1 s.</td>
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<tr>
<td>28:43</td>
<td>Volleyball</td>
<td>1 s.</td>
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<tr>
<td>28:47</td>
<td>Gymnastics</td>
<td>2 s.</td>
</tr>
<tr>
<td>28:48</td>
<td>Ballet Dance</td>
<td>1 s.</td>
</tr>
<tr>
<td>28:49</td>
<td>Field Hockey</td>
<td>1 s.</td>
</tr>
<tr>
<td>28:50</td>
<td>Softball</td>
<td>1 s.</td>
</tr>
<tr>
<td>28:51</td>
<td>Field Hockey</td>
<td>1 s.</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.
Physical Education and Dance 2 s.h.
Coaching for Women's Sports 2 s.h.
Advanced Coaching 2 s.h.
Kinesiology 3 s.h.
Care of Athletic Injuries 2 s.h.
Physiological Implications for Teaching Physical Education 3 s.h.
Principles and Administration of Intercollegiate Women's 2 s.h.
Methods and Materials in Elementary Physical Education 2 s.h.
Individual Projects in Laboratory Practice (Coaching Practicum) 2-3 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.
or
28:108 Principles and Administration of Intercollegiate Women's 2 s.h.
or
7E:71 Methods and Materials in Elementary Physical Education 2 s.h.
7S:90 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 major are:
28:1, 2, 5, 7, 40-57 or equivalent experience 7-8 s.h.
28:37, 37-E 3 s.h.
104:61, 65 3-4 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 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.

Honors Program
The Honors Program is designed to serve the interests of the superior student. To be eligible for Honors, the student must have at least a "B" average at the beginning of the junior or senior year when Honors 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 experienced 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 here has been a growing philosophy of education for women and many of the graduates of these programs have played and are still playing leadership roles in the profession, in their institutions and their communities.

The curricula assume previous education in the respective fields. A program is planned with the individual in mind 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 variety 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 pro-
grams. Others, such as sports communication, are possible. Oc-
casionally an internship is possible in the specialization. The graduate student group is cosmopolitan and international in make-up.

A research laboratory is available in Hale House Gymnasium. It is equipped primarily for biomechanical and biomechanics research and motor learning, including equipment for electromyographic research. Other needs may be met on a cooperative basis. Com-
plete computer service is available as needed for research.
The Master of Arts Degree

The M.A. degree is awarded on completion of at least 20 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 M.A. thesis) 0-4 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 2 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 advisor. Suggested areas:

- Anatomy
- Administration
- Correctives (Adaptives)
- Curriculum
- Elementary School Program
- Health
- Kinesiology (Biomechanics)
- Measurement
- Motor Learning
- Motor Skills
- Outdoor Education
- Philosophy and History
- Physiology
- Psychology of Sport
- 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 comprehensive 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:

28D:112 Rhythmic Analysis of Dance 2 s.h.
or
28D:129 Dance Accompaniment 2 s.h.
28:80 Anatomy 4 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.
28:127-128 Dance Company Class 2 s.h.
28:177 Labanotation 3 s.h.
28:178 24 s.h.

Prerequisites
12 hours from the following or related subjects in theater, music, etc.

*28:82 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 arr.
28:178 Labanotation 3 s.h.
28:181-182 Dance Company Class 1-4 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 to all majors
planning to teach. See "Catalog of Education" for certification
requirements for public school teaching.

Dance majors must take 3 technique classes 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 farther 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
28:28 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.
28:175-176 Theory and Criticism of Dance 3-6 s.h.
28:205 Theory 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

Gymnastics. 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 Materi
dal Union. The field for outdoor sports and hard
surfaced tennis courts are near Halsey Gymnasium. The proximity
of the river makes canoeing instruction feasible on a regular class
schedule. The archery range is located along the river in a natic
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 intramural golf

Courses

Physical Education

Primarily for Undergraduates
28:110 General Physical Education 1 s.h.
28:111 Elective Physical Education 1 s.h.
28:112 Elective Physical Education 1 s.h.
28:113 Elective Physical Education 1 s.h.
28:114 Elective Physical Education 1 s.h.
28:115 Elective Physical Education 1 s.h.
28:116 Elective Physical Education 1 s.h.
28:117 Elective Physical Education 1 s.h.
28:118 Elective Physical Education 1 s.h.
28:119 Elective Physical Education 1 s.h.
28:120 Elective Physical Education 1 s.h.
28:121 Elective Physical Education 1 s.h.
28:122 Elective Physical Education 1 s.h.
28:123 Elective Physical Education 1 s.h.
28:124 Elective Physical Education 1 s.h.
28:125 Elective Physical Education 1 s.h.
28:126 Elective Physical Education 1 s.h.
28:127 Elective Physical Education 1 s.h.
28:128 Elective Physical Education 1 s.h.
28:129 Elective Physical Education 1 s.h.
28:130 Elective Physical Education 1 s.h.
28:131 Elective Physical Education 1 s.h.
28:132 Elective Physical Education 1 s.h.
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28:180 Elective Physical Education 1 s.h.
28:181 Elective Physical Education 1 s.h.
28:182 Elective Physical Education 1 s.h.
28:183 Elective Physical Education 1 s.h.
28:184 Elective Physical Education 1 s.h.
28:185 Elective Physical Education 1 s.h.
28:186 Elective Physical Education 1 s.h.
28:187 Elective Physical Education 1 s.h.
28:188 Elective Physical Education 1 s.h.
28:189 Elective Physical Education 1 s.h.
28:190 Elective Physical Education 1 s.h.
<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>28:48 Bedroom Dance</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>28:49 Field Sports</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>28:50 Softball</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>28:51 Field Hockey</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>28:52 Basketball</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>28:53 Modern Dance I</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>28:54 Modern Dance II</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>28:55 Swimming</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>28:56 Track and Field</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>28:57 Recreational Sports</td>
<td>1 a.h.</td>
</tr>
</tbody>
</table>

**28:71 Methods and Materials in Elementary School Physical Education**
- 2 a.h.
  - Same as Education 78:71. Physical education majors only. Fall.

**28:72 Methods and Materials in Elementary School Physical Education**
- 2 a.h.

**29:09 Anatomy**
- 4 a.h.
  - Required of all students majoring in physical education; general biology students with emphasis on factors influencing movement. Fall.

**29:011 Kinesiology**
- 3 a.h.

**29:01 Independent Study**
- 1 a.h.

**29:02 Honors Readings**
- 2 a.h.

**29:04 Honors Projects**
- 2 a.h.

**29:05 Honors Seminar**
- 3 a.h.

**For Undergraduates and Graduates**

**28:101 Fitness for the Individual**
- 2 a.h.
  - Fitness needs of youth and adult, physiological process of conditioning.

**28:102 Research in Women in Sports**
- 2-3 a.h.
  - Review of research conducted, and planning for research needed relative to women in competitive programs.

**28:104 Health Education Workshop**
- 1-2 a.h.

**28:105 Care of Athlete Injuries**
- 2 a.h.
  - Immediate care and rehabilitative treatment of injuries occurring in women's sports.

**28:106 Physiological Implications for Teaching Physical Education**
- 2-3 a.h.
  - Physiological effects of exercise and lack of exercise, methods of conditioning for various activity programs. Fall.

**28:107 Correlations**
- 3-6 a.h.
  - Methods of general and specific correlative studies of youth and adults, related work in functional conditions and athletic injuries. Prerequisites: 28:00 and 28:01 or equiv.

**28:108 Principles and Administration of Intercollegiates for Women**
- 1-2 a.h.
  - Course of intercollegiates designed to provide educational value for the participant.

**28:109 Coacting**
- 1-4 a.h.
  - Selected sports for esoteric majors; analysis and coaching techniques presented in workshop by experienced coaches. Fall.

**28:110 Workshop: Methods of Teaching Sports**
- 1-4 a.h.
  - Selected sports and the teaching of each for beginners as well as for the more skilled; emphasis on different age levels; presented in workshop form by experienced teachers. Summer.

**28:111 Measurement**
- 3 a.h.
  - Selection and administration of physical measurements and motor tests; use of data. Spring.

**28:119 Methods and Principles of Physical Education**
- 2 a.h.
  - Philosophical bases of teaching and learning. Same as Education 78:146. Fall.

**28:120 Organization and Administration of Physical Education**
- 2 a.h.

**28:121 History of Physical Education**
- 1 a.h.

**28:120 Sports Participation for Girls and Women**
- 2 a.h.

**28:127 Advanced First Aid and Instructor Training**
- 3 a.h.

**28:128 Interrelationships of Health and Physical Education**
- 3 a.h.
  - Physical education and human development programs in society as related to health of youth in today's society. Fall.

**28:129 Health Problems of Youth**
- 1 a.h.
  - Workshop on current health problems. Summer.

**28:130 Elementary School Physical Education**
- 3 a.h.
  - Materials, methods, considerations planning, opportunities for improving performance skills in all gym areas, as well as for teaching experience. Primarily for elementary education majors, junior standing or above. Fall. Same as 78:121.

**28:131 Recreation Education**
- 1 a.h.
  - A problem-solving approach to teaching of fundamental movements, rhythms and activities included in elementary school physical education programs. Summer.

**28:132 Seminar in Leadership in Extracurricular Activities**
- 2 a.h.
  - Philosophical approach to programming and control of sports programs. Summer.

**28:140 Workshop: Elementary Physical Education**
- 1 a.h.

**28:161 Sports Information**
- 3 a.h.
  - Interrelationships between news, press, public relations, and the media. Introduction of methods and techniques in horse the news media informed about athletic events. Fall.

**28:162 Elementary School Physical Education**
- 3 a.h.
  - Materials, methods, considerations planning, opportunities for improving performance skills in all gym areas, as well as for teaching experience. Primarily for elementary education majors, junior standing or above. Fall. Same as 78:121.

**28:163 Health Education**
- 3 a.h.
  - Through understanding of health skills, energy, rates, fitness, managing growing maturities and competitive opportunities in specific sports.

**28:164 History of Sport**
- 2 a.h.

**28:165 Health and Safety**
- 2 a.h.
  - Individual opportunities to work with athletic teams, sports editors (newspapers, magazines, radio, television) and sports information directors.

**28:166 Seminars**
- 1-3 a.h.
  - Mini-courses with notable persons in sports journalism and/or broadcasting.

**28:167 Physiological Dimensions of Sport**
- 3 a.h.
  - Overview of psycho-physiological factors in sport involvement.

**For Graduates**

**28:110 Principles and Administration of Intercollegiates for Women**
- 1-2 a.h.
  - Emphasis on intercollegiates designed to provide educational value for the participant.

**28:112 Coacting**
- 1-4 a.h.
  - Selected sports for esoteric majors; analysis and coaching techniques presented in workshop by experienced coaches. Fall.

**28:113 Workshop: Methods of Teaching Sports**
- 1-4 a.h.
  - Selected sports and the teaching of each for beginners as well as for the more skilled; emphasis on different age levels; presented in workshop form by experienced teachers. Summer.

**28:114 Measurement**
- 3 a.h.
  - Selection and administration of physical measurements and motor tests; use of data. Spring.

**28:119 Methods and Principles of Physical Education**
- 2 a.h.
  - Philosophical bases of teaching and learning. Same as Education 78:146. Fall.

**28:120 Organization and Administration of Physical Education**
- 2 a.h.

**28:121 History of Physical Education**
- 1 a.h.

**28:120 Sports Participation for Girls and Women**
- 2 a.h.

**28:127 Advanced First Aid and Instructor Training**
- 3 a.h.

**28:128 Interrelationships of Health and Physical Education**
- 3 a.h.
  - Physical education and human development programs in society as related to health of youth in today's society. Fall.

**28:129 Health Problems of Youth**
- 1 a.h.
  - Workshop on current health problems. Summer.

**28:130 Elementary School Physical Education**
- 3 a.h.
  - Materials, methods, considerations planning, opportunities for improving performance skills in all gym areas, as well as for teaching experience. Primarily for elementary education majors, junior standing or above. Fall. Same as 78:121.

**28:131 Recreation Education**
- 1 a.h.
  - A problem-solving approach to teaching of fundamental movements, rhythms and activities included in elementary school physical education programs. Summer.

**28:132 Seminar in Leadership in Extracurricular Activities**
- 2 a.h.
  - Philosophical approach to programming and control of sports programs. Summer.

**28:140 Workshop: Elementary Physical Education**
- 1 a.h.

**28:161 Sports Information**
- 3 a.h.
  - Interrelationships between news, press, public relations, and the media. Introduction of methods and techniques in horse the news media informed about athletic events. Fall.

**28:162 Elementary School Physical Education**
- 3 a.h.
  - Materials, methods, considerations planning, opportunities for improving performance skills in all gym areas, as well as for teaching experience. Primarily for elementary education majors, junior standing or above. Fall. Same as 78:121.

**28:163 Health Education**
- 3 a.h.
  - Through understanding of health skills, energy, rates, fitness, managing growing maturities and competitive opportunities in specific sports.

**28:164 History of Sport**
- 2 a.h.

**28:165 Health and Safety**
- 2 a.h.
  - Individual opportunities to work with athletic teams, sports editors (newspapers, magazines, radio, television) and sports information directors.

**28:166 Seminars**
- 1-3 a.h.
  - Mini-courses with notable persons in sports journalism and/or broadcasting.

**28:167 Physiological Dimensions of Sport**
- 3 a.h.
  - Overview of psycho-physiological factors in sport involvement.

**Primarily for Graduates**

**28:110 Principles and Administration of Intercollegiates for Women**
- 1-2 a.h.
  - Emphasis on intercollegiates designed to provide educational value for the participant.

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- 1-4 a.h.
  - Selected sports for esoteric majors; analysis and coaching techniques presented in workshop by experienced coaches. Fall.

**28:113 Workshop: Methods of Teaching Sports**
- 1-4 a.h.
  - Selected sports and the teaching of each for beginners as well as for the more skilled; emphasis on different age levels; presented in workshop form by experienced teachers. Summer.

**28:114 Measurement**
- 3 a.h.
  - Selection and administration of physical measurements and motor tests; use of data. Spring.
Physical Education

28.243 Seminar: Health Concerns of Women 2 s.h.

28.243 Seminar: Philosophy of Curriculum Construction 3 s.h.

28.244 Seminar: Health Education Program 2 s.h.

28.245 Seminar: Planning and using opportunities in physical education for teaching of health. 2 s.h.

28.245 Seminar: Supervision 2 s.h.

28.246 Seminar: Problems in supervision; open only to those with experience in supervision. 2 s.h.

28.247 Seminar: Philosophy of Physical Education 3 s.h.

28.248 Seminar: Sociology of Sports 2-3 s.h.

28.249 Seminar: Improvement of Instruction in Elementary Physical Education 2 s.h.

28.280 Seminar: Current Developments in Philosophy of Education 2 s.h.

28.291 Comparative Physical Education 2 s.h.

28.291 Comparative Physical Education Program 2 s.h.

28.292 Individual Differences in Ability Classes 2 s.h.

28.293 Lifespan and Development of Human Abilities; emphasis on changes in physical abilities. 2 s.h.

28.294 Lifespan and Development of Human Abilities; emphasis on changes in physical abilities. 2 s.h.

28.294 History of Women in Sports 2 s.h.

28.295 Professional Writing 2 s.h.

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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. Through the rigorous job sharing 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 Football
27:34 Coaching of Baseball
27:35 Coaching of Track and Field Athletics
27:36 Coaching of Basket Ball
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
27:108 Introduction to Human Perceptual-Motor Performance

27:141 Elementary Exercise Physiology
27:123 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

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
78:192 Laboratory Practice in Elementary School

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 statistics. 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 special 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
4:5 Elementary Chemistry Laboratory
4:121 Organic Chemistry I
22M:2-3 Mathematical Techniques I-II
22M:20 Elementary Functions
29:1-2 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
27:53 Human Anatomy
27:91 Leadership Training I
27:105 Adapted Physical Education
27:108 Educational Psychology and Measurement
75:145 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:

27:92 Human Anatomy
27:56 First Aid
27:57 Introduction to Athletic Training
27:103 Administration of Physic's Education and Athletics
27:197 Biomechanics of Physical Education
27:108 Introduction to Human Perceptual-Motor Performance
27:141 Elementary Exercise Physiology
75:192 Observation and Laboratory Practice in the Secondary School

*This course may be waived on the basis of appropriate experience as a coach.
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 and are designated to meet the standards for certification by the National Athletic Trainers Association and included in the following courses:

17:41 Contemporary Nutrition
17:142 Nutrition
31:1 Elementary Psychology
79:75 Educational Psychology and Measurement
72:13 Introduction to Human Physiology
63:101 Health Science I
27:53 Human Anatomy
27:56 First Aid
27:57 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 joint-venture relationship 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 presence of these facilities, together with the close working relationships between the faculty of this department and those of various departments in the College of Medicine, offer and enhance the training for a pre-physical-therapy program. Because there is a rapidly increasing demand for physical therapists who are willing to serve as athletic trainers for school, college and university teams, the pre-physical-therapy program in physical education offers 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
27:56 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
27:153 Advanced Anatomy and Kinesiology
4:14 Principles of Chemistry I and II
4:6 Elementary Chemistry Laboratory
79:71 Educational Psychology and Measurement
29:1-2 College Physics
31:1 Elementary Psychology
31:13 Psychology of Adjustment
11:163 Abnormal Psychology
35:3 Principles of Animal Biology
37:41 Principles of Human Genetics
37:101 Principles of Modern Embryology
37:103 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 educators 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 in the counseling of interscholastic 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 graduates with the M.A. degree without thesis has been excellent.

Undergraduate 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 s.h.
- Human physiology: 3 s.h.
- Personal hygiene (or equivalent): 2 s.h.
- Administration of physical education and athletics: 2 s.h.
- Methods in physical education: 2 s.h.
- Practice teaching (or equivalent): 2 s.h.
- Teaching of gymnastics: 1 s.h.
- Teaching of swimming: 1 s.h.
- Coaching (one sport): 1 s.h.

Electives in physical education and related areas: 13 s.h.

Total: 30 s.h.

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 27:21-22 Practicum I and II, at least one course must be selected from each of these three groups:

Group I

27:105 Adapted Physical Education (may not be counted if
student has completed equivalent course in undergraduate study) 27:167 Measurement and Evaluation in Physical Education

Group II

Group III

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.

- 27:102 Advanced Physical Education 27:257 Biomechanics of Human Motion
- 27:337 Seminar: Research in Physical Education Curriculum

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, morale 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 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 65:161 Introduction to Biostatistics.
The foreign language requirement differs for each area of specialization. All candidates not required to demonstrate proficiency in a foreign language must satisfactorily complete 7P-248 Data Processing or 52C: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 specialization.
The courses required by area of specialization are:

**Adapted Physical Education**
- 7U:130 Exceptional Children
- 27:201 Research-Adapted Physical Education (may be repeated)
- 27:205 Adapted Physical Education: Special Topics and Research
- 60:109 Human Anatomy and Neuroanatomy
- 60:110 Neurobiology and Behavior

**Administration and Supervision in Physical Education**
- 7D:201 Foundations of School Administration
- 27:201 Research: Administration and Supervision
- 27:203 Psychology of Sport
- 27:160 Behavior Management in Physical Education Athletics
- 27:207 Advanced Administration of Physical Education
- 27:227 Advanced Administration of Athletics
- 27:240 Professional Preparation in Physical Education

**Anatomy**
- 37:102 Principles of Modern Embryology
- 27:153 Advanced Anatomy and Kinesiology
- 60:103 Gross Human Anatomy for Medical Students
- 60:109 Human Anatomy
- 60:110 Human Anatomy and Neuroanatomy
- 37:112 Cell, Tissue and Organ Biology
- 60:221 Microscopic Anatomy for Graduate Students

**Biomechanics**
- 527:190 Readings in Energy Engineering (include statics, dynamics, mechanics of fluids, transfer processes and deformable bodies)
- 3:120 Fundamentals of Laboratory Instrumentation
- 60:109 Human Anatomy and Neuroanatomy
- 27:201 Research-Biomechanics
- 27:357 Research Techniques in Biomechanics

**Curriculum in Physical Education**
- 7E:300 Elementary Education
- 7E:291 Secondary School Curriculum
- 7P:332 Seminar: Educational Psychology II: Psychology of Learning
- 7X:301 Current Issues in Education
- 27:140 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**
- 72:202 Advanced Exercise Physiology
- 72:151 Intermediate Physiology
- 99:130 Metabolism

**Measurement and Evaluation**
- 72C:100 Introduction to Computing with FORTRAN
- 7P:242 Statistical Methods, and
- 7P:244 Correlation Methods or
- 7P:246 Design of Experiments
- 7P:293 Construction and Use of Classroom Tests as Evaluation Instrument
- 7P:297 Educational Measurement and Evaluation
- 7P:367 Seminar: Research in Measurement and Evaluation in Physical Education (may be repeated)

**Motor Performance and Learning**
- 27:201 Research-Motor Learning (may be repeated)
- 27:312 Selected Issues in Information Processing and in Motor Control
- 27:314 Seminar in Motor Behavior Research
- 31:119 Human Memory, Learning and Conceptual Processes
- 31:155 Human Engineering
- 31:223 Information Processing in Psychology

**Therapeutics**
- 101:327 Research in Therapeutics
- 101:214 Principles of Human Motion II
- One of these:
  - 72:110 Neurobiology and Behavior
  - 72:271 Advanced Cardiovascular Physiology
  - 72:247 Advanced Respiratory Physiology
- One of these:
  - 60:105 Microscopic Anatomy for Medical Students
  - 59:202 Readings in Mechanics
  - 72:202 Advanced Physiology and Exercise
  - 72:281-4 Advanced Neuropsychology

**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 ( 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, provide 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

Primarily for Undergraduates

27:10 Elementary Physical Education 1 a. h.
Elective for students who have satisfied requirements for physical education skills (see "Major Skills").

27:23 Elementary Physical Education 1 a. h.
Comprehensive.

27:34 Elementary Physical Education 1 a. h.
Comprehensive.

27:44 Elementary Physical Education 1 a. h.
Comprehensive.

27:54 Elementary Physical Education 1 a. h.
Comprehensive.

27:64 Elementary Physical Education 1 a. h.
Comprehensive.

27:74 Elementary Physical Education 1 a. h.
Comprehensive.

27:84 Elementary Physical Education 1 a. h.
Comprehensive.

27:94 Elementary Physical Education 1 a. h.
Comprehensive.

27:105 Elementary Physical Education 1 a. h.
Open to any student who does not wish academic credits or who desires to enroll a class for early enrollment.

27:711 Introduction to Physical Education 0 a. h.
Orientation lecture on historical and educational aspects of physical education. First semester.

27:70 Social Forms of Dance 1-2 a. h.
Same as 280:23. First semester.

27:21 Teaching of Recreational Sports 2 a. h.
Contact: Practices and meetings as scheduled in the winter. First semester.

27:22 Teaching of Recreational Sports II 2 a. h.

27:23 Teaching of Gymnastics 2 a. h.
Teaching techniques of conditioning exercises, elementary apparatus and tumbling exercises.

27:33 Coaching of Gymnastics 2 a. h.
Prerequisite: High school varsity experience or equivalent.

27:34 Coaching of Football 2 a. h.
Prerequisite: High school varsity experience or equivalent. Second semester.

27:34 Coaching of Baseball 2 a. h.
Prerequisite: High school varsity experience or equivalent. Second semester.

27:36 Coaching of Track and Field Athletics 2 a. h.
Prerequisite: High school varsity experience or equivalent. First semester.

27:37 Coaching of Basketball 2 a. h.
Prerequisite: High school varsity experience or equivalent. First semester.

27:37 Teaching of Badminton 2 a. h.
Prerequisite: High school varsity experience or equivalent. Second semester.

27:38 Coaching of Competitive Swimming 2 a. h.
Prerequisite: High school varsity experience or equivalent. Second semester.

27:78 Coaching of Wrestling 2 a. h.
Prerequisite: High school varsity experience or equivalent. First semester.

27:79 Coaching of Track and Field Athletics 2 a. h.
Prerequisite: High school varsity experience or equivalent. Second semester.

27:80 Administration of Intramural Athletics 2 a. h.

27:81 Human Anatomy 2 a. h.

27:82 First Aid 0 a. h.

27:82 Introduction to Athletic Training 2 a. h.
Prerequisite: 27:33. First semester.

27:83 Practicum in Special Physical Education 3 a. h.
Laboratory experience in adapted physical education, exercise therapy and corrective therapy. Prerequisites: 27:33 and 27:35. First semester.

27:84 Practicum in Special Physical Education 3 a. h.
Laboratory experience in adapted physical education, exercise therapy and corrective therapy. Prerequisites: 27:33 and 27:35. Second semester.

27:85 Special Project 2 a. h.

27:86 Leadership Training I 1 a. h.
Classical semester before registering.

27:87 Leadership Training II 1 a. h.
Classical semester before registering.

27:88 Leadership Training III 1 a. h.
Classical semester before registering.

For Undergraduates and Graduates

First semester.

27:109 Administration of Physical Education and Athletics 2 a. h.
Second semester.

27:110 Adapted Physical Education 2 a. h.

Saturday and Evening Summer Program.

27:112 Biomechanics of Physical Education 2 a. h.
First semester.

27:113 Introduction to Human Perceptual-Motor Performance 2 a. h.
Second semester.

27:115 Workshop in Growth and Development 1 a. h.
Correspondence course.

27:116 History of Physical Education 2 a. h.
Prerequisite: 27:115. First semester.

27:120 Track and Field Athletics 2 a. h.
Correspondence course.

27:130 Workshop in Advanced Athletic Coaching 2 a. h.
Second semester.

27:151 Advanced Theory and Techniques of Swimming and Diving 2 a. h.
First semester.

27:152 School Physical Education Program 3 a. h.
Same as Education 25:16. First semester.

27:153 Workshop: Physiological Effects of Activity 1 a. h.
Summer session.

27:154 Elementary Exercise Physiology 2 a. h.
Prerequisite: 27:153. First semester.

27:155 Knowledge and Performance Tests in Physical Education 2 a. h.
First semester.

27:156 Advanced Anatomy and Physiology 3.5 a. h.
Emphasis on preparation for teaching and therapy at the graduate level. Second semester.

27:166 Instructional Methods in Physical Education 3 a. h.
Same as Education 23:16. Summer session.

27:167 Advanced Instruction in Selected Activities 2 a. h.
Division of Cooperative Education.

27:168 Sports Movement for Drama 1 a. h.
Same as Education 23:16. Summer session.

27:1718 Biomechanics of Athletics 2 a. h.
Prerequisite: 27:108. Second semester.

27:180 Physical Education for Elementary Schools 2-3 a. h.
Same as Education 23:18. First semester.
27/160 Perceptual Motor Skill Development in Children
2 a.h.
Second semester.

27/167 Measurement and Evaluation in Physical Education
2 a.h.
First semester.

27/170 Workshop in Athletic Training
1 a.h.
First semester.

27/171 Medical Supervision of Athletes
2 a.h.
Second semester.

27/182 Evaluation Techniques in Athletic Training
2 a.h.
First semester.

27/183 Athletic Training: Modalities and Therapies
2 a.h.
Second semester.

27/186 Laboratory Practice in Athletic Training
2 a.h.
First semester.

27/189 Supervision of Physical Education
3 a.h.
Same as Education 70/246. First semester.

Primarily 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
First semester.

27/205 Adapted Physical Education: Special Topics and Research
4 a.h.

27/206 Advanced Administration of Physical Education
2 a.h.
First semester.

27/207 Advanced Administration of Physical Education
2 a.h.
Second semester.

27/227 Public School Curriculum in Physical Education
2 a.h.
Same as Education 70-245. Second semester.

27/240 Preparation in Physical Education
2 a.h.
Critical analysis of current undergraduate and graduate preparation programs in physical education. See note below.

27/241 Scientific Principles of Physical Conditioning
1.3 a.h.
First semester; 72/141. Same as 72/212. First semester.

27/287 Biomechanics of Human Motion
4 a.h.
First semester.

27/288 Seminar: Current Developments in Biomechanics
0 a.h.
Second semester.

27/289 Advanced Measurement and Evaluation in Physical Education
3 a.h.

Second semester.

27/295 Electromyography in Kinesiology and Biomechanics
3 a.h.
Same as 10/255. Second semester.

27/298 Human-Theta Banding
3 a.h.

27/306 Seminar: Physical Education for the Mentally Retarded
2 a.h.
First semester.

27/308 Human Perceptual-Motor Performance
2 a.h.
Nontechnical principles and practical implications for teaching. First semester.

27/310 Cognition
6 a.h.
Special seminar. 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.

27/327 Seminar: Research in Physical Education Curriculum
3 a.h.
Students who have met completed 27/257 or equivalents must elect 27/327. Second semester.

27/338 Seminar: Models and Theory in Curriculum
3 a.h.
Second semester.

27/367 Research Techniques in Biomechanics
4 a.h.
First semester.

27/367 Seminar: Research in Measurement and Evaluation in Physical Education
First semester.

27/401 Seminar in Scientific Writing
Second semester.

27/402 Research Methods in Physical Education
First semester.

27/403 Seminar in M.A.
First semester.

27/404 Thesis: M.A.
3 a.h.
Not to exceed 12 semester hours.

Physical Therapy

See "College of Medicine."

Physician’s Assistant Program

See “College of Medicine.”

Physics and Astronomy

Department head: James A. Van Allen

Associate department head and undergraduate advisor: Edward B. Nelson


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 students registering during each semester of the academic year and 130 during the summer sessions. 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 for students having similar enrollments are offered for majors in physics and for others with special interest in the subject. There are about 35 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 recent national stenches 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:

22/M-05 Calculus of One Variable
16 a.h.

22/M-05 Calculus of Two Variables
16 a.h.

22/M-05 Linear Algebra
16 a.h.

or

22/M-05 Engineering Calculus (IV)
16 a.h.

or
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  2 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 29-99 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 (with or without thesis), and one in astronomy, the Master of Science (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 interdepartmental 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 the 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 at the time 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 critical essay (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.
29-177  Optics  3 s.h.
29-118  Statistical Physics  3 s.h.
29-129-130  Electricity and Magnetism  6 s.h.
29-133  Advanced Laboratory  4 s.h.
29-171-172  Mathematical Methods of Physics  6 s.h.
29-191  Atomic Physics  3 s.h.
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear Physics</td>
<td>3 a.h.</td>
<td>Complex variable and vector and tensor analysis, is used largely in nuclear physics.</td>
</tr>
<tr>
<td>Master of Science Degree in Astronomy</td>
<td></td>
<td>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:</td>
</tr>
<tr>
<td>Introductory Quantum Mechanics</td>
<td>3 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Optics</td>
<td>3 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Statistical Physics</td>
<td>3 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Introduction to Stellar Astrophysics I-II</td>
<td>6 a.h.</td>
<td>Study of the formation and evolution of stars.</td>
</tr>
<tr>
<td>Solar System Astrophysics</td>
<td>3 a.h.</td>
<td>Study of the formation and evolution of stars.</td>
</tr>
<tr>
<td>Electricity and Magnetism</td>
<td>6 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Advanced Laboratory</td>
<td>2 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Astronomical Physics</td>
<td>2 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Mathematical Method of Physics</td>
<td>6 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Atomic Physics</td>
<td>3 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Doctor of Philosophy Degree in Physics</td>
<td></td>
<td>The program of study for the Ph.D. degree 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.</td>
</tr>
<tr>
<td>All candidates for the Ph.D. must take at least 27 semester hours of graduate courses in the Department, excluding 25 220, 25 228, and seminars. The following minimum program is recommended as preparation for the comprehensive examinations:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classical Mechanics</td>
<td>3 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Statistical Mechanics</td>
<td>3 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Classical Electrodynamics</td>
<td>6 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Quantum Mechanics I-II</td>
<td>6 a.h.</td>
<td>Study of the electronic and magnetic properties of solids.</td>
</tr>
<tr>
<td>Advanced mathematics, such as the theory of functions of a complex variable and vector and tensor analysis, is used largely in advanced courses. An introduction to these fields is given in 25 171, 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.</td>
<td></td>
<td></td>
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<tr>
<td>Research</td>
<td></td>
<td>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 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, isospecronic 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, plasmas physics, theory of solids, theory of elementary particles, solar terrestrial physics and astrophysics. Exceptional opportunities are available for experimental research in space physics. Prospective qualified for graduate study are invited to apply for fellowships and assistantships. Requires should be directed to the head of the Department.</td>
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<tr>
<td>Courses</td>
<td></td>
<td>Physics</td>
</tr>
<tr>
<td>Prerequisites and co-requisites are specified as guides and may be varied by the instructor. An elementary course may not be repeated for credits 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 25 1-3, 25 17-18, 25 26, 25 58, and/or 25 61-62 are accepted toward the College of Liberal Arts core requirement in the Natural sciences.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primarily for Undergraduates</td>
<td></td>
<td>College Physics</td>
</tr>
<tr>
<td>25 1-3 Course Physics</td>
<td>4 a.h.</td>
<td>Electromagnetism, light and modern physics. Combination of 25 1, which is prerequisite. Offered both semesters and summer session.</td>
</tr>
<tr>
<td>25 17-18 Course Physics</td>
<td>4 a.h.</td>
<td>Electromagnetism, light and modern physics. Combination of 25 1, which is prerequisite. Offered both semesters and summer session.</td>
</tr>
<tr>
<td>25 26 Course Physics</td>
<td>4 a.h.</td>
<td>Electromagnetism, light and modern physics. Combination of 25 1, which is prerequisite. Offered both semesters and summer session.</td>
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<tr>
<td>25 58 Course Physics</td>
<td>4 a.h.</td>
<td>Electromagnetism, light and modern physics. Combination of 25 1, which is prerequisite. Offered both semesters and summer session.</td>
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<tr>
<td>25 61-62 Course Physics</td>
<td>4 a.h.</td>
<td>Electromagnetism, light and modern physics. Combination of 25 1, which is prerequisite. Offered both semesters and summer session.</td>
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<td>Advanced mathematics, such as the theory of functions of a complex variable and vector and tensor analysis, is used largely in advanced courses. An introduction to these fields is given in 25 171, 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.</td>
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<td>Electromagnetism, light and modern physics. Combination of 25 1, which is prerequisite. Offered both semesters and summer session.</td>
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<td>Electromagnetism, light and modern physics. Combination of 25 1, which is prerequisite. Offered both semesters and summer session.</td>
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<td>4 a.h.</td>
<td>Electromagnetism, light and modern physics. Combination of 25 1, which is prerequisite. Offered both semesters and summer session.</td>
</tr>
</tbody>
</table>
Physics and Astronomy

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nertics Field. Prerequisites: 29/129, 1296, 191, 172 or equivalent.

29:216 Classical Electrodynamics 3 s.h.
Special relativity, review of charges in fields, theories of radiation motion and special topics. Prerequisites: 29:213.

29:220 Individual Critical Study 3 s.h.
Study of a topic in conjunction with faculty mentor. For candidates for B.S. degree without thesis in physics or astronomy.

29:220 Quantum Mechanics I 3 s.h.
Nonrelativistic quantum mechanics; Schrödinger wave mechanics, Hartree approximations; perturbation theory; scattering, spin and spin-orbit interactions; quantum many-body physics; selected applications; introduction to relativistic theory. Prerequisites: 29/191, 172, 177, 178.

29:248 Quantum Mechanics II 3 s.h.
Continuation of 29:220.

29:249 Advanced Nuclear Physics 3 s.h.
Properties of nuclear physics and their interpretation; major properties of nuclei; quantum mechanics, shell models, collectivity models, gamma transitions, beta-decay, nuclear reaction mechanisms and other topics. Prerequisites: 29/191, 192 and 249. May be repeated.

29:261 Seminar: Plasma Physics 3 s.h.
Dissertation of current research.

29:263 Seminar: Solid State Physics 3 s.h.
Dissertation of current research.

29:264 Seminar: Telescopes of Physics and Astronomy 3 s.h.
Dissertation of current research.

29:265 Seminar: Theoretical Physics 3 s.h.
Dissertation of current research.

29:267 Seminar: Nuclear Physics 3 s.h.
Dissertation of current research.

29:271 Theoretical Solid State Physics 3 s.h.
Current principles of quantum theory of solids; lattice quantum, electronic properties, band theory, solid-state effects, electromagnetic and other topics; emphasis on principles of elementary excitations. Prerequisites 29/193, 249, 249d. May be repeated.

29:273 General Relativity and Cosmology 3 s.h.
Einstein's theory of gravitation; applications in astrophysics and cosmology. May be repeated.

29:274 Statistical Mechanics I 3 s.h.
Advanced mathematical methods for statistical mechanics; current may vary from year to year. V., foundations of kinetic theory and thermodynamics; statistical mechanics of quantum or statistical mechanical systems. May be repeated.

29:275 Special Topics in Quantum Mechanics 3 s.h.
Selected topics in quantum theory; field theory, dispersion relations, group theoretical analysis of fundamental particle classification schemes; magic numbers and nuclear structure; continued study of quantum mechanics. May be repeated.

29:282 Advanced Quantum Physics 3 s.h.
Prerequisites: 29/192; computer and electronic radiation in biological systems; spectroscopic and magnetic properties of magnetic fields; magnetic properties of systems. May be repeated.

29:283 Advanced Plasma Physics 3 s.h.
Prerequisites: 29/192. May be repeated.

29:285 Seminar: Space Plasma Physics 3 s.h.
Dissertation of current research.

29:287 Seminar: Nuclear Physics 3 s.h.
Dissertation of current research.

29:290 Seminar: Nuclear Physics 3 s.h.
Department of Nuclear Physics, scientific papers selected for review, written criticism and discussion. May be repeated.

29:320 Individual Critical Study 3 s.h.
See "Physics."
Political Science

Department chairman: Paul C. Stoner

Political Science

The program in political science deals with general principles of human behavior and organization which enable one to understand and explain situations, events, and problems. Both the undergraduate and graduate programs in political science emphasize broad and comprehensive study, rather than narrow specialization on restricted aspects of the subject.

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.

Standard Major

Undergraduates seeking a standard major must meet the following requirements:

1. At least 27 semester hours of work in political science, including 301 Introduction to American Politics or 302 Introduction to Politics, and two of these introductory courses:
   - 3010 Introduction to Political Behavior
   - 3011 Introduction to Political Theory
   - 3012 Introduction to Comparative Politics
   - 3013 Introduction to World Politics, and
   At least 15 semester hours in political science courses numbered 300 or above.

2. Students who transfer from other colleges or universities must take at least nine of the 27 semester hours of work in political science at The University of Iowa.

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 junior and community colleges. The general Master of Arts degree is normally pursued by persons whose ultimate degree objective is the Ph.D.

Honors in Political Science

The department 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. Honors students must take Honors Introduction to Political Inquiry (3018), and must complete at least two semesters of work in the advanced Honors Seminar (3017-3018) with a grade of B or better each semester. In some cases, the Honors adviser 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.

Teaching Major

Undergraduates planning to teach in the social sciences with an emphasis on political science must meet these requirements:
schedule suggested below implies completion within a year, the program is self-critically flexible to accommodate students who may require additional time to meet all its 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.
- 6E: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.
- Electives 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 for 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 3.5, 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 30-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 doctoral 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 to the M.A. with thesis. The student may be encouraged to seek the Ph.D. only after he or she has demonstrated scholarly competence 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; one course in each 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.

**Doctor of Philosophy Program**

Students are encouraged to seek the Ph.D. only after they have demonstrated their scholarly competence 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; one course in each 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 other 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 full year 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 the member of the examining committee a written dissertation proposal. The dissertation proposal must be examined and approved by the examining committee. It must be explained and defended in the oral examination, which deals also with 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 credits are granted for the preparation of dissertations, and students may register for credit for reading or research solely for work on their dissertations.
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 to 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 equivalents: 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 area 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 (School 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
31:119 Human Memory, Learning and Conceptual Processes
31:124 Introduction to Mathematical Models in Psychology
31:132 Motivation
31:133 Perception

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 Psychotherapy
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 developmental 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 graduate students 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
contribution to the discipline of psychology and to society gen-
erally.

The work appropriate jobs for graduates of this program are in
academic, government, business or private institutions which
provide opportunities for continuing analysis and investigation of
fundamental questions about behavior, for teaching about research
results and methodologies, 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 severely 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 stu-
dent entering with a master's degree from another institution will
require at least an additional two years in the department depend-
ing 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. in this department, and may be the
primary degree objective for a very few students, particularly
those in special joint programs. This degree is granted after
satisfactory completion of at least 30 semester hours of course-
work including requirements appropriate to the training area
with a cumulative grade-point average of at least 3.7. 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 is also 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 earning the M.A. This degree requires satisfac-
tory completion 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 core theory, research
methods and investigative 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 compe-
tence 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
progress 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 com-
prehensive Examination, set by the training area, covering a range
of material disseminated in 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
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 more
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
undertaken 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 gradu-
ate students are 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: cog-
nitive processes, sensation and perception, and experimental child
psychology.

Students specializing in cognitive processes acquire expertise in
areas such as information processing and decision-making, learn-
ing 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 devel-
oping specialization in applied research techniques, computer-con-
trolled data acquisition and reduction systems, and electronic
instrumentation. In addition, they acquire a solid background in
statistical procedures and in the historical and contemporary theo-
retical 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 tech-
niques of classical and operant conditioning, physiology, neuro-
pharmacology, neurochemistry, neuroendocrinology, autono-
tomy and comparative psychology. Students in this program will
have abundant opportunities to develop relevant skills including
computer-assisted experimentation, electronic instrumentation,
neuropsychological 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 neuropsychology. In addition to broad training in

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Psychology
psychological theory and research methods, students in the phy-
siology and behavior laboratories conduct experiments in one or more related scientific disciplines. They also have extensive laboratory experience to develop skills in neuroscientific techniques, electronic instrumentation and recording methods, laboratory computer usage, etc.

The social psychology program offers specialized training in three 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, conformity, social facilitation, behavioral contagion and social reinforcement. The second includes attitude acquisition, cognitive consistency and the notions of commitment, persuasion and attribution. Under the third sub-area, one might focus on group versus individual performance, on inter-culture or on topics in the area of social interaction. In addition to thorough training in the basic disciplines of experimental psychology, statistical analysis, computer processing, etc., the student in the social area has ample opportunities to handle instrumental observation laboratories 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, practicum experience in the Department's Research and Training Clinic is closely integrated with course-
work in the content, theory and research methods of psychology and with supervised research experience. Students may develop special competence in such areas as psychophysiology, aggression, psychotherapy, behavior therapy, schizophrenia, psycho-diagnosis, childhood behavior disorders and clinical neuropsy-
chology. Programs usually take shape in one or more sub-areas and opportunities for additional clinical experience in placements with local agencies such as the Vetetarian Administration Hospital, the Iowa Psychopathic Hospi-
tal, the Mental School for Handicapped Children and the Oakdale Rehabilitation unit. Students ordinarily also complete a one-year internship in an accredited clinical facility either before or after completion 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 study a variety of age-related changes in various aspects of behavior, e.g., sensory and percep-
tual processes, verbal processes and memory, learning and cogni-
tive abilities. Students also may focus on social competence 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 theories 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 Center in Psychology, a student-operated laboratory, includes a large number of small laboratory computers, as-
to-neous data acquisition and reduction systems, observation studios with remote audio-visual control and recording equipment, soundproof chambers, closed-circuit TV systems, electro-physiological recording rooms, conditioning laboratories, the Research and Training Clinic and well-equipped electronic, mechanical and woodworking shops. Specialized equipment and research trailers are available for use in studies conducted in schools and other locations.

Students and faculty have easy 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 Child Care Center, the University's General, Children's and Psychiatric Hospitals, the Veterans' Administration Hospital, the Veterans Counseling Center, 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 assistantships, research assistantships, traineeships, tuition scholar-
ships, etc. No separate application for financial aid is required.

Graduate Admissions

As is evident from the preceding paragraphs, the graduate program in psychology is open primarily to 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 and other information evidence of 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 graduate coursework will be reviewed by the faculty members of the appropriate training areas 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 show 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
 Either 311 or 312 is prerequisite to all other courses in psychology except 311:17 and 311:18.

Subject to this general prerequisite and to specific prerequisites for particular courses, all psychology courses are open to freshmen.

Either 311 or 312, but not both, may be taken toward the College of Liberal Arts social science core requirement, and only one may be applied toward the major in psychology.

311:1 Elementary Psychology 3 a.h.
Summary of psychology as a behavioral science; topics include sensation and perception, learning processes, child development, memory and forgetting, biological bases of behavior, individual differences, personality, abnormal behavior and social influences. In addition to scheduled class meetings, students are required to become familiar with main methods of investigation in psychology through eight hours of participation in research studies or review of research literature.

311: General Psychology 4 a.h.
Same topics and requirements as 311:1, but with additional discussion sessions and greater emphasis on manner in which experimental method is applied to analysis of behavior. Recommended for students taking B.S. major in psychology; also open to all honors students, and to other qualified students with permission of instructor.

312: Psychology of Adjustment 3 a.h.
The basic principles of psychology as applied to contemporary perspectives of personal adjustment.

314: Introduction to Child Psychology 3 a.h.
Survey of research and theory on biologic, cognitive and social aspects of development from infancy through adolescence.

315: Introduction to Social Psychology 3 a.h.
Research relating behavior of individual human organisms to factors in social environment; socialization and socialization, attitudes development and change, social influences on perceptual and conceptual processes, social interaction; contributions by sociologists and anthropologists.

316: Introduction to Group Dynamics 3 a.h.
Topics of social-emotional nature that derive group formations, functioning and maintenance; although emphasis is on psychological research literature, material in social fields is covered.

317: Educational Psychology and Measurement 3 a.h.
Same as Education 77:15.

318: Psychology in Business and Industry 3 a.h.
Appraisal of psychology to problems in the world of work; emphasis on personnel selection, training, motivation, research, measuring job performance.

318: Evaluating Psychological Research 3 a.h.
Basic concepts and principles basic to evaluation and utilization of scientific research. Students who have had 311:18 or equivalent are required for only 3 a.h.

319: Comparative Psychology and Ethology 3 a.h.
Survey of experimental and descriptive work in the study of animal behavior and the relationship of studies of animals to man; corner of the causes and functions of behavior; topics include: learning, social behavior, communication, motivation and evolution.

320: Introduction to Cognitive Psychology 3 a.h.
Survey of basic principles of human reasoning, memory and higher mental processes including decision-making, problem solving, creativity and language.

321: Research Practicum in Psychology 3 a.h.
Small group participation in faculty research projects; includes literature review, planning of studies, data collection, analysis, interpretation and write-up. Prerequisite: sophomore standing and consent of instructor. May be repeated.

321: Special Readings in Psychology 3 a.h.
For undergraduate majors in psychology. Prerequisites: sponsorship of staff member and approval of chairman of department.

318: Honors Seminar in Psychology 3 a.h.
Supervised library research to culminate in original generation and written paper on advanced issue in psychology. Admission by invitation of Department Honors Representative.

318: Honors Thesis Research 3 a.h.
Supervised individual research project, leading to written thesis and oral defense. Open only to Honors students.

For Undergraduates and Graduates

318:1 Social Psychology 3 a.h.
Current research activities in social psychology; primary emphasis on laboratory study of social behavior; critical evaluation of contemporary theories and methodologies.

318:2 Psychology as a Science 3 a.h.
Analysis of the nature of the concepts, laws and theories of modern psychology, with discussions of the logic of measurement and probability; exercises in analyzing psychological research. Prerequisites: Junior or senior standing or permission of instructor.

318:3 Development of Social Behavior 3 a.h.
Basic processes affecting children's responses to the social environment; attachment and dependency, social reinforcement, imitation and social development.

318:4 Experimental Social Psychology 3 a.h.
Experimental approaches to attitude modification, social perception, judgment and related social processes; theory and critical evaluation of methodology in representative types of problems.

318:5 Personality 3 a.h.
Determinants, correlates, consequences of adjunctive functions and personality development.

318:6 Attitude Change 3 a.h.
Current theoretical approaches to attitude change; laboratory and field methods of research; consideration of basic processes of change within broader framework of psychology.

318:7 Language Development 3 a.h.
Recent research and theories relating to the acquisition of language (syntax, semantics, phonology, vocabulary), discussed within framework of cognitive development. Same as Speech Pathology and Audiology 311:14, and Linguistics 103:17.

318:8 Sociocultural Processes 3 a.h.
Classic work on group processes stimulating experimental studies, field studies and interdisciplinary topics. Topics may include: conformity, obedience, leadership, cooperation, conflict, group decision making, conflict, leadership and social influence. 311:15 recommended but not required.

318:9 Psychology of Aggression 3 a.h.
An integrative approach to theoretical and research on egocentric behavior in human and animal subjects.

31110 Learning and Motivation in Children 3 a.h.
Survey of research and theory as children's conditioning, discrimination learning, reinforcement, acquisition, extinction, and transfer of learning and motivational systems.

31111 Child Development 3 a.h.
Same as Education 79:15. Not open to seniors.

31112 Socialization of the Child 3 a.h.
Influence of family interaction and societal events on the development of social behavior, and the development.

31113 Introduction to Psychological Testing 3 a.h.
Same as Speech Pathology and Audiology 311:15 and Linguistics 103:17.

31114 Cognitive Development of Children 3 a.h.
Developmental research and theory concerning conceptual, perceptual and verbal processes of children.

31115 Emotional Psychology 3 a.h.
Same as Education 79:15.

31116 Stages of Development 3 a.h.
Research and theory on selected stages of development.

31117 Exceptional Children 3 a.h.
Same as Education 79:10.

31118 Developmental Psychobiology 3 a.h.
Review of theory and research concerning biological and experimental influences on the development of behavior in humans and non-human organisms.
Recreation Education

31:212 Seminar: Development of Verbal Processes - 2 a.h.
Selected topics pertaining to children's verbal behavior. Prerequisite: consent of instructor.

Same as Speech Pathology and Audiology 5:234 and Linguistics 102:221.

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: 31:230 or consent of instructor.

31:251 Seminar: Chemical Influences on Behavior - 2 a.h.
Selected topics on relations between brain chemistry and behavior. Prerequisite: consent of instructor.

31:252 Seminar: Psychobiology of Motivation - 2 a.h.
Current topics on the biological basis of motivated behavior.

Theoretical analyses of learning and animal's complex discrimination tasks. Includes comparison of theoretical expectations and empirical results. Prerequisite: 31:220 or consent of instructor.

31:260 Seminar: Motivation - 2 a.h.
Theoretical and experimental treatments of selected topics in areas of motivation, punishment, conflict, creation and frustration.

31:261 Seminar: Behavior Theory - 2 a.h.
Selected theory and data concerning systematic problems in intra-human behavioral analysis. Prerequisite: 31:227 and consent of instructor.

Experimental findings and theoretical interpretations in fields of verbal learning, language behavior, concept formation and problem-solving. Prerequisite: consent of instructor.

31:264 Seminar: Conditioned - 2 a.h.
Method, theory, empirical outcomes in classical conditioning and relations to instrumental learning.

Selected topics on nervous system control of behavior.

31:266 Seminar: Psychobiology - 2 a.h.
Selected topics on anatomical and neurochemical bases of behavior. Prerequisite: consent of instructor.

31:268 Seminar: Mathematical Psychology - 2 a.h.
Selected problem in applications of mathematical models to animal and human behavior.

Various mathematical models in perception and psychopathology; detailed study of literatures and models in signal detection theory.

Prerequisite: 31:266 or permission of instructor.

31:281 Seminar: Real Time Computing - 2 a.h.
Consideration of microcomputer and microprocessor systems for on-line control of experiments and data collection.

31:282 Seminar: Psychophysiology - 2 a.h.

31:283 Seminar: Psychopathology - 2 a.h.
Systematic consideration of selected issues in psychopathology.

Systematic review of psychopathology. Prerequisite: consent of instructor. May be repeated.

31:286 Seminar: Clinical Psychology II - 2 a.h.
Systematic treatment of selected topics. Prerequisites: 31:241 and consent of instructor. May be repeated.

31:291 Seminar: Personality Assessment - 2 a.h.
Selected topics related to grouped behavior in human and non-human species.

Systematic consideration of selected issues in psychopharmacology.

31:296 Seminar: Behavioral Therapy - 2 a.h.
Systematic treatment of selected topics in behavioral therapy.

31:297 Seminar: Psychophysiological Approaches - 2 a.h.
Systematic treatment of selected issues in psychological testing and assessment.

31:300 Seminar: College Teaching of Psychology - 2 a.h.
Consideration of purposes, organization and materials for undergraduate college courses in psychology.

31:305 Seminar: Research Principles and Methods - 2 a.h.
Arr. Specialized, advanced research methods and techniques uniquely characteristic of disparate subject matter areas of different instructors. Prerequisite: consent of instructor.

Psychopharmacological work in Psychology Clinic for training and research under supervision of clinical psychology faculty members. Prerequisite: permission of Clinical Training Committee.

Supervised practice in psychological techniques of behavior change. Prerequisite: permission of Clinical Training Committee.

31:403 Practicum in Psychology II - arr.
Supervised practice and clinical experience in the application and evaluation of behavior therapies.

Related Courses in Other Departments

Anatomy:
60:110 Neurobiology and Behavior

Biodiversity:
99:120 The Diversity of Biological Materials

99:120 Aquatic Ecosystems (A, H, A)

Botany:
32:100 Introduction to Botany

Chemistry:
32:100 Introduction to Chemistry

Computer Science:
32:100 Introduction to Computing

Economics:
79:120 Psychology of Reading

Physiology:
79:120 Theory and Techniques in Educational Measurement

79:148, 340, 341 Biological Statistics 1-311

Philosophy:
32:203 Philosophical Problems of the Social Sciences

32:303 Philosophy of Science

Physics:
29:200 Electromagnetism

29:200 Electronics

Psychology and Biophysics:
72:151 Intermediate Psychology

72:212 Medical Psychology

Speech Pathology and Audiology:
3:120 Fundamentals of Lab Instrumentation

3:182 Articulation Disorders

3:194 Advanced Laboratory Instrumentation

3:200 General Experimental Psychophysics

3:201 General Experimental Psychophysics Lab

5:290 Physiology of Hearing

Zoology:
37:101 Principles of Human Genetics

37:102 Fundamental Zoology

Recreation Education


Degree offered: B.A. in "Recreation Education".

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 20 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 Recreation 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 1-2

First aid proficiency

Swimming proficiency

**Area of Concentration (5 s.h.)**

One of the following:

- Recreation and Park Administration
- Recreation Program Leadership and Supervision

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.

- 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 30 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 coursework 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 attempted 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 options are recreation administration, therapeutic or therapeutic recreation. Each requires 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.

21 s.h.
Depending on his or her background in the field, the student may be required to make 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 option emphasizes techniques of 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 36 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 Postdoctoral Assistantships for Doctoral Candidates. This assistance is made available through the Department as well as through special programs in Therapeutic Recreation Service for Handicapped Children.

Courses

Primary for Undergraduates

104/105 Foundations of Recreation 1-2 s.h.
Basic philosophical, historical, scientific foundations and developments in leisure and recreation; functions and settings of organized recreation and survey of organizations and agencies concerned with recreation.

104/105 Recreation Leadership 2 s.h.
Leadership principles and techniques, program activities.

104/105 School Recreation 2 s.h.
School recreation programs for children.

104/105 Recreational Crafts 2 s.h.

104/105 Advanced Recreational Crafts 2 s.h.

104/105 Camp Leadership 2 s.h.

104/105 Library Studies for Camp Counselors: ACA certification program. 2 s.h.

104/105 Orientation to Rehabilitation Settings 2 s.h.
Institutes and community rehabilitation programs programming, psychosocial, educational, physical handicapped, vocational, aging and aging.

104/105 Park and Recreation Agency Orientation 2 s.h.

For Undergraduates and Graduates

104/113 Contemporary Issues in Recreation 2 s.h.
Current issues of recreation and leisure in world society; human and technological values as they relate to leisure. Primarily for non-majors.

104/115 Recreation in Leisure 2 s.h.
Community settings, conferences and written reports related to specific area of interest.

104/111 Internship in Recreation 2 s.h.
Practical field experience arranged to include diverse leadership, program planning and administrative procedures. Prerequisites: 104/129 and permission of instructor.

104/111 Internship in Recreation 2 s.h.

104/112 Internship 1 s.h.
Current issues; respect of all social and cultural standards ensuring in recreation.

104/101 Introduction to Therapeutic Recreation 2 s.h.
Basic concepts of recreation's role in rehabilitation; organization and development of programs. Approaches to understanding behavior of patients and adaptation of activities to basic disability areas.

104/102 Role of Therapeutic Recreation in Rehabilitation 2 s.h.
Role of therapeutic recreation in total institutional and community rehabilitation effort. Specific attention given to cooperative role of therapeutic recreation in relation to total institutional program.

104/129 Recreation Service for The Dull-Minded 2 s.h.

104/129 Administration of Recreation 2 s.h.
Programming, personnel, finance and budget, liability, areas and facilities, other administrative aspects of recreation. Prerequisite: 104/129.

104/129 Administration of Recreation 2 s.h.
Continuation of 104/129 for students specializing in park and recreation administration.

104/131 Social and Community Recreation 2 s.h.
Role of recreation in selecting the home and training of total community involvement in recreation through school, church, volunteer agency, commercial, private, industrial, institutional, military and municipal programs.

104/132 Community Recreation 2 s.h.

104/134 Recreation Program 2 s.h.
Planning and evaluation of recreation programs: organization, programming, utilization of resources, use of facilities and leadership.

104/136 Parks and Recreation Facility Management 2 s.h.
Introduction to recreation and park facility management: personnel, program, planning, design and standards.

104/136 Recreation Program II 2 s.h.

104/139 Principles of Outdoor Recreation 2 s.h.
Administration of natural resources and public land on national, state, local and private levels; responsibilities of recreation personnel 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 budget, areas and facilities, ACA standards, administrative structure, legal aspects, evaluation and other administrative aspects of organized camping recreation.

104/142 Principles of Outdoor Education 2 s.h.
Development and scope of outdoor education, educational significance, philosophy, organization, administration, methodology and case studies; outdoor recreation in interpretive programs in ecology for recreation and adaptive recreation.

104/143 Principles of Environmental Education 2 s.h.
Organization, administration, leadership and programming for school camp; integration into regular curriculum. Prerequisite: 104/139.

104/139 The Role of the College Union 2 s.h.

104/139 Workshop Curriculum Program 2 s.h.
Investigation of problems related to specific area of interest.

104/139 Research Study 2 s.h.
Open to majors and non-majors. May be repeated.

104/139 Field Experience in Recreation 2 s.h.
Design, execution and analysis of research project.

Primary for Graduates

130/301 Problems 2 s.h.
\n130/301 Graduate Projects 2 s.h.

130/301 Graduate Projects 2 s.h.

130/302 Concepts of Recreation and Leisure 2 s.h.
Advanced preparation, historical, scientific foundations and developments in leisure and recreation; leadership principles; and current area and field studies. Designed primarily for graduate level graduate students in undergraduate degree in recreation and/or park management.

130/302 Problems in Therapeutic Recreation 2 s.h.
Designed to prepare therapeutic recreation specialists to meet clients, particularly handicapped individuals' recreation needs, disabilities and handicaps, to develop future and consequence to effect therapeutic recreation activities which contribute to clients' active social and recreational functioning. Prerequisites: graduate status and consent of instructor.

130/302 Problems in Therapeutic Recreation 2 s.h.

130/302 Problems in Therapeutic Recreation 2 s.h.

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Religion

104:232 Seminar: Therapeutic Recreation 3 s.h.
Senior and special project approach to therapeutic recreation is specific setting such as psychiatric, physically handicapped, mentally retarded, correctional, etc; evaluation techniques and procedures unique to activity therapy program.
104:233 Seminar: Camping am.
104:234 Planning and Design of Recreation and Parks Areas and Facilities 3 s.h.
Principles: sociology, standards of design, planning, construction, etc, measure of area 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.
104:239 Research in Recreation Research project development, selection, method and design.
104:310 Recreation College Teaching Internship am.
104:452 Seminar: Thesis II am.
104:420 Advanced Professional Seminar Recreation Parks: Leisure am.
104:421 Advanced Professional Problems Recreation Parks: Lakeside am.
104:422 Advanced Professional Practicum Recreation Parks: Lakeside am.

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 as a way of life 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 field. 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 church and synagogue. 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 interest; provided they take a minimum of four (100-level) courses in Religion, one of which is ordinarily the majors’ seminar (22.166 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

Religious 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 religion. Study is offered in five areas, including 13 fields: Jewish and Christian Scriptures Old Testament New Testament Post-Biblical Judaism History of Christianity Study (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 need not 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 investigation 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 admission 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 later than 12 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 ten semester hours of coursework at the 100-level or above outside the School of Religion with grades of “A” or “B”, six 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 later than three semesters of credit will 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:

1. Jewish and Christianity in the Hellenistic World
2. History of Theology and Religious Thought in the West
3. Contemporary Theology and Religious Thought
4. Studies Relating Theology and Other Academic Disciplines

The student may apply for admission 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 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 working on for that semester.

Depending on the student’s program, the comprehensive examinations 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-assistships (TA); and research-assistships (RA).

The 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 summer support, 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

251 Old Testament Survey
252 Old Testament Survey

253 New Testament Survey
254 New Testament Survey

255 Literature of New Testament in Historical Setting

256 Introduction to the Catholic Church

257 Introduction to the Catholic Church

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Religion

of the Catholic Church; developments since Vatican II. offered alternate fall sessions.

25-30 Religion in Human Culture 4 a.h.
   The paradigm religion major. Cannot be counted for both major and core course requirements. Same as Core 11:35; offered fall semester.

25-30 Religion in Human Culture 4 a.h.
   Combination of 32:35. Same as Core 11:35; offered spring semester.

25-46 Living Religions of the World 3-3 a.h.
   Religious thought and practice in Mediterranean area, Western Asia, North Africa, Europe, ancient Americas. Alternate spring semester.

25-31 Varieties of Mystical Experience 3 a.h.
   Examination of the writings of representative Western mystics, together with theological and psychological interpretations of their experiences; offered alternate fall semesters.

25-72 Religion in American History, 1607-1800 3-3 a.h.
   Development of religious thought and life from the Puritan era to the 19th century. Same as History 1672; offered fall 1976.

25-72 Religion in American History, 1800-2000-Prerequisite 3-3 a.h.
   Development of religious thought and life from the Civil War to "natural theology." Same as History 1673; may be taken in sequence. Offered fall 1977.

25-79 Theologies of Liberation 3 a.h.
   A study of the interaction between several liberation movements and religion, and the resulting change in the understanding of the person and function of religious; offered spring 1977.

25-89 Religion and war until today for Peace 3-3 a.h.
   Attempts to use war and violence, and strategies for peaceful religious traditions; offered alternate spring semesters.

25-87 Jews and Judaism 2 a.h.
   The history of the Jews and their synagogues of belief from the biblical beginning to the present day; offered spring 1979.

For Undergraduates and Graduates

25-100 God and man in the Hebrew Bible 3-3 a.h.
   God and man; God and nature; creation; sex and reproduction in the Hebrew Bible; offered spring 1976.

25-101 Biblical Archaeology 3 a.h.
   Contributions of archaeological research to understanding historical and cultural backgrounds of biblical period; offered spring 1978.

25-102 Introduction to Biblical Literature 3 a.h.
   Offered fall 1976.

25-103 Jewish Mysticism 3 a.h.
   Offered fall 1979.

25-104 Jewish Philosophy 3 a.h.

25-105 The Synagogue Group 3 a.h.
   Interpretation of the first three Gospels, with reference to the other two. 1977-78: Matthew.

25-107 Paul 3 a.h.
   Aspects of Pauline theology in historical context; offered 1977-78.

25-108 Christian Ethics 3-3 a.h.
   Specific issues of Christian ethics and survey of leading ethical thinkers, according to discipline and dynamics of Christian theology. Offered alternate fall semesters.

25-109 History of Christian Ethics 3-3 a.h.

25-110 Problems of Christian Ethics 3-3 a.h.
   Major topics as viewed by Christian ethicists, applications to problems of marriage, divorce, social relations, war, and peace. Offered 1978-79.

25-111 Biblical Hebrew I 3 a.h.

25-112 Biblical Hebrew II 3 a.h.

25-113 Readings in the Hebrew Bible 3 a.h.

25-114 Biblical Aramaic 3 a.h.

25-115 The World of the Old Testament 3 a.h.
   Themes of life and death, heroes and heroines of Old Testament; focus on periods of transition and religious and moral traditions in Near East and Israelite in light of their historical setting and impact on contemporary culture and society. Offered fall 1977.

25-116 Readings in Intertestamental Jewish Texts 3 a.h.
   Reading and interpretation of intertestamental literature. Offered spring 1977.

25-117 History of Theology I: Patriarchal Era 3 a.h.
   From and of New Testament period to end of 5th century; offered spring 1977.

25-118 History of Theology II: Scholasticism and Reformation 3 a.h.
   Scholastic theology; their role in the development of Luther and Calvin and to Church of Tiber. Offered spring 1977.

25-120 Protestant Faith 3 a.h.
   Focus on various denominations; recent studies in major religious denominations in current Protestant teaching. Offered spring 1977.

25-121 Theologies of Luther 3 a.h.
   Analysis of religious thought of 16th-century reformer. Offered fall 1976.

25-122 Religion and History of Ancient Israel I 3 a.h.
   Study of social religious, historical developments in ancient Israel (600 B.C.) reflected in selected historical, biblical, prophetic, poetic texts of the Old Testament; offered fall 1976.

25-123 Religion and History of Ancient Israel II 3 a.h.
   Study of social religious developments in ancient Israel (500-50 B.C.) reflected in selected historical, poetic, wisdom, and apocalyptic texts of the Old Testament; offered spring 1977.

25-124 Prophecy in Biblical Israel 3 a.h.
   Literary, historical, and theological analysis of the prophetic movement in ancient Israel and its impact upon today; offered 1977-78.

25-125 Theology of the Old Testament 3 a.h.
   Old, mid, and late, as advanced by Old Testament thought; offered spring 1977.

25-126 Theological Questions I 3 a.h.
   Treatment of basic questions of religious thought such as the meaning of "God," concepts of the divine, and phenomena of deification and idolatry. Offered fall 1977.

25-127 Theological Questions II 3 a.h.
   Offered Spring 1977.

25-128 Choral Music and Controlling Values 3 a.h.
   Study of major musical problems (e.g., social injustice, economic underdevelopment, environmental decay); their relation to the values of individuals and society. Offered fall semester.

25-129 History of Christianity to 1500 3 a.h.
   History of Christian Church from its origin through its development in the Mediterranean literary culture. Offered fall 1976.

25-130 History of Christianity, 1500-1900 3 a.h.
   History of Christian Church from its origin through its development in the Mediterranean literary culture. Offered fall 1976.

25-131 History of Christianity, 1500-1900 3 a.h.
   History of Christian Church from its origin through its development in the Mediterranean literary culture. Offered fall 1976.

25-132 Christian Marriage 3 a.h.
   Religious dimensions of sexuality, marriage, and family life from perspective of the Christians; Christian ethics and contemporary developments; offered alternate spring semesters.

25-133 19th- and 20th-Century Catholic Theology 3 a.h.
   Principal developments in Catholic thought from 1860 to present period; offered alternate spring semesters.

25-134 Recent Developments in Catholic Theology 3 a.h.
   Principal themes in Catholic theology; offered alternate spring semesters.

25-135 Religious Thought of Moses Mendelssohn 3-3 a.h.
   A study of selected portions of his Guide to the Perplexed; offered fall 1978.

25-136 Values in Contemporary Culture 3 a.h.
   Principal themes in contemporary culture; offered alternate spring semesters.

25-137 Theological Thought of Moses Mendelssohn 3-3 a.h.
   A study of selected portions of his Guide to the Perplexed; offered fall 1978.

25-138 Medieval Jewish life 3 a.h.
   Social, economic, and intellectual history of the Jews in the Middle Ages; offered spring 1978.

25-139 Judaism in Southeast Asia 3-3 a.h.
   Judaism in India, Burma, and Ceylon: history, doctrine, practices, and modern expressions. Same as Aise Asian Languages and Literatures 39:1154; offered alternate fall semesters.

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sophomore years, provides instruction in the fundamentals of leadership and management, with emphasis on leadership development. Enrollment in the Basic Course involves no service obligation. Students demonstrating officer potential are selected for the Advanced Course, taken over the junior and senior years and including advanced leadership and management training, instruction in the theory and dynamics of the military team, and the development of students' abilities to think creatively and to write and speak effectively.

Before the junior year, air force cadets attend four field training sessions offered at bases across the country. Airway cadets attend a six-weeks advance camp at Fort Lewis, Washington, between the junior and senior years. Entry into the Advanced Course is competitive, and entails a commitment to serve three years as an army officer or four years as an air force officer. Commissioned officers who volunteer for flight training or other service schools may receive an additional service obligation. All ROTC scholar
ship cadets accept a four-year commitment. Students who have not taken the Basic Course may qualify for the Advanced Course by attending a six-week basic summer camp. Priority for summer camp assignments is given by the army to community college students and by the air force to students majoring in scientific and technically-oriented subjects.

Certain service veterans may be eligible for immediate entry into the Advanced Course. Students who have had military instruction elsewhere may receive partial credit for comparable ROTC coursework at Iowa. All students with prior military experience should contact the appropriate department to gain ROTC credit toward a commission.

Although the full ROTC programs vary in length from four years, they can be completed in two, three, or three and a half years, with departmental approval.

Graduating students in five- or six-year academic programs leading to baccalaureate degrees or the master's degree may expect ROTC and delay reporting for active military duty until they have completed their degree work. Students can complete professional education in medicine, dentistry or law after completing ROTC work, and go on active duty as captains.

Special Programs

The Pershing Rifles, the college's proud cadet corps, is one of the largest and most active in the nation. The members of the cadet corps are the life blood of the ROTC program. They work with the Adjutant General's Corps to support ROTC operations on campus. The Pershing Rifles are dedicated to the promotion of ROTC and the enhancement of the ROTC program's reputation on campus and in the community.

Special Facilities

The Department of Military Science uses several areas north of Iowa City for practical field problems. It uses a variety of military equipment, such as helicopters and FM radios, in the practical leadership exercises and in support of the Pershing Rifles. Cadets visit Rock Island Arsenal and Camp Dodge, near Des Moines, to observe army operations and review equipment. Junior-year cadets also use the Camp Dodge leadership reaction course, orienteering course and rappelling facilities.

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

ROTC scholarships, providing tuition, books, laboratory fees and a $500 per month tax-free subsistence allowance, are available to high-school seniors, ROTC cadets and qualified two-year program applicants. All cadets in the Advanced Course receive a $1,500 per month tax-free subsistence allowance. Cadets are supplied with books for University classes taught by military faculty and uniform forms for training exercises. A $500 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

23A:11 Aerospace Military 100 1 s.h.
Introduction to aerospace, the world of flight; history of the airplane; introduction to national and international air power; history of aerospace; employment of special-purpose forces.
23A:12 Aerospace Military 200 1 s.h.
Continuation of 23A:11.
23A:31 Aerospace Military 300 1 s.h.
Strategic analysis of air power from the days of Confucius to Vietnam; including development of air power doctrine, influence of technology on air power, use of air power in military and non-military operations.
23A:32 Aerospace Military 400 1 s.h.
Continuation of 23A:31.
23A:88 Aerospace Military Studies; Flight instruction 2 s.h.
Flight instruction, flight operation, navigation, meteorology. Required for qualified APO/RRTC cadets; open to other students with consent of instructor.
23A:89 Leadership Laboratory 0 s.h.
Opportunity for cadets to acquire self-confidence, develop leadership and management skills, and learn the intricacies of leadership through practical application in a military environment.
23A:90 Leadership Studies 2 s.h.
Leadership studies review of international security strategies and the role of leadership in international relations.
23A:91 Leadership Studies 3 s.h.
Leadership studies review of international security strategies and the role of leadership in international relations.

Military Science

23D:10 The Military Science 1 s.h.
Introduction to the structure and role of the United States Army.
23D:11 Introduction to Leadership 1 s.h.
Basic leadership concepts, method of instruction, uses of map for map reading, military navigation and military operations.
23D:12 American Military 1 s.h.
Study of American military history and development of society.
23D:13 American Military History 1 s.h.
A study of American military history and development of society.
23D:15 American Military History 1 s.h.
Study of American military history and development of society.
23D:16 American Military History 1 s.h.
Study of American military history and development of society.
Russian

Bachelor of Arts Program

Students who major in Russian must meet the general requirements for a degree in Liberal Arts and be at least 26 semester hours of credit in advanced Russian courses:

41:111-112 Intermediate Composition and Conversation 8 h.
41:113 Advanced Composition and Conversation 3 h.
41:171-172 Readings in Representative Russian Literature 6 h.
41:191 Russian Civilization 3 h.

Two of the following:
41:151 Russian Literature in Translation (1800-1860) 3 h.
41:152 Russian Literature in Translation (1860-1917) 3 h.
41:158 Solzhenitsyn 2 h.
41:181 Soviet Literature in Translation 3 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-struction in Business Russian may be arranged with the consent of 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 seminar 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 Lingeling 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 literature, though 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
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 Master 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 have completed the equivalent of the undergraduate major in Russian. Deficiencies in previous training may be removed 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 Proseminar, 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. Ordinary teaching assistantships are not awarded to first-year students, although exceptions are sometimes made on the basis of advanced language skills. Applications are considered only from 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 language 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 monograph 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 Language Laboratory provides facilities for language 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 electronic classroom, a soundproof workroom and a library of tape and disc recordings are also available.

Courses
For Undergraduates and Graduates
41:195 Elementary Russian 4 s.h.
41:196 Elementary Russian
Prerequisite: 41:101 or equivalent.
41:202 Russian for Reading 3 s.h.
Emphasis on reading scientific and technical Russian material. For students, especially those majoring in sciences, who need primarily to develop reading ability for research purposes.
41:204 Russian for Reading
Prerequisite: 41:202 or equivalent.
41:309 Second-Year Russian
Students second-year course recommended for students satisfying their foreign language requirement and desiring further training in active use of the language. Prerequisite: 41:202 or equivalent.
41:310 Second-Year Russian
Prerequisite: 41:205 or equivalent.
41:4 Special Readings
Prerequisite: 16 semester hours of language instruction.
41:509 Intensive Conversation
Prerequisite: 41:106 or equivalent.
41:510 Intensive Conversation
Prerequisite: 41:106 or equivalent.
41:511 Intermediate Composition and Conversation
Prerequisite: 41:106 or equivalent.
41:512 Intermediate Composition and Conversation
Prerequisite: 41:106 or equivalent.
41:519 Advanced Composition and Conversation
Prerequisite: 41:106 or equivalent.
41:514 Advanced Composition and Conversation
Prerequisite: 41:106 or equivalent.
41:520 Methods of Russian
Prerequisite: 41:106 or equivalent.
41:527 Phonetics and Pronunciation
Prerequisite: 41:106 or equivalent.
41:521 Russian Literature in Translation (1800-1898)
Conducted in English, Same as School of Letters 108:121.
41:522 Russian Literature in Translation (1899-1917)
Conducted in English, Same as School of Letters 108:122.
41:588 Tolstoy and Dostoevsky
Conducted in English, Same as School of Letters 108:125.
41:588 Schiller/Hoffmann
Conducted in English.
41:589 Modern Russian Poetry in Translation
Conducted in English, Same as School of Letters 108:129.
41:591 Russian Literature: Russian Literature
Conducted in Russian, Prerequisite: 41:112 or equivalent.
41:735 Readings in Russian Literature
Conducted in Russian. Continuation of 41:171, but may be taken as independent unit.
Prerequisite: 41:112 or equivalent.
41:819 Soviet Literature in Translation
Conducted in English, Same as School of Letters 108:181.
41:856 Russian Culture
Conducted in English, Same as School of Letters 108:194.
41:891 Russian Civilization
Conducted in English.
41:920 Honors
May be repeated to a maximum of eight semester hours. Prerequisite: consent of Department.
Science Education

Primary for Graduates
41:241 19th-Century Russian Literature 2 sh.
41:252 Old Russian Literature 2 sh.
41:211 19th-Century Russian Literature 3 sh.
41:212 20th-Century Russian Literature 3 sh.
Continuation of 41:211 may be taken as independent unit.
41:218 Russian Poetry 3 sh.
41:221 Soviet Literature 3 sh.
41:208 Problems in Research Methods 15 sh.
41:223 Seminars: Tolstoy and Dostoevsky 3 sh.
41:233 Seminars: Pushkin 3 sh.
41:261 History of the Russian Language 3 sh.
41:260 Old Church Slavonic 3 sh.
41:275 Special Work 1 sh.
41:310 History Thesis 1 sh.

Science Education

Heads: Robert E.ayer
Degrees conferred: M.A.T., M.S., Ed.D., Ph.D.

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 educa-
tion with a concentration in science is recommended for elemen-
tary majors with interest in science as a primary field. Special programs for high school students are administered by the De-
partment, including environmental studies, Secondary Student Training Programs, 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 special certification for graduate students who have completed bachelor's degrees without fulling 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 educa-
tion program science in the University of Iowa. In addition, the normal sequence of education courses totals 20 to 28 additional hours of credit. No degree objective is implied, although it is possible to receive a master's degree in science. 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 desire 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 means 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 not a research degree and is not intended as preparation for future 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., biology, physical science or earth science.

The M.S. with Thesis
This degree is appropriate for candidates who plan to continue for the special degree at the Ph.D. It features a thesis which can emphasize a problem in science education. If the 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 26 hours in two fields of science.

The M.S. for Science Supervisors
Since the need of 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, there are fewer electives required for this program since special super-curricular courses and experiences are required. (Problems remain in Iowa for special endorsement and certifica-
tion as a supervisor without meeting all requirements for endorse-
ment 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. Witz
Educational Center Directors: Robert Jackson (Glasgow); Larry McCar (Cedar Rapids); A. Louise Miley (Des Moines); J. Douglas Moyer (Quin City)


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 groups of student goals—employment in the areas of social service open to persons with the B.A. degree (e.g., aspects of public welfare, 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.

30:1

The following courses are required for the major:

Introduction to American Politics 4 s.h.

or

30:100 The American Political System 4 s.h.

31:1

Elementary Psychology 4 s.h.

or

31:3 General Psychology 4 s.h.

34:1

Introduction to Sociology: Principles Economics 4 s.h. or 68:1, 68:2, 68:7, or 68:100

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 3 s.h.

42:182 Social Work Processes 3 s.h.

42:193 Field Experience 7 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 a 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 treatment 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 administrative processes, planning, supervision, consultation and organizational development. Students examine operational processes, the internalization of organizations in the community, evaluating
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 advisable.

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 semster. A part-time student is one who plans to complete the M.S.W. program in six semesters or more. An individualized program may be advanced, 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 required, with a reasonable distribution of courses in the sciences and humanities.

The applicant's personal statement will be reviewed and evaluated. 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 applicant's place of employment.

Courses
Primary for Undergraduates
421 Helping Individuals and Families 3 s.h.
Introduction to basic models, processes, and client issues. May be repeated for credit if coursework is at a higher level. This course is intended for preprofessional and other students without formal social work training. Prerequisite: none.

4212 The Field of Social Work 3-4 s.h.
Social welfare as a social institution; historical development; meaning of social work practice; profession of social work; same as Sociology 34-102.

4216 Social Work Practice 3 s.h.
Practicum of social work service used by social workers with individuals, groups, and communities; advanced communication skills; emphasis upon integration of theory and practice. Prerequisites: 42102, 42131, 42141; consent of instructor.

42191 Individual Study 1-3 s.h.
Enrollment of student's interest and other direction of faculty member. May be repeated. Prerequisite: 42199.

42199 Honors in Social Work 1-3 s.h.
Supervised Individual research. Prerequisites: Honors Program. May be repeated.

42199 Field Experience 1-3 s.h.
Practicum experience in social welfare agencies and organizations; requires a minimum of 380 hours in agency participation for 3 s.h. units. Prerequisites: 42102, 42131, 42141; consent of instructor. Exclusions with consent of instructor.

42199 Senior Seminar 3-6 s.h.
Selected social welfare problems, issues, innovations and trends.

For Graduates and Undergraduates
(Note: Courses below with numbers followed by asterisks are required in the M.S.W. Program.)

42111 Legal Foundations of Social Welfare 3 s.h.

42111 Social Work Education for both the graduate and undergraduate programs.
45254 Social Work Practice: Selected Aspects II
45255 Social Welfare Policy: Selected Aspects II
45256 Social Welfare Policy: Selected Aspects III
45257 Social Welfare Policy: Selected Aspects IV
45258 Project in Social Work Research
45259 Applied Management Seminar
45260 Advanced Social Work Research
45261 Practicum in Social Work I
45262 Practicum in Social Work II
45263 Practicum in Social Work III
45264 Practicum in Social Work IV
45265 Urban Growth in Developing Countries
45266 Advanced Management Lab
45267 Individual Study

Sociology
Chairperson: Ronald L. Aaron
Address of main office: 40-237, Sociology 43, 240, one of the following three courses: CMA 4-237, CMA 4-238, CMA 4-239, Sociology 43, 240, one of the following three courses: CMA 4-237, CMA 4-238, CMA 4-239.

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 may 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 research and training in sociology. Undergraduate students majoring in sociology should plan their programs in joint consultation with a sociology adviser 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, or social sciences are advised to seek the Bachelor of Science degree. Both programs require 26 semester hours of coursework in sociology, including 34:1 Introduction to Sociology Principles, 34:2 Introduction to Sociology Problems, 34:10:1 Theory, Research, and Statistics, and 12 hours of electives. The two-semester sequence, theory, and statistics sequences 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 Logics of Social Science, 36:103 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: CMA 4-25, CMA 4-27, Quantitative Methods I, and/or CMA 4-28 Elementary Statistics; or complete both 225:16 Introduction to Programming with PL/I and 225:17 Introduction to Programming with PL/I. Students with exceptionally strong high school mathematics backgrounds may substitute the more advanced CMA 4-25, CMA 4-27, Calculus I-II sequence for the first option. All majors are advised to take two 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.

Social Teaching Major
The sociological 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, sociopolitics, economics, geography, political science; and the professional courses in addition to required for teaching certification (23-25 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 34:497 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 32 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 34.215 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's 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 after entering the joint program toward the 90 hours required for the J.D., even though these hours are also counted 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 credit does allow 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 a 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 one major and one minor area chosen from among the areas currently represented on the faculty, such as social psychology, deviance, criminology, family, stratification, organizations, sociology, theory, methods and statistics.

A detailed statement of regulations for graduate study is available upon request. Prospective doctoral candidates should carefully consider the statements.

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 applica-

tion statement 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 tuition 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 Hewlett-Packard 2000E educational computers. 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 social science courses are required to take 34-1, 34-2, 34-10 and 34-11.

34.1 Introduction to Sociology: Methodology

34.2 Introduction to Sociology Problems

34.3 Analysis of selected variables of problematic and deviant behaviors from a sociologi-

34.10 Theory, Research and Statistics

34.11 Microsociology and Social Change

34.13 Social Problems

34.14 Social Policy

34.15 Social Control

34.16 SocialMovements and Social Movements

34.17 Social Change and Social Movements

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34.81 Social Movements and SocialMovements
the research process; general issues associated with designing social research; data collection; the role of research design in shaping research data and questions; and reading and interpreting research findings. Prerequisites: 34-1, 34-2 and a declared major in sociology.

34-1 Theory, Research and Ratiocination
Crosslisted: 34-10. Prerequisites: 34-10. 3 a.h.

34-12 Logic of Social Science
Exploration of selected topics in contemporary philosophy of social science. Prerequisites: 34-10, 34-11.

34-15 Individual Study
Supervised reading to study special areas or subsection of sociology in which the student has had a basic course.

34-16 Honors Research Project
The honors candidate selects a special research project, under his or her honors chairperson, who often consults with the honors committee. May be repeated.

Advanced Courses
Social Theory
34-190 The Development of Modern Social Theory
3 a.h.
Considers the development of modern social theory. Recommended for sociology majors and students completing the requirements of general education.

34-201 History of Sociological Theory
3 a.h.
Examination of ideas of early 19th and 20th-century social thinkers. Taught by Minor, Water, Dorfman, Sisel and Moore. Prerequisite: graduate standing or consent of instructor.

34-202 Contemporary Sociological Theory
3 a.h.
Currents in sociological thought and theory. Prerequisite: 34-201 or 34-202 or consent of instructor. May be repeated.

34-204 Sociology of Knowledge
3 a.h.
Role of ideas, belief systems, and social life. Prerequisites: 34-201 and 34-202 or consent of instructor. May be repeated.

34-206 Sociological Methodology
3 a.h.
Survey of social science methodology, the development of new techniques, and developments in sociological theory and methodology. Taught by Minor. Prerequisites: graduate standing or consent of instructor.

34-302 Social Problems: Contemporary Social Theory
3 a.h.
Comprehensive and evaluative reading in contemporary sociological thought. Prerequisites: graduate standing and consent of instructor.

34-304 Social Research: General System Theory
3 a.h.
Survey of theories of general systems theory. Taught by Minor and/or Water. Prerequisites: 34-301 or equivalent. Consent of instructor.

Qualitative and Methods of Research
34-113 Societal Simulations and Educational Computing
3 a.h.
Introduces students to the use of computer simulations and related hardware in teaching and learning. Prerequisite: consent of instructor. May be repeated.

34-211 Nonparametric Statistics in Social Research
3 a.h.
Studies nonparametric statistics in social research. Taught by Minor. Prerequisites: 34-214 or equivalent.

34-212 Mathematical Sociology
3 a.h.
Mathematics as a tool for sociological research. Taught by Minor. Prerequisites: graduate standing and consent of instructor.

34-214 Survey Statistics and Data Analysis
3 a.h.
Prerequisite: 34-213. Consent of instructor. Considers the use of statistical concepts in behavioral science using the computer laboratory to teach concepts of descriptive statistics and hypothesis testing. Taught by Minor. Prerequisites: 34-214 and 34-215.

34-215 Sampling, Measurement and Observation Techniques
3 a.h.
Prerequisite: 34-214. Assumes familiarity with research design techniques, data collection and statistical techniques.

34-310 Intermediate Statistics and Data Analysis
3 a.h.
Prerequisite: 34-214. Intermediate level. Taught by Minor. Prerequisites: 34-214 and 34-215 or equivalent.

34-311 Statistical Programs and Data Analysis
3 a.h.
Prerequisite: 34-214. Taught by Minor. Prerequisites: 34-214 and 34-215 or equivalent.

34-312 Theory and Research Design
3 a.h.
Prerequisites: 34-214 and 34-215 or equivalent. Taught by Minor. Prerequisites: 34-214 and 34-215 or equivalent.

34-315 Advanced Statistics and Data Analysis
3 a.h.
Taught by Minor. Prerequisites: advanced graduate standing and consent of instructor. May be repeated.

34-316 Qualitative Research Methods and Data Analysis
3 a.h.
Prerequisite: 34-214. Taught by Minor. Prerequisites: advanced graduate standing and consent of instructor. May be repeated.

Social Psychology
34-420 Principles of Social Psychology
3 a.h.
Basic concepts and principles of social psychology: personality, interpersonal and group processes.

34-421 Social Psychology of Consumer Behavior
3 a.h.
Social psychological perspective of consumer behavior and social aspects of the marketplace.

34-422 Social Psychology of Mental Health
3 a.h.
Psychological, social, and interpersonal analysis of the social psychology of mental health and mental illness. Taught by Minor. Prerequisites: 34-410 or consent of instructor.

34-423 Media Communication
3 a.h.
Focus on communication (intake, intake and output) and how these forms are mediated with social structures and processes. Prerequisites: 34-420.

34-425 Small-Group Analysis
3 a.h.
Talvez: 34-214. Taught by Minor. Prerequisites: graduate standing and consent of instructor. May be repeated.

34-426 Collective Behavior
3 a.h.

34-427 Social Forces and Interaction
3 a.h.
Social forces and interaction: class, race, sex, and/or the interactionist perspective. Taught by Minor. Prerequisites: 34-420 or consent of instructor. May be repeated.

34-428 Current Interpersonal Conflict
3 a.h.
Talvez: 34-214. Taught by Minor. Prerequisites: 34-420 or consent of instructor. May be repeated.

34-701 Development and Control of Aggression
3 a.h.
Study of the social factors contributing to the development of interpersonal aggression, the circumstances occurring in aggression and the social requirements for reducing aggression. Prerequisites: 34-10 or 34-11.

34-702 Interpersonal Conflict
3 a.h.
Study of social psychological theory and research in the study of interpersonal conflict and aggression. Prerequisites: 34-10 or 34-11.

34-703 Social Psychology of Alcohol Use and Community Problems
3 a.h.
Basic concepts and alcohol and chemical dependency analyzed in terms of the 社会ological process and the recovery process.

34-704 Modern Approaches to Social Psychology
3 a.h.
Basic concepts and research methodologies in social psychology. Taught by Minor. Prerequisites: 34-410.

34-711 Contemporary Approaches to Social Psychology
3 a.h.
Basic and modern approaches to social psychological theory and methodology. Taught by Minor. Prerequisites: 34-700 and 34-701 or equivalent. May be repeated.

34-712 Consumer Psychology
3 a.h.
Basic and advanced approaches to social psychological theory and methodology. Taught by Minor. Prerequisites: 34-700 and 34-701 or equivalent. May be repeated.
34.180 American Society 3.0 h. 
American society in comparative perspective: its structure and function; comparative approach to study of large, complex, modern societies; institutional intermediaries; definitions in terms of social control, institutional differentiation as an effect of social change. Prerequisite: 34.1. Same as American Civilization 45.180.

34.184 Organizations 3.0 h. 
Approaches to the study of occupational, social, religious, and educational organizations; innovative of organizational components with each other, the participants and the environment. Prerequisite: 34.1 or consent of instructor.

34.186 Sociological Folklore 3.0 h. 
Work cooperation pattern of recognition; occupation and professional norms; occupational groups and organization; workers and complex organizations; sociology and social organization; work, leisure and alienation. Prerequisite: 34.1.

34.188 Social Inequality 3.0 h. 
Approaches to the study of social inequality; inequality in the United States; results in social inequality; relationships between social class and other social categories. Prerequisite: 34.1.

34.189 Sociology of Religion 3.0 h. 
Comparative study of religious beliefs and practices; basis in social organization; social consequences in liberal societies. Prerequisite: 34.1. Same as Sociology 32.188.

34.192 Stratification: Theory and Measurement 3.0 h. 
Principles and empirical approaches to social class and other forms of social inequality.

34.191 Sociology of Popular Culture 2.0 h. 
Analysis of the social processes, roles and participation of popular culture: relations of popular culture to major social institutions; popular culture in various historical and social contexts and cultures. Prerequisite: 34.1. Same as American Civilization 43.181.

34.193 Sociology of Art 2.0 h. 
Form and invention; the social role of art; organization of the arts in industrial society; the arts in the university. Prerequisite: 34.1.

34.192 Seminar: Sociology of Religion 2.0 h. 
Background of current sociological theories of religion; critical examination of contemporary social, political and theological interest. Prerequisite: 34.1. Same as Sociology 33.192.

34.194 Seminar: Medical Sociology 2.0 h. 
Medical sociological techniques and issues in the study of social stratification. Prerequisite: 34.1 or consent of instructor.

34.196 Seminar: Social Stratification 2.0 h. 
Theoretical and methodological issues in social stratification. Prerequisite: 34.1 or consent of instructor.

34.198 Seminar: Medical Sociology 2.0 h. 
The sociology of health and health care; sociology of medical care; medical sociology; sociology of medical education. Prerequisite: graduate standing and consent of instructor.

34.203 Seminar: Prejudice and Intergroup Relations 2.0 h. 
Research and theory on prejudice and intergroup behavior. Prerequisite: 34.1 or consent of instructor. May be repeated.

34.207 Seminar: Demographic Methodology 2.0 h. 
Exploration of selected problems in demographic theory. Prerequisite: graduate standing and consent of instructor.

34.209 Seminar: Occupational Structure and Social Mobility 2.0 h. 
Examines the interrelated systems of work, careers and social mobility; redefinition of structure, social classes, stratification; modern social mobility; marriage and stratification; status choice; social structures, stratification and mobility. Prerequisite: graduate standing and consent of instructor.

34.220 Complex Organizations 2.0 h. 
An introduction to the study of organizations for graduate students. Major topics: productivity, efficiency, innovation, coordination, conformity and satisfaction. Prerequisite: graduate standing and consent of instructor.

34.222 Methods of Organizational Research 2.0 h. 
Selected topics in research of organizational research. Prerequisite: graduate standing or consent of instructor.

34.224 Seminar: Generalization and Change 2.0 h. 
Theory, research and methodology of problems of social change: various models of social change, economic growth, cultural transmission, bureaucratic fission, cultural organizations and evolutionary organizations. Same as Sociology 73.192.

Community and Population

34.170 Population and Society 3.0 h. 
Factors and processes determining population size, composition and distribution; relations of population to social organization and human welfare; recent trends in population; socio-cultural problems. Prerequisite: 34.1.

34.172 The Urban Community 3.0 h. 
Processes of urbanization and change of urban life; nature of urban social relations; organization of city life; urban sociological patterns and demographic analysis; regional influences of metropolitan centers. Prerequisite: 34.1.

34.174 World Population Problems 3.0 h. 
World population trends and processes; world crises and consequences by country and world areas; cultural contrasts in migration patterns and family planning. Prerequisite: 34.1.

34.175 Introduction to Demography 3.0 h. 
Principles and techniques of understanding the demographic characteristics of recently emerging human populations; emphasis on both natural and spatial demography.

34.179 Problems of Community Organization 3.0 h. 
Formal organizations, informal groups, voluntary associations and the relation to general community life. Prerequisite: 34.1.

34.179 Seminar: Human Behavior 3.0 h. 
Pedagogical views of human society and selected empirical applications; implications for the study of social organization. Prerequisite: graduate standing.

34.275 Seminar: Community Research 3.0 h. 
Development of forms and design for a community study relevant to project plans of the Iowa Urban Community Research Center. Prerequisite: consent of instructor.

34.275 Seminar: Urbanization 3.0 h. 
Problems growing out of the increase in urban population and the relative decline in rural population. emphasis on Iowa and the Midwest Region. Prerequisites: graduate standing and consent of instructor. Same as Sociology 70.275, Political Science 30.275, Social Work 42.275, Urban and Regional Planning 180.275.

Independent Reading and Research Projects

34.380 Independent Study 3.0 h. 
34.386 Research 3.0 h. 
34.388 Thesis 3.0 h.

Spanish and Portuguese

Department chairman: George E. Mills

Fellows: Mary Lois Davis, Daniel John Dyer-Crosby, Omar Fernandez, Felix Garcia-Robles, Joseph Fonsich, profesor ayudante Edward de Cens, B. W. Kings, assistant professors George De Martinez, Wataru Minabe, E. Thomas Dougherty, Enrique Fuentes-Borja, Carlos Jaffa, assistant professors Ana Pineda, Maria Soto, John T. Woman, associate professor Patricia Williams

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. Students 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.
<table>
<thead>
<tr>
<th>Latin American Literature</th>
<th>Program II: Emphasis on Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>35:237 Modernism</td>
<td>History of the Spanish Language and Medieval Literature</td>
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<tr>
<td></td>
<td>35:251 Medieval Spanish Literature I 5 s.h.</td>
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<tr>
<td></td>
<td>35:253-254 Historical Spanish Grammar I-II 4 s.h.</td>
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<tr>
<td></td>
<td>Comparative Linguistics 3 s.h.</td>
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<tr>
<td>Plus three fields (nine hours) taken from two or three of the following areas:</td>
<td>Golden Age Literature</td>
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<td>35:225 Drawn of the Golden Age 3 s.h.</td>
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<tr>
<td>Area A</td>
<td>35:226 Cervantes—Don Quixote 3 s.h.</td>
</tr>
<tr>
<td>35:236 Contemporary Spanish American Novel 3 s.h.</td>
<td>Modern Peninsular Literature</td>
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<tr>
<td>35:236 Novels of the Mexican Revolution 3 s.h.</td>
<td>One of the Following:</td>
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<tr>
<td>35:236 Contemporary Cuban Narrative 3 s.h.</td>
<td>35:220 19th Century Spanish Novel 3 s.h.</td>
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<td></td>
<td>35:221 19th Century Spanish Poetry and Drama 3 s.h.</td>
</tr>
<tr>
<td>Area B</td>
<td>35:223 20th Century Spanish Poetry 3 s.h.</td>
</tr>
<tr>
<td>35:243 Spanish American Colonial Literature 3 s.h.</td>
<td>35:224 20th Century Spanish Novel 3 s.h.</td>
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<tr>
<td>35:243 Spanish American Essayists and Thinkers 3 s.h.</td>
<td>35:228 20th Century Spanish Essay 3 s.h.</td>
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<tr>
<td>35:242 Spanish American Literature of the 19th Century 3 s.h.</td>
<td>35:241 20th Century Spanish Drama 3 s.h.</td>
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<tr>
<td>Area C</td>
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<tr>
<td>35:257 Modernism</td>
<td></td>
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<tr>
<td>35:244 Spanish American Poetry of the 20th Century 3 s.h.</td>
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<tr>
<td>Area D</td>
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<tr>
<td>35:251 Spanish American Drama 3 s.h.</td>
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<td>35:245 Spanish American Short Story 3 s.h.</td>
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<td>35:257 Chilean Short Story 3 s.h.</td>
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<tr>
<td>Area E</td>
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<tr>
<td>A course in Brazilian literature 3 s.h.</td>
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<tr>
<td>Contemporary Language and Stylistics</td>
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<tr>
<td>35:208-209 Graduate Spanish Language I-II 8 s.h.</td>
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<tr>
<td>35:210 Studies in Style 3 s.h.</td>
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<tr>
<td>35:217 Literary Theory and Explication of Texts 2 s.h.</td>
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<tr>
<td>Professional Training</td>
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<tr>
<td>35:211 Research Methods and Bibliography 2 s.h.</td>
<td>Contemporary Language and Stylistics</td>
</tr>
<tr>
<td>35:233 Seminar in College Teaching 1 s.h.</td>
<td>35:157 Spanish Phonology 3 s.h.</td>
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<tr>
<td>Seminars</td>
<td>35:208-209 Graduate Spanish Language I-II 8 s.h.</td>
</tr>
<tr>
<td>Two seminars at The University of Iowa (300 level) 4 s.h.</td>
<td>Additional Graduate Language (excluding seminars below)</td>
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<td>35:210 Studies in Style 3 s.h.</td>
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<tr>
<td></td>
<td>35:217 Literary Theory and Explication of Texts 2 s.h.</td>
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<tr>
<td>Specialization</td>
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<tr>
<td>Students in the Hispanic Literature program (Program I) 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 minor/program, as initial employment opportunities are enhanced by having a wide spread in areas of preparation.</td>
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<tr>
<td>Professional Training</td>
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<tr>
<td>35:211 Research Methods and Bibliography 2 s.h.</td>
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<tr>
<td>35:233 Seminar in Teaching 1 s.h.</td>
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</tr>
<tr>
<td>Seminars</td>
<td>Two seminars in language at The University of Iowa (300 level) 4 s.h.</td>
</tr>
</tbody>
</table>
Spanish and Portuguese

Ph.D. Comprehensive Examinations

The doctoral comprehensive examinations assure a general knowledge of Spanish peninsular and Spanish American literatures and their three broad fields, such as a literary genre or a historical literary period, chosen by the candidate and representing both of the following groups:

- Spanish Language and Stylistics
- Medieval Literature
- Golden Age Literature
- Modern Literature of Spain
- Spanish-American Literature
- Latin-American Literature

Candidates following the program with emphasis on language 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 the doctoral 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 radio, tape recorders, record players, soundproof recording rooms, two drill rooms with 50 dual-channel tape recorders providing a simultaneous master duplicator and student record, an electronic classroom, a soundproof work room, 16mm 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" ("Hablan en Español"), sponsored by the department, is broadcast weekly on University radio station WRUU.

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 less than two years of high school study in Spanish will be placed in a freshman or sophomore semester class. It is to be background is less than two years of high school Spanish, a beginning Spanish course will be taken in the first semester. Prospective entering students should consult a departmental advisor. Students holding a two-year advanced placement may take the placement test. Transfer students who have taken college Spanish at other institutions will be placed according to courses previously completed.

A student may take, except with the approval of the chairman, side credit in any elementary course if he or she has already completed a higher-level course in which the elementary course or its equivalent is a prerequisite.

- 34:53 Elementary Spanish II
- 34:54: Contemporary Latin American Narrative
- 35:11 Intermediate Spanish
- 35:12 Intermediate Spanish
- 35:15 Spanish Conversation: Sophomore Level
- 35:20:21 Spanish Pronunciation
- 35:22: Contemporary Spanish American Fiction
- 35:23 Reading Spanish
- 35:25:26:27 Special Work
- 35:28:29 Advanced: Spanish Literature

For Undergraduates and Graduates

- 35:101 Peninsular and Golden Age Literature
- 35:102 Modern Spanish Literature
- 35:116: Contemporary Spanish American Fiction
- 35:118 Peninsular and Golden Age Literature
- 35:119 Spanish Literature and Painting
- 35:120:121 Spanish American Literature and Painting
- 35:123:124 Spanish American Literature and Painting
- 35:125:126 Spanish American Literature and Painting
- 35:127:128 Spanish American Literature and Painting
- 35:129:130 Spanish American Literature and Painting

Spanish and Portuguese

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Speech and Dramatic Art, Broadcasting and Film

Department administrators: Samuel L. Becker
Degree offered: B.A., M.L., M.F.A., Ph.D.

The Department is concerned with communication as a means of personal expression and development; with communication as the major tool by which people adjust themselves to their society and their society to themselves; with communication as the essential process for the operation of any society, especially the highly technological society, with artistic as well as functional communication. These concerns with communication are manifested in two ways: faculty attempts and attempts of the Department's students to better understand communication processes, and joint efforts to help improve abilities to communicate effectively, whether as actors or directors, creativity leaders, supervisors, participants in a group, film-makers, broadcasters, designers, playwrights, teachers, authors, or parents.
The Department has six major divisions, whose emphases and distinctive courses are described below under the headings "Interdivisional Courses," "Speech Education," "Dramatic Art," "Rhetorical Societies," "Communication Research" and "Broadcasting and Film."

General Departmental Requirements

Bachelor of Arts

Regardless of his or her area of specialization, a student seeking a Bachelor of Arts degree in the Department must earn:
A minimum of 24 semester hours in the Department, including at least one course in dramatic art division, at least one course in the broadcasting and film division and at least one course in the rhetorical studies or communication research division.

A minimum of eight semester hours of production/performance courses and a minimum of eight semester hours of nonproduction/performance courses in the Department.

Requirements for the Master of Arts

A minimum of 30 semester hours including 36-300 Introduction to Research or its equivalent.

A research thesis, 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 spring 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 and at least 15 semester hours completed in the College of Education's graduate program in higher education.

Successful completion of a six-hour report. A course in dramatic art assigned teaching position. Satisfactory performance on a nine-hour written examination over areas of learning agreed upon by the student and his or her graduate committee.

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 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 advisor 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 spring term, February 30 for student wishing to maximize probability of admission. Admission decisions are based upon a comprehensive consideration of the applicant's undergraduate achievements, letters of reference and other evidence of scholarly potential or achievement. Graduate Record Examination scores and samples of one's scholarly work are desirable for this latter purpose.
Interdivisional Courses

26:10 Workshop in Speech and Dramatic Art 8.0 s.h.
Methods of analysis, literary research, communication theory, and related forensic areas; practical in voice laboratory, drama, and creative writing. Open to graduate students in English,History, and Philosophy. Special consent. Must be a high school junior to receive credit.

28:50 Voice Improvement for Speakers and Actors 3.0 s.h.
Practical instruction in voice and speech for public speakers, teachers, lecturers, broadcasters, and actors. Includes study of principles of voice development, conservation and projection, and introduction to the phonetics, prosody, and phonemes of standard American English.

28:67 Oral Interpretation of Literature 3.0 s.h.
Introduction to principles and practice of reading literary prose and poetry in auditions: analysis, interpretation, evaluation; recommended for students in elementary education and English.

28:99 Honors in Speech and Dramatic Art 3.0 s.h.
Open to seniors and graduate students by permission.

28:181 Readers’ Theater 2.0 s.h.
Critical analysis and oral presentation of many complex works of fiction, nonfiction, poetry and drama. Periods and genres of literature studied vary by semester.

28:200 Introduction to Research 1.0 s.h.
Enrollment of all new graduate students in speech and dramatic art except those enrolled for degree in Master of Fine Arts; problems of selecting and developing research problems; study and application of representative methods and techniques of research; literature, discussions, readings, papers and reports; guidance in research.

28:285 Master’s Thesis I 3.0 s.h.

28:285 Master’s Thesis II 3.0 s.h.

28:285 Master’s Thesis III 3.0 s.h.

Speech Education

Professor: In charge: Douglas T. Fink
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 33 semester hours in the Department of Speech and Dramatic Art. The following should be included in one’s plan of study:

26:55 Voice Improvement for Speakers and Actors 3.0 s.h.
26:57 Oral Interpretation of Literature 3.0 s.h.
26:107 Directed Speech Activities (spring semester) 3.0 s.h.

At least two courses from the Division of Dramatic Art:

36:30 Introduction to Broadcasting and Film 3.0 s.h.
36:57 Introduction to Theatrical Design 3.0 s.h.
36:118 Stagecraft I 3.0 s.h.

One of the following is recommended:

36:120 Directing I 3.0 s.h.

A minimum of two courses in the Division of Broadcasti

Film. These are recommended:

36:15 Introduction to Broadcasting and Film Production 3.0 s.h.
36:25 Mass Media and Mass Society 3.0 s.h.
36:50 American Broadcasting 3.0 s.h.

36:51 Survey of Film 3.0 s.h.

A minimum of two courses in the Division of Rhetorical Studies. These are recommended:

36:50 Interpersonal Communication 3.0 s.h.

Electives in speech and dramatic art:

Nonproduction or nonperformance courses 6.0 s.h.

In addition to the secondary education T.E.P. foundations courses, students seeking teacher certification in speech and dramatic art must also register for:

75:160 Methods: Speech (or 36:160) (fall semester) 3.0 s.h.
75:191-192 Observation and Practice in the Secondary School 1.0 s.h.
75:187 Seminar: Curriculum and Student Teaching 1.0 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 02:01 Language and Society and 30:01 Introduction to American Politics. Majors are strongly advised to complete a minor certification in English or other instructional 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.

Minor Certification in Speech and Dramatic Art

Completion of twenty semester hours in speech and dramatic art 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 political speaking courses); 2) theatre and dramatic art (acting, stagecraft, technical theatre and oral interpretation); 3) broadcasting and film.

Courses

36:178 Workshop in Group Oral Interpretation 3.0 s.h.
36:184 Workshop in Directing and Mass Communication and Media in the Secondary Schools 3.0 s.h.
36:185 Workshop in Interpersonal Communication 3.0 s.h.
36:187 Workshop in Communication Studies and Research 3.0 s.h.
36:189 Workshop in Children’s Literature and Creative Dramatics 3.0 s.h.

36:107 Directed Speech Activities 3.0 s.h.

36:107 Directed Speech Activities 3.0 s.h.

36:107 Methods: Speech 3.0 s.h.

36:107 Methods: Speech 3.0 s.h.
Communication Research

Professor in charge: John W. Rowes
Degree 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 experiences 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 Department of Mathematics and Statistics, and take 26.203 Psychological Problems of the Social Sciences in the Department of Philosophy. Work is advanced statistics and communication seminars. Some students also take training in research tools required of students in this department. Opportunities for varied research in addition to that required for the 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

26.178 Workshop in Teaching Dramatics, Forensics and Speech Art. Methods, media, social and cultural background of teaching and supervision of students in courses and extra-curricular activities; opportunities for observation, discussion and practice in teaching verbal and speech development, dramatic art, discussion and debate, radio and television, and individual speech, dramatic and literary events. Same as Section 79:178.

26.200 Colloquium Teaching Freshmen Rhetoric. Literature and methods involved in teaching composition, public speaking and reading. Same in English 105-110.

26.201 Current Issues: Degree and Tenure in Speech and Dramatic Art Education 2-4 a.h.

Communication Research 2-4 a.h.

Contemporary Communication Education 2-4 a.h.

Course is designed to increase the teaching competence of college teachers. Basic learning theories and student competencies will be explored. Students will devise college level curricula including course justification, content, scope, philosophy, instructional goals and behavioral objectives, and suitable texts for teacher and student evaluation. Emphasis in this course is on the "basic course" in speech. Students will prepare a pedagogical research topic of their choice.

Communication Research

Professor in charge: John W. Rowes
Degree offered: M.A., Ph.D.

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Rhetorical Studies

Professor in charge: Douglas Brimberg
Degree offered: M.A., Ph.D.

Bachelor of Arts

This major is recommended for students preparing for active participation in public affairs or teaching. It is intended to serve as an effective focus for a sound liberal education.

Requirements include at least 24 and no more than 36 semester hours in the Department. The program aims at a reasonable balance between doing and knowing—between courses that emphasize informed and guided improvement in oral performance, and courses that are theoretical, critical and historical study of the principles and practice of public address and the interrelations of public address and theatre, film, radio, television and other arts of communication. The student concentrating in public address also is expected to complete a substantial number of courses in other departments in the College of Liberal Arts.

Programs for majors include:

36.53 Voice Improvement for Speakers and Actors

One of the following:

36R:30 Communicating in Public

36R:31 Group Communication

36R:32 Intercultural Communication

36:57 Oral Interpretation of Literature

36:151 Reader's Theatre

One of the following:

36R:124 Theory and Practice of Argument

36R:125 Theory and Practice of Persuasion

36R:126 Interview and Conference Methods
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, 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 the all public speaking skills before audiences outside the classroom. Students may choose to work in debate, creative, interpretative reading or expository 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 be: Introductions 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 usual sections of this department’s description.

Courses
36:25 Principles of Speech Communication 3 a.h.
Instructional and practical practice in fundamentals of oral communication; qualitative University requirement is for speech students; not offered courses. 36:25, 36:27, 36:30 or equivalent.
36:28 Communicating in Public 3 a.h.
Intermediate course in public speaking, preparing previous coursework (36:25, 36:27, 36:30 or equivalent).
Renaissance and Modern Rhetoric 2-4 a.h.

Theoretical and historical aspects of rhetoric, 1400 - 1800. Same as English 327.

Contemporary Rhetoric 2-4 a.h.

Theoretical and ethical foundations, 1800 to present. Same as English 327.

Modes of Discourse 2-4 a.h.

Cultural examination of major modes of discourse; their characteristics, conditions and development.

The Rhetoric of Revolution and Reform 2-4 a.h.

Case studies of the rhetoric generated by revolutionary and reform movements in Britain and America; 1750 to the present.

Studying Politics: Political Communication 2-4 a.h.

Analytical and critical examination of political and communication theories and their usefulness in explaining the operation of and written political discourses.

Seminar: Rhetoric and Public Discourse 2-4 a.h.

Guided investigation of selected theorists and practitioners; subject varies by semester.

Seminar: Aristocratic 2-4 a.h.

Internship examination of Aristotle's Rhetoric and related texts; survey of relevant scholarship.

Seminar: Argument 2-4 a.h.

Studies in the philosophy of argument, with special attention to the work of major writers in Ethics, logic, epistemology and rhetoric.

Seminar: Speech Art 2-4 a.h.

Studies in the analysis of speech acts, with special attention to the work of Austin and Searle.

Seminar: Communication, Culture and the Popular Arts 2-4 a.h.

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

Bachelor of Arts

This program is intended for the student who seeks an understanding of the broadcasting and film media and their relationship to the largest 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 elect 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 as 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 housed in the University Television Center and in the studio of University radio station, WSUI. The large television studio in the center is equipped with three monochrome standard broadcast cameras; teleprompter, studio lock, production 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 production room with reel-to-reel 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 "poop" 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 Arriflex and four Arrilex 16mm cameras; five Sony cassette, two Sony reel-to-reels, and three Nagra battery-operated audio recorders; and two Lowell 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 "Flatbods," and a sync-mysten interlock viewing area.

The University maintains a complete motion picture laboratory and all 16mm processing and printing is done on campus. There is a stereo-to-sync-program-insert three-channel mixing facility. A Moviola library reader is available for students who may wish to study a particular film in detail.

Courses

Speech and Dramatic Art, Broadcasting and Film

Speech and Communication

3 a.h.

Introduction to Speech and Communication. Emphasis on relationships between speech and behavior, with special attention to the personal, social and cultural aspects of communication. Prerequisite: English 220.

Broadcasting

3 a.h.

Introduction to Broadcasting and Film Production. For the student with no previous experience, the course is presented with a short video production projects, two show super-8 films and two audio production projects. The emphasis is on gaining an understanding of the elements and effectiveness of production. Equipment and training is provided.

American Broadcasting

3 a.h.

Overview of broadcast media in communication forces; lectures and class discussions explore history of television and radio; emphasis on programming, industry structure and audience composition.

Survey of Film

3 a.h.

Introduction to motion picture history, theory and criticism, including study of relationships of film to other art forms; film screenings included.

Selective Films

3 a.h.

Assignment of varied kinds of films, including fiction, documentary and experimental. Through frequent short writing assignments, students learn to discuss films, analyze and criticise. Same as English 285.

Mass Media and Media Sociology

3 a.h.

Special section of undergraduates with some content for graduate students who are not majors in Speech and Dramatic Art. Prerequisite: Speech and Drama 285.

Introduction to Broadcasting and Film

3 a.h.

Special section of undergraduates with some content for graduate students who are not majors in Speech and Dramatic Art.

Radio Production

3 a.h.

Special section of undergraduates with some content for graduate students who are not majors in Speech and Dramatic Art.

Radio Workshop

3 a.h.

Independent creative work for students who have completed and demonstrated outstanding talent in perceivable Speech 235.

Film for Televislon

3 a.h.

Operation and use of the 16mm film camera, editing, lighting and shooting of short films for broadcast. Prerequisites: Speech 235.

Television Production I

3 a.h.

Theoretical and practical aspects of television production; responsibilities of writer.
producer, director and other production roles; transaction practice. Perspective: 300–305.

300-114 Television Production II 3 a.h.
Preparation and development of television programs; emphasis on experimental formats and experiences in use of sound, music, rhythmic, stylized and practice in television; major stages of production experience. Perspective: 300-113.

300-115 Television Workshop 3 a.h.
Individual creative work for students who have completed and demonstrated outstanding talent in production, 300-114. Perspective: 300-03 and consent of instructor.

300-123 Film Production II 3 a.h.
Advanced production practice, script writing, editing, camera and recording tech- niques, development of student work; emphasis on theoretical and aesthetic aspects. Perspective: 300-121 and consent of instructor.

300-133 Film Workshop 3 a.h.
Individual creative work for students who have shown outstanding talent in 300-123. Perspective: consent of instructor.

300-134 New Directions in Video 3 a.h.
Examination of the theoretical underpinnings and impact of recent developments in video technology; experimental production/programming the expansion of video into innovative uses. Perspective: 300-133.

300-135 Technology of Film Production 3 a.h.
A hands-on introduction to the technical basis for editing, chemistry, film stocks, cameras design, sound recording, editing and lab practice of film production. Perspective: 300-137.

300-137 Television in Society 3 a.h.
The role of the media in affecting social, cultural and political values. A consideration of the factors which determine the form and function of programs. In-class screening of representative television programs. Perspective: 300-139 and 300-139 Film Writing.

300-139 Broadcasting and Film Writing 3 a.h.
Exposure to visualization and scriptwriting; original and adaptation; developing and editing: documentary: directory, characterization and structure in feature films. Perspective: broadcasting or film courses and advanced work in writing.

300-140 The Criticism of Broadcasting 3 a.h.
A study of the broadcast media from the perspective of the critic; an examination of the philosophical, theoretical and program design elements as they affect the Brodcasting the creative process. Perspective: 300-139.

300-140 History of Broadcasting 3 a.h.
An overview of broadcast media; attention focused toward understanding content and perspective on 20th-century America provided by radio and television broadcasting. Perspective: 300-140.

300-141 Regulation of Broadcasting 3 a.h.
Study of legal and societal systems which regulate content and business practices of broadcasting media, (radio, television, cable, Internet) on FCC policies and local broadcast court cases. Perspective: 300-139.

300-142 Controversy in Broadcasting 3 a.h.
Study of major issues of coming; courses and FCC which affect broadcasting; topical issues, perspective: 300-140.

300-143 Social Impact of Mass Communication 3 a.h.
An examination of the social impact of the mass media in society and their effects. Discussion of major philosophical issues involving the use and control of communication. Perspective: 300-140.

300-144 Film and Public Policy 3 a.h.
Preparation for public policy based on historical research of case problems of officials and societal momentum. Government investigation of violence and obscenity; censorship; reform, production of films, and policy for public and role of film, and other areas. Perspective: 300-143.

300-145 Cable Broadcast Communications 3 a.h.
Examination of the development of cable telecommunications in the United States with emphasis on regulatory policy issues relating to the development of cable infrastructure. Perspective: 300-144.

300-146 Documentary and Public Issue Broadcasting 3 a.h.
Focus on functions, devices, and effects of photojournalism, videojournalism, and television; emphasis on historical development of documentary television forms and the role in a multipolaristic society, social meaning of programs that impact on the subject. Perspective: 300-145.

300-147 Broadcasting and Education 3 a.h.
Overview of the development and current status of broadcasting in education. Examination of research and evaluation of educational programs in production, presentation and utilization of radio and television in formal instruction and general education. Perspective: 300-146.

300-148 Comparative Systems of Broadcasting 3 a.h.
A study of broadcasting systems in various countries, their history and development, with an emphasis on the regulatory processes and programming structures of each. Perspective: 300-147.

300-149 Public Broadcasting 3 a.h.
Investigation of the roles, organizations and problems of noncommercial broadcasting by inter- estive and radio, especially since in recognition by federal legislation of an educational program service to commercial broadcasting. Perspective: 300-148.

300-149 Broadcast Management 3 a.h.
An examination of management techniques in radio and television operations, including: strategic planning, production, personnel, sales, internal relations, program integration and community responsibility. Perspective: 300-149.

300-144 Documentary Film 3 a.h.
Historical and cultural survey of documentary as research, experimental and projective form; screening experimental work of Frederic Hatton, Newsreel and mass media trends. Perspective: 300-144.

300-145 Film and Marketing 3 a.h.
Research films and the motion marketing relationships between producers of images, texture of images and structure of images; often based on particular types of films, those played for social or political purposes, for business, etc. Perspective: 300-145.

300-146 The American Film 3 a.h.
Examination of films made during the time of American influence on Europe. Perspective: Chouest, Kajara, Venus, Lauch, Patto, Women, Krippner, Craps; the program film, camera, production film, the production environment, including casts, actors, actresses, and actors. Perspective: 300-146.

300-148 Short Film History 3 a.h.

300-149 French Cinema 1920-1960 3 a.h.
The history of film in French culture. Analysis of films and description of influence of filmmakers in politics, religion, etc. Perspective: 300-149 and 300-148.

300-150 National Cinema 3 a.h.
Focus change: the history of the cinema and its relation to the culture of either England, Italy, Japan, Germany or Russia. Same as Letters 108-193 and Japanese 300-146.

300-150 Film Criticism 3 a.h.
Study of the purpose, presuppositions and ends of film criticism; major theoretical positions related to various areas of content to film criticism; theoretical discussion reflected in writings of students in the course. Perspective: 300-149.

300-151 Theory of Film 3 a.h.
Introduction to major theoretical positions: Vertinsky and Andre. Pressure; Cineology; schoological; aesthetical; semiotic; phenomenological. Perspective: 300-150.

300-152 Film Script Analysis 3 a.h.
Same as 300-151.

300-153 Literature and the Film 3 a.h.
Same as American Civilization 45-75, English 431, 437, Letters 108-173.

300-154 American Film and Popular Art Forms 3 a.h.
Same as 300-153.

300-155 Art and Movement Movements 3 a.h.

300-155 Narrative and Nonfiction Art Forms 3 a.h.
Same as English 417 and French 9-105.

300-156 American Film History 3 a.h.
The course examines films in terms of various approaches (e.g., the social, political, etc. of the New Wave) and associated with (e.g., Hitchcock). Topic will differ from semester to semester. May be taken for credit more than once. Same as Letters 108-180 and American 431-155.

300-156 Research Methods in Mass Communication 3 a.h.
Critical approach to the study of mass communication processes, with emphasis on secondary studies of analysis. Practical experience of such studies. Perspectives: 300-154.

300-211 Influences in Film Production 3 a.h.
A study of the influences of production practices of the film industry on the present day and the future of film production. Perspective: 300-211.

300-227 Communication Processes and Media 3 a.h.
Investigation of research and theory which explain the production in which information flows into our environment and into society, creation of the "world view" and the effects and influence of that treated. Perspective: 300-227.
Dramatic Art

Director: Lewis Gaff

Degrees 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 personal and professional 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 graduate department 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 Bar. 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, criticism or drama or theatre is required.

Master of Fine Arts

Students demonstrate exceptional ability in playwrighting, 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 must apply 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 II is a large, flexible space in which class projects, highly experimental productions and readers' theatre productions are performed with limited scenery before small audiences. Studio I, with'permanent systems for light and sound control, offers directing and design an opportunity to stage its 200 seats and define the playing area, thus permitting experimentation with several possible relationships between the actors and audience. The E.C. Mathis Theatre is an excellently equipped proscenium theatre which offers seating for almost 500 persons. The division also performs in the recently completed Flancher Auditorium. Seating 2,680, this facility is used by the numerous professional touring shows which perform in Iowa City, and hosts 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 scenic 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 Theatres to the fully computerized lighting controls and the five-channel sound system used in Flancher Auditorium.

Courses

For Undergraduates

MTT-9 Shakespeare

Sears as English 69.

MTT-12 Shakespeare

Same as English 97.

MTT-61 Drama in Western Culture

6 ah.

MTT-62 Drama in Western Culture

6 ah.

MTT-75 Modern Drama

Same as English 75.

MTT-76 Selected Plays

5 ah.

MTT-82 Southern Feast

Same as School of Law 104.3 and German 126.

MTT-101 Acting I

3 ah.

100.100 American Film and American Culture

See a selected group of American films as they reflect, stage or illustrate relevant aspects of American culture. Same as American Civilization 15:500.

360.8 American Cinema: National Cinema

3-4 ah.

Focus change; emphasis on great British, Italian, Swedish, Japanese, or Latin American films.

360.8-616 Seminar: Film Aesthetics and Criticism

3-4 ah.

360.8-618 Seminar: Film Theory

3-4 ah.

360.8-616 Seminar: Film History

3-4 ah.

360.8-616 Seminar: Broadcast Photography

3-4 ah.

Focus change; emphasis on history of broadcasting, political communication, the broadcasting, broadcasting criticism, broadcasting regulations, cable communication, and public broadcasting.

360.8-626 Seminar: Mass Communication Research

3-4 ah.

Focus change; critical review of theories and studies on various aspects of mass communication, including communication and political processes, audience behavior and methods for studying mass communication processes; individual research projects.

For Undergraduates and Graduates

MTT-100 American Film Laboratory

av.

Individual assignments in various aspects of dramatic production.

MTT-101 Acting I

3 ah.

Readings, improvisation and some study developing actor's psychological techniques.
exercises to enhance concentration of attention, observation, imagination and sensory
imagination and visualisation.

SIT1124 Articulation I 3 a.h.
Readings and exercises focusing upon techniques of articulation, gesture and
communication. Prerequisite: SIT101.

SIT1125 Movement 2 a.h.
Basic dance technique for movement analysis. Development of awareness and control of body in
space and movement of both inside and outside the body. Involves open-ended exploration.

SIT1126 Acting Workshop 2-3 a.h.
Advanced acting workshop. Prerequisite: SIT1124 and audition.

SIT1127 Voice for the Actor 1-2 a.h.
Voice development for stage. Open only to students enrolled in SIT1128.

SIT1128 Movement for the Actor 1-2 a.h.
Movement training for the stage. Open only to students enrolled in SIT1127.

SIT1129 Period Styles in Movement 2 a.h.
Classical period to 18th century. Emphasis on dance and choreographic technique.

SIT1130 Rendering 1 a.h.
Enhanced technical skills in drawing, historical costume presentation and
perspective for the stage.

SIT1131 Rendering II 1 a.h.
Analysis of styles for theatre designers and technicians. Technical drawing for
scenery design, costume, lighting and property design. Prerequisite: SIT1130.

SIT1132 Introduction to Theoretical Design 2 a.h.
Introduction to the design process and design for the theatre. Fundamental design
concepts and their applications. Prerequisite: SIT1131 and 120 hours of academic
study in the visual arts.

SIT1133 Production Design I 2-3 a.h.
Projects in scenic, costume, lighting and property design. Prerequisite: SIT1132.
Same as Art 1130.

SIT1134 Production Design II 2-3 a.h.
Continuation of SIT1133. Same as Art 1131.

SIT1135 Studio for Theoretical Design 2-3 a.h.
Individual assignments in design development for scenic areas of design. Study in design
principles and techniques for scenic rendering and costume design. Media comprehension. Prerequisite: SIT1133 and 120 hours of academic study. May be repeated. Same as Art 1131.

SIT1136 Drafting of Scenery 3 a.h.
Drifting techniques and conventions for theatre designers and technicians.

SIT1137 Equipment Materials and Procedures for Preparation of theatrical scenery.

SIT1138 Stage Makeup II 2-3 a.h.
Continuation of SIT1137.

SIT1139 Stage Makeup III 2-3 a.h.
Advanced work in stage makeup, including stages makeup, and special effects.

SIT1140 Stage Makeup IV 2-3 a.h.
Design and control methods for light on stage.

SIT1141 Scene Construction in the Theatre 2-3 a.h.
Design, construction and maintenance of electrical systems for control of sound, light and video.

SIT1142 Environmental Design I 3 a.h.
Prerequisite: permission of instructor. Same as Art 1132.

SIT1143 Interior Design II 3 a.h.
Prerequisite: permission of instructor. Same as Art 1140.

SIT1144 Introduction to Art Managers 2 a.h.
Study and organization of production design.

SIT1145 Stage Management 1 a.h.
Design and execution of stage makeup.

SIT1146 Stage Management II 2 a.h.
Basic elements of scenery technology.

SIT1147 Stage Management III 2 a.h.
Lectures on some painting materials, shop layout and techniques of applying scenic
paint. Covers scenic painting and stage management.

SIT1148 Advanced Scene Painting 2-3 a.h.
Design, construction and maintenance of scenic painting and stage management.

SIT1149 Properties and Special Effects 2-3 a.h.
Preparation and assembly of properties for the theatre. Development of control of stage properties.

SIT1150 Stage Costumes: Patterns 2-3 a.h.
Selection and use of patterns for stage costumes.

SIT1151 Stage Costumes: Drafting and Draping 2-3 a.h.
Preparation of stage costumes with particular reference to period detail.
Advanced Degree

Master of Arts Degree

The M.A. program in speech pathology and audiology may be a professional program to prepare the student for immediate placement in clinical service positions, or it may be a general program of graduate study leading to additional study 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 presupposed 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.

Requiring 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 examination 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 of Speech Pathology and Audiology.

Required means for the professional M.A. degree:

A. All Majors

*3:116  Neuropsychology of Speech and Language 3 s.h.
*3:150  Foundations of Clinical Management 3 s.h.
*3:177  Articulation and Phonetics 3 s.h.
*3:185  Hearing Loss and Audiology 4 s.h.
3:214  Child's Language Disorders 3 s.h.
3:244  Rehabilitative Audiology 3 s.h.
7C:599  Counseling for Related Professions 2-3 s.h.

Two advanced seminars or thesis 4 s.h.

*Equivalent undergraduate course will be accepted as meeting requirements.
Additional semester hours of practicum registration sufficient to meet supervised, direct clinical experience requirements for Certificate of Clinical Competence of the American Speech and Hearing Association and to provide broad supervised practicum experience.

B. Speech Pathology, General Clinical Emphasis

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<tr>
<th>Courses listed under A and:</th>
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<tbody>
<tr>
<td>3:183 Slurring</td>
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<tr>
<td>3:212 Voice Disorders</td>
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<tr>
<td>3:235 Neuropathologies of Speech and Language</td>
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<td>3:237 Cleft Palate</td>
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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

<table>
<thead>
<tr>
<th>Courses listed under A and B, and:</th>
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<tbody>
<tr>
<td>7E:104 Remedial Methods in Speech and Hearing</td>
</tr>
<tr>
<td>7E:192 Laboratory Practice in Elementary School</td>
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</tbody>
</table>

Practicum, research and elective courses to bring total to at least 38 semester hours.

D. Audiology Major, General Clinical Emphasis

<table>
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<th>Courses listed under A and:</th>
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<tbody>
<tr>
<td>3:120 Fundamentals of Laboratory Instrumentation</td>
</tr>
<tr>
<td>3:121 Audiology Instrumentation Laboratory</td>
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<tr>
<td>3:140 Manual Communication I</td>
</tr>
<tr>
<td>3:240 Introduction to Diagnostic Audiology</td>
</tr>
<tr>
<td>3:261 Advanced Audiology</td>
</tr>
<tr>
<td>3:345 Audiologic Procedures for Special Populations</td>
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</table>

Practicum, research and elective courses to bring total to at least 38 semester hours.

E. Audiology Major, School Hearing Clinician

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<tr>
<th>Courses listed under A and D, and:</th>
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<tbody>
<tr>
<td>7E:104 Remedial Methods in Speech and Hearing</td>
</tr>
<tr>
<td>7E:192 Laboratory Practice in Elementary Schools</td>
</tr>
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</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 | 2-3 s.h. |
Exceptional Children | 3 s.h. |
Remedial Methods in Speech and Hearing | 2 s.h. |
Laboratory Practice in Elementary School | 3-5 s.h. |
Education Electives | 11 s.h. |

General Program

The M.A. program for the student planning to continue to the Ph.D. degree is individually planned in consultation with the student's advisor. It usually includes a substantial portion of the courses previously listed for the professional M.A. program. Certain of the courses, however, may be omitted, deferred or replaced by other courses when appropriate for the student's plan of study leading to the Ph.D. degree. Students planning to continue to the Ph.D. degree are required to present a thesis as part of the M.A. program and successfully complete a final oral examination.

Doctor of Philosophy Degree

The Ph.D. program provides for comprehensive training for the scholar and researcher in speech and hearing processes and their disorders and also for more intensive specialization in particular clinical problems in which the student may have special interest. The Ph.D. program is usually planned with specialization in speech pathology, audiology, speech science or hearing science. Within each area the candidate and advisor may provide for special emphasis through suitable selection of advanced seminars and research areas. Most students will find that their special interests lie in one or more of the four listed areas. The establishment of prescribed programs for these areas is not intended to circumscribe the graduate curriculum of the Ph.D. candidate who has specified goals or interests which are not adequately met by these programs. Individual programs designed to meet special interests and goals are encouraged, provided only that the student's purposes are closely defined and that he or she presents an adequate plan of study for their accomplishment.

Courses beyond those included in the departmental listings are drawn mainly from the areas of physics, engineering, mathematics, statistics, psychology, neurology, anatomy and psychology.

The nature of the Ph.D. comprehensive examination is determined for each student by a five-member comprehensive examination committee. This committee, in consultation with the student, designs and carries out a plan for comprehensive examination of the student's ability to function independently in a research and/or clinical environment. The examination must include both a written and oral performance. Candidates whose earlier training has not included a master's thesis will not fulfill the comprehensive examination requirement until they have completed a suitable research project and presented a paper summarizing its results. This project is to be of a magnitude appropriate for a master's thesis. It is expected that the comprehensive examination will be completed prior to the end of the student's first calendar year of full-time, post-master's study. The Ph.D. candidate must also successfully complete a dissertation based on original research in the area of specialization.
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
- 3:590 Research Speech Pathology
- 2:591 Research Audiology
  or
- 2:592 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 practicums

C. Audiology
Courses listed under A and:
- 3:254 Psychacoustics
- 3:255 Psychacoustics Laboratory
- 3:256 Physiology of Hearing
  - Seminars in areas of interest
  - Clinical practicums

D. Speech and language science
Courses listed under A and:
- 3:254 Psychacoustics
- 3:255 Psychacoustics Laboratory
  - Seminars in areas of interest
  - Courses in linguistics and psycholinguistics
- Courses in biological and physical sciences and mathematics

E. Hearing science
Courses listed under A and:
- 3:254 Psychacoustics
- 3:255 Psychacoustics 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 Master 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 these 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 six 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 generally are 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. Later 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 session 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 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 ensure 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 audiology. 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 outpatient evaluations and reevaluation programs for speech, hearing and language problems, and a six-week summer resident 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 includes audiometric testing suite, diagnostic and therapy suite, 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, is 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, physiologic and perceptual studies of speech and for audiologic, psychoacoustic and neurophysiologic 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
5116 Introduction to Speech and Hearing Processes and Disorders
3 a.h.
Speech, language and auditory behavior as field of scientific study; description of major types of speech, hearing and language disorders.
3:26 Phonetics of American English
3 a.h.
Concepts and symbols of phonetic transcription; application of International Phonetic Alphabet to description and analysis of American English.
3:27 Honors Seminar
3 a.h.
Readings, reports, preparation of papers and discussion of research problems in speech pathology and audiology. Open only to honors students.
3:28 Honors Thesys
3 a.h.
Preparation of major thesis; conducting research in speech pathology and audiology. Open only to honors students.
5118 Anatomy of Speech and Hearing Mechanisms
3 a.h.
Anatomy of peripheral and central structures of speech and hearing mechanics; sections on general anatomy included.
3:1113 Fundamentals of Speech Science
3 a.h.
Physiologic, acoustical, perceptual characterization of speech; principles and methods for the laboratory study of speech. Prerequisites: 3:1106, 3:1105 or permission of instructor.
5136 Introduction to Hearing Sciences
3 a.h.
Normal auditory process; review of anatomy, acoustics, physiology of the auditory
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 basis of planning activities has now broadened to include social decisions that transcend a variety urban or regional focus, such as health policy and planning, environmental policy and planning, or criminal justice system policy and planning. In addition, within the strictly urban focus, the field now encompasses the planning of the urban management system itself. These newer emphases 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 full recognition of professional status by the American Institute of Planners, and meets 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 membership in social planning. This rating resulted from a poll of both planning academics and practicing planners.

At Iowa, "social planning" is viewed in its broad concept, 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 welfare status usually associated with more service-oriented fields.

Our faculty and students are engaged both in human settlements and social problems, and in applied social science methodologies adapted for professional interventions. In addition, our students are required to take 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 53-semester-hour, four-year 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 parts. The first deals with urban structure and dynamics. It teaches the student the analysis, empirical and judgmental methods employed by practitioners. Required courses are 102:210 Introduction to Analytic Methods, 102:220 Intermediate Analytic Methods, 102:240 Economics for Policy Analysis and
102:206 Planning Methods.

The third curricular part deals with methods for intervention into natural urban systems to attain the more desirable conditions defined by the various analytic techniques. Required courses are 102:207 History and Theory of Planning, 102:239 Collective Decision Making, 102:208 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 curricu- lum. The workshop sequence provides practice in professional analysis and synthesis, in the continual context of professional report writing on urban problem situations. The workshop se- quence parallels and complements the academic training of the first three parts of the curriculum with heavily applied tasks intended to develop judgment about professional situations. Re- quired courses are 102:308 Workshop in Information Systems and Presentation, parallelizing and applying Urban Structure and Dynamics Sequence; 102:301 Laboratory in Issue Analysis, par- allelizing and applying Techniques of Planning Analysis Sequence; and 102:303 Laboratory in Program Design and Evaluation, par- allelizing and applying Intervention Methods Sequence. The re- quired 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 pro- gram. 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 prefer to substitute an economics department graduate course in public finance for the planning program's otherwise required 102:214 Organizational Resource Allocation 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 specializations, 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 major system is that while breadth and specialization (required in the first four parts) are necessary to professional competence in any field of planning, specific subject portions of a narrower kind are very useful for the purposes of the initial professional position and the initial profes- sional direction of personal development.

No thesis is required, 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 in- ternship for 12 weeks, at the student’s discretion, if the student chooses to write an essay discussing and evaluating the internship experience.

Experiential Learning

Faculty and students in the planning and policy development program at Iowas bring 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 pro- fessional experience includes practicing architect, community or- ganizer and race relations specialist, special assistant to state governor, chief regional planner, state planning director, R.A.D. consultant, legislative assistant to the N.Y.C. council, United Nations urban development consultant, counsel to a state armed assistance majority leader, urban renewal director, and city manag- er.

The student contribution to the experiential aspect of the learn- ing community is equally diverse. For example, the 31 students entering in 1975-76 included 6 who had majored in economics, four in political science, three in anthropology, three in architec- ture, 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 1975-76 entering class aggregated a mean undergraduate grade-point average of 3.38, and a mean (com- bined) 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 distin- guished one, or the combined GRE aptitude scores are at least 1300, or there is compelling evidence of distinct leadership quali- ties 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 public health planners leading to the M.A. or M.S. in Planning and the Ph.D. in preventive medicine. The total number of core courses is reduced to three years of coursework by virtue of the joint agreement. A thesis and general examination is ad- ditionally required for completion of the Ph.D. Separate admission to both academic units is required.
Urban Transportation

102.356 Special Problems in Planning 2.8 h.
Advanced problems in urban analysis, regional analysis, urban design and land-use development; research of planning problems of special interest to student with approval of Department. Written report and one presentation required.

102.521 Seminar: Social Planning 3.8 h.
Analysis of social policy issues such as family, education, employment, health care, urban problems. Emphasis placed on philosophical foundations of analysis as well as on methodological elements.

102.523 Planning and Land-Use Controls Seminar 3.8 h.
Examination of traditional zoning controls, flexible controls and market devices. PUD's, state land use planning, critical area controls, growth management, exclusionary zoning, fair housing, environmental impact assessment.

102.525 Seminar on Special Problems 3.8 h.
Opportunity for faculty and students to present seminars on topics of interest as determined by student presentation or by the Department.

102.526 Seminar in American World Planning 3.8 h.
Introductory review of scientific, cultural, political and socioeconomic experiences of major countries in the U.S. with special focus on Native Americans, blacks and Hispanics in the contemporary urban world.

102.527 Seminar: Selected Problems in Social Policy 3.8 h.
Problems in selected areas: alternative, education, health, justice, poverty and welfare. Emphasis on inter-relationships and effective approach from public institutional and private perspectives.

102.529 Collective Decision Making 3.8 h.
A study of decisions made by collectives, for the purpose of making the legislative and institutional framework within which planning proceeds. National, political, and organizational processes of decision making are studied and contrasted.

102.540 Economics for Policy Analysis 3.8 h.
Fundamentals of microeconomic theory applied to problems of planning and policy analysis. Emphasis on price theory, resource allocation, public goods, includes practical in economic laboratories.

102.541 Process and Problems of Development in Latin America 3.8 h.
Background studies in history, geography, political structure, population, health and welfare, followed by processes of current operating programs and planning efforts, economic integration, development plans for specific regions, varying incomes with Latin American experience, faculty from various departments.

102.543 Organizational Policy Analysis 3.8 h.
A study of organizations as the principal entities through which public policy and planning are planned and carried out. Both governmental (central and private) and non-governmental (private and nongovernmental) organizations are analyzed.

102.560 Justice Policy and Planning 1.0 h.
Introduction to Justice Planning: criminal justice system; crime, politics, corrections, juvenile justice, emphasis on policy planning and policy issues.

102.561 Seminar: Urban Policy and Planning 3.8 h.
Survey of problems and techniques in criminal justice planning; evaluation of programs of government and private organizations; emphasis on procedures for design and evaluation of policy experiments.

102.562 Seminar: Social Policy and Planning I 3.8 h.
Evaluation of efficiency and equity of investment in and management policy alternative projects and systems, particularly on international and national projects.

102.563 Seminar: Social Policy and Planning II 3.8 h.
Individual research projects on topics in race relations and land use; examples: industrial development, land rental evaluations, on-rental alternatives, racial abandonment, housing covenants, expansion of mixed income facilities. Prerequisites: 102.260 and 102.350 or consent of instructor.

102.576 Urban Growth in Developing Countries 3.8 h.
Overview of theoretical and practical analysis of problems associated with urbanization and development in the developing nations. Same as Anthropology 115-275, Economics 24-275, Sociology 24-275, Political Science 30-275 and Geography 44-275 (interdepartmental courses).

102.579 International Development Research Project in Linen of Thesis 3.8 h.

102.580 Thesis: Urban and Regional Planning 3.8 h.
Research and analysis of special planning problems selected by student with approval of Department. Development of opportunity for student to apply knowledge obtained in area of specialization.

102.590 Laboratory in Information Systems and Presentation Techniques 3.8 h.
Introduction to basic information systems, graphic and display techniques, and communication in written and oral forms; reviews, outlines, written and oral reports examining practical planning and policy issues.

102.591 Laboratory in Issues Analysis 2.8 h.
Skills analysis, advocacy techniques, and communication skills through a combination of case studies, scenarios, written and oral reports covering practical planning and policy issues.

102.592 Laboratory in Program Design and Evaluation 2.8 h.
Emphasis problems and procedures in the design and evaluation of urban policy experiments, combine case studies, scenarios, written and oral reports.

102.594 Internship in Urban Planning 3.8 h.
Students in the transportation certification program are required to enroll in this course each term for 1-3 hours credit.

Urban Growth in Developing Countries

Program Coordinator: Michael L. McKinley

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 (24-275), Geography (44-275), Political Science (30-275), Social Work (42-275), Sociology (54-275) 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 by 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, statistical, and behavioral elements. It is a multi-disciplinary 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 of transportation investment, transportation management and planning, and distributional equity into a technologically sound analytical framework. With few exceptions, graduates of the program are currently employed in a variety of functions in the transportation field.

Rather than providing a graduate 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 transcript. 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 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 assures the continuity of an interdisciplinary approach to transportation planning.

Each student must take two courses from the selected option and two from any of the other options.

Required Core Courses
102:111 Introduction to Urban Transportation
587:272 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
102:259 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 examined 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 educational experience in areas such as travel behavior, transit systems design, transit finance, and impact evaluation. Urban and regional laboratory available for this learning process (Carroll, Iowa City, Cedar Rapids, Quad Cities and Johnson County) provide an attractive range of smalls 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; most of it is aimed 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 ($600 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 $600 per month.

The financial support indicated above is not intended to cover all potential sources available 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: Marjorie 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, psychological, 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 Civilization
45:002 American Civilization II (American Women Writers)
45:002 American Civilization II (American Women's Autobiographies and Journals)
45:002 American Civilization II (Women in 19th Century Empires)
45:002 American Civilization II (Women in U.S. Reform Movements)
<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>History</th>
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<tr>
<td>45:002</td>
<td>American Civilization II (Black Women Writers)</td>
<td>16:99 Historical Background of Contemporary Issues</td>
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<tr>
<td>45:002</td>
<td>American Civilization II (American Family, New Alternatives)</td>
<td>16:133 European Women: Sex, Society and Culture</td>
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<td>45:112</td>
<td>The Popular Image of Women in America</td>
<td>16:158 Sex, Society and Culture: Traditional Europe</td>
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<td>45:144</td>
<td>Changing Concepts of Women in Literature</td>
<td>16:159 Sex, Society and Culture: Modern Europe</td>
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<tr>
<td>45:145</td>
<td>Women in Literature (Representative British and American Women Writers)</td>
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<td>45:203</td>
<td>Socialization and Self-Concept</td>
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<tr>
<td>Anthropology</td>
<td>Women's Roles: Cross-Cultural Perspective</td>
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<td>113:156</td>
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<tr>
<td>Art</td>
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<td>11:190</td>
<td>Themes in Art History (Women Artists of the 20th Century)</td>
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<tr>
<td>Basic Skills</td>
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<tr>
<td>10:3</td>
<td>Rhetoric (Women's Studies section)</td>
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<tr>
<td>10:43</td>
<td>Physical Education Skills (Self-Defense for Women)</td>
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<td>Education</td>
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<tr>
<td>7C:112</td>
<td>Human Sexuality</td>
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<td>7C:150</td>
<td>Psychological Aspects of Women's Roles</td>
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<tr>
<td>7C:260</td>
<td>Issues and Application in Counseling Women</td>
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<td>7P:140</td>
<td>Sex Role Stereotyping and Socialization in Education</td>
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<td>English</td>
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<tr>
<td>8:114</td>
<td>American Regional Literatures (Southern Women Writers)</td>
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<td>8:124</td>
<td>American Poetry (Autobiographical Mode: Women Poets of the '60's and '70's)</td>
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<tr>
<td>8:125</td>
<td>Modern British and American Poetry (Women Poets)</td>
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<td>8:176</td>
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World Order Studies
Program director: Susan H. Vogus (on leave)
Acting program director: Leaf D. Henry

The existence and quality of life are increasingly threatened by forces over which humanitarians have so far exerted 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 this urgent need, The University of Iowa is offering a new multidisciplinary, 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 predominantly policy-centered 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 values find the World Order 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 major in a traditional major degree program; and (3) students who seek 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 concerns: 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 preserve 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, multidisciplinary 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
*000:100 Global Interdependence and Human Survival: An Introduction to World Order Studies
016:178 The United States in World Affairs: 1900 to Present
030:013 Introduction to World Politics
030:110 Introduction to International Law
Same as 91:285.
030:181 The United Nations
064:165 The Changing World

Global Interdisciplinary and Human Survival: An Introduction to World Order Studies
016:178 The United States in World Affairs: 1900 to Present
030:013 Introduction to World Politics
030:110 Introduction to International Law
Same as 91:285.
030:181 The United Nations
064:165 The Changing World
War Prevention
00:168 Politics of War and Peace
06:1:23 The Global Political Economy of the Military-Industrial Complex
00:162 The Literature of Peace and War
01:169 War and Society
03:164 Problems of International Relations: Military Affairs
00:164 Problems of International Relations: Arms Control
03:286 Religion and the Quest for Peace

Human Rights
03:169 Human Rights
10:236 American Minorities
11:147 Comparing Cultures: Imperialism, Neo-Colonialism and World Order
Same as 113:148, 113:149
113:181 Race, Ethnicity and International Relations

Economic Welfare
03:0:07 Introduction to Global Poverty
03:1:72 Topics in International Business: Multinational Enterprise and Economic Development
06:1:127 Natural Resources in the World Economy: Control and Conflict
06:1:129 Economic Development: Underdeveloped Areas
06:1:166 The Political Economy of Socialism
04:1:51 Social Problems of Underdeveloped Areas
Same as 113:151
04:4:162 Geography of the Third World

Ecological Stability
03:0:12 Introduction to the Global Environment
03:2:100 Plants and Human Affairs
06:1:133 Economic Growth and Environmental Decay
01:1:24 Man and His Physical Environment
Same as 4:25, 29:25
01:1:26 Technology and Man
Same as 4:26
01:2:02 Lectures in Man and His Environment
01:2:125 A Planet in Crisis
Same as 37:125
01:2:177 Native Materials and Man
01:2:183 Principles of Mineral Economics
01:2:184 Economic Geology of Fuels
01:7:040 Nutritional Ecology of Man
03:4:174 World Population Problems
04:3:002 Natural Resources and Mankind
04:4:019 Natural Environmental Issues
04:4:119 Natural Environmental Issues
04:4:123 Geography of Natural Resources
05:1:105 Technology and Society
Same as 43:100, 53:105
05:3:123 Man and His Environment
05:3:152 Environmental Toxicology
05:8:191 Energy in Contemporary Society
Same as 49:191, 91:191

Values Clarification
03:2:131 World Order and Conflict Values
03:2:135 American Political Thought
03:2:110 Problems of Christian Ethics
03:3:101 The Pursuit of Happiness
03:3:121 The Good Society
03:3:152 Values in the Contemporary World
03:3:154 Human Nature and the Impact of Science
Same as 13:154
03:4:156 Sociology of Alternative Life-Styles

Future
04:2:156 Probable World Futures
00:8:163 The Uses of Utopian Literature
03:2:087 Religion and the Quest for Human Destiny: From Eden to 2001
04:2:157 Preferred World Futures

Realization Strategy
07:3:170 Methods: Social Studies
07:3:187 Seminar: Curriculum and Student Teaching
097:140 Problems in Integrating the Teaching of Environmental Science
102:228 Community Organization

Miscellaneous
30:180 Independent Study: Problems in International Law and Policy
Same as 91:678

Recommended Study
Because the World Order Studies Program is designed to meet a variety of interests and needs, students are free to elect as much or as little of the curriculum as they wish. However, students seeking more than limited participation are urged to consider the following three sets of the Program, each of which includes the first course listed above (000:0100), which is introductory to the entire Program:

Use I. Comprises the basic core of the Program: Global Interdependence and Human Survival (000:1000); Introduction to World Politics (30:04:13); World Order and Conflict Values (03:2:131); and Probable World Futures (04:2:156). Intended as a general introduction to world order problems and issues, it therefore provides only a limited overview. If possible, should be supplemented by at least one course listed under the four problem areas comprising the topical focus of the Program.
Most appropriate of these topical courses are those marked by an asterisk (*). Introduction to International Law (302:110, 691:285) and Preferred World Futures (402:157) also recommended.

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 (302:146); Human Rights (302:165); Introduction to Global Poverty (304:799); and Introduction to the Global Environment (434:234). They are intended as a relatively detailed survey of world order problems and issues, but if possible should be supplemented by introductory courses to International Law (302:110, 691:285) and Preferred World Futures (402:157), 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 those of four other courses listed under one of the four problem areas 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 (302:110, 691:285) and Preferred World Futures (402:157), 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 circum-stances. For example, students admitted to Teacher Education Programs of the College of Education may find it sufficient to take only the basic introductory course (302:110) and the courses listed under "Curriculum and Teaching." Nor are the above three uses mutually exclusive or incapable 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.

So also may students specializing in foreign language 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. These are opportunities are 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, business administration, economics, education, engineering, English, geography, history, law, medicine, 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 Studebaker Foundation (Muscatine, Iowa) in cooperation with The College of Liberal Arts and the University of Iowa. The Center is a project of the University of Iowa and is sponsored by The Studebaker Foundation, the institute for World Order (New York City), the State University of Iowa Foundation, and The University of Iowa.

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

Program chairman: Jerry J. Kotter


Degrees offered: B.A., B.S., M.S., Ph.D.; also M.S. in biology jointly with Biology 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. University of Iowa alumni have advanced degree programs in zoology and related research leading to the research, teaching (university, four-year college, community college, secondary and primary school) or health professions (medicine, dentistry, paramedical).

The basic courses offered in the Department serve both in majors and other students planning to enter health-related professions, or fields such as psychology, anthropology and sociology, as well as students in other fields who have a cultural interest in biological science.

Principles of Animal Biology, a one-semester introduction, presents the basic concepts and is ordinarily the first course taken in the Zoology Department. Majors must also take basic courses in a general biological 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 sciences 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:

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<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tr>
<td>8W:10</td>
<td>Expository Writing</td>
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<tr>
<td>22M:16</td>
<td>Calculus for the Biological Sciences</td>
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<td>or 22M:25 Calculus I</td>
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## Principles of Chemistry I, II
6 s.h.

## 6:00
Elementary Chemistry Laboratory
2 s.h.

## 4:112
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.

### 28-29 s.h.

## In the Zoology Department:

### 27:3
Principles of Animal Biology
5 s.h.

### 27:128
Fundamental Genetics
3 s.h.

### 27:129
Fundamental Genetics Laboratory
2 s.h.

### 27:109
Genetics
4 s.h.

### 27:105
Cell Physiology
4 s.h.

### 27:131
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 27:3 and any course numbered 100 or above (other than 37:125), except that no more than three hours can be included from 37:196-198. 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:

- 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 100-level course may not be used except A Plant in Chile (12:125) and other comparable courses directed primarily at non-science students.

- 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 minimums.

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 as Honors degree in zoology by completing a total of at least six semester hours in 37:196 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 two decades 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, neurobiology 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 committees which overseeing M.S. theses and evaluate the examinations. When a student is approved for continuation toward a Ph.D. degree, he or she seeks 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 assigned to thesis research and writing.

The remaining hours are to be selected in consultation with the student's advisory committee, and the choice of courses may 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 satisfy any deficiencies as revealed by the diagnostic examinations (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. 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 24-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 a formal course of study and proficiency 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 proficiencies (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. The Ph.D. degree candidate has demonstrated proficiency in research through the M.S. thesis, or through equivalent research work in his or her research, which culminates in the doctoral dissertation. 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, research assistantships, provided either through the Graduate College 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 postdoctoral 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 approved 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 areas, or required to take specific courses to enhance their background in the area. These requirements are made to ensure breadth of background for specialized graduate work. Any deficiencies in mathematics, chemistry or physics are to be made up during the first year. Applicants with a degree other than biology or ecology may request modification of certain of the area requirements, if this is the province of the student's degree committee.

Admission
An application for graduate admission should have a grade-point average of at least 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 additional 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, fish, 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 of the University. The Department is equipped 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. Conventional of various sorts, including refrigerated, high-speed and ultra-high-speed models, are available.

Other special equipment includes electrophoresis and chromatography apparatus; electron amplifying and recording equipment.
In the College of Business Administration, the B.B.A. candidate must have at least a 2.0 grade-point average on all coursework attempted, on all business and economics coursework attempted at Iowa, and on all coursework attempted at Iowa in the major or area of concentration.
semester hours of pass/fail credit in his or her last 60 semester hours of coursework. Courses with the 6A, 6B or 6E 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 or 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 obvious irregularity is 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 coursework 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 credit 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 administrative 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, 57 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 completed. This 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 Marketing—M.B.A. 3 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 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:260 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 non-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 electives and specialized areas. The
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 serve 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 country. 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, research, service 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...
Institute are drawn from the departments of Business Administration and Economics and from the Center for Labor and Management.

## Accounting

**Department chairmen:** Valdez C. Lemka

**Faculty:** professors B.L. Snavely, Willard B. Kingery, Jr., Helmut Schauer, John H. Smith, associate professors Gilbert Meynard, associate professors Valdez C. Lemka, Occo Salavantis, assistant professors Robert Capaldi, Thomas Riggs, Wilfred Ucker

**Degrees offered:** B.B.A., M.A.

Accounting is the systematized recording, classifying, and interpretation of the economic facts of a business or other institution, to permit effective management and to provide information for investors, creditors, and the general public. Many educators consider training in accounting an ideal preparation for a business career because it offers a view of all aspects and phases of business organization. A bachelor's degree in accounting offers entry into a specialized field at the professional level.

The demand for industrial accountants has increased greatly; accounting graduates in industry may advance to executive positions. Many state and federal governmental agencies employ accountants. The demand for certified public accountants (CPAs) continues to increase. A CPA may work for one of many regional, national, or international firms, or he or she may establish an independent practice.

**B.B.A. in Accounting**

All students in the undergraduate program in accounting must complete a basic core of accounting courses including income tax accounting, accounting for management analysis and control, financial accounting, auditing concepts and procedures, and senior seminar in accounting. The undergraduate major in accounting requires a basic core of accounting courses totaling 18 semester hours as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A:115</td>
<td>Income Tax Accounting</td>
<td>3</td>
</tr>
<tr>
<td>6A:130</td>
<td>Accounting for Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Analysis and Control</td>
<td></td>
</tr>
<tr>
<td>6A:131</td>
<td>Financial Accounting: Assets</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>and Equities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Topics</td>
<td></td>
</tr>
<tr>
<td>6A:144</td>
<td>Auditing</td>
<td>3</td>
</tr>
<tr>
<td>6A:145</td>
<td>Senior Seminar in Accounting</td>
<td>1</td>
</tr>
</tbody>
</table>

In addition to other business administration courses required of all candidates for the degree Bachelor of Business Administration, accounting majors are required to complete 6B:70 and 6B:71.

The student may take elective accounting coursework beyond the basic accounting core. However, a maximum of 27 semester hours of credit in accounting courses may be counted toward the B.B.A.

## Master of Arts

The Master of Arts program in accounting is designed to meet the needs of individuals who wish to prepare further for professional careers in accounting and accounting-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.

### Prerequisites

- Undergraduate accounting major (or equivalent)
- 6B:70 Quantitative Methods (or equivalent)
- 6B:71 Statistical Analysis (or equivalent)

### Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A:220</td>
<td>Managerial Accounting Theory</td>
<td>3</td>
</tr>
<tr>
<td>6A:221</td>
<td>Financial Accounting Theory</td>
<td>3</td>
</tr>
<tr>
<td>6A:222</td>
<td>Information Systems and EDP</td>
<td></td>
</tr>
</tbody>
</table>

Two additional graduate accounting courses (selected from elective course offerings)

- 6B:276 Operations Research in Business—M.B.A. (or equivalent)

Non-accounting graduate electives (minimum of 12 semester hours)

Students who have not met all prerequisites normally will complete the M.A. requirements in one calendar year (two semesters and one summer session).

Students who have not completed the prerequisites may enter the program and may need up to two years to complete both the prerequisites and the requirements. The first year coursework would be a combination of graduate and undergraduate courses designed to fulfill the prerequisites.

The candidate may elect to write a thesis for which three semester hours of graduate accounting credit may be received. All candidates are required to take an Oral Comprehensive Examination covering the fields of study included in the program. This examination will be arranged by the advisor near the end of the student's program.

## Ph.D. Program

Candidates wishing to major in accounting should refer to the description of the program leading to Doctor of Philosophy in the College of Business Administration section.

### Courses

#### Primarily for Undergraduates

- **6A:15 Introduction to Accounting**
  - 3 hours
  - Survey and analysis of contemporary accounting information systems; emphasis on external reporting by business enterprises subject to major limitations; internal control; managerial accounting and financial management; preparation of statements for decision-making in organizations; internal controls; and their relation to decision models employed by firms. Prerequisite: 6A:13 or equivalent.

#### For Undergraduates and Graduates

- **6A:15B Income Tax Accounting**
  - 3 hours
  - Introduction to federal tax administration, structure and procedure; implications for individual and corporate decision-making. Prerequisites: 6A:1 or 6A:15 or equivalent.

- **6A:15I Accounting for Management Analysis and Control**
  - 3 hours
  - Concepts and methods used in internal financial information systems; quantification and interpretation of behavioral elements of organizational decision systems and their implications for accounting information. Prerequisite: 6A:1I; 6E:70; 6E:71; or their equivalent.

- **6A:15II Financial Accounting: Assets and Equities**
  - 3 hours
  - Concepts and methods of corporate external reporting, theoretical basis of current reporting practices analyzed in context of investor-decision models and proposed alternative accounting methods; preparation of major external reports—earnings statements, balance sheets, and funds statements. Prerequisite: 6A:1I or equivalent.
8A.132 Financial Accounting: Advanced Topics 3 s.h.
Special problems in corporate external reporting, such as business combinations and reorganizations, consolidated financial statements, leases, guarantees, present and expedient exchange futures, and structured and analyzed. Continuation of 8A.131. Prerequisite: 8A.131 or equivalent.

8A.141 Advanced Tax Accounting 3 s.h.
Partnership, corporation, gift, estate, and trust tax problems; tax planning and research. Prerequisite: 8A.132 or equivalent.

8A.142 Auditing 3 s.h.
Review of internal control in accounting systems and consideration of audit statutes, standards and procedures necessary to test integrity of accounting system and financial reports. Prerequisite: 8A.136 or 8A.152 or equivalent.

8A.145 Senior Seminar in Accounting 3 s.h.
Advanced topics in accounting include estate, inheritance, and corporate taxation; financial reporting for special entities, such as consolidated and nonconsolidated organizations; approach to tax decisions through planning and research. Prerequisite: 8A.115, 8A.155, 8A.172 and senior standing.

8A.179 Special Topics in Accounting 3 s.h.
Elective course for senior accounting majors. Advanced topics in accounting covered to greater depth than topics chosen by student and faculty interest. Multiple sections offered if more than one topic demanded. Prerequisite: consent of instructor:

8A.182 Financial Accounting 3 s.h.
Survey of current practice and thought relating to external reporting by firm to its investors, creditors and critics. Current conceptual reporting methods and their alternatives. Primarily for M.B.A. students with undergraduate accounting as a minor or undergraduate business majors. Prerequisite: senior standing or admission to the Graduate College.

8A.214 Accounting for Management 3 s.h.
Introduction to the financial information systems, accounting information and analysis involved in management of a business enterprise. Special emphasis on concepts of financial analysis as they relate to the objective of the business, and the use of this analysis in planning and controlling business affairs. Prerequisite: 8A.172 and 8A.194. Concurrent with 8A.215.

8A.215 Financial Information for External Users 3 s.h.
Concepts and methods of preparing financial statements, and techniques of analyzing and interpreting financial statements. Special emphasis on ratios and techniques of income capital and cash flow analysis. Prerequisite: 8A.172 or 8A.194. Concurrent with 8A.214.

8A.221 Financial Accounting Theory 3 s.h.
Structure of financial accounting; concepts of measuring and analyzing economic relationships. Prerequisite: 8A.214 and 8A.215 or equivalent.

8A.222 Information Systems and EDP 3 s.h.
The evaluation and design of financial information systems and control systems. Topics include auditing strategies and concepts related to EDP; external auditing and analytical review; information systems and systems design and analysis. Prerequisite: 8A.223.

8A.223 Internal Control and EDP 3 s.h.
Systems and controls for effective use of computers in financial organizations. Prerequisite: 8A.222 or EDP 8A.172. Concurrent with 8A.222.

8A.230 Auditing Practice and Regulation 3 s.h.
Historical and future role of the auditor as a control function through internal auditing and the growth of public accounting. Prerequisite: 8A.222 or permission of instructor. Prerequisite: 8A.222. Concurrent with 8A.223.

8A.231 Research in Tax Accounting 3 s.h.
Current tax problems and possibilities of continuing research in tax matters. Emphasis on individual areas of taxation. Prerequisite: 8A.222 or 8A.223. Concurrent with 8A.222.

8A.232 Contemporary Issues in Accounting 3 s.h.
Special topics dealing with contemporary accounting topics. Selection of topics will vary from semester to semester, depending upon instructor and students' interests. Prerequisite: 8A.221.

8A.240 Empirical Research in Accounting 3 s.h.
Methodology of research and the relationship of research to accounting practice. Consideration of research problems and methodology. Each student is expected to complete a research project. Prerequisite: 8A.221.

*Required of all M.A. students in accounting.

Business Administration

Department chairman: Bruce M. Kirk

Degree offered: B.B.A.

The purpose of Iowa's undergraduate program in business administration is to give the student a general overview of business with its specialization in management 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 interaction in business and society at large.

Students graduating with the B.B.A. in business administration have a wide range of career choices. That largest number go into marketing. Many are employed by financial institutions and in junior management positions. Others enter government service and other nonbusiness fields requiring administrative skills. Many continue their studies toward advanced degrees. There is considerable latitude within career areas. For example, the avenues open to a business administration graduate with a major in marketing include advertising and promotion, contest, 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 may select two of three courses 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); or

In addition to courses outlined in the general statement, students may elect a major in one of the following areas:
Requirements for the Major in Finance
6B:15 Financial Management
6B:71 Statistical Analysis
6B:111 Investments
6B: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:
6B:112 Security Analysis
6B:114 Commercial Banking
6B:118 Intermediate Financial Management

Requirements for the Major in Financial Economics
6B:15 Financial Management
6B:111 Investments
6B:113 Financial Markets and Institutions
6B:173 Managerial Economics
6E:103 Microeconomics
These are to be followed by two of the following:
6B:114 Commercial Banking
6B:117 Money and Banking
6B:119 Economics of the Government Sector
6B:141 Industrial Organization

Requirements for the Major in Insurance
6B:20 General Insurance
6B:121 Property and Liability Insurance
6B:122 Life and Health Insurance
At least one, but no more than two courses from the following:
6B:21 Insurance Mathematics
6B:123 Public Economic Security Programs
6B:124 Risk Management
Six additional hours of courses are specified by the student's advisor.

Requirements for the Major in Industrial Relations
6B:158 Personnel Management
One of the following:
6B:151 Employment Rights
6B:152 Labor Relations Legislation
One of the following:
6B:153 Collective Bargaining
6B:154 Employee Relations in the Public Sector
One of the following:
6B:155 Manpower Policy and the Development of Human Resources
6B:111 Labor-Manpower Economics
6B: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
6B:158 Personnel Management
6B:161 Individual Behavior in Organizations
6B:152 Group Behavior in Organizations
6B:163 Design and Management of Organizations
One of the following:
6B:168 Managerial Information Processing and Decision Behavior
6B:169 Selected Problems in Administrative Management
Other courses designated by the area faculty.

Requirements for the Major in Management Systems
6B:72 Computer Analysis
6B:177 Simulation Methods
6B:180 Management Information Systems
6B:181 Topics in Management Information Systems
A student who does not wish to take both 6B:176 and 6B: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
58B:144 Information Systems Design
6B:178 Topics in Operations Management
A course approved by the student's advisor.

Requirements for the Major in Management Science
Two of the following:
6B:70 Quantitative Analysis
6B:71 Statistical Analysis
6B:72 Computer Analysis
Two of the following:
6B:175 Decision Theory for Business
6B:176 Operations Management
6B:177 Simulation Methods
One of the following:
6B:179 Managerial Economics
6B:178 Topics in Operations Management

Requirements for the Major in Marketing
At least four, but no more than five:
6B:132 Marketing Distribution Systems
6B:134 Marketing Research
6B:135 Consumer Behavior
6B:137 Advertising Theory and Planning
6B:138 Marketing Communications
6B:141 Senior Seminar in Marketing
58B:147 Marketing Management
Master of Arts

The Master of Arts program in business administration is designed for the student who seeks an opportunity for intense specialization and a research experience. The program is available on both a thesis and non-thesis 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 at 30 or the 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 minor in 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major area</td>
<td>9</td>
</tr>
<tr>
<td>Minor area</td>
<td>6</td>
</tr>
<tr>
<td>Economic theory and/or administrative science</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
<tr>
<td>Thesis</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

The Master of Arts degree without thesis in business administration has the following requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major area</td>
<td>12</td>
</tr>
<tr>
<td>Minor area</td>
<td>6</td>
</tr>
<tr>
<td>Economic theory and/or administrative science</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
<tr>
<td>Research methodology</td>
<td>3</td>
</tr>
<tr>
<td>Research reports (two)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35</strong></td>
</tr>
</tbody>
</table>

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 in the non-thesis 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

**Primarily for Upper-Division Undergraduates**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>60:16</td>
<td>Financial Management</td>
</tr>
<tr>
<td>60:25</td>
<td>General Insurance</td>
</tr>
<tr>
<td>60:21</td>
<td>Insurance and Insurance Mathematics</td>
</tr>
<tr>
<td>60:31</td>
<td>Insurance Underwriting</td>
</tr>
<tr>
<td>60:47</td>
<td>Introduction to Law</td>
</tr>
<tr>
<td>60:81</td>
<td>Administrative Management</td>
</tr>
<tr>
<td>60:70</td>
<td>Quantitative Analysis</td>
</tr>
<tr>
<td>60:71</td>
<td>Statistical Analysis</td>
</tr>
<tr>
<td>60:72</td>
<td>Computer Analysis</td>
</tr>
<tr>
<td>60:61</td>
<td>Financial Analysis</td>
</tr>
<tr>
<td>60:62</td>
<td>Production Management</td>
</tr>
<tr>
<td>60:63</td>
<td>Organization and Management of Manufacturing</td>
</tr>
<tr>
<td>60:64</td>
<td>Production Management</td>
</tr>
</tbody>
</table>

**Courses for Undergraduates and Graduates**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>60:16</td>
<td>Financial Management</td>
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</tr>
<tr>
<td>60:64</td>
<td>Production Management</td>
</tr>
</tbody>
</table>

**Courses for Executive Readings in Business Administration**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>60:11</td>
<td>Business Administration</td>
</tr>
<tr>
<td>60:12</td>
<td>Security Analysis</td>
</tr>
<tr>
<td>60:13</td>
<td>Financial Analysis</td>
</tr>
<tr>
<td>60:14</td>
<td>Commercial Banking</td>
</tr>
<tr>
<td>60:15</td>
<td>Financial Analysis</td>
</tr>
<tr>
<td>60:16</td>
<td>Financial Analysis</td>
</tr>
<tr>
<td>60:17</td>
<td>Production Management</td>
</tr>
<tr>
<td>60:18</td>
<td>Organization and Management of Manufacturing</td>
</tr>
<tr>
<td>60:19</td>
<td>Production Management</td>
</tr>
</tbody>
</table>

**Selected Topics in Finance**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
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<tr>
<td>60:11</td>
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<td>Organization and Management of Manufacturing</td>
</tr>
<tr>
<td>60:19</td>
<td>Production Management</td>
</tr>
</tbody>
</table>
69:182 International Business
3 a.h.
Stud of management decisions; international monetary system. basic, major worldwide trade, development of less-developed countries, foreign investment, discrimination between international and domestic business operations emphasized.

69:183 Topics in International Business
3 a.h.
Various aspects of international economics and international finance; course covers a few topics in depth; e.g., multinational industry studies, financing the balance of payments, current economic and political aspects of the world economy, international trade, economic integration of Europe, etc.

69:184 Production Planning and Control
3 a.h.
Methods of setting the limits, regulations and levels of production in the individual firm. Prerequisite: 69:180.

69:185 Entrepreneurship and New Business Formation
3 a.h.
Characteristics and problems of new business, training of the entrepreneur and the management of the new business, and problems concerning the acquisition of the new business. Prerequisite: 69:180. Enrollment to be limited.

69:189 Experimental Courses
Arr.
Available for special courses not regularly offered.

M.B.A. Prerequisite Courses

69:150 Computer Methods-111.A.B.
3 a.h.
Use of computers in business management; computer programming languages emphasizing line shared BASIC, library programs, systems design, MDS, data base systems.

69:154 Managed Finance-111.A.B.
3 a.h.
Goals of financial management, characteristics of financial instruments and markets, costs of funds and allocation of resources, working capital management.

69:158 Management of Organizations-111.A.B.
3 a.h.
Fundamental concepts, research and applications used in understanding organizational roles through collective efforts, decision making, organizational and financial change, staffing techniques, control mechanisms, etc.

69:160 Marketing Management-111.A.B.
3 a.h.
Marketing's relationship to business and society, environmental influence on marketing, force of the marketing mixture and factors influencing the market manager.

69:177 Descriptive Methods
3 a.h.
Quantitative methods applicable to business and economic problems; estimation, forecasting, regression, trend analysis, prediction, planning, marketing, finance, and management.

69:184 Society, Law, and Business-111.A.B.
3 a.h.
The role, the legal, social, and ethical role of the business institution, the individual's role in participating in an industrial society. Primarily for graduates.

69:201 Directed Readings in Business Administration
Arr.
Individualized graduations is selected topic in business administration.

MLA, 115.2 M.A. Research Project
1 a.h.
This one-credit is for research leading to the M.A. degree. Prerequisite: consent of instructor.

69:221 Social Environment-111.A.B.
3 a.h.
Focus on social problems facing the U.S.: social welfare, crime, urbanization, etc.; analysis of social problems and social policy in both causes and solutions; ethical roles of government and citizens' groups.

3 a.h.
Problems associated with policy, structural problems and policy decision models, current and past most administrators, high class, cost of funds, capital budgeting, dividends, mergers. Prerequisites: 69:184 or equivalent.

69:224 Strategic Planning
3 a.h.
Organization, role, and regulations of capital markets; influence of capital planning, interaction of financial with other economic segments. Prerequisite: consent of instructor.

69:235 Portfolio Theory and Planning
3 a.h.
Examination of economic and financial concepts relating to management of portfolios or financial institution; topics include portfolio models, performance measurement, risk and portfolio construction. Prerequisite: consent of instructor.

69:250 Seminar in Finance
Arr.
Prerequisite: consent of instructor.

69:250 Management of Financial Institutions
3 a.h.
Principles and issues which apply to all banks and savings institutions. Includes bank and savings account, management of bank and savings institutions, the outlook for the future of banks and savings institutions, and the future of the money market. Prerequisites: 69:195 or consent of instructor.

69:255 Risk Management and Insurance
3 a.h.
Principles of financial risk management; risk and insurance, risk management principles, risk management devices for dealing with them, accident insurance, product and liability insurance, and risk management systems. Prerequisite: 69:195 or consent of instructor.

69:256 Seminar in Insurance
Arr.
Prerequisite: consent of instructor.

69:257 Marketing Management
3 a.h.
Methods of design and analysis of marketing research studies; including surveys and laboratory and market experiments. Contributions will be made in the area of market data collection, analysis and evaluation. Emphasis will be on applications to marketing problems, and discussion will be made on the effect of new developments.

69:258 Multivariate Methods in Marketing
3 a.h.
The course will provide a brief overview of multivariate methods and approaches to the following methods used as they relate to marketing problems: regression analysis, factor analysis, discriminant analysis, canonical analysis, AID analysis, and clustering. Emphasis will be on applications to marketing problems, and discussion will be made on the effect of new developments.

69:250 Marketing Models
3 a.h.
Examination of theoretical and operational models in marketing with emphasis on current advances; logical flow and quantitative methods as they apply to solving marketing management problems, criticisms of depth of a number of models and participation in model development projects.

69:241 Psychological Scaling for Marketing Applications
3 a.h.
Survey of the psychological scaling techniques which have applications in marketing research. Topics include: inferential and descriptival scaling methods, multi-all scale design, scaling of stimuli and scaling of words. Prerequisites: 69:184 and 69:195.

69:242 Social Research in Marketing
Arr.
Examination of current marketing literature and current research interests of faculty and students. Prerequisite: consent of instructor.

69:243 Topics in Social Research
3 a.h.
Case studies, organized by library research in space, sex, age, health discrimination, other groupings and rights and the classification of these discrimination. Other groupings will be studied. Prerequisites: 69:192.

69:245 Employment Relations and Public Policy
3 a.h.
Public relations and labor relations, with emphasis on labor-management relations.

69:246 Industrial Relations-111.A.B.
3 a.h.
Examination of the management of labor relations; performance of labor relations, labor-management relations. Personnel management, employee relations, tension, factors leading to friction, etc.

69:247 Human Resource Management
3 a.h.
Principles for managing human resources; evaluation of the social sciences are applied to problems of recruitment, selection, training, performance evaluation, compensation, benefits and affiliation, discipline, etc. Prerequisites: 69:195 or consent of instructor.

69:248 Seminar in Industrial Relations
Arr.
Prerequisite: consent of instructor.

69:249 Administrative Science I-111.A.B.
3 a.h.
Goals, concepts and research methodology in organization, planning, processing, and controlling small group processes in administrative science; management and control; economics, decision theory, and behavior science. Structure. Prerequisites: 69:243 or consent of instructor.

69:249 Administrative Science II-111.A.B.
3 a.h.
Principles, methods, and controlling small group processes in administrative science. Structure. Prerequisites: 69:243 or consent of instructor.

69:249 Administrative Science III-111.A.B.
3 a.h.
Principles, methods, and controlling small group processes in administrative science. Structure. Prerequisites: 69:243 or consent of instructor.

69:249 Administrative Science IV-111.A.B.
3 a.h.
Principles, methods, and controlling small group processes in administrative science. Structure. Prerequisites: 69:243 or consent of instructor.
Business Education

Chancellor: Norman F. Kelleher
Faculty: associate professors John R. Schmoker,
Assistant professors: Robert S. Brown, Stanley Cooper, Ernest V. Zuber
Degree offered: B.A., M.A., M.B.A., Ph.D.

The Undergraduate Program

The undergraduate program in business education is designed primarily for students who wish to become teachers of business subjects at the secondary school level. Students in the program have two options: (1) completing a major by satisfying one of several possible business administration degree requirements, or (2) choosing at least two-nine-hour sequences from the available business administration major areas. In addition, students majoring in business education must complete the general requirements for the Bachelor of Business Administration degree, as well as the general education requirements for the Iowa Professional Teaching Certificate. Business education majors receive a broad foundation in business administration courses, as well as specialized professional courses in business education, to prepare them for their first teaching experience.

Typically, business teachers prepare for two types of business subjects at the secondary school level. One type of program prepares teachers of basic business subjects (this category generally includes such courses as general business, business law, economics, consumer economics, business management, business mathematics and accounting). By taking the basic business concentration, a student will develop the skills to apply business and economic principles to the teaching of basic business subjects.

Another type of preparation is for teachers of office-related subjects (including typing, shorthand, word processing and office practice) in addition to the subjects listed above for the basic business teacher. By taking a concentration in administrative services, the student will develop the skills and understanding to teach these office-related subjects.

Student teaching under the supervision of both an experienced secondary school business teacher and a university professor is the capstone of the undergraduate program. The student must choose one from these two teaching options:
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 two of the 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>65:2</td>
<td>Business Typing Problems</td>
<td>3 h.</td>
</tr>
<tr>
<td>65:22</td>
<td>Transcription</td>
<td>3 h.</td>
</tr>
<tr>
<td>65:35</td>
<td>Business Machines Applications</td>
<td>2 h.</td>
</tr>
<tr>
<td>65:112</td>
<td>Word Processing</td>
<td>3 h.</td>
</tr>
</tbody>
</table>

One of the following:

- 65:125 Organizational Communication (3 h.)
- 65:126 Written Communication in Business (3 h.)

One of the following:

- 65:145 Office Management (3 h.)
- 65:155 Business Data Processing (3 h.)

Total: 17 h.

*Administrative services majors who do not intend to teach shorthand, substitute 65:147 Basic Systems Analysis 3 h.

Requirements for Area of Concentration in Basic Business

Select one of the following:

- 65:100 Decision Making for Consumers (3 h.)
- 65:108 Principles of Basic Business (3 h.)
- 65:189 Basic Business and Consumer Issues (3 h.)
- 65:155 Business Data Processing (3 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 h.)
- 75:187 Seminar: Curriculum and Student Teaching (1-3 h.)

Courses for Nonmajors

Two areas of concentration in administrative services without the teacher certification courses (consisting of a minimum of three courses (9 h.) in each area or a total of 18 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 competencies 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 (3-2 h.)
- 65:204 Seminar: Teaching Accounting (2-5 h.)
- 65:205 Seminar: Office Education (3 h.)
- 65:207 Seminar: Information Processing (3 h.)
- 65:210 Managing Business Instruction (3 h.)
- 65:240 Seminar: Business Teaching (3 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, or (2) 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 business 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 graduate education courses which constitute professional preparation for secondary school teacher certification.
Two semesters and two semesters are usually necessary to complete the program. The certification sequences consist of 24-26 semester hours of graduate coursework as follows:

One elective course in education: 3 s.h.
  Audiolinguai Teaching Methods
  Social Development of the School-Age Child
  Principles of Guidance
Construction and Use of Classroom Tests 3 s.h.
  Preprofessional Seminar: Educational Psychology
  Philosophy or History of Education
  Methods (credit arranged)
  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
Due 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 adviser.

Appropriate doctoral-level coursework approved by the adviser in each area, for these sets 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
Primary for Undergraduates

811 Basic Typewriter 2 s.h.
  Keyboarding; problem solving related to personal and business communications such as letters, memos, and reports. Open only to students with no formal training.

812 Business Typewriter Problems 2 s.h.
  In-depth development and integration of skills and knowledge necessary for solving problems related to the production of letters, forms, memos, reports, and other business communications. Prerequisites: 811 or equivalent.

817 Basic shorthand 2 s.h.
  Shorthand theory and development of skill through business dictation and transcription.
  Open to students with less than one year of high school shorthand or equivalent. Prerequisites: 812 and consent of instructor.

822 Transcription 2 s.h.
  Review of shorthand theory, emphasis on development of advanced skill in taking business dictation and in transcribing on a production basis. Prerequisites: 817 or equivalent; computer 823 or equivalent.

823 Business Machine Applications 2 s.h.
  Instruction in ten-key adding machines, electronic calculators and other printing tabulators, employing business applications. Use of business-related mathematical principles and basic statistical measures.

For Undergraduates and Graduates

811-0 Independent Study 1 s.h.
  Individualized guided study or projects in business education. Permission required prior to registration. Hours arranged.

812-0 Determining Needs for Consumers 3 s.h.
  Application or problem solving in such areas as consumer credit and financial services—emphasis on consumers' consumer actions and basic economic principles. Prerequisite: 78-0.

824 Principles of Basic Business 3 s.h.
  Emphasis on the application of basic business management principles to real-world business situations. Computer applications in basic business principles.

827 Business and Consumer Issues 3 s.h.
  Exploration of contemporary consumer-business issues such as housing, food, energy, technology, and other topics affecting living styles and personal values. Same as 72-7.

813 Word Processing 2 s.h.
  Concepts of word processing as a system for improving efficiency of business operations. Introduction to specific operating/bilingual systems. Study of procedures in a word processing system. Prerequisite: 62-2 or equivalent.

818 Organizational Communication 3 s.h.
  Organizational, psychological and language processes including: verbal behavior; communication skills, systems and technology; five-levels satisfaction of information requirements; purpose; language; and public speaking.

818-1 Written Communication in Business 3 s.h.
  Application of communication theory and psychological principles in such business communications as letters, reports, and procedures. Prerequisites: satisfaction of electives requirement or equivalent, and junior standing.

819-1 Office Improvement 3 s.h.
  Principles of organization and management related to the information production functions of secretaries; human factors and systems concepts and practices in office systems. Prerequisite: junior standing.

820-1 Basic Systems Analysis 3 s.h.
  Introduction to computer philosophy, theory and practice; systems analysis, design and measurement, applied systems projects. Prerequisite: junior standing.
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 12 semester hours in 100-level economics courses, including 66:103 Microeconomics and 66:105 Macroeconomics. Candidates for the B.B.A. degree may meet the requirements for the degree through alternative programs in the College of Business Administration and complete 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 Program

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 in graduate program and faculty. Graduates of the department have gone on to occupy prestigious 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. If a student 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 in law to apply 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
- 66:200 Topics in Economics 1 s.h.
- 66:180 Mathematics for Economics 2-3 s.h.
- 66:204 Macroeconomics 1 3 s.h.
- 66:261 Economic History of North America 3 s.h.
- 66:205 Money and Banking 3 s.h.
- 9-10 s.h.

Second Semester
- 66:202 Price Theory 3 s.h.
- 66:184 Methods of Quantitative Economics 3 s.h.
- 66:207 History of Economic Thought I 3 s.h.
- 66:208 History of Economic Thought II 3 s.h.
- 66:215 Econometrics I 3 s.h.
- 66:216 Econometrics II 3 s.h.
- 66:217 Elective 3 s.h.
- 12 s.h.

Third Semester
- 66:203 Microeconomics I 3 s.h.
- 66:211 Mathematical Economics I 3 s.h.
- 66:221 Field Course 3 s.h.
- 9 s.h.

Second Semester
- 66:203 Microeconomics I 3 s.h.
- 66:211 Mathematical Economics I 3 s.h.
- 66:221 Field Course 3 s.h.
- 9 s.h.

Third Semester
- 66:206 Macroeconomics II 3 s.h.
- 66:221 Econometrics I 3 s.h.
- 66:221 Field Course 3 s.h.
- 9 s.h.

Fourth Semester
- 66:204 Macroeconomics II 3 s.h.
- 66:222 Field Course 3 s.h.
- 9 s.h.

For students with a sufficient mathematical and statistical background, part or all of 66:180 will be waived. Students planning to

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 loads of nine to ten semester hours in the sequence presuppose 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 minimum mathematics requirement of two semesters of calculus. This requirement must be satisfied by the end of the first semester of the program.
Economics

major in economics should take 22:153-154 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 counted the second time he replaces 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 whether 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 appointed for the 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 requirement for the Ph.D. degree. 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 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 supply enough credit for both 6E:1 and 6E:2.

6E:1 Principles of Economics
Organization and workings of modern economic system: roles of markets, prices, and competition in promotion of economic welfare; regulation of business and industry; price levels and inflation; problems of growth, equity, and distribution of income and wealth; economic factors in social and personal adjustment; relationships between economic and non-economic factors; price controls; labor relations.

6E:2 Principles of Economics
Natural forests and major, intermediate, and government policies affecting markets; economic efficiency and the role of government; enterprise and consumer behavior; price determination; money and interest; national income and output measurement; poverty and distribution of income and wealth; economic factors in environment; alternative economic systems; international trade; world trade agreements, economic systems, international business, and international organizations.

6E:7 Contemporary Economic Problems and Policy
Current problems and policies of interest to students in economics, graduate or undergraduate. The course is designed for students who have taken 6E:1 or 6E:2.

Economic Analysis and Policy
6E:103 Price, Employment, and Production Theory
3-4 s.h.
This course is an economic treatment of price, employment, and production decisions, national income analysis, employment, growth, and economic policy. Application of economic theory. Decision-making of business concerns. Examination of current economic questions and controversies. Primarily for students with graduate or advanced standing.

6E:106 Microeconomics
3 s.h.
Economic theory of consumer behavior, producer behavior, and role of markets in coordinating economic decision; conditions for efficient resource allocation by market mechanism. Primarily for 6E:1 and 6E:2 in senior standing.

6E:108 Macroeconomics
3 s.h.
Measurement of national income, unemployment, and inflation; determinations of national income, aggregate demand and supply analysis of the U.S. and other nations; monetary policy, fiscal policy, and government as an economic force. Typically for students with senior standing or permission of the instructor. Emphasis on observable policy alternatives. Primarily for students with senior standing.

6E:111 Labor-Supply Workforce Economics
3 s.h.
Impact of industrialization on labor markets with analysis of working problem areas: resource supply and demand; labor productivity; wages and fringe benefits; working hours and techniques; impact of economic policies on labor market economics. Typically for students with senior standing or permission of the instructor.

6E:111 Labor-Supply Workforce Economics
3 s.h.
Primarily for 6E:1 and 6E:2 in senior standing.

6E:113 Health Economics
3 s.h.
Structure and trends in American medical care industry and applications of economic analysis to its problems of production, pricing, and distribution; special attention to supply and demand conditions in markets for hospital and physician services. Impact of economic factors on health care policy and governmental planning specialists. Primarily for 6E:1 and 6E:2 in senior standing.

6E:115 Economics of Human Resources
3 s.h.
An examination in more applications of economic theory to human beings considered as economic entities; particular emphasis upon consequences of discrimination in labor markets.

6E:117 Money and Banking
3 s.h.
Monetary theory, financial systems, and policies, with emphasis on role of money in the determination of price levels, national income, and the world economy. Typically for 6E:1 and 6E:2 in senior standing.

6E:118 Economics of the Government Sector
3 s.h.
Economic functions of government in modern economy, economic decisions relating to government, federal, state, and local budgeting, taxation, government expenditures and financing, and public debt. Typically for 6E:1 and 6E:2 in senior standing.

6E:123 Political Economy of the Military-Industrial Complex
3 s.h.
Thematic in nature (treatment as a special program) of the role of military production in the world economic system, the political and economic consequences for development, and its economic, political, and social consequences. Typically for 6E:1 and 6E:2 in senior standing.
Economics

SE:129 International Economics 3 s.h.
Foreign exchange and balance of payments; international monetary arrangements and policy; principles of international trade; effects of tariffs and restrictions on functioning of economies and international economics. Prerequisites: 66:1 and 66:2 or senior standing.

SE:127 Natural Resources in the World Economy: Control and Conflict 3 s.h.
Economic issues connected with the "new scarcity" in natural resources (agriculture, energy) in the world economy. Analysis of supply and demand conditions, market controls, implications for economic growth and development, role of technological advancement, and actual and potential conflict among nations. Prerequisites: 66:1 and 66:2 or senior standing.

SE:129 Economic Development: Underdeveloped Areas 3 s.h.
The problem of underdevelopment in Third World countries; examination of theories and policies of economic development. Prerequisites: 66:1 and 66:2 or senior standing.

SE:133 Economic Growth and Environmental Decay 3 s.h.
Causes and consequences of economic growth (development) and pollution, energy depletion, and economic growth implications of neo-classical growth; measurement of economic growth and progress, current environmental and resource use problems; policies for environmental preservation. Prerequisites: 66:1 and 66:2 or senior standing or consent of instructor.

SE:138 Regional and Urban Economics 3 s.h.
Theory of location and regional development; factors influencing location of production, city location and hierarchies, land-use patterns, and measurement and change in regional economic activity; public policy issues in regional and urban economics. Prerequisites: 66:1 and 66:2 or senior standing.

SE:139 Problems in Urban Economics 3 s.h.
Application of economic analysis to urban problems; evaluation of role of city and urban economics; problem areas examined include; slums, race and poverty, housing, land use, transportation, urban finance, policies, and public policy for urban development. Prerequisites: 66:1 and 66:2 or senior standing.

SE:141 Industrial Organization 3 s.h.
Structure of major American industries and effectiveness of public policy development of theory of market behavior, welfare economics, and anti-trust laws. Prerequisite: 66:1 or senior standing.

Economic History, Systems and Ideologies

SE:129 Entrepreneurial and Organizational History 3 s.h.
Economic history with emphasis on concepts of long-term economic growth, innovation and responsibility for economic change. Emphasis on role of entrepreneurs and their role in economic development. Prerequisite: 66:1 or senior standing.

SE:161 History of Economic Thought 3 s.h.
Economic and social history of economic thought from earliest times to modern. Prerequisites: 66:1 and 66:2 or senior standing.

SE:162 Orthodoxy and Radical Thought in Economics 3 s.h.
Central problems of orthodoxy and radical thought and policy; historical development of economics; relationship between liberal and radical thought and policy; critical evaluation of arguments of traditional thinking and new left thinking. Prerequisites: 66:1 and 66:2 or senior standing.

SE:165 Comparative Economic Systems 3 s.h.
Economic systems, origins and attributes of economic systems; contemporary economic theories and the industrial state. Prerequisites: 66:1 and 66:2 or senior standing.

SE:164 Cabbagehead Economics 3 s.h.
Critical Study of Popular Economics, The New Industrial State, Economics and the PCAP Report, and other writings. The works of John Kenneth Galbraith are examined as the vehicle for making connections to the international movement of thought known as "new economics". Prerequisites: 66:1 and 66:2 or senior standing.

SE:166 Comparative Labor Movement 3 s.h.
Historical and economic treatment of labor movements in selected industrial nations: England, the United States, France, Germany, Russia, and United States; assessment of labor movement theories; economic and political impacts of labor unions and collective bargaining. Prerequisite: 66:111 or senior standing.

Quantitative Methods

SE:180 Mathematical Proofs for Economists 5-6 s.h.
This course requires three distinct introductory mathematics and statistics texts: one in mathematics, one in statistical inference, and one in computer science knowledge. Lagrange multiplier theory and Taylor's expansion. Prerequisites: The only prerequisite is for the mathematical level which requires at least one, and preferably two semesters, of calculus.

SE:182 Introduction to Econometrics 3 s.h.
Introduction to statistical approach to economics; simple and multiple linear regression identification, identification problems, survey of applications.

SE:184 Methods of Quantitative Economics 3 s.h.
Theory of economic measurement, regression, analysis of variance, price indices, time-series, introduction to time series analysis, and the notion of cointegration statistic. Prerequisite: first course in SE:180 or consent of instructor.

M.B.A. Courses

SE:180 Consumer and Firm Behavior 3 s.h.
Model of consumer and firm behavior with applications; market equilibrium and market structure.

SE:181 National Income Analysis 3 s.h.
Measurement of economic activity, determinants of national income, components of business fluctuations; money, prices, inflation, monetary and fiscal policy.

For Advanced Undergraduates

SE:187 Senior Thesis in Economics 3 s.h.
Primarily for senior students. Prerequisites: permission of instructor.

SE:189 Senior Seminar in Economics 3 s.h.
Prerequisite: consent of instructor.

SE:195 Readings and Independent Study in Economics 3 s.h.
Prerequisite: consent of instructor.

Primary for Graduates

SE:280 Topics in Economics 6 s.h.
Introduction to the progress in the profession, faculty, and areas of economic specialization offered within department.

SE:281 National Income Analysis 3 s.h.

SE:282 Price Theory 3 s.h.
Theory of demand; principles of production; cost analysis; theory of firms, market structure.

SE:283 Microeconomics I 3 s.h.
Principled analysis of various factors within commodity and risk; welfare analysis; theory; classical demand theory; production, cost, and theory of the firm; perfect and imperfect markets; general equilibrium and market equilibrium.

SE:284 Microeconomics II 3 s.h.
Inflation and productivity measurement; models of income determination; Keynesian vs. classical analysis; analysis of the commodity, money, and labor markets; single sector neo-Keynesian and neoclassical models of economic growth; general form of constrained equilibrium; theory of economic policy.

SE:285 Macroeconomics I 3 s.h.
Competitive equilibrium, existence, and stability; price specifications and competitive equilibrium; growth and income distribution in an open economy; stability; and money and developments in welfare economics.

SE:286 Macroeconomics II 3 s.h.
Microfoundations of macroeconomics: neo-Keynesian, and neoclassical macroeconomic models; growth and model of new macroeconomics; growth models with two or more proofs; applied economic policies.

Economics
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<th>Course Code</th>
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<td>EE530</td>
<td>Seminar in Economic Development</td>
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<td>EE531</td>
<td>Seminar in Economic History</td>
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<td>EE539</td>
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Preliminary: consent of instructor.
The Collee 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
- Restorative Dental Sciences
- Oral Medicine
- Community Dentistry
- Pediatric Dentistry

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 "clinics" 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 a variety of settings which closely simulate 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. The 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 the more than 283 professional journals the College currently receives.

The Dental Science Building consists of connected four-story wings located on either side of a mall. The south wing is devoted to clinical teaching, with various departmental clinical 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 audio-visual production center and the programs in community dentistry.

Promotions and Graduation
Students promotions and graduation are determined by the Aademic 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, absences and general fitness to enter the dental profession. The decision reached by the ad hoc committee constitutes the final decision.

State Board of Dental Licensure Examination

The states of Kansas, Colorado, Missouri, Oklahoma, Iowa, Wisconsin, Nebraska, Minnesota, Wisconsin, North Dakota 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 its 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-Sterilization-Instrument Management System (S.S.I.M.S.) that provides the student with most of the instruments and supplies necessary throughout dental training. The instructor assigns lists for the program leading to the D.D.S. degree 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 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 $2,500 each year of their undergraduate professional studies. Preference is given to students who would not otherwise be able to finance health professions 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 portions 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 Kelling Foundation, the Iowa Dental Achievement Fund and other sources, to help students in emergency situations.

Dental students are also eligible for much of the assistance provided through the University's Office of Student Financial Aid. This includes opportunity 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 Psi Omega, have chapter houses at Iowa, and both have dental 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 application is made. 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.

Preprofessional Studies

The preprofessional 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 either 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 personal qualities 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 freshmen 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 Admissions Test
All applicants must complete the Dental Admission Test sponsored by the Council on Dental Education of the American Dental Association. Testing for the dental profession are conducted by the University of Iowa is a testing center. Applicants must take the test no later than October in order to be admitted the following fall. 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 non-refundable and is credited toward the first year's tuition. Applicants who fail to make the deposit within the time specified forfeit 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 and the University's regulations on residence. If it is found possible to consider a limited number of applicants who are not residents of Iowa, preference will be given to nonresident applicants 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 required part of the dental curriculum:

- 60:113 Human Gross Anatomy for Dental Students
- 60:114 Human Nervous System
- 60:239 Principles of Pathology
- 60:222 Dental Microbiology
- 60:115 Medical Physiology
- 60:116 Biochemistry for Dental Students
- 60:117 Pharmacology for Health Sciences: Dental
- 60:118 Pharmacology for Health Sciences: Medical

Clinical Management Concepts
Faculty: assistant professor Thomas V. Gathie, associate professor Nott H. Lutsky, instructors Christopher G. Courtsey, clerkl, L. Senter.
Fixed Prosthodontics

112:116 Advanced DAI 1 a.h.
Self-directed learning program introducing the basic concepts and skills needed to effectively utilize parodontal dental assistance. Topics covered include principles of work scheduling, methods of laboratory transfer, operating field maintenance and interpersonal communications. Prerequisite: senior dental student.

112:116 TEAM 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, interpersonal communication and personnel management. Prerequisite: senior dental student.

112:117 TEAM Clinic 2 a.h.

112:117 Group Advance Seminar 1 a.h.
Weekly series of meetings and student activities arranged to provide educational experiences in clinical science and treatment coordination utilizing complex patient record systems.

Special Courses

112:118 Ethics Options 2 a.h.
Selection from a series of elective mini-courses to emphasize the scientific basis of dental practice.

112:119 Programs Abroad 1 a.h.
Opportunities for foreign dental students are regulated with the faculties of dental colleges abroad.

112:250 Advanced Dental Brings 1 a.h.

Fixed Prosthodontics

Department head: Keith R. Hayek
Faculty: professor E.S. Heath, I.L. Veld; associate professor C.W. Less; associate professor D.P. Hines; instructor E. Nak.
Degree offered: M.S.

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 Prosthodontics 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 is fixed prosthodontics 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 practices 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 adviser, constructs an individual curricular plan 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 inferences in medicine is required. Some coursework in the general area of education or in one 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 inactivation 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 D.M.D. degree or its foreign equivalent. No advanced GME is required.

Courses

112:120 Occlusion 2 a.h.
Interdisciplinary introduction to concepts of occlusion and mechanics.

112:145 Fixed Prosthodontics Techniques Laboratory 1 a.h.
Lectures covering introduction to fixed prosthodontics including definitions, materials and techniques used in construction of various types of restorations and fixed prosthodontics.

112:145 Fixed Prosthodontics Techniques Laboratory 3 a.h.
Technical procedures required in fabrication of fixed prosthodontics.

112:200 Prostodontics Materials Laboratory 2 a.h.
Manipulation and testing of dental materials is taught through fabrication of laboratory projects.

112:210 Dental Materials 2 a.h.
Behavior of organic and inorganic substances as physical and mechanical properties of dental materials is taught.

112:250 Fixed Prosthodontics 4 a.h.
Semester covering previously acquired knowledge is biologic and basic science and techniques courses with clinical fixed prosthodontic procedures practice in dental laboratory supplemented by individual supervision and demonstration.

Primarily for Graduates

112:256 Seminar: Fixed Prosthodontics 1 a.h.
Conference and discussion on assigned research topics.

112:256 Seminar: Occlusion 1 a.h.
Conference and discussion on assigned research topics.

112:257 Seminar: Dental Materials 1 a.h.
Conference and discussion on assigned research topics.

112:258 Fixed Prosthodontics Topics 1 a.h.
Assigned research topics for student seminar presentations.

112:260 Research: Fixed Prosthodontics 1 a.h.
Research design and selection of data on selected research problems.

Dissertation.

112:265 Advanced Clinical Fixed Prosthodontics 3 a.h.
Students complete assigned cases in support of thesis.


112:268 Library Assignment: Fixed Prosthodontics 1 a.h.
Literature search and preparation of bibliography and assistance.

112:269 Clinic Twentkip: Fixed Prosthodontics 1 a.h.
Teaching assignments for credit.
Comprehensive Care

Division head: Richard G. Ganter
Professor: associate professor Robert Cooper, Richard G. Ganter, Roger L. Wright; instructors Howard W. Dobson, John V. Denning, H. Douglas Hall, Darrell J. Kiel, John A. Latika

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 experience. The ultra-modern facilities of the new Dental Science Building are designed to simulate 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

114:100 Comprehensive Care Lectures 1 h.

114:101 Comprehensive Care Clinic 18 h.

Clinical applications of previous cognate, psychomotor and affective learning experiences toward development of an integrated and comprehensive system of dental health care.

114:102 Group Practice Seminar 1 h.

Dynamic evaluation of a dental group practice, with discussions of treatment progress of patients assigned to the group. Methods are explored and developed to maximize communication and efficiency of dental services provided by the group.

114:104 Specification in General Practice 1 h.

Class lectures from the various dental specialties provide current techniques and methods related to the practice of general dentistry. Students receive individualized instruction in the selection of graduate specialty programs.

114:105 Diagnosis and Treatment Planning Seminar 1 h.

Students present documentation of diagnostic procedures used in the development of a treatment plan and treatment for selected clinical problems. Students are challenged to defend findings and conclusions.

Dental Hygiene

Department chair: Pauline Brine

Professor: associate professors Pauline Brine, Dorothy Ross, Nancy Gay; instructors professors Cez Baffi, Sharon Haydon, Elizabeth Huson, Patricia Petrou; adjunct instructors Professors Kay Mather; instructors Jeff Glaessene, Donna Kepz

Degree offered: B.S., M.S.

In response to the growing interest of Iowa dentists to employ dental hygienists, the dental hygiene program was initiated as a field of study at the University in 1953. At that time major educational 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 opportunities. 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 Anatomy
86:062 Human Microscopic Anatomy
86:063 Dental Radiology for Dental Hygienists
86:065 Topics in Dental Therapeutics
86:066 Basic Pathology
92:061 Introduction to Periodontology
82:061 Operative Dentistry I and II Hygienists

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 (88:085 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 (88:088 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 as isolated subject-oriented units, such as dental health education, public health and audiovisual media, are incorporated into an integrated core of learning. Learning emphasis is 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 coursework 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 (4:49 General Chemistry II, General Chemistry Laboratory);
- Four semester hours of microbiology (61:166 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 applications.

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 for 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
- 7P:413 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-social sciences 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=4.0).

Traineeships
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 tax-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 trainee 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=4.0). 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. For
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 various areas.

Facilities

University of Iowa dental hygiene majors receive their professional preparation in the University's new Dental Sciences Building. This building is part of the University of Iowa Health Center complex, one of the nation's outstanding health science teaching, research and patient care facilities.

Financial Aid

In addition to financial assistance available to University students in general, there are a limited number 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

88:061 Dental Hygiene Core I 8 a.h. Introduction to dental hygiene theory, clinical skills, dental anatomy and dental diseases. Didactic and clinical experiences are related to complete prophylaxis and dental hygiene procedures.

88:062 Dental Hygiene Core II 8 a.h. Emphasis on application of dental hygiene theory in the performance of intermediate clinical dental hygiene and oral diseases control procedures.

88:62 Topic in Dental Therapeutics 3 a.h. Selected study of the effects of drugs on living tissue. Various classes of drugs are examined and their application to the clinical practice of dentistry and dental hygiene.

88:055 Clinical Dental Hygiene 7 a.h. Practice of advanced dental hygiene procedures with emphasis on providing comprehensive care and clinical services.

88:056 Seminar: Dental Hygiene Concepts and Practice 4 a.h. Review of current research and advances in preventive procedures, clinical, legal and social responsibilities of health care providers; current and extended roles in dental hygiene practice.

88:057 Practicum: Community Dental Health 8 a.h. Application of dental health, dental care, educational and research activities to applied in field experiences in design, implement and evaluate health care and educational programs.

88:058 Seminar: Community Dental Health 4 a.h. Study of factors influencing health, health care delivery and utilization. Dental epidemiology, need and demand for dental care, dental care systems, and research methods used to determine these factors are emphasized.

88:111 Independent Study 4 cr. Designed for students who plan to pursue advanced study or to explore career interest in dental hygiene education, research or public health.

For Graduates

88:201 Seminar: Dental Hygiene Literature Review 3 cr. Analysis of dental hygiene literature as it applies to clinical, sociological, and educational factors influencing trends and current status of knowledge in field of dental hygiene.

88:203 Evaluation of Dental Hygiene Research 3 cr. Evaluation of biological and clinical research in dental hygiene and related fields; and the effects of research findings on therapy and practice of dental hygiene.

88:202 Research: Dental Hygiene 4 cr. Literature review and selection of research topic, preparation of proposal and design for master's thesis.

88:204 Selected Topics in Dental Hygiene Education 3 cr. Theory and methods related to specific areas of dental hygiene education (individual, didactic or field settings). Content emphasis on theoretical and methodological issues.

88:306 Advanced Topics: Oral Health Care 4 cr. Evaluation of current research conducted in cultural, sociological and psychological factors influencing and hygiene and oral health 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.

Final 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

82:108 Operative Dentistry Laboratory for Hygienists 2 s.h.

Basic study of dental materials and methods by which these materials are applied to the restorative procedures of operative dentistry.

82:130 Dental Anatomy Lectures 1 s.h.

Lectures and seminars concerning dental embryology, dental anatomy, eruption patterns and extractions of human primary and permanent dentition.

82:191 Dental Anatomy Laboratory 3 s.h.

Detailed study of human teeth morphology and function utilizing wax replacement models and natural and plastic teeth.

82:192 Operative Dentistry I 2 s.h.

Lectures and seminars concerning dental caries etiology, principles and design of cavity preparations, restorations, and placement of restorative materials; use of instruments in procedures pertaining to operative dentistry.

82:193 Operative Dentistry Laboratory and Clinic I 2 s.h.

Study and application of procedures involved in preparations of dental tooth to receive dental restoration, students prepare all classes of cavities in natural and plastic teeth, use various dental restoratives in fabrication of restoratives.

82:16050 Hospers Operative Dentistry II 1 s.h.

Lectures and seminars concerning the principles and design of cavity preparations, the restoration of teeth, patient management, pulp control and other aspects of clinical practice.

82:141 Clinical Operative Dentistry II 1 s.h.

Clinical training in operative dentistry on patients in operative clinic. Second year.

82:160 Operative Dentistry III 4 s.h.

Lectures, seminars, clinical demonstrations, combined with supervised patient treatment for each theme covered in dental hygiene. Students perform all forms of restorations on patients under the supervision of the instructor as part of a program of postgraduate improvement in understanding of physiological and anatomic importance of restorative treatment in patients. Third year.

Primary for Graduates

Discipline Studies

82:238 Operative Dentistry Seminar I 1 s.h.

Literature review and discussion of past and present status of Operative Dentistry.

82:239 Operative Dentistry Seminar II 1 s.h.

Reading and discussion of the research relating to the biomechanical aspects of cavity preparation and fill: restoration.

82:237 Operative Dentistry Seminar III 1 s.h.

Readings and discussions of research relating to problems associated with maintaining dental pulp vitality.

82:238 Operative Dentistry Seminar IV 1 s.h.

Readings and discussions of the research relating to Dental Materials and their use in Operative Dentistry.

Research Program

82:330 Operative Dentistry Research I 3 s.h.

Topic selection, core seminar and literature review for research project. Begin research protocol.

82:331 Operative Dentistry Research II 3 s.h.

Present completed, begin research investigation.

82:332 Operative Dentistry Research III 3 s.h.

Complete research investigation, gather and organize data.

82:333 Operative Dentistry Research IV 3 s.h.

Data gathered and organized, begin writing thesis.

82:334 Thesis Preparation Operative Dentistry 3 s.h.

Comprehensive defense before the committee, and comprehensive examination.

Clinical Studies

82:240 Operative Dentistry Advanced Clinic I 1 s.h.

In-depth study of past and present restorative procedures; advanced, restorative assignments on a monthly.

82:241 Operative Dentistry Advanced Clinic II 1 s.h.

Treatment of patient cases in the Operative Clinic; assignments and discussions of case problems; concentration on analog restorative procedures.

82:242 Operative Dentistry Advanced Clinic III 1 s.h.

Treatment of patient cases in the Operative Clinic; assignments and discussions of case problems; concentration on core gold restorative procedures.

82:243 Operative Dentistry Advanced Clinic IV 1 s.h.

Treatment of patient cases in the Operative Clinic; assignments and discussions of case problems; concentration on core gold restorative procedures.

82:244 Operative Dentistry Advanced Clinic V 1 s.h.

Treatment of patient cases in the Operative Clinic; assignments and discussions of case problems; concentration on other metal restorative procedures.

Endodontics

D.D.S. Program

82:142 Endodontics 2 s.h.

Lectures, seminars and laboratory projects designed to give understanding of basic principles, concepts and technical procedures necessary for treatment of pulpal pathosis in human teeth.

82:161 Clinical Endodontics Practice 4 s.h.

Clinical endodontic practice; clinical problems evaluated, discussion of treatment of each individual case followed by student's practical application on simple endodontic cases. Pulp-acl-ectomy and root canal therapy.

82:168 Special Topics in Endodontics 3 s.h.

Endodontics Literature Review I 1 s.h.

Reading of the past and present of endodontic literature.

82:231 Endodontic Literature Review II 1 s.h.

The introduction to modern methods of endodontics and discussion of dental materials used in endodontics.

82:232 Endodontic Literature Review III 1 s.h.

Research papers, research, emphasis of endodontic mechanics research.

82:233 Endodontic Literature Review IV 1 s.h.

Research papers, emphasis of endodontic mechanics research.

92:389 Research in Endodontics 3 s.h.

Topical selection; protocol preparation and carrying out investigative completed research investigation and gathering of data; writing of thesis and defense before thesis committee.

82:336 Thesis Preparation in Endodontics 3 s.h.

Introduction for graduate students to areas of research in endodontics, also carries out a clinical or controlled project.
82:239 Advanced Clinical Endodontology
Clinical treatment of patients, progressing from simple to more advanced, finally to complex and unforeseen. Students are exposed to cases that require diagnostic and comprehensive procedures. 2 a.h.

82:240 Seminar in Endodontology I
Clinical and diagnostic procedures in relation to advanced clinical cases of varying difficulty. Diagnostic and prognostic procedures leading to treatment planning and alternative treatment procedures of clinically difficult cases. 2 a.h.

82:241 Seminar in Endodontology II
Clinical endodontic procedures as they relate to difficult endodontic cases. Evaluation of success and failure of endodontic cases in relation to treatment planning followed; surgical endodontics, concepts, techniques. 2 a.h.

82:261 Seminar in Endodontology IV
All areas of dental treatment related to endodontics; complex cases and difficult patient conditions; relationship of endodontics to other dental specialties, by guest lecturers. 1 a.h.

82:262 Practice Teaching in Endodontology
For students interested in teaching in dentistry, especially in endodontics; organizing a course; practice teaching in undergraduate and graduate level. 1 a.h.

82:263 Tissues and Measurements in Dental Education
Basic practical aspects of test and measurements to be used in dental education, including criteria referenced tests, norm-referenced tests and performance evaluation methods. 2 a.h.

82:264 Design and Evaluation of Research in Dentistry
Opportunity to order basic research into meaningful sequences providing practical protocol writing forms for dental research. Prerequisite: introductory statistics. 2 a.h.

82:265 Action Research in Dental Teaching
Designed to give graduate students or beginning teachers guided experience working with dental students in short-term, behavioral, research projects; student data and supervisory data gathering; not related to thesis preparation. Prerequisite: statistics, educational psychology measurement and research design. 2 a.h.

Oral Pathology and Diagnosis
Head: Gilbert L. Lilly Faculty: professors Gilbert L. Lilly; William R. Taylor; professor emeritus Allen K. Feinberg; associate professors Frank E. Palaszewski; Frank L. Honnold; William S. Moulthrop; Donald A. Martz; Charles S. Capron; John A. Hagerty; John J. Scipio; associate professors Philip S. Hornick, Francis H. Sipp; instructors Jules A. Hartman, John M. Haywood. Degree offered: M.S.

Predoctoral Program
The primary objective of the Department is to provide instruction to dental students and other health-profession students in the etiology and natural history of diseases occurring in and about the oral cavity. Instruction includes the clinical, laboratory, radiographic and microscopic features of these diseases and their management. Instruction is provided in the physical evaluation of patients to identify systemic diseases and their influence upon oral therapy and the influence of oral therapy on systemic diseases.

Graduate Program
Advanced instruction is available for graduate-level students in health sciences and related fields in preparation for specialty practice or careers in teaching and research. Candidates for the Master of Science degree are expected to develop substantial ability for research into mechanisms of oral disease and should anticipate that considerable effort will be devoted to completion of an assigned research project and the thesis which will be based on it.

The focus for research will be determined for each student after consultation with the major advisor, but all must successfully complete a course in statistical methods applicable to biological research. Minimum requirements for completion of this program are eighty-six months of full-time work and satisfactory completion of the required courses.

The required courses are:


Since most graduates of advanced programs in oral pathology follow academic careers, students will participate in predoctoral teaching in the Department as part of their education.

Special Program
The Certificate in Oral Pathology combines academic study with extensive laboratory practice of oral pathology under staff supervision. The course requires a minimum of twenty-four months of full-time work for completion. Qualification for the certificate includes completion of all required courses with a passing grade, demonstration of competence in the practice of oral pathology and a satisfactory grade in a final comprehensive examination before an examination committee composed of members of the graduate faculty in the Department of Oral Pathology and Diagnosis. Although additional courses may be elected if circumstances permit or require, required courses in this program are:

86:135 Oral Pathology 86:180 Topics in Oral Pathology 86:200 Oral Pathology and Diagnosis Literature Review 86:225 Oral Pathology and Diagnosis Seminar I 86:226 Oral Pathology and Diagnosis Seminar II 86:227 Oral Pathology and Diagnosis Seminar III
86:240 Oral Pathology Advanced Clinic
86:341 Oral Diagnosis Advanced Clinic
86:242 Dental Radiology Advanced Clinic
86:250 Pathologic Processes
86:256 Advanced Oral Pathology
69:201 General Pathology for Medical Students
69:202 Systemic Pathology for Medical Students
92:216 Dental Sciences Research Methodology
92:213 Advanced Biomedical Studies
92:214 Advanced Biomedical Surveys

Facilities
The laboratories of the Department are equipped for training in histopathology, immunopathology, laboratory diagnosis and ex- perimental pathology. Laboratories are available with facilities for investigation of ultramicrotome of both soft and calcified tissues.

Admission Requirements
Applicants must have completed an accredited program leading to the D.D.S. or D.M.D. degree or its foreign equivalent, with a minimum cumulative grade point average of 2.7 (4.0 scale), and must present satisfactory scores on 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
86:081 Basic Pathology 2 a.h.
Clinical and pathologic relations between normal and pathologic oral tissues, physical examina-
tion and laboratory techniques, identification of diseases associated with oral tissues involved in significant diseases of the scalp. Required for dental hygiene.
86:082 Dental Radiology for Dental Hygienists 1 a.h.
Solutions to problems encountered in services in oral diagnosis and laboratory procedures. First level.
86:083 Dental Radiology for Dental Hygienists 1 a.h.
Supervision of x-ray equipment, principles of radiology in protective apparatus and radiographic film. Second level.
86:180 Topics in Oral Pathology 1 a.h.
Lectures and demonstrations in concentrated areas of special knowledge to pathology. For advanced students is permitted and graduate students.
86:136 Oral Diagnosis and Treatment Planning 2 a.h.
Principles used in the oral cavity; correlation between oral and systemic conditions; use of diagnostic aids; reconstruction of diagnostic aids; diagnosis of disease with correlation to oral pathology. Second level.
86:137 Oral Prophylaxis 1 a.h.
Lectures, conferences, demonstrations, laboratory course devoted to diseases involving oral tissues. Second level.
86:146 Introduction to Diagnostics 2 a.h.
Fundamental principles and techniques in diagnosis, radiology and clinical pathology required for clinical practice are practiced in lectures, clinics and seminars. Second level.
86:191 Clinical Pathology 2 a.h.
Study and practice of diagnosis of oral diseases by laboratory methods and interpreted and recorded in clinical procedures. Emphasis placed on those procedures adequate to office practice. Third level.
86:191 Clinical Dental Radiology 1 a.h.
Supervised experience in taking and processing intraoral and extraoral radiographs, principles of radiology and interpretation. Third level.
86:192 Oral Clinical Diagnosis 1 a.h.
Practical application of diagnosis and treatment planning for patients. Third level.
86:193 Oral Clinical Diagnostic 1 a.h.
Supervised clinical experience in taking, processing and interpreting intraoral and extraoral radiographs. Fourth level.
86:194 Clinical Admissions Emergency 1 a.h.
Supervised clinical experience in taking, processing and interpreting intraoral and extraoral radiographs. Fourth level.
86:195 Advanced Clinical Dental Radiology 1 a.h.
Supervised clinical experience in taking, processing and interpreting intraoral and extraoral radiographs. Fourth level.

Graduate Courses
86:311 Oral Pathology and Diagnosis Literature Review 0 a.h.
Assigned reading and preparation of elements. Prerequisite: consent of instructor.
86:323 Oral Pathology and Diagnosis Seminar I 1 a.h.
Explores concepts in clinical diagnosis and treatment evaluation. Prerequisite: consent of instructor. Summer only.
86:330 Research in Oral Pathology and Diagnosis 0 a.h.
Required for M.S. candidates, but may be open to other qualified students whose research interests coincide with existing departmental research facilities. space permits. Prerequisite: consent of instructor. May be repeated.
86:340 Oral Pathology Advanced Clinic 1 a.h.
Diagnosis by laboratory methods, conferences with departmental staff, participation in operations of the clinical laboratory. Prerequisite: consent of instructor.
86:341 Oral Pathology Advanced Clinic 1 a.h.
Advanced clinical, laboratory and radiographic techniques. Interpretation. Prerequisite: consent of instructor.
86:342 Oral Pathology Advanced Clinic 1 a.h.
Advanced clinical, laboratory and radiographic techniques. Interpretation. Prerequisite: consent of instructor.
86:350 Radiographic Procedures 0 a.h.
Basic principles of diagnosis, emphasis on specific techniques. Prerequisite: consent of instructor. Fall only.
86:351 Advanced Oral Pathology 1 a.h.
Clinical study of diseases involving oral tissues, content can be adapted to special interest of student. Bibliographic research, biologic study of histopathologic processes and diagnostic interpretation emphasized. Prerequisite: consent of instructor.

Oral Surgery
Department Head: L. Lyle

The Department of Oral Surgery is involved in both the predoctoral and residency programs. It combines clinical and didactic training on an individual basis to the interns, abilities and development of the students. The predoctoral program is based 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 as- signed 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 minimally invasive 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 needs 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 com- pleted 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 ad- vanced coursework in such subjects as applied pharmacology, anatomy, pathology, physiology and microbiology, and reviews such closely related disciplines as roentgenology, anesthesiology, physical therapy 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 anesthesia through an assigned rotation in the Department of Anesthesiology. Previous advanced training in physical diagnosis, physiology, pharmaco- logy 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.

GRT 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. The applicant should be in the upper third of his or her graduating class.

Information required includes application for graduate oral surgery, applicant appraisal forms 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 but are strongly recommended. Applicants may be interviewed any time after the application has been completed and the staff elects to take active 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 ap- proximately March 1.

Facilities
The University Health Center has outstanding basic and clinical science departments which stimulate and support scholarly re- search and superior clinical practice. The facilities of the Universi- ty 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
67/156 Anesthesia, Analgesics...
67/115 Patient Evaluation and Management...
67/333 Oral Surgery...
67/145 Patient Evaluation and Management...
67/155 Clinical Oral Surgery...
67/124 Oral Surgery...
67/125 Oral Surgery...
67/126 Advanced Oral Surgery...
67/128 Oral Surgery...
67/146 Clinical Oral Surgery...
67/148 Clinical Oral Surgery...
67/150 Oral Surgery...
67/155 Patient Evaluation and Management...
67/155 Clinical Oral Surgery...
Graduate Courses
87-201 Hospital Procedures 3 a.h.

Orthodontics
87-202 Dental Science Review 4 a.h.

Graduate Program
87-203 Hospital and Allied Health 3 a.h.

87-204 Principles of Anesthesia 1 a.h.

Study of oral and maxillofacial structures and psychiatric emergencies may include animal surgery.

87-205 Palm and Forehead Control 3 a.h.

Concepts of stress control, massage, relaxation, and immunosuppressive therapy and their control; physiology of various oral and system components and their management.

87-206 Principles of Anesthesia 1 a.h.

Review of literature in general anesthesia with study of agents and their effects on respiratory and cardiovascular systems.

87-211 Literature Seminars and Journal Club 1 a.h.

Special attention to material covered in assigned mini-projects.

87-213 Surgical Case Reports 3 a.h.

Review of theory and techniques together with laboratory exercises.

87-214 Rongeur Interpretation 2 a.h.

87-215 Physical Diagnosis 2 a.h.

Review of principles of physical diagnosis.

87-216 Oral Pathology Conference 1 a.h.

87-217 Advanced Oral Surgery Seminar I 1 a.h.

87-218 Advanced Oral Surgery Seminar II 1 a.h.

Autopsy report.

87-219 Advanced Oral Surgery Seminar II 1 a.h.

Assigned readings.

87-221 Oral Surgery Research I 3 a.h.

Special problems and large research program.

87-222 Oral Surgery Research II 3 a.h.

87-223 Oral Surgery Research III 3 a.h.

87-224 Thesis Project 1 a.h.

Complete research project and data gathering.

87-225 Thesis and Defense 1 a.h.

Thesis and defense. Comprehensive examination in three year program.

87-226 Clinical Orthodontics I 3 a.h.

Clinical Orthodontics I

87-231 Oral Surgery Research III 3 a.h.

87-232 Oral Surgery Research IV 3 a.h.

87-233 Orthodontics 3 a.h.


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Periodontics

Primary for Graduates

50:210 Introduction to Advanced Clinical Periodontics 2 s.h.
For first-year graduate students; emphasis on growth and development, child management, and therapy.
50:211 Problems 1 s.h.
Anxiety of various medical problems in the child patient.
50:229 Pediatric Literature Review I 1 s.h.
Diseases of the periodontium, management, preventive and operative techniques, and disease of pediatric periodontia.
50:236 Pediatric Literature Review II 1 s.h.
Diseases of preventive orthodontics, fluoride therapy, health and nutrition guidelines, endodontia, pharmacology and minor oral surgery in relation to pediatric periodontia.
50:277 Pediatric Literature Review III 1 s.h.
Diseases of the periodontium, preventive-conservative techniques, multheaded care for the handicapped child.
50:299 Pediatric Literature Review IV 1 s.h.
Denture of congenital and acquired defects; treatment and advanced pharmacology for periodontia.
50:229 Dental Management of the Handicapped Child 1 s.h.
Principals and techniques for maintaining various handicapping conditions of children in the dental office.
50:229 Research in Periodontics 1 s.h.
50:229 Thesis Preparation 3 s.h.
Preparation of original research project and completion of thesis.
50:245 Advanced Clinical Periodontics 3 s.h.
Comprehensive clinical management of pediatric periodontia, operative therapy, endodontia and minor oral surgery.
50:249 Pediatric Physical Diagnosis for Dental Practitioners 1 s.h.
Principles and problems of physical examination of the child.
50:243 Pediatric Therapy for Dental Practitioners 1 s.h.
Principles of therapy in various disease entities.
50:243 Pediatric Hospital Rehabilitation 1 s.h.
Comprehensive dental care under general anesthesia.
50:244 Pediatric Restorations 1 s.h.
Pediatric diseases and their hospital management.
50:203 Preventive Teaching in Periodontics 1 s.h.
Observation and practice in current teaching procedures.

Periodontics

Department heading: Philip A. LaBrec.
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 student. Emphasis is placed on applying the biological concepts of periodontology to the 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,

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 practices 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 experience in adjacent University and V.A. Hospitals. Research facilities include a departmental research laboratory and collegiate laboratories in the areas of Histology and Histochimistry, Microbiology and Biochemistry, Electron Microscopy with EM and SEM capabilities and Growth and Development. These collegiate 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 unassisted 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
50:201 Introduction to Periodontology 2 s.h.
Lecture and laboratory course devoted to basic concepts of periodontology for the dental hygiene.
50:210 Periodontal Methods 2 s.h.
Periodontal methods, procedures in group settings, slide and lecture sessions augmented by laboratory and clinical experience.
50:100 Periodontology 3 s.h.
Comprehensive clinical management of the periodontal patient.
50:120 Periodontology 2 s.h.
Clinical concepts of periodontology and the clinical management of periodontal patients are presented by lecture and seminar topics.

Predoctoral Program
50:201 Introduction to Periodontology 2 s.h.
Lecture and laboratory course devoted to basic concepts of periodontology for the dental hygiene.
50:210 Periodontal Methods 2 s.h.
Periodontal methods, procedures in group settings, slide and lecture sessions augmented by laboratory and clinical experience.
50:100 Periodontology 3 s.h.
Comprehensive clinical management of the periodontal patient.
50:120 Periodontology 2 s.h.
Clinical concepts of periodontology and the clinical management of periodontal patients are presented by lecture and seminar topics.
Graduate Courses
32:051 Advanced Periodontology
Provides intensive graduate study with comprehensive review of periodontal therapy.
32:055 Clinical Seminar in Periodontics
Covers comprehensive management of periodontal patients, presented with emphasis on non-surgical and surgical treatments and presentation for complete dental hygiene management. Consent to participate in this seminar must be obtained. Required fall and spring seminars.
32:035 Methods of Instruction in Periodontics
Experience in course design in periodontics, including behavioral objectives and means of evaluation.
32:037 Procedures Teaching in Periodontics
Practical experience in lecturing, student direction and clinical teaching in periodontics.
32:038 Recent Advances in Periodontics
Examination of recent advances and innovations in periodontics.
32:010 Periodontology Pedagogy Seminar
Explores didactic instructional methods and student feedback in the clinical periodontics course.
32:112 Applied Oral Microbiology
Review and extension of student's knowledge of microbiology as it applies to oral health problems.
32:113 Biostatistical Aspects of Periodontology
Applications of biostatistical techniques (anova, correlation, regression, etc.) to periodontology.
32:214 Periodontics-Orthodontics
Combination course in orthodontics and periodontics, designed to meet needs in periodontal patients.
32:036 Dental Science Research Methodology
Introduces students to general and specific methods for preparation and examination of biological specimens, research on dental research.
32:217 Dynamics of the Oral Soft Tissues
Review of methods and literature associated with changes in the tissues of periodontal and peri-implant.
32:235 Periodontology Literature Review I
32:236 Periodontology Literature Review II
32:237 Periodontology Literature Review III
32:238 Periodontology Literature Review IV
32:239 Research in Periodontology
32:231 Thesis Preparation in Periodontology
Preparation of original research project and completion of thesis.
32:540 Advancing the Practice of Periodontology
Comprehensive clinical management of the periodontal patient with emphasis on the complex case.

Preventive and Community Dentistry
Division: Dr. Philip Reis
Faculty: Professor W. Philip Reis; associate professor Howard M. Jayze, Robert S. Logan; assistant professors Robert W. Greens, Derek R. Wilt, Roger J. Wright; instructor John R. Schiller
Degree Awarded: M.S.

Programs in preventive and community dentistry are designed to provide dental students with experiences to increase their awareness of oral health needs and to encourage students to develop and implement approaches to alleviate these needs. Exemplar 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.

Students assigned to these programs or the department's resources are two mobile dental vans, one with a dental office 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 the educational requirements necessary to establish their eligibility for the American Board of Public Dental Health.

The program requires 60 semester hours of coursework. The usual full-time program requires two full academic years plus one summer session.

Courses
111:115 Preventive Dentistry
This introductory course is open to second-year dental students. It is designed to familiarize students with the changing field of preventive dentistry. The emphasis is on providing students with the knowledge base and the techniques necessary for the practice of preventive dentistry.

111:116 Community Dentistry
This introductory course is open to second-year dental students. It is designed to familiarize students with the changing field of community dentistry. The emphasis is on providing students with the knowledge base and the techniques necessary for the practice of community dentistry.

111:117 Clinical Photography
This course covers the student in the dental office, emphasizing the use of photography in dentistry.

111:119 Community Experience Requirement

Broadway Hospital Externship
Students spend four weeks in a variety of positions in the community hospital setting.

111:120 Mental Health Education

Mental Health Education
Two weeks of two to three hours each at the Independence Mental Health Institute, two weeks of two to three hours each at a mental health facility.

Mobile Unit Program
Two mobile units are used to provide dental services to underserved people throughout Iowa under faculty supervision. These units are designed to address the needs of areas that are not served by other programs. The units provide a variety of services, including general dentistry, oral surgery, and public health programs.

Private Practice Preceptorship
During each of six one-week periods, approximately 30 students may elect to spend approximately one week of their regular academic year in a private practice setting. The students are expected to gain experience in various aspects of practice, office management, and community affairs.

Rural Health Center Externship
Two to four weeks on rural health centers provide dental services to rural communities. These experiences are designed to provide students with the opportunity to practice in a rural environment and to gain experience in various aspects of rural health care.

Preventive and Community Dentistry 255
Removable Prosthodontics

Department head: Ronnie R. Sandell
Faculty: James R. Simonds, L. E. Barker, William W. Zirven, Thomas N. Ruegsegger, Jean S. Reinholz
Instructor: Lawrence R. Hauer, Paul L. Maxwell, John R. Noblett
Degree offered: M.D.

Removable prosthodontics is the specialty of dentistry involving complete dentures and removable partial dentures.

The preclinical program provides the student with the basic principles, procedures and concepts of removable prosthodontics, required for the practice of general dentistry. This is accomplished through laboratory projects and treatment of patients with differing prosthodontic needs.

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 GRE is required.

Courses

46140 Removable Prosthodontic Technique Lecture 1 s.h.
46141 Removable Prosthodontic Technique Laboratory 3 s.h.
46150 Prosthodontic Materials Laboratory 2 s.h.
46160 Removable Prosthodontics 4 s.h.
46250 Complete Denture Seminar I 1 s.h.
46256 Removable Partial Denture Seminar I 1 s.h.
46257 Complete Denture Seminar II 1 s.h.
46258 Removable Partial Denture Seminar II 1 s.h.
46265 Removable Partial Denture Construction 4 s.h.
46266 Removable Partial Denture Construction 4 s.h.
46270 Research: Removable Prosthodontics 1 s.h.
46281 Thesis Preparation: Removable Prosthodontics 1 s.h.
46282 Advanced Removable Prosthodontics 4 s.h.
46291 Practice Teaching: Removable Prosthodontics 1 s.h.
46300 Journal Club 1 s.h.
46389 Review of current literature in prosthodontics 1 s.h.
46381 Library Assignment: Removable Prosthodontics 1 s.h.

Discussion of assigned readings that are considered essential to removable prosthodontic literature.
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 University of Iowa. Students who declare at 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 Office, 116 Schaeffer Hall, and submit an Application for Admission to the Teacher Education Program to the Office of Admissions, 440 University Hall 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 2.00 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 2.00 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
Undergraduate 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 Tests;
- Be free of any health impairment or physical handicap which will prejudice 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 3.0 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).
Student Teaching

The final phase of the Teacher Education Program is the professional semester, devoted to supervised student teaching and directed observation in a variety of situations. Periodic seminars provide for discussion and evaluation of student teachers' experiences. Student teachers usually live in the communities in which they have their student teaching assignments. To register for student teaching, the student must have:

- Satisfactorily completed eight semester hours during one academic session in residence at The University of Iowa.
- Satisfactorily completed foundations courses, 72-75 Educational Psychology and Measurement, 7V-101 Operation of AV Equipment (Elementary) and 72-100 Introduction: Elementary and Early Childhood Teaching or 73-100 Introduction: Secondary School Teaching and 7E91 or 75-91 Pre-Education Practice.
- Satisfactorily completed the appropriate methods course.

Maintained a cumulative grade-point average of not less than 2.00 as an undergraduate student; 2.30 as a graduate student. 2.70 as a M. A. T. candidate in all college work attempted; all college work attempted at The University of Iowa and all work attempted in his or her teaching major;

Filed application for an assignment by March 15 preceding the academic year during which student teaching is desired.

Waivers

Students who have completed practicum-type experiences or courses which they feel should be considered in lieu of requirements should consult with their advisors concerning waiver procedures.

The CUTE Program

Students who feel they may better advance their educational interests through an inner-city situation, and who are interested in working with inner-city youth, may apply for the Cooperative Urban Teacher Education (CUTE) program through the Director of Student Teaching. Iowa is one of several midwestern institutions which place selected students in the Kansas City inner-city system. The program is open to any student who meets the requirements for student teaching.

Overseas Student Teaching

In cooperation with the University of Wisconsin - River Falls, a split student teaching assignment is available (eight weeks in one of our regular centers and eight weeks in either Australia, England, Republic of Ireland, Scotland, or Wales). Students must make their own housing arrangements, housing will be located for the students by the on-site coordinator. Students electing this program must meet the regular requirements for student teaching.

State Requirements

Certification to teach in many states requires a course in U.S. history or American government. An initial certificate may be obtained in Iowa without meeting this requirement. However, a certified teacher who has not previously met the requirement must complete a minimum of two semester hours of U.S. history or 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 requirements:

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, 1492-1777 3 s.h.
16-062 American History, 1777-Present 3 s.h.
16-161 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 advancement 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 admissions requirements may be admitted under the classification Certification Only. With students in this program, the advisors 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...
certification should apply for Professional Improvement status. Admission to a certification program only leading to teacher certification requires a minimum undergraduate grade-point average of 2.50.

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 in 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 consecutive semesters 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.

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.
*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., 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.
Non-Divisional Programs
Serial Foundations: M.A., Ph.D.

*K-12 Program are offered jointly through Early Childhood and Elementary Education and Secondary Education Divisions.

**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 20,000 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 practice, 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 for production of videotapes, color slides, filmstrips, super 8 films, thermafax, 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, EKhC microfilms, 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 symposia, provides consultative services to school systems, and provides training experience 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 programs, visits by evaluation teams and adherence to published 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 investigation 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
Though 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 major 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 facility contains 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 - specified 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 the facility.

The financial support of the facility is provided by local, state and federal sources.

Financial Aids

The College of Education maintains experienced 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 seeking 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

Individual 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, but not always, made from within the program area of the assistantship.

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 normally are awarded to students in Education who hold assistantships on College of Education or related budgets. Applications may be obtained from 200 Jefferson Building, Students who are eligible are required to register for a minimum of nine semester hours of credit for each semester or five semester hours for the Summer Session for which they expect to receive these tuition awards. An application for a graduate assistantship (i.e., tuition aid) obtained from and filed with the Office of Student Personnel will be given consideration for a graduate assistantship and tuition aid (except for the Special Research Assistantship, see below). Applications are valid for the academic year and the subsequent 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 are eligible for these special assistantships. These 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 transcript of college work completed (undergraduate as well as graduate), letters of recommendation, and scores on the Graduate Record Examination Aptitude Test. The application deadline must be followed exactly or a special form which may be obtained from the Program in Testing, Personnel Selection Committee, 358 Lindquist Center for Measurement. The application deadline is February 1st of each year.

Loans and Outside Employment

Information on 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
Social Foundations of Education

Coordinator: Robert Beiling
Faculty: Professor Robert Beiling; associate professor William Duffy

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 humanistic 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 (79) to remain in the program.

Courses
Social Foundations and Comparative Education

TF:15 History of American Education 2-3 s.h.
Our educational thinking and action of past 300 years as they have contributed to today's schools in United States

TF:158 European Schools 2-3 s.h.
Treatment of contemporary educational changes in five European nation-states: similarities and differences between social, political and religious trends in the USSR, Scandinavia, England, France and Spain.

TF:154 Education in Newly Developing Countries 2-3 s.h.
Problems and trends in education in selected areas and countries of Latin America, Africa and Southeast Asia.

TF:157 History of Education 2-3 s.h.
Ideas and concepts of great educational contributors from early days to present. Educational and social changes will be examined, as well as trends in philosophy, psychology, and the development of educational practice in United States.

TF:157 Philosophy of Education II 3 s.h.
Ethical, philosophical and social aspects of education as they influence educational system. Central issues under study: the scope and limits of education; the nature of education; the role of education in the modern world.

TF:158 Educational Sociology 3 s.h.
Overview of major social trends, influences and courses of action in American culture. Analysis of our institutions of social welfare in American society.

TF:155 John Dewey and Education 3 s.h.
Dewey's philosophy and educational writings with particular emphasis on his theories of education, democracy, and social change.

TF:159 Sex Roles in Society and Socialization 3 s.h.
Sociology of sex roles, sex differences and socialization in a modern society.

TF:152 Individual Instruction in Social Foundations and Comparative Education 3 s.h.
Preparation: consent of instructor.

TF:352 Seminar: Social Philosophy and American Higher Education 2 s.h.
Comparison and analysis of current social philosophies, historical bases and
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practical influence on contemporary higher education. Prerequisite: consent of instructor.

77-304 American Contribution to Educational Philosophy 3 a.h.
American philosophy and its influence on American Public education. 3 a.h.

77-308 Child Development and Family Education Systems 3-6 a.h.
Present issues, trends and problems among school-age children in intellectual, emotional, social and vocational development. 6 a.h.

77-309 Seminar: Value Problems in the Administration of American Education 3 hours.
Philosophical and sociological ideas which underlie American system for administering public education. Exploration of various ideas to place of both conformity and disorder in democratic society and democratic educational systems. Contemporary issues used to provide focus for examination of these ideas. Same as ED 340.

77-492 Ph.D. Thesis 4 a.h.
Prerequisite: consent of supervisor.

Interdisciplinary Courses

77-102 Facilitating Career Development in Schools 4 a.h.
Conceptual framework for understanding work and its relationship to vocational education. Major area in achievement with applications. Fall and spring.

77-390 Current Issues in Education 3-6 a.h.
Senior seminar for economics of educational practice. Required topics in area in program: advanced tool to help students understand issues among students and faculty in all divisions in College of Education.

77-342 Seminar: Psychology and Education of the Ordinarily Different 3 a.h.
Readings and discussions to understand effects of change, significance and deprivation on psychological development and school achievement of all students, and how to provide optimal learning conditions for students with disabilities.

Counselor Education

Chairperson: Albert B. Reed


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

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

Master of Arts Admission Requirements

No specific program of undergraduate study or work experience is required, although students considered inadequately prepared will be expected to arrange for summer courses while undergoing graduate study.

A personal interview is desirable, but not required. Applications will ordinarily be expected to meet at least one of the following qualifications to be considered for the M.A. program:

A minimum undergraduate grade-point average of 3.06 or a total score of at least 1,000 on the Graduate Record Examination (aptitude test), or

A minimum score of 550 on one of the two aptitude portions of the Graduate Record Examination, or

Evidence of outstanding leadership in extracurricular activities at an undergraduate institution, or

Highly successful experience in the field.

Candidates must also evidence an appropriate level of emotional balance, personality and interpersonal skills. Students admitted on an conditional basis will usually be required to earn a 3.06 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 area; 3.00 grade-point average; successful experience in college student personnel work or equivalent experience is preferable.

Ph.D. Admission Requirements

Same as minimum for Graduate College and M.A. program, and as follows:

Students admitted on conditional basis will usually be required to earn a 3.00 G.P.A. to be admitted to regular status.

The M.A. thesis or 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

Preferably an undergraduate major or minor in psychology, or a major in some related field, G.P.A. 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 have been 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

Same as minimum requirements for Graduate College. In addition, a personal interview is highly desirable. Applications are reviewed March 1, for fall admissions only.

Ph.D. Admission Requirements

Same as 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, 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 be given 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 forms by the applicant and letters of reference. 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 self-help-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 support their part-time assistantships to graduate students in the College Student Personnel Program. Applicants for assistantships should contact the coordinator of the particular counseling education program they plan to enter.

Courses

For Undergraduates and Graduates
Counseling and Guidance

For Undergraduates and Graduates
Counseling and Guidance

Directed toward those students who are concerned about their educational and vocational goals, special emphasis is given to the vocational decision-making, self-actualization and explanation of the world of work.

2 s.h.

Background, philosophy and services in school guidance programs. Relationship of guidance to other educational personnel services. Prerequisite: consent of instructor.

11 s.h.

Scholarship and Change in the Counselor

Laboratory course involving open strategies other than one-to-one, one-way dialog model to bring about change in human systems. Prerequisite: consent of instructor.

1 s.h.

Human Sexuality

Exploration of physiological and psychological aspects of human sexuality. Same as Social Work 42.12, Human Development 15.114, Nursing 106.112.

1 s.h.

Teaching Sexuality in Schools: Perceptions of Teachers. Same as Social Work 42.12, Human Development 15.114, Nursing 106.112.

1 s.h.

Teaching Sexuality in Schools: Perceptions of Teachers. Same as Social Work 42.12, Human Development 15.114, Nursing 106.112.

1 s.h.

Teaching Sexuality in Schools: Perceptions of Teachers. Same as Social Work 42.12, Human Development 15.114, Nursing 106.112.

1 s.h.

Teaching Sexuality in Schools: Perceptions of Teachers. Same as Social Work 42.12, Human Development 15.114, Nursing 106.112.

1 s.h.
Early Childhood and Elementary Education

Early Childhood and Elementary Education

Preparation: Jerry N. Kake

Degree offered: B.A., B.S., M.A., M.S., Ph.D.

The programs offered by the Division are designed to prepare graduates for employment in specific positions in public schools and institutions of higher education. 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 centers, 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 for such children in infant-toddler groups, in classes for three-, four-, and five-year-old children, and in kindergartens and meet the requirements of the Iowa endowment number 53 for nursery school/kindergarten teachers.

Students interested in dual certification at the nursery school/kindergarten level and the kindergarten/elementary level should follow the early childhood education program with the early childhood area of specialization listed in enrollment numbers 10 and 53.

Program Requirements

Special Core Requirement

Students desiring to be 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 Science and 7E:163: Methods: Elementary School Mathematics. This core requirement may be satisfied in one of three ways:

- Satisfactory completion of courses 97:55, 97:56, and 223:M:80;
- Satisfactory completion of equivalent courses at another four-year approved college or university;
- Prior to declination of an education major and/or admission to a teacher education program, successful completion of The University of Iowa natural science core course requirement and the passage of special exams dealing with the content of 97:55-97:56 and 223:M:80. Students not passing the science competency examination must register for 97:104.

*Students not passing the mathematics examination must register for 223:M:80.

Foundations Courses

7P:75 Educational Psychology and Measurement 3 s.h.
7E:100 Introduction: Elementary and Early Childhood Teaching 2 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.
or
31:14 Introduction to Child Psychology 3 s.h.

*17:128 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):

*17:15 Parent-Child Relationships 3 s.h.
7U:139 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 advisor.
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 (for 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 or 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 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.

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 team 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 educational background, in-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.

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 School or 7E:159 Laboratory Practice in Elementary School; 7U:159 Laboratory Practice in Education of the Physically Handicapped Child; 7U:152 Laboratory Practice in Education of the Mentally Retarded Child; and 7E:158 Supervised Teaching in an Early Childhood Center. No additional coursework may be taken during the student teaching semester. No more than two creditable 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, 7E:300 Elementary Curriculum, is specifically required of all candidates but each candidate must elect at least one course from each of these areas: Social Foundations, Educational Psychology and Measurement, and Supervision. In addition, each candidate must complete an area of specialization and select a 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 state 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:

7E:302 The Science Curriculum in the Elementary School 3 s.h.
7E:292 Advanced Techniques of Teaching Science in the Elementary School 3 s.h.
7E:350 Seminar: Science Education 1 s.h.
7E:292 Current Readings in Science Education 2 s.h.

In addition, all candidates must complete coursework in at least two science areas. A minimum of six 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 of successful teaching experience, qualifies the student for certification as a Reading Specialist, Iowa endorsement number 54.

Four courses are required of all candidates:

7E:264 Building Foundations for Reading: Preliminary and Primary 3 s.h.
7E:265 Supervision of Intermediate Grade Reading 3 s.h.
7E:264 Seminar: Elementary Reading 3 s.h.
7E:184 Methods: Reading in Secondary School 3 s.h.

In addition, candidates must complete one or more courses each in 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, curriculum, 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 prepared 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 dissertation 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 assistan- tships involve teaching in the Early Childhood Education Center, some involve the supervision of undergraduate majors enrolled in 7E:91 Pre-Kindergarten Practicum; 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
7E:271 Methods and Materials: Elementary School Physical Education 3 s.h.
7E:272 Methods and Materials: Elementary School Physical Education for Physical education majors only. See also Physical Education for Women 27:72.
7E:272 Methods and Materials: Elementary School Physical Education for Physical education majors only. Prerequisite: 7E:71 or consent of instructor. See also Physical Education for Women 27:72.
7E:281 Pre-Kindergarten Practicum 1-3 s.h.

The practicum involves working with children and teachers in early childhood and elementary schools and early childhood centers for at least ten hours per week for each semester hour of
Early Childhood and Elementary Education

7E:149 Implementation of the Unified Science and Mathematics Program for Elementary Grade 1 and 2 2 a.h.
Continuation of 7E:134.

7E:150 Implementation of GMP (Developing Mathematical Processes) in the Elementary School I 2 a.h.
Continuation of 7E:149.

7E:151 Introduction to New Activities for Science Programs K-12 3 a.h.
Introduction to integrate instructional materials from major curriculum programs which emphasize new curricula, research and development will be emphasized. Same as 7E:150.

7E:152 Introduction to New Activities for Science Programs K-12 II 3 a.h.
Synchronizes classroom implementation of new activities for an activity-based science classroom, supplemented and enriched materials and activities. Same as 7E:152.

7E:153 Implementation of New Activities for Science Programs K-12 III 3 a.h.
Continuation of 7E:152-7E:152.

7E:154 HSP (Human Science Program) for Junior High School Science 3 a.h.
Introduction to materials, nationals and methodology of Human Science Program. Related tests developed and available from the Science Education Center will be explored. Same as 7E:164.

7E:155 HSP (Human Science Program) for Junior High School Science I 3 a.h.
Implementation of Human Science Program related tests will be supplemented and enriched and materials and activities. Same as 7E:155.

7E:156 HSP (Human Science Program) for Junior High School Science II 2 a.h.
Continuation of 7E:155.

7E:157 Methods: Early Childhood Education I 3 a.h.
Acquaintance with current educational literature in all curricular areas; emphasis on application of educational theory and instructional processes in pre-kindergarten education. Open to junior and senior education majors and graduate students.

7E:158 Supervised Teaching in an Early Childhood Center 3 a.h.
Supervised teaching in pre-kindergarten early childhood centers. Application must be made to the Office of Student Personnel, College of Education. Permission. Same as 7E:157.

7E:159 Methods: Early Childhood Education Special Needs Module 3 a.h.
For pre-kindergarten-primary and special education teachers and counselors; emphasis on theory, curriculum and methodology useful for integrating children with special needs into regular classrooms, or for special classrooms themselves.

7E:160 Methods: Elementary School Mathematics 3 a.h.
Selection of materials for a language arts program selected from grade 7, through grade 12. Emphasis on planning processes and development of programs needed to achieve goals. Approach to personal and social development through creative dramatic and music instruction. Emphasis on language development, concepts concerning language and social development.

7E:161 Methods: Elementary School Social Studies 3 a.h.
Objectives and curricula for grades kindergarten through six; development of study habits and problem solving.

7E:162 Methods: Elementary School Science 2 a.h.
Principles and practices of teaching at the elementary school for presentation of instruction in elementary science majors; emphasis upon techniques which characterize new approaches to science.

7E:163 Methods: Elementary School Mathematics 2 a.h.
Methods used in kindergarten and grades one through six; teaching reading and computational operations meaningfully.

7E:164 Methods: Elementary School Reading 3 a.h.
Basic methods, trends, recent materials and tested lessons in reading programs of kindergartners, primary and upper elementary grades.

7E:167 Methods: Early Childhood Education II 3 a.h.
Acquaintance with required educational materials and instruction in curricular areas; special emphasis on application of educational theory and on instructional materials for kindergartners, first and second grade.

7E:171 Reading Clinic: Teaching Techniques 3 a.h.
Dynamics of individual reading and instructional reading for children at all levels of reading ability and disability with specific emphasis on diagnostic procedures and techniques used in the classroom. Permission: 7E:154 or 7E:170; Must be taken with 7E:172.

7E:172 Reading Clinic: Teaching Practice 3 a.h.
Practicum in application of diagnostic teaching techniques and reading curricular development. Permission: 7E:164 and 7E:170. Must be taken with 7E:171.

7E:175 Teaching Geometry in the Elementary School Mathematics 3 a.h.

7E:176 Language Arts Laboratory Workshop 3 a.h.
Workshop for elementary school teachers; language arts consultants and supervisory to examine a selected issue within elementary school language arts and, through creative self-expression, linguistic applications, language development or creative models, practical opportunity to design learning experiences and nurture available programs and materials.

7E:177 Early Childhood Education 2 a.h.
For elementary school teachers, reading teachers, reading specialists, and principals who wish to explore materials, fundamentals, and instructional programs which are currently being used to adapt teaching materiais in different situations; areas covered include teaching strategies, management systems, individualized instruction, open classrooms and programmed reading; specific practical ideas are explored and materials developed for implementation of individualization; attention is given to effects of individualization on the total teaching experience of pupils.

7E:178 Workshops Early Primary Supplication 3 a.h.
Emphasis on exposure to new modes development in curriculum materials and supporting theoretical background; application of these materials and development of new materials for specific transitional situations, includes direct observation of children. Enrollment by permission.

7E:179 Early Childhood Education/Elementary Mathematics 1 a.h.
Examines values of creative arts, familiarizes students with creative dramatic activities, develops ability to plan dramatic experiences, and provides guided experiences in leadership development. For students in education, speech and drama art, recreation, etc.

7E:180 Music Workshop for Elementary Music Teachers 1 a.h.

7E:182 Supervision of Science in the Elementary School 1 a.h.
Supervision of student teachers of science, class procedures and student performance evaluation; teaching aids and tools, demonstration, evaluation, field trips.

7E:183 Art Education Workshop 3 a.h.
Curriculum issues for preschool and elementary school art; emphasis on recent art movements and social studies, field trips, demonstrations, video presentations. Same as ENS:186.

7E:184 Curriculum Foundations 2 a.h.
Junior and senior candidates in elementary education; understanding of curriculum, philosophy, theories, and principles, learning process, direction of development and shaping of pupil product. Same as 7E:186.

7E:185 Supervised Teaching in Elementary School 3 a.h.
Application: permission must be made to the Office of Student Personnel, College of Education.

7E:186 Laboratory Practice in Elementary School 3 a.h.
Supervised teaching and observation in special subject of elementary curricula. Permission: courses of instructor.

7E:187 Assisted Teaching 3 a.h.
Introduction to course designed to encourage an education student and his related education student of education student with analogous major for education; study risk is a given framework of general class emphasis in student major subject. Same as 7E:197.

7E:204 Analytical and Synthesis of Children's Literature to Develop Education Environments 3 a.h.
Thematic villains and sequence methodology for literature programs in a variety of instructional settings; literature analysis, research techniques and media applications in instruction. Permission. Same as 7E:186.

7E:204 Advanced Practicum in Pre-School Education 3 a.h.
Directed observation and participation at the Early Childhood Education Center.

7E:205 Teaching the Low Achiever in Mathematics 3 a.h.
Implementing programs for improving both attitude and mathematical proficiency of low achievers in mathematics. Same as 7E:206.
Educational Administration

7E581 Observation and Analysis of Intra-Rental Practice 2-3 a.h.
Observation of elementary school instructional practices; critical review of evidence related to instruction.
7E584 Laboratory Practice in Supervision 2-3 s.h.
Individually planned practical experiences in a variety of supervisory roles. Prerequisite: consent of instructor.
7E585 Practicum in Classroom Teaching 2-3 s.h.
Practicum: consent of instructor.
7E586 Special Problems in Science Education 2-3 s.h.
Individual research projects which may evolve into thesis for advanced students; causes of growing interest in basic research for advanced students. Prerequisite: consent of instructor.
7E587 Field Service Project in Elementary Education 2-3 s.h.
Practicum: consent of instructor.
7E588 M.A. Thesis in Elementary Education 2-3 s.h.
Practicum: consent of instructor.
7E595 Educational Specialist Research in Elementary Education 2-3 s.h.
Practicum: consent of instructor.
7E596 Seminar: Child Art and Art Education 2-3 s.h.
Analysis and evaluation of current concepts of child art and child development; principles, creativity, and art education; historical development of ideas of child art, child development and art education. Same as TE595.
7E598 Research in Art Education 2-3 s.h.
Individual research under supervision; application of thesis preparation to doctoral degree development. May be repeated for credit.
7E599 Ph.D. Thesis in Elementary Education 2-3 s.h.
Practicum: consent of instructor.

Educational Administration

Chairsperson: To be named
Faculty: professor George A. Chamblee, Harry C. DeFur, Wesley E. Ekle, Walter S. Fehey, Howard B. Jones, Henry G. Kahn, William E. Lam, Stanley K. Lam, John B. McWhorter, Ralph A. Sites, associate professors Owen L. Springer, assistant professors June S. Cox, Randall E. Miller, L. Davis Webb
Degree offered: M.A., Ed.D., Ph.D.

M.A. in Educational Administration

The purpose of this program is to prepare individuals for appointment as superintendents of elementary or secondary school principals, central staff, certain positions with state department of education, or positions with local education agencies.

The thesis program is recommended for students who plan to do graduate work for an advanced degree or who have a special interest in research.

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 educational objective.

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 education 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 purpose 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

7E541 Foundations of School Administration 3 s.h.
For holders in school administration; emphasis on processes common to all phases of educational administration; conceptual framework for administration of elementary and secondary schools, principles of educational administration, and the various roles of the administrative team.
7E542 Computer Applications in Education 3-5 s.h.
Principles of educational data processing and computing with applications in educational administration, remediation and research.
7E544 Educational Systems Analysis and Operation Research 3 s.h.
Application of systems analysis and operational research methods in educational planning and decision-making; methods include linear programming, queueing, decision tables, marginal, risk, and network.
7E545 Secondary School Administration 3 s.h.
Relates and responsibilities of secondary school administrators in planning and implementing the educational program, staff policies, pupil-teacher relationships, and procedures, school organization and program planning.
7E546 Elementary School Organization Patterns 3 s.h.
Organizational structures and factors influencing school functioning and program organization.
7E549 State and Federal Planning of Public Education 3 s.h.
Emphasis on operations of public education, determination of policy and policy in planning of public schools by local, state and federal agencies.
7E550 Statistical Techniques, ED 507A. Social Science Systems 3 s.h.
Overview of school business administration and role of school business officer, with emphasis on modern systems analysis and decision-making processes.
7E551 Theory of Educational Administration 3 s.h.
Application of psychological, social, cultural, economic, and political factors to developing educational structures and the description, analysis and methodology of administrative behavior.
7E552 Legal Aspects of School Administration 3-5 s.h.
Enhances the teacher and student with some attention to the principal, effect of laws, and administrative processes; includes liability, regulations, rights, privileges and responsibilities of school personnel; examines principles of law derived from

70:289 Legal Aspects of School Administration 3-2-0
Introduction to the legal aspects of education, including organization, property, finances, origin, legitimation and non-legal relationships; use of constitutional and statutory provisions plus court decisions. Designed primarily for administrators applicable to teachers.

70:291 Advanced Urbanization 3-2-0
Problems of urban areas related to education, city government, institutions; small-scale urban problems developed by students; social use of resources. Same as Sociology 54:279, Urban and Regional Planning 54:101, Public Administration 54:202.

70:294 Seminar: Elementary Supervision and Administration 3-2-0
For experienced supervisors and administrators; to develop a broad understanding of the major issues in elementary school supervision and instructional evaluation; preparation for research and evaluation of research proposals. Prerequisites: 70:241 or equivalent and consent of instructor.

70:295 Seminar: Problems in Public Administration 3-2-0
Explanation of structure and functions of school government and general government; issues and trends in school intergovernmental relations; preparing issues concerning improved school intergovernmental relations; model building.

70:296 Seminar: Computer Applications in Education 3-2-0
Research and practice in applications of computer in educational administration; instruction and research. Prerequisites: 70:201 and 70:202.

70:298 Seminar: School Business Management Administration 2-2-0
Problems of school business management explored with emphasis on contemporary issues; student should be able to conduct self-studies in local school districts as result of course; some laboratory work included.

70:298 Seminar: The Economics of Education 2-2-0
Exploration of economic aspects of education and economics, including supply and demand, resource allocation and productivity, educational planning and efficiency and effectiveness.

70:296 Seminar: Research Design 1-1-0
For graduate students working toward degree; developing dissertation topic and prospect; defining problem, methods of data gathering, design, language, form.

70:298 Research Practicum 3-0-0
Small-scale projects or projects assigned to efficiently developed and assigned; supervision is based on individual needs for personal and professional development. Same as consent of instructor.

70:297 Educational Administration Process 2-2-0
Supervision by school administration, special emphasis on the administrative process in the educational organization, planning, evaluation and decision-making. Read for all Grad. Students.

70:297 Seminar: Organizational Theory and Educational Theory and 3-2-0
Emphasis is on the interrelationships between educational organization and educational administration.

70:294 Seminar: Student Issues and the Working Relationship 2-2-0
Students select work of particular interest in theoretical systems and develop papers for presentation at various levels. 70:319.

70:296 Seminar: Values Problems in the Administration of American Edu- 2-2-0
Criticizes educational and sociological ideas which underlie American education; analysis of administrative projects and change; relationship of education to society; American and comparative education issues.

70:301 Selected Topics in Educational Administration 1-0-0
Individual and group investigation of contemporary problems and issues in educational administration. Prerequisite: 70:201 and consent of instructor.

70:311 Seminar: Case Studies in School Administration 3-2-0
Administrative problems, and issues experienced in actual school situations: case analysis and discussion of cases using theoretical models and theory. Open to graduate students majoring in educational administration and to those who have had some previous experience. Prerequisites: senior course 7:111 or 7:191 and consent of instructor.

70:335 Field Service Practicum in Educational Administration 1-0-0
Prerequisite: consent of instructor.

70:363 M.A. Thesis in Educational Administration 1-0-0
Prerequisite: consent of instructor.

70:369 Educational Specialist Research in Educational Administration 1-0-0
Prerequisite: consent of instructor.

70:445 Ph.D. Thesis in Educational Administration 1-0-0
Prerequisite: consent of instructor.

Educational Psychology, Measurement and Statistics
Charles J. DeWarren

Ph.D. Program offered: Educational Psychology-M.A.; Ph.D. Measurement and Statistics-M.A.; Ph.D.; Reading-Reading, M.A.

M.A. in Educational Psychology
This degree program, which may be taken with (36.0 minimum) or without (32.0 minimum) thesis, is intended to provide the student with an introductory overview of educational psychology. The admission requirements are the same as those established by the Graduate College. Prior teaching experience is highly desirable but is not required for admission to the program.

Only one course, 7P:143 Introduction to Statistical Methods, is specifically required of all candidates but each candidate must elect at least one course from each of four areas, Teaching and Developmental Processes, Measurement and Research, and Social Foundations. Candidates must develop concentrations in at least two fields. Fields are defined as the four areas designated above, plus Measurement, Statistics, and Reading Disabilities.

Candidates must write comprehensive examinations covering their chosen fields of concentration.

M.A. in Educational Measurement and Statistics
This degree program, which may be taken with (36.0 minimum) or without (32.0 minimum) thesis, is intended to provide minimal training for the student seeking to qualify for a position which calls for a specialized competence in educational measurement and research methodology. Such positions are typically found in larger school systems, for government instruction, test publishing organizations, or research centers.

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, and no offering evidence of superior ability is available, the admission may be conditional. A background in college mathematics and experience as a teacher or researcher are highly desirable but not required for admission to the program.

All students are required to complete a common core of courses encompassing from 21 to 23 semester hours. Courses comprising this core include a general graduate level survey-type course in educational psychology, an intermediate level course in classical statistical analysis, a course in basic statistical methods, a course in educational measurement methodology, a course in test construction, and a course in educational measurement and evaluation.

Elective courses (9-11 minimum) must include at least one course offered by the divisions of Elementary, Higher or Second-
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. Candidates may retake 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 2.5 s.h.
7P:150 Educational Measurement for the Classroom Teacher 3.5 s.h.
7U:251 Individual Intelligence Testing 3.5 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 do 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 700 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 minimal course requirements (26 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 five hours of writing in two or more areas from among general educational psychology, human development, learning motivation, and institutional 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 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 700 and that evidence of superior ability is available, the admission may be on a conditional basis. Students expecting to concentrate 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 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 additional work in mathematical statistics. Those who concentrate in the area of educational measurement and
evaluation will be advised to take appropriate courses in curricu-
um, guidance or higher education. Work in other departments of the University is encouraged.

The written comprehensive examinations normally involve three three-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-
mittee.

The dissertation topic (12 to 16 s.h. may be earned in the form of dissertation credits) is 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.

Other 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-
tion of the student's course program will include relevant courses offered by the Department of Speech Pathology and Audiology, Department of Linguistics, and courses selected from the full-scale psychology program of the Department of Psych-
ology.

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 such student's programs.

Financial Aid

The Division normally employs two graduate students as teaching assistants in educational psychology and two in educational stat-
istics. These are half-time academic year appointments and hold-

ings are permitted to carry a study and/or research load of up to 12
s.h. per semester. These positions are generally awarded to expe-
rrienced advanced doctoral students in either educational psychol-
ogy or educational measurement and statistics. Possible candidates may address inquiries to the chairmen of the division.

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

2-3 s.h.

Tests in mental development and classroom learning; child and student character-
istics; problems in classroom management; construction, use, interpretation and evaluation of educational tests. Same as Psychology 31-1.

TP-102 Learner Characteristics

2 s.h.

Description of individual differences found to have direct implications for teaching.

TP-106 Child Development

2 s.h.

Behavioral, social, emotional, motor, mental health, and emotional development of the child. Same as Psychology 51-1.

TP-109 Personality and Mental Hygiene

2-3 s.h.

Personality and adjustment of normal child; motivation and control of typical behavior patterns; principles for modifying behavior; prevention of adjustment disorders.

TP-109 Socialization of the School-Age Child

2-3 s.h.

Social development, peer-social influences, development of attitudes and interests, effects of social class on social development.

TP-110 Educational Psychology

2-3 s.h.

Psychology in teaching and learning: development concepts, social processes, language and thought, personality and social skills, models of teaching and research, theory and applications of learning process. Same as Psychology 31-11.3.

TP-110 The Adolescent and Young Adult

2 s.h.

Behavioral and social development, physical, psychological and cultural factors in adolescence and young adulthood. Same as Psychology 41-1.

TP-114 Introduction to Programmed Learning

2 s.h.

Theoretical basis of programmed teaching; case histories of teaching machines and other devices. Structure and functioning of teaching; model programs for summated teaching. Same as Psychology 31-11.4.

TP-120 Computers in Education

2 s.h.

Introduction to use of micro-computers in education, graphic concept of computing, computer-managed instruction, instructional design, analysis and simulation, use of computer in guidance and counseling, testing administra-
tion and simulation of computer and social factors influencing the use of computers in education.

TP-126 Development and Educational Environment

2-3 s.h.

Analysis and interpretation of research data; descriptive statistics; frequency distri-
butions, t-tests, one-way analysis of variance, correlational measures; regression, multiple regression, and analysis of variance; testing of hypotheses.

TP-128 Systematic Statistics I

2 s.h.

Conception of the research, analysis of parametric data, follow-up procedures, analysis of non-parametric data, hypothesis testing, and model development. Same as Statistics 21-9.

TP-128 Systematic Statistics II

2 s.h.

Analysis of data from experiments, one and two factor analysis of variance, repeated measures analysis, correlation, and non-parametric statistics. Same as Statistics 21-10.

TP-150 Educational Measurement for the Classroom Teacher

2-3 s.h.

Programming 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 of less than 1000 and grade-point averages below 2.50 may be admitted conditionally. 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 our 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/101 Operation of Audio-Visual Equipment
Principles and practice in operating and maintaining picture projectors, audio and video tape recorders, stereo and tape players, projectors, cameras, the dry-magnetic or magnetic hearing aid.

TV/105 Reduction and Utilization of Educational Media
Principles of multi-media education; provide experience in preparing for, editing, and preparing instructional materials; basic techniques for developing teacher-oriented instructional units. Prerequisite: TV/101, which may be repeated concurrently.

TV/116 Introduction to Educational Communications and Technology
Principles of audio-visual communications and technology in teaching and learning: professional roles, equipment, problems and trends. Prerequisite: TV/105 or consent of instructor.

TV/142 Graphic Communication Materials
Planning and use of graphic materials for communication and instruction; emphasis is on designing, developing, producing, developing, preparing, duplicating, graphic lettering and high contrast photographic techniques. No graphic background required.

TV/144 Photography for Instruction
Planning and production of Instructional materials using still or motion picture
photography, tile skills covered, major project required.

TV:451 On-line Instruction Education 1 s.h.

TV:450 Fundamentals of Instructional Applications 1 s.h.

TV:452 Instructional Design 2 s.h.

TV:453 Instructional Management 3 s.h.

TV:454 Instructional Supervision 1 s.h.

TV:455 Instructional Research 1 s.h.

TV:456 Instructional Planning 1 s.h.

Undergraduate Programs

B.S. in Health Occupations

The health occupations education major has been designed to prepare teachers for employment at the community college level in preparatory health occupations education programs. In addition to basic skill and core requirements of the College of Liberal Arts, students will complete courses in professional education and additional coursework in the health occupations education specialty field and/or supporting areas.

Students making application to this program must currently hold appropriate certification, licensure and registry appropriate to the area of health occupations education in which they wish to teach, e.g., dental assisting, medical office assisting, respiratory therapy; and the like. The health occupations education major is planned upon this base, and provides work in professional education and the liberal studies appropriate to teachers who wish to acquire a baccalaureate degree.

Applicants to the program must satisfy criteria for admission to the Teacher Education Program of the College of Education.

The health occupations’ education program has been submitted to the Iowa Department of Public Instruction for approval in teacher certification and career education requirements.

Program Requirements

Coursework in Professional Education

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP:131</td>
<td>3-4 s.h.</td>
</tr>
<tr>
<td>TP:150</td>
<td>2-3 s.h.</td>
</tr>
<tr>
<td>TP:100</td>
<td>3-4 s.h.</td>
</tr>
<tr>
<td>TP:107</td>
<td>2-3 s.h.</td>
</tr>
</tbody>
</table>

Curriculum and Teaching Procedures

One course from each group:

Group I

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP:136</td>
<td>5 s.h.</td>
</tr>
<tr>
<td>TP:616</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

Group II

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH:162</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>TH:112</td>
<td>5 s.h.</td>
</tr>
<tr>
<td>TH:271</td>
<td>2-3 s.h.</td>
</tr>
<tr>
<td>TH:197</td>
<td>2-3 s.h.</td>
</tr>
</tbody>
</table>

Post-Secondary and Continuing Education

Chairperson: Dr. D. Anderson

[Further information on courses and programs]
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 also 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 Instructional 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:101 Operation of Audio-Visual Equipment 3 s.h.
7V:105 Selection and Utilization of Educational Media 3 s.h.
7V:116 Introduction to Educational Communications and Technology 3 s.h.

Coursework in the health occupations education specialty and supportive fields should be carefully planned in consultation with the adviser.

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 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 a 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.

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 documentation 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. Information data, accreditation and approval reports, college catalogs, etc., are to be found in the collection.

Financial 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

67R8 Individual Study: Higher Education

Purpose: To prepare in a master's degree program.

7H:100 Problems and Policies in Higher Education 3 s.h.

Study and analysis of current selected topics, problems and policies in American Higher Education. A basic course open to non-majors and undergraduates.

7H:181 Designing Learning Programs for Health Careers Education 3 s.h.

Emphasis placed on development and evaluation of educational programs, supported planning procedures and typical curricula analysis and practical application in field activities, individualized to meet various background and objectives. Some in Health Education Endorsement 156.

7H:138 Learning Strategies for Career Education 3 s.h.

Role of health specialist as teacher examiner; variety of teaching strategies explored through discussion, observations and teaching activities individualized to meet various background and objectives.

7H:175 Post-High School Faculty Development Workshop 0-2 s.h.

Designed to provide post-high-school instructors with work in other discipline areas in some aspect of professional education; workshop topics may include programs for upgrading of administative and supportive personnel as well as faculty members.
secondary school students must have an understanding and appreciation of adolescents, a sound background in the liberal arts, an open mind toward contemporary issues and his problems, and enthusiasm for the subject taught.

Junior and senior high school teachers usually specialize in a particular subject, although many teach classes both in their major subject and in related subjects. Teachers of home economics, 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 teachers 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 necessary for the teacher's 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 experience at both the secondary and elementary levels.

During the Freshman and Sophomore years, the student completes most of the general requirements for the bachelor's degree by acquiring proficiency in rhetoric, mathematics, physical education and a foreign language, and by satisfying core requirements in literature, natural science, social science and historical-cultural fields.

Program Requirements

<table>
<thead>
<tr>
<th>Foundations Courses</th>
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</thead>
<tbody>
<tr>
<td>Undergraduate courses for a certificate to teach in a secondary school (junior or senior high school) should complete the foundations courses listed below in their sophomore or junior year. Graduate students may elect equivalent graduate courses with the approval of their advisor. 2 s.h.</td>
<td></td>
</tr>
<tr>
<td>78-100 Pre-education Practicum</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>71-100 Introduction, Secondary School Teaching</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>79-73 Educational Psychology and Measurement</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

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 must make applications for student teaching by March 15 preceding their senior year. Students elect 78-192 and/or 78-192 Observation and Laboratory Practice in Secondary Schools. The student teaching period is one fall 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:

| 75-190 Individual Projects in Laboratory Practice | 3 s.h. |
| 75-187 Seminar Curriculum and Student Teaching | 3 s.h. |
| 7TV-105 Selection and Utilization of Educational Media | 2 s.h. |

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 (30-34 s.h.). 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 approval by the University for teaching in a second field (18-24 s.h.). Copies of the major teaching 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 education, 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. or M.S. and Ed.S. degrees, which usually combine advanced work in the academic disciplines and professional education, are designed to enhance the preparation of master teachers, department heads, supervisors, curriculum coordinators, and coordinators for secondary schools and community colleges.

More extensive interdisciplinary programs leading to the Ph.D. degree 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 College of Education and another academic department of the University, whereas other programs are administered primarily by only one of the cooperating units.

Programs leading to the M.A.T., 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: applicants 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 meals, 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, test 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 assistantships is available for students pursuing Ph.D. degrees in secondary education. Holders of such assistantships are permitted to register for no more than 12 hours per semester. Unlike special permission is granted, holders must register for at least nine hours per semester. The assignments of assistantships vary, but most involve the participants in teaching selected undergraduate methods courses or in the supervision of practicum experiences.

Courses

71.81 Pre-Education Practicum 1.5 a.h.
Responsibility for directing students and in-service teachers in performing daily tasks for 3 hours per week. To be taken concurrently with 71.40.
71.102 Introduction to Secondary School Teaching 2 a.h.
Course of secondary education, including past and present educational trends; studies explore characteristics of teachers, students and schools; development of preservice training among these groups.
71.101 Introduction to Education 2 a.h.
Basic structures of field of education; consideration of administrative organization, historical background and contemporary problems at both elementary and secondary levels.
71.103 Directing Senior Activities 2 a.h.
71.104 Laboratory Procedures 2 a.h.
Application of problem-solving in each course on consumer credit and financial decisions; emphasis on student's responsibility and development in fundamental principles of consumer credit and management; credit for 3 hours of laboratory. Same as Business 40.104.
71.105 Principles of Basic Business 2 a.h.
Integration of principles of business structure and function into the fundamental principles of economic and financial management; intended primarily for secondary school teachers of business and social studies subjects. Same as Business 40.104.
71.106 Advanced Methods: Art 2 a.h. (51-62)
Theory and principles of education at the elementary and secondary level in the fields of art appreciation, art and music planning, evaluation, criticism, and instructional environmental educational techniques.
71.108 Introduction to Environmental Studies for K-12 Programs 2 a.h.
An introduction to resources and activities available for integrating environmental studies into the K-12 curriculum to serve course content and serve in supplement existing curricula. Same as 70.106.
71.127 Implementation of Environmental Studies for K-12 Programs II 2 a.h.
Consideration of essential activities in the area of environmental studies, associated with classroom implementation and activities in the area of environmental studies. Same as 70.107.
71.137 Implementation of Environmental Studies for K-12 Programs III 2 a.h.
Same as 70.13, Continuation of 71.107-71.107 for the spring.
71.160 Audit: Business and Consumer Issues 3 a.h.
Exploration of issues which affect to consumer welfare and the business community. Issues such as housing, food, energy, peaceful, and other aspects of life style, personal values and consumer interest. Same as 60.100.
71.161 Methods: Business Subjects 3 a.h.
Study of objectives, content, materials, and methods for teaching business subjects; students may enroll for three or six semester hours of credit, depending upon area of specialization chosen; in consultation with student's advisor, from the following sequence: accounting (1 a.h.); advertising (1 a.h.); office administration (1 a.h.); bookkeeping/auditing (1 a.h.); basic business (1 a.h.); principles of business (551-51); and criminology. Same as Business 60.101.
71.113 Methods: Journalism 3 a.h.
Improving journalism activities in secondary school, with focus on methods of teaching; problems involved in initiating student publication and in the production of school publications. Same as Journalism 60.107.
71.115 Seminar: English 3 a.h.
Instruction in methods, materials and organizational techniques in teaching high school English. Emphasis on laboratory session, integrated with lectures and discussions, students receive informal experience in simulated teaching situations. Same as English 60.20.
71.116 Methods: Foreign Language 3 a.h.
Emphasis on techniques of teaching foreign languages in secondary schools; sequence study of methods and materials development and practice of teaching techniques and organizing teaching. Same as French 91.100, German 110.100, Latin 20.100, Spanish 20.100.
71.117 Workshop Introduction to Intermediate Science Curriculum Study for K-12 High School 2 a.h.
Workshops currently available, workshop programs and workshops developed specifically for the Junior High School. Particular emphasis on the ISC program.
71.118 Implementation of Informal Science Curriculum Study Junior High School Science I 2 a.h.
Particular emphasis on individualized instruction and classroom management practices.
71.119 Implementation of ISC Junior High School Science II 2 a.h.
Continuation of 70.118.
71.120 Laboratory Procedures 1-2 a.h.
Use and techniques of language laboratory equipment and materials. Same as French 91.100, Spanish 110.100, and English 110.100.
71.122 Methods: Home Economics 2 a.h.
Philosophy, general methods in home economics. Required for home economic endorsement and vocational approval. Same as Home Economics 71.100.
71.123 Methods: Physical Education and Recreation 2 a.h.
Planning, organizing and evaluating extracurricular activities in secondary school. Planning of various ideas, preparing for competitive speech and debate activities. Same as Speech and Debate 39.107.
71.127 Workshop Introduction to TPE (Technology, People and Environment) for Secondary School Teachers 2 a.h.
Introduction to TPE activities and materials available to provide students K-12 with interdisciplinary, realistic approaches to the study of current and future sociotechnical problems and issues. Same as Environment 70.127.
71.138 Implementation of TPE (Technology, People and Environment) for K-12 Science Enrichment I 2 a.h.
Consideration of activities, methods, and implementation strategies which facilitate teaching when the elementary or secondary student is involved with the science, mathematics, or social sciences. Same as Environment 70.128.
71.139 Implementation of TPE (Technology, People and Environment) for K-12 Science Enrichment II 2 a.h.
Continuation of 71.138. Same as Environment 70.129.
71.150 Workshop for Secondary School Journalism Teachers 2 a.h.
Intensive workshop designed for teachers responsible for journalism publications.

71.184 Introduction to Environmental Studies for K-12 Programs
An introduction to resources and activities available for integrating environmental studies into the K-12 curriculum to serve course content and serve in supplement existing curricula. Same as 70.106.
71.187 Implementation of Environmental Studies for K-12 Programs I
Consideration of essential activities in the area of environmental studies, associated with classroom implementation and activities in the area of environmental studies. Same as 70.107.
71.188 Implementation of Environmental Studies for K-12 Programs II
Same as 71.107. Continuation of 71.107-71.107 for the spring.
71.160 Audit: Business and Consumer Issues
Exploration of issues which affect to consumer welfare and the business community. Issues such as housing, food, energy, peaceful, and other aspects of life style, personal values and consumer interest. Same as 60.100.
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Improving journalism activities in secondary school, with focus on methods of teaching; problems involved in initiating student publication and in the production of school publications. Same as Journalism 60.107.
71.115 Seminar: English
Instruction in methods, materials and organizational techniques in teaching high school English. Emphasis on laboratory session, integrated with lectures and discussions, students receive informal experience in simulated teaching situations. Same as English 60.20.
71.116 Methods: Foreign Language
Emphasis on techniques of teaching foreign languages in secondary schools; sequence study of methods and materials development and practice of teaching techniques and organizing teaching. Same as French 91.100, German 110.100, Latin 20.100, Spanish 20.100.
71.117 Workshop Introduction to Intermediate Science Curriculum Study for K-12 High School
Workshops currently available, workshop programs and workshops developed specifically for the Junior High School. Particular emphasis on the ISC program.
71.118 Implementation of Informal Science Curriculum Study Junior High School Science I
Particular emphasis on individualized instruction and classroom management practices.
71.119 Implementation of ISC Junior High School Science II
Continuation of 70.118.
71.120 Laboratory Procedures
Use and techniques of language laboratory equipment and materials. Same as French 91.100, Spanish 110.100, and English 110.100.
71.122 Methods: Home Economics
Philosophy, general methods in home economics. Required for home economic endorsement and vocational approval. Same as Home Economics 71.100.
71.123 Methods: Physical Education and Recreation
Planning, organizing and evaluating extracurricular activities in secondary school. Planning of various ideas, preparing for competitive speech and debate activities. Same as Speech and Debate 39.107.
71.127 Workshop Introduction to TPE (Technology, People and Environment) for Secondary School Teachers
Introduction to TPE activities and materials available to provide students K-12 with interdisciplinary, realistic approaches to the study of current and future sociotechnical problems and issues. Same as Environment 70.127.
71.138 Implementation of TPE (Technology, People and Environment) for K-12 Science Enrichment I
Consideration of activities, methods, and implementation strategies which facilitate teaching when the elementary or secondary student is involved with the science, mathematics, or social sciences. Same as Environment 70.128.
71.139 Implementation of TPE (Technology, People and Environment) for K-12 Science Enrichment II
Continuation of 71.138. Same as Environment 70.129.
71.150 Workshop for Secondary School Journalism Teachers
Intensive workshop designed for teachers responsible for journalism publications.
programs or mass media classes; emphasis on brief journalistic skills, advising school publications, editorial content, photography, design and typography, various development and teaching of career mass media; emphasis on media ethics and work with student personnel requirements, same as Journalism 19:142.

19:153 Teaching Social Studies in Middle Grades and Junior High 2 3.s.

Understanding of early childhood, staging and designing practical classroom materials for middle and junior high school students; familiarizing students with teaching techniques and approximations for those grouped previously in a lower junior high school.

19:158 Methods: mathematics 4 s.h.

Survey of teaching subject matter, organization of course and techniques of teaching. Prerequisites: Freshmen 220:30 and 220:65 is course of instruction.


Required of all instrumental music educators; seniors, juniors and seniors in the school music methods required for teaching certification; includes care and repair of instruments.

19:161 Seminar: Contemporary Issues in Music Education 4 s.h.

Current developments in music education with emphasis on music curriculum development and teaching practices. Same as Music 23:599.


Emphasis upon principles, methods and teaching organization of general music course in junior high school, and some notes of music in allied arts and humanities through music in senior high school.

19:167 Instrumental Techniques 1-3 s.h.

Same as Music 30:122.

19:168 methodology of Music 2 s.h.

Session of interest, perception, aesthetic experience, musical abilities of children and major hearing.

19:168 Methods: Secondary Physical Education 3 s.h.

Purpose to develop in a wide spectrum of experiences: types of teaching behavior, classroom procedures, program construction, teaching theory and classroom control; considerable emphasis on preparation of teaching materials and across-training. Not open to music education majors or minors.

19:168 Methods and Principles of Physical Education 3 s.h.

Same as Physical Education and Dance-Honors Gymnasium 28:119.

19:167 Creative Methods and Conducting 3 s.h.

Same as Music 32:109.

19:168 Conducting and Conducting 3 s.h.

Same as Music 32:106.

19:168 Laboratory: Psychology of Music 2 s.h.

Experience in analyzing and measuring various social and behavioral responses in musical activity.

19:169 String Techniques and Methods 2 s.h.

Same as Music 30:121.

19:169 Methods: Physical Science 3 s.h.

Specific teaching skills useful in modern secondary school curricula; includes course organization and teaching methods, behavior and aquatic science. Must be taken together with a field experience.

19:169 Methods: Biological Science 3 s.h.

Continuation of 19:169; includes individual exploration of various natural curricula, teacher capabilities, reinforcement, includes in-service experiences. Prerequisite: 19:169.

19:161 Workshop in Theatre Performance 2 s.h.

Directing, Technical, Arts Management; investigation and application of directing and administration of current practices in professional directing; scheduling of each project determined by interests of students involved. Activeassignments:getattrting direction, management, organization and performance; play to be selected when company is known and will be performed during final week of term; space in Theatre and Drama 30:102.

19:154 Instructional Media in Physical Education 3 s.h.

Primary for analysis of physical education, but open to teachers of other subject matter area and athletic educators; selection, utilization and development of available educational material emphasis upon effective utilization of media in teaching-learning process. Same as Physical Education for Men 21:154.

19:155 Instructional Media: Alcohol Education 2 s.h.

Basic information on alcohol use, abuse and allocoholism; for elementary and secondary social educators, or in a more limited context, for: sociology, criminology, social sciences, other disciplines, criminology, physical education, health education and other subject areas.

19:188 School Physical Education Programs 2 s.h.

Anthropology, social and psychological factors influencing curriculum in physical education, current program trends practiced. Same as Physical Education 20:177.

19:197 Developing School and Community Programs to Reduce Drug Abuse 2 s.h.

Primary for inservice and preservice teachers, administrators and volunteer workers in local schools and teachers in developing local school and community anti-drug education curriculums and programs.

19:198 Psychology; Speech 3 s.h.

19:199 Introduction to New Activities Science Program K-12 3 s.h.

Integration of new interdisciplinary science core into current high school curriculum; course content and development will be emphasized. Same as 19:121.

19:201 Implementation New Activities Science K-12 3 s.h.

Emphasis on classroom implementation of new activities for an activity-based science laboratory; supplemental and experimental materials and activities. Same as 19:121.

19:202 Implementation New Activities Science Programs 2 s.h.

Creation of 19:121/122/125. See also Elementary 70:135.

19:204 HISP for Junior High School Science 2 s.h.

Introduction to the scientific, technical and methodology of the Human Science Program; explore related skills developed locally and available from the Science Education Coord. Same as 19:124.

19:204 HISP for Junior High School Science 1 2 s.h.

Introduction to junior high school science. Includes practical and technical skills; available from the Science Education Coord. Same as 19:123.

19:204 HISP for Junior High School Science 3 2 s.h.

Introduction to the development of an integrated junior high school science curriculum. Same as 19:124.

19:204 Introduction to HISP for Secondary High School Science 1 2 s.h.

Introduction to materials, course and methodology of Integrated Science Instruction (ISI) program.

19:206 Implementation of ISI for Secondary High School Science 1 2 s.h.

Introduction to materials, course and methodology of Integrated Science Instruction (ISI) program.

19:206 Implementation of ISI for Secondary High School Science 2 2 s.h.

Continuation of 19:204.

19:207 Methods: Social Studies 3 s.h.

Planning social studies content for teaching purposes, building classroom materials, problem-solving and new approaches to social studies, social science content. Social science methods; role-playing and role play; relationship of the social sciences are discussed and illustrated by drawing on the Table 1 fact, history, sociology, economics, psychology, the role and role play which are demonstrated through materials selected from other curricula.

19:207 Teaching Social Studies to In-Habit-able Children 3 s.h.

Problems in theory in the curriculum, examination of current topics such as Black, Chinese, and other North American history; the role of discovery and inquiry in approach, and special needs of the same Warren Project and Firth Subtle in Children will be evaluated for study.

19:207 Approaches and Materials in Citizenship Education 3 s.h.

Focus on foundation for the new materials and teaching strategies designed that meet needs of community centers, libraries and schools, aimed at political behavior, instructional material from various areas such as history, literature and similar "basics of presentation."

19:207 Approaches and Materials Teaching Social Economic Problems 1 s.h.

Emphasis on core course materials and materials drawn from the social sciences, especially sociology and economics, and materials that can be incorporated into other courses; presentation activities taught during lessons from materials; reviewing films, and educational materials and new.

19:207 Studies In Citizenship 1, 2, 3 s.h.

Issues about topics about which are courses in American government, economics, sociology and Politics of American Democracy; opportunity to become thoroughly engaged with problems from American Political Issues; Comparing
Special Education

Chairperson: Alan R. Frank
Faculty: professors Clifford S. Hulse, Raymond B. Novakoff, Paul M. Berlik; associate professors Laura J. Brown, Alan R. Frank, John F. Landry, Jr., Arche I. McKeown; assistant professors Robert C. Getler, Alaska Metivongtae
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 current 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 coming 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 in the elementary level (approval number 81); approval to teach the mentally retarded at the secondary level (approval number 81, endorsement number 20); or approval to teach 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 (program 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 choices in the chosen area of teaching—either the mentally retarded or the physically handicapped.

Program Requirements

Special Core Requirement—Natural Science

Students majoring in Early Childhood, Elementary and/or Special Education should complete the special Science/Mathematics Foundation designated for them. Completion of this core requirement is a prerequisite to enrollment in 70:142 Methods—Elementary School Science and 70:143 Methods—Elementary School Mathematics. This core requirement may be satisfied in one of these ways:


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 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 228:40.

Continuous Core

7U:30 Introduction to and Observation of Exceptional Children 3 s.h.
7U:31 Introduction to and Observation of Exceptional Children II 3 s.h.
7U:34 Pre-Education 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 requirement. 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.
Other required coursework:
77:75 Educational Psychology and Measurement 3 s.h.
75:91 Pre-Education Practicum (optional) 1-2 s.h.
75:100 Introduction to Secondary School Teaching 2 s.h.
75:170 Psychology of Reading 2 s.h.
77:170 Psychology of Reading 3-4 s.h.
77:170 Operation of Audio-Visual Equipment 1 s.h.
77:195 Selection and Utilization of Educational Media 2 s.h.
34:1 Introduction to Sociology: Principles 4 s.h.
34:140 Child Development 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.S. 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 CRI (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 60) 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 evalu-
ation. A 3.00 grade-point average on master’s degree coursework is preferred; applicants without master’s degrees 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 perceived training needs.

Special Facilities

Special facilities available to students in Special Education include the University Hospital School (for mentally retarded and physically handicapped) and the University Psychopathic 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 Zober Memorial Tuition Stipend is available to an upper division or graduate student in a training program for teachers of the physically handicapped.

Courses

710: Introduction to and Observation of Exceptional Children I 3 s.h.

Various topics of concern to children and their education problems are described and discussed. Restricted to students in special education. Fall.

712: Introduction to and Observation of Exceptional Children II 3 s.h.

Continuation of 710:50. Restricted to special education majors. Prerequisite: 710:50. Spring.

712S: Instructional Methods and Procedures in Special Education I 3 s.h.

Participation in taped teaching simulations; emphasis on educational development and selection and utilization of various methods and materials applicable for one or more different kinds of handicapped children. Prerequisites: 710:50, 15, 34 or equivalent and admission to Teacher Education Program in special education. Fall.

713: Instructional Methods and Procedures in Special Education II 2 s.h.

Continuation of 710:52. Prerequisite: 710:52. Spring.

713W: Pre-Examination Practicum with Exceptional Children 2 s.h.

Involves observing and working with children with various types of handicaps. Restricted to majors in special education. Taken concurrently with 710:50, 712:50.

713W: Methods Practicum in Special Education 2 s.h.

Takes concurrently with 710:52 and 710:53. Involves applying knowledge gained in lectures in actual teaching situations. Restricted to majors in special education.

712S: Elementary Education for Exceptional Children 3 s.h.

Survey of exceptional children and school programs; for transfer students and seniors in special education. Same as Psychology 31:117. Fall, spring, summer.

710:53: The Culturally Different in Educational Settings 3 s.h.

Problems in teaching culturally different children of school age, research on impact of disabilities, the background knowledge potential of this population. Spring, summer. Same as 710:53.

710:56: Mental Retardation 3 s.h.

Mental retarded child: his life or this problem; causes, diagnosis and psychological problems of retardates; principles, theories and conditions in teaching of educable mentally retarded in public school settings. Spring, summer.

710:58: The Traumatic and Sub-Traumatic Mentally Retarded Child 3 s.h.

Selection of pupils, organization of program, management of retardate child; curriculum content, specific materials and methods for instructing trainable children. Prerequisite: consent of instructor. Spring.

710:57: Education of the Gifted 3 s.h.

Three perspectives will be taken as the basis for instruction, as specified by the instructor, knowledge base of history and programs for gifted, methodology and techniques for providing in adequate educational opportunities for the gifted, techniques for evaluating programs of gifted. For those interested in educational processes and programs for gifted individual. Fall.

710:61: Laboratory Practicum in Education of the Physically Handicapped Child 3 s.h.

Practicum with physically handicapped: Prerequisite: consent of instructor.

710:62: Laboratory Practicum in Education of the Mentally Retarded Child 3 s.h.

Student teaching with the mentally retarded: Prerequisite: consent of instructor.

710:69: Individual Instruction in Special Education Undergraduate 5 s.h.

Prerequisite: consent of instructor.

710:61: Exceptional Children: Assessments and Research 1-5 s.h.

Appraisal of current state of knowledge in special education: emphasis on research pertinent to special education. Usually taken concurrently with 710:202, working directly with handicapped children or adults in practical settings. Prerequisite: consent of instructor. Fall, summer.

710:62: Exceptional Children: Curriculum, Methods and Materials 1-4 s.h.

Curriculum, methods, and instructional interventions for special education. Usually taken concurrently with 710:202. Prerequisite: consent of instructor. Spring, summer.

710:69: Exceptional Children: Professional Education 3 s.h.


710:66: Advanced Problems in Psychology of Exceptional Children 3 s.h.

Current psychological techniques in interviewing and evaluating exceptional children.

710:66: Administration and Supervision of Special Education 3 s.h.

For directors of special education programs and school administrative personnel.

710:67: Practicum in School Psychological Services 2 s.h.

Practicum in psychological and educational evaluation in school psychology. Prerequisites: 710:52, 710:54, 710:201 and consent of instructor. May be repeated.

710:68: An Introduction to the Field of Learning Disabilities 3 s.h.

Administrative of individual educational assessment instruments and interpretation of test results; supervised practical experience in assessment and planning. Prerequisite: 710:50 or consent of instructor. Spring.

710:69: Community and Social Services for the Handicapped 3 s.h.

Organization of community and regional services to mentally retarded, . e., d., m., c., s., m., c., t., h., n., a., s., c., e., n.; experiences provided in an actual setting for students in special education. Prerequisite: consent of instructor.

710:67B: Personality and Personal Adjustment 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 subjective personality tests. Prerequisite: consent of instructor. Fall.

710:64: Introduction to Behavior Disorders/Learning Disabilities 3 s.h.

Systematic examination of sociological model of behavior disorders and mental retardation within various community settings providing psychological, social and educational programs for children and youth with behavior difficulties. Prerequisite: consent of instructor.

710:65: Behavior Disorders/Learning Disabilities I 3 s.h.

Tardiness, troubles, principles, causes, problems, lessons, methods and procedures of specific educational programs concerning educational practice for children and youth with behavioral dysfunctions. Prerequisite: consent of instructor.

Special Education
TU246 Behavior Disorders/Learning Disabilities II 3 s.h.
Concurrent: TU247. Prerequisite: consent of instructor.

TU247 Practicum: Behavior Disorders/Learning Disabilities II 1 s.h.
Supervised practica with children and youth with psychosocial disorders, taken concurrently with TU246. Prerequisite: consent of instructor.

TU248 Practicum: Behavior Disorders/Learning Disabilities II 2 s.h.
Concurrent: TU247. Prerequisite: consent of TU247 and TU249. Prerequisite: consent of instructor.

TU249 Seminar: Behavior Disorders/Learning Disabilities II 1 s.h.
Integration of theory and practice; group exploration of practicum experiences. Taken concurrently with TU248 and TU246. Prerequisite: consent of instructor.

TU250 Seminar: Behavior Disorders/Learning Disabilities II 1 s.h.
Completion of TU248, taken concurrently with TU248 and TU246. Prerequisite: consent of instructor.

TU251 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 scores. Prerequisite: TU142.

TU252 Advanced Laboratory Practicum with Exceptional Children 1 s.h.
Observation, experimentation, 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.

TU253 Individual Instruction in Special Education 1 s.h.
Prerequisite: consent of instructor.

TU256 Seminar: Advanced Problems in Teacher Education for Prospective Teachers of Exceptional Children 1 s.h.
Perspective on problems dealing with program design, program goals, methods, evaluation and evaluation practices; recruitment; selection; certification; accreditation; practice course. Prerequisite: consent of instructor.

TU258 Seminar: Current Issues in School Psychology 3 s.h.
Restricted to Ed. S. and Ph.D. students. Prerequisite: consent of instructor.

TU259 Seminar: Research Practicum in Special Education 1 s.h.
Areas of research in special education: design of small-scale research projects, particular interest in planning, managing, and reporting research; students assigned to current projects for practical experience in research. Prerequisite: consent of instructor. Fall.

TU261 Seminar: Program Development in Special Education 1 s.h.
Prerequisite: consent of instructor.

TU277 Seminar: Current Issues in Special Education Administration 3 s.h.
Prerequisites: TU226 and consent of instructor. Spring.

TU285 Practicum in College Teaching 1 s.h.
Prerequisite: consent of instructor.

TU287 Supervision of School Psychology Practicum 1 s.h.
Devised methods of employing school psychology practicum students.

TU298 Field Service Project in Special Education Internship 1 s.h.
Prerequisite: consent of instructor.

TU300 M.A. Thesis in Special Education 1 s.h.
Prerequisite: consent of instructor.

TU305 Educational Specialties Research 1 s.h.
Prerequisite: consent of instructor.

TU353 Ph.D. Thesis in Special Education 1 s.h.
Prerequisite: consent of instructor.

TU484 Ph.D. Thesis in School Psychology 1 s.h.
Organization of the College

Extraordinary demands have been imposed on the engineering profession in general and on engineering education in particular by the broadening spectrum of activities in which the engineer practices and the increasing complexity 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, Civil Engineering, Chemical Engineering, Electrical Engineering, 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 program. 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 according to broad functional areas of modern engineering endeavor. Each division is responsible for the development and operation of all laboratories at all levels of activity and for all purposes for the content, teaching, and scheduling of all academic courses; and for the conduct of all research programs. The chief administrative officer of a division is the division chairman.

This grouping of resources according to broad functional areas combined with strong formal curricular programs provides clear insight for the student of the cross- disciplinary nature of modern engineering while he is exposed to academic studies individually and professionally arranged within the educational scope of the College and encourages interdisciplinary and innovative programs.

Iowa Institute of Hydraulic Research

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 fluids 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 1600 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 flume and low-force 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 flumes, special air-flow apparatus and liquid flow
circuits. Most of the Institute's research engineers, who cur-
rently number 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 750 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-
teraction with the University's IBM 360-65 and H0P-2000 com-
puter systems via video display and hard copy terminals. The
laboratory also contains other 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 are aided in their transition from the placement ser-
vice 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 be enrolled 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 requirements 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 funda-
mental 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
whole four years of undergraduate study. The stems are mathe-
matics, basic and applied sciences, socio-humanistic studies, and
analysis and design. 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 stem. 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 rhetoric, 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 philo-
osophy 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

4.1 Principles of Chemistry I 3 s.h.
10:1 or 10:3 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: Compu-
tation 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
10:2, 10:3, and 10:4 will be allowed 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
chemical engineering majors (64 Principles of Chemistry II) or civil and mechanical engineering majors (95000 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, philosophy, sociology, psychology, 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 literature 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-56 to 89 semester hours Senior-90 or more semester hours

Academic Probation and Good Standing

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 enrolled 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 courses 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 courses on a pass-fail basis. The P-F option may not be used for courses taken to fulfill the choric 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 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. 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.

Admission

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;
- Ranked 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 transcript of all college work. Each applicant should have:

- Completed at least one semester of calculus or its equivalent;
- Achieved 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 the student on 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 events 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; Chi Kappa Nu, honorary electrical engineering fraternity; and Eta Tau Sigma, honorary mechanical engineering fraternity, 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 rating "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 for a particular curriculum. The suffix denotes 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 first 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:

52 Energy Engineering
54 Information Engineering
56 Materials Engineering
58 Systems Engineering

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 as shown below:

0 Undergraduate Engineering Core Program
1 Biomedical Engineering
2 Chemical Engineering
3 Civil Engineering
4 Environmental Engineering
5 Electrical Engineering
6 Industrial and Management Engineering
7 Mechanical Engineering
9 Mechanics and Hydraulics

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 300 and above designate courses primarily for graduates. The table below provides further means of conveying information on the level and type of course.

| 201-202 | Freshman core program courses |
| 020-029 | Sophomore core program courses |
| 030-039 | Junior core program courses |
| 040-049 | Required courses in undergraduate program |
| 091-094 | Undergraduate professional program seminars |
| 095-097 | Contemporary topics courses for undergraduates |
| 098 | Individual investigation courses for undergraduates |
| 101-109 | Courses for which little or no engineering, science or mathematics background is required |
| 110-119 | Undergraduate elective or lower level graduate course |
| 190 | Readings courses for non-engineering majors |
| 191-194 | Seminars for undergraduates and graduates |
| 195-197 | Contemporary topics courses for undergraduates and graduates |
| 198 | Individual investigations for graduates |
| 199 | M.S. thesis research |
| 210-289 | Upper level graduate courses |
| 291-294 | Seminars for graduates |

295-297 Contemporary topics courses for graduates

Ph.D. thesis research

The courses offered by each division are listed within each division's section. Within each level, courses are arranged in reverse order of the first digit of the suffix. For example, the courses in the discipline engineering and applied statistics within the Division of Systems Engineering are listed in numerical order with 38-033 Probability and Statistics for Engineering and Physical Sciences through 386-232 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

Program chairman: Kevin Reece
Faculty: professors: Dan O. Neuman, D. B. McDonald, James G. Cohen, Kevin Reece; associate professors: Chih-hua Chen, David M. Levy, Norman J. Maje, associate professors Robert Ross, Lawrence J. Reis
Degree offered: B.S.

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 core curriculum, and has been developed to prepare students for the challenges and opportunities associated with careers in biomedical engineering. Students who complete this program may pursue career opportunities in industry (the design and development of biomedical instrumentation, diagnostic aids, life support systems, prototypical and orthotic devices, man-machine systems, etc.), or they may elect to continue their formal education in the engineering, medical or legal profession. The program has been carefully designed so that it is possible to satisfy the current requirements of the Graduate College and the colleges of Medicine, Dentistry and Law.

Extensive 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. Biomedical engineering graduate and engineering students participate actively with college faculty members and their colleagues.
Curriculum

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
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</thead>
<tbody>
<tr>
<td>4:1 Principles of Chemistry I</td>
<td>7 s.h.</td>
</tr>
<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>580:001 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>
</tr>
<tr>
<td></td>
<td>15 s.h.</td>
</tr>
<tr>
<td>Second Semester</td>
<td></td>
</tr>
<tr>
<td>4:6 Elementary Chemistry Laboratory</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>10:2 Rhetoric or free elective</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22M:36 Engineering Calculus II</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>580:002 Introduction to Engineering: Design II</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>580:004 Introduction to Engineering: Computation</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>4:4 Principles of Chemistry II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td></td>
<td>16 s.h.</td>
</tr>
</tbody>
</table>

Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>22M:37 Engineering Calculus III</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>520:016 Thermodynamics I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>540:011 Dynamic Systems Analysis I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>560:015 Materials Science I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>560:017 Mechanics of Solids</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>18 s.h.</td>
</tr>
</tbody>
</table>

Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>580:039 Probability and Statistics for Engineering and Physical Sciences</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>580:021 Principles of Design I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>520:020 Mechanics of Fluids and Transfer Process</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>521:031 Elementary Bio-engineering</td>
<td>4 s.h.</td>
</tr>
<tr>
<td></td>
<td>17 s.h.</td>
</tr>
</tbody>
</table>

Second Semester

| 29:82 Physics I            | 3 s.h. |
| 4:121 Organic Chemistry I  | 3 s.h. |
| 580:022 Principles of Design II | 3 s.h. |
| Technical electives*        | 3 s.h. |
| Socio-Humanistic electives  | 4 s.h. |
|                                | 16 s.h. |

Senior Year

| First Semester              |  |
| 561:083 Biomedical Engineering Design I | 3 s.h. |
| Socio-Humanistic electives  | 6 s.h. |
|                                | 15 s.h. |

Second Semester

| 561:084 Biomedical Engineering Design II | 3 s.h. |
| Technical electives*                  | 3 s.h. |
| Socio-Humanistic electives             | 9 s.h. |
|                                | 15 s.h. |

*Each student must take at least three of the five courses listed below, plus nine additional semester hours in appropriate accredited engineering, biological and/or health science related courses.

Chemical Engineering

Program chairman: James O. Odens
Faculty: professors: Boo-Tak Ilvay, James O. Odens, Kyrilov C. Valeric
Professor Emeritus Earl H. Hagemann; associate professor Keith B. Babcock, Edward M. Kill, Arthur F. Venti; associate professor Ilie C. Wu
Degrees 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 designed 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  Elective  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.

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: Computation  2 s.h.

Sophomore Year

First Semester
23M:37  Engineering Calculus III  4 s.h.
580:017  Mechanics of Solids  4 s.h.
540:011  Dynamic Systems Analysis I  3 s.h.
560:015  Materials Science I  3 s.h.
  Socio-humanistic elective  4 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.

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.

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.

Senior Year

First Semester
4:121  Organic Chemistry I  3 s.h.
562:051  Chemical Reaction Kinetics  3 s.h.
562:052  Biotechnics 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.

Second Semester
4:122  Organic Chemistry II  3 s.h.
4:141  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.

Courses in the Socio-humanistic stem must be selected to satisfy the College of Engineering policy. *Students who have chosen chemical engineering as a major at the beginning of the second semester, freshman year, should take 4:004 (Principles of Chemistry I) in that semester, reducing the load in the second semester of the sophomore year.

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, rheology, 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: Harlan Kane
Faculty: professors: Jan E. Benham, Richard R. Dasgupta, John F. Kennedy, Howard W. McQuade, Wayne L. Pecksen; associate professors Kenneth J. Durkin; associate associate professors Naoyuki Y. Naito, William C. Smolen
Graduate assistants: John J. O'Meara; summer professors Henry Sievers, Thomas E. Crull, Susan Neeves, C. Jou, Lee D. McMullin, and Assistant Professor Hans C. Turovsky; instructor Robert J. Smith
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 include transportation systems to move masses of people and products, such as bridges, highways, public transit systems, sewers, harbors, airports, seaports and even spaceports; large scale structures and office buildings 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 new 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 engineers work with architects, landscape architects, planners, economists, financiers, sociologists, lawyers and other specialists as members of the design team. Some civil engineers work in engineering offices; others may be called upon to construct or supervise the projects they have designed. These field assignments, none of which are 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
First Semester
4000: Principles of Chemistry I 3 s.h.
10:1 or 10:3 Rhetoric 4 s.h.
22:035 Engineering Calculus I 4 s.h.
50:001 Introduction to Engineering: Design I 2 s.h.
224:003 Introduction to Engineering: Graphics 2 s.h.
Total 15 s.h.

Second Semester
4006: Elementary Chemistry Laboratory 2 s.h.
10:002 Rhetoric or free elective 3 s.h.
224:006 Engineering Calculus II 4 s.h.
50:007 Statics 2 s.h.
580:002 Introduction to Engineering: Design II 2 s.h.
580:004 Introduction to Engineering: Computer 2 s.h.
Total 15 s.h.

Sophomore Year
First Semester
224:007 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
224:008 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.
540:025 Electromagnetic Theory 4 s.h.
563:031 Structural Analysis I* 4 s.h.
563:091 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.
563:091 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.

Civil Engineering 297
Senior Year
First Semester
563:006  Soil Mechanics  3 s.h.
563:091  Professional Seminar**  0 s.h.
Design elective** and/or technical electives  6 s.h.
Deferred sequence*  3 or 4 s.h.
Social-humanistic electives  3 s.h.
Total  15 or 16 s.h.
Second Semester
563:091  Professional Seminar**  2 s.h.
Design elective** and/or technical electives  6 s.h.
Deferred sequence*  3 s.h.
Social-humanistic electives  6 s.h.
563:097  Senior Project  1 s.h.
Total  16 s.h.

* A sequence 523:065, 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:

First Semester
523:151  Hydraulic Systems Design in Environmental Engineering
563:135  Structural Design II
Second Semester
529:164  Hydraulic Design
563:173  Transportation Systems Design

Courses in the Social-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 or areas 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 must prepare and defend a dissertation which contributes to knowledge in the field. No foreign language is required.

The department cooperates in interdisciplinary doctoral programs with the Program 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 10 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=4). 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
Lecturing assistant program: Donald M. Levy
Graduate program chairman: Doug H. Creasy
Degree offered: M.S., M.E., Ph.D.

Undergraduate Program
The undergraduate program provides the basic foundation for professional training in electrical 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 necessary background in circuits, control systems, electromagnetism, 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>10-1 or 10-3 Rhetoric</th>
<th>4 s.h.</th>
</tr>
</thead>
<tbody>
<tr>
<td>22M:35</td>
<td>Engineering Calculus I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>4:1</td>
<td>Principles of Chemistry I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>580:001</td>
<td>Introduction to Engineering Design I</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>590:003</td>
<td>Introduction to Engineering Graphics</td>
<td>2 s.h.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 s.h.</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 | 3 s.h. |
|                |                        | 13 s.h. |

### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>560:017</th>
<th>Mechanics of Solids</th>
<th>4 s.h.</th>
</tr>
</thead>
<tbody>
<tr>
<td>22M:37</td>
<td>Engineering Calculus III</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>520:016</td>
<td>Thermodynamics I</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td>560:015</td>
<td>Materials Science I</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>540:011</td>
<td>Dynamic Systems Analysis I</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 s.h.</td>
<td></td>
</tr>
</tbody>
</table>

### Second Semester

| 22M:38         | Engineering Calculus IV | 4 s.h. |
| 540:030        | Logic and Digital Systems | 3 s.h. |
| 540:012        | Dynamic Systems Analysis II | 3 s.h. |
|                |                        | 17 s.h. |

### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>22-81</th>
<th>Physics I</th>
<th>3 s.h.</th>
</tr>
</thead>
<tbody>
<tr>
<td>22S:39</td>
<td>Probability and Statistics for Engineering and Physical Sciences</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>545:080</td>
<td>Principles of Electrical Engineering Design I</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>545:060</td>
<td>Electronic Circuits I</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>545:020</td>
<td>Communication Systems</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>545:091</td>
<td>Professional Seminar**</td>
<td>0 s.h.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 s.h.</td>
<td></td>
</tr>
</tbody>
</table>

### Second Semester

| 4:1            | 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. |
|                |                        | 16 s.h. |

### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>545:070</th>
<th>Electrical Engineering Materials and Devices</th>
<th>3 s.h.</th>
</tr>
</thead>
<tbody>
<tr>
<td>545:082</td>
<td>Principles of Electrical Engineering Design III</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td>545:091</td>
<td>Professional Seminar**</td>
<td>0 s.h.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science core electives**</td>
<td>3 s.h.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technical electives</td>
<td>4 s.h.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 s.h.</td>
<td></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 advisor, and together with the advisor plans his or her individual graduate program, with freedom of choice bounded 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
either the Graduate College or by the program but are introduced into the program by the advisor and the graduate committee that they are appropriate in light of the particular student’s goals. The program recognizes the student’s desire to complete the graduate degree program without sacrifice of quality, and encourages the student to proceed toward graduation as quickly as possible.

The basic program, which is fundamental to electrical engineering, has a wide application, and thus results in interdisciplinary research in several areas. Opportunities are available for the student to work toward his or her own interests and participate in a creative effort.

Specialized studies and research within the program are centered in the following areas: digital signal processing, analysis and synthesis of speech, network theory, classical and optical control theory, linear and nonlinear systems theory, stochastic systems, communication networks, filtering and estimation theory, systems identification, computer systems, communication systems, digital control, plasma physics and physical electronics. The College of Engineering’s Guided Self-Study Program enables students in neighboring cities to take courses while employed full-time. Research can be carried out by these students during the summer or through the independent study option.

In cooperation with the Quad Cities Graduate Study Center, the program offers an extension program in electrical engineering in the Quad Cities area.

Master of Science

Both thesis and non-thesis programs are available. The degree requires at least 30 semester hours of credit in an approved, coherent program acceptable 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, or electives, and at least nine semester hours of coursework outside of electrical engineering, ordinarily 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 547:98 Individual Investigation is required in addition to at least 12 semester hours in electrical engineering. This independent study is to be a special project completed under the supervision of the student’s program 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 547:98 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. For Ph.D. students, an M.S. student with a grade-point average less than 2.7, but higher than 2.3 in courses in electrical engineering, mathematics and physics, may be admitted on probation. Each application is reviewed on an individual basis. Excessive circumstances may permit deviations from the normal standards.

Engineering

Program chairperson: George M. Laszlo

Faculty: professors J. Wayne Bregel, San Hui Huang, George Laszlo, Howard McCullough, associate professor James Anderson, assistant professor Joseph Sinopoli

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 assurance 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 specific 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 se-
quiter 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
10:1 or 10:3
22M:35
380:001
380:003
Second Semester
4:6
10:2
22M:36
380:002
380:004
Second Semester
25:83
282/022
282/027
First Semester
Design course
Technical electives
Socio-humanistic elective
Second Semester
Design course
Technical electives
Socio-humanistic elective

Sophomore Year
First Semester
22M:37
520:016
540:011
560:015
560:017
Second Semester
22M:38
540:012
560:019
540:023
Socio-humanistic elective
Second Semester
29:82
520:020
580:021
Socio-humanistic elective
Junior Year
First Semester
280:039
29:82
520:020
580:021
Second Semester
Physics II
Principles of Design II
Engineering Management Science
Technical elective
Socio-humanistic elective
First Semester
Design course
Technical electives
Socio-humanistic elective

Socio-humanistic elective courses must be selected to satisfy the
College of Engineering policy.

Environmental Engineering

Program Chairman: Richard R. Day
Faculty: Professors: Clyde M. Berry, Aikard R. Dagen, Keith R. Long, Donald R.
McConnaughy, James O. Oden, Wayne L. Patsch, William W. Sorey; associate
professors: David C. Chan, Donald J. Singer; assistant professors: Neil B. Fisher,
L. D. McConnaughy.
Degree Offered: 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 engi-
neering have been awarded.
Prior to 1968, the graduate program in environmental engi-
neering was open only to individuals holding an undergraduate
degree in engineering. Since 1968, individuals with undergrad-
uate degrees in other 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 relation-
ships 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 man-
agement or solid waste management. Through the appropriate
selection of elective courses students may emphasize the analysis
and design of pollution control facilities, water resources, envi-
ronmental 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 Energy
Engineering section of this catalog. Courses which have been
designed primarily for the Environmental Engineering Program
are identified by the digit "9" in the third position of the course
number prefix. Course descriptions are provided in this catalog
within the section devoted to the Division of Energy Engineering.

Master of Science

The master's degree may be earned on 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 course
work and 6 semester hours of credit for research. The non-thesis
program requires a minimum of 36 semester hours of credit.
Twenty-four 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 admis-
sion 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 main-
tain a grade-point average of 2.7 are placed on academic proba-
tion. 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 advisory 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 back-
ground 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 back-
grounds 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 can-
didacy for the degree. These examinations are conducted at least
once annually. All of the student's coursework has been com-
pleted. These examinations cover previous coursework and rel-
ated 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 aid is available through research and teaching assis-
tanceships, fellowships, and direct employment on contractual re-
search projects and studies conducted through the Environmental
Engineering Program.

Industrial and Management Engineering

Program chairman: J. M. Litchaways
Faculty: professors W. D. Jones, J. M. Litchaways, J. B. Simon; associate
professors E. M. Meikle, J. S. Ranbury, associate professor D. L. Bricker; lecturers
C. V. Perl, instructors D. H. Black, I. O. Poyrer, J. W. Simon

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

The industrial and management engineer 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
advised to management, or he may be in a line unit participating
directly in decision-making processes. His job title might be opera-
tions analyst, industrial engineer, systems analyst or engineer,
operational research analyst, internal consultant, supervisor or
manager. He may be employed by a manufacturing firm, a
government agency or a business 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 comput-
ing. An undergraduate handbook, describing the program in greater
detail, is available upon request.
### Curriculum

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Principles of Chemistry I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>10.1 or 10.3 Rhetoric</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>22M/035 Engineering Calculus I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>580/001 Introduction to Engineering: Design I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>580/003 Introduction to Engineering: Graphics</td>
<td>2 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15 s.h.</strong></td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6 Elementary Chemistry Laboratory</td>
<td>2 s.h.</td>
</tr>
<tr>
<td><strong>+ 10.2</strong> Rhetoric or free elective</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>22M/036 Engineering Calculus II</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>580/002 Introduction to Engineering: Design II</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>580/004 Introduction to Engineering: Computation</td>
<td>2 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14 s.h.</strong></td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>560/015 Materials Science I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>580/027 Engineering Management Science</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22M/037 Engineering Calculus III</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>540/011 Dynamic System Analysis I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>560/017 Mechanics of Solids</td>
<td>4 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17 s.h.</strong></td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>567/070 Materials Science II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>**** Economics elective</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>22M/038 Engineering Calculus IV</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>540/012 Dynamic System Analysis II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>520/016 Thermodynamics I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17 s.h.</strong></td>
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#### Junior Year

<table>
<thead>
<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>566/071 Materials Processing I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>586/140 Qualitative Methods</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>225/039 Probability and Statistics for Engineering and Physical Sciences</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>580/021 Principle of Design I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>540/025 Electromagnetic Theory</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>586/091 Professional Seminar</td>
<td>0 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16 s.h.</strong></td>
</tr>
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</table>

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>29/082 Physics I</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>586/141 Introduction to Operations Research</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>*31/001 Elementary Psychology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>580/022 Principles of Design II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>*</td>
<td>Humans elective</td>
</tr>
<tr>
<td>*586/091 Professional Seminar</td>
<td>1 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17 s.h.</strong></td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>*** Science core elective</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>586/144 Information Systems Design</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>*31/106 Psychology in Management</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>586/121 Design of Work Methods</td>
<td>4 s.h.</td>
</tr>
<tr>
<td><strong>Technical elective</strong></td>
<td>4 s.h.</td>
</tr>
<tr>
<td>586/091 Professional Seminar</td>
<td>0 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16 s.h.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technical elective</strong></td>
<td>3 s.h.</td>
</tr>
<tr>
<td><strong>Technical elective</strong></td>
<td>3 s.h.</td>
</tr>
<tr>
<td>*31/155 Human Engineering</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>586/133 Quality Control, Reliability and Engineering Statistics</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>+ Humans elective (100-level)</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>586/091 Professional Seminar</td>
<td>1 s.h.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16 s.h.</strong></td>
</tr>
</tbody>
</table>

*Strongly recommended social science electives

**Program courses satisfying technical elective requirements include:

- 587/101 Communications in Industry I
- 586/124 Operational Systems Design
- 586/128 Engineering Administration I
- 586/142 Production Inventory Models
- 586/143 Quantitative Investment Analysis
- 586/147 Sequencing and Scheduling
- 586/149 Digital Systems Simulation I
- 586/147 Advanced Managerial Psychology

**The science core elective may be selected from:

- 29/083 Physics II
- 586/019 Mechanics of Deformable Bodies
- 520/030 Mechanics of Fluids and Transfer Processes
- or a biological science course, such as

- 52/031 Elementary Bio-Engineering

which is recommended.

**The economics elective may be selected from:

- 62/010 Price, Employment and Production Theory
- 68/173 Managerial Economics
- 68/103 Microeconomics
- 68/111 Labor-Manpower Economics

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**Industrial and Management Engineering**

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+ 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 10:3 Rhetoric and 10:2 Rhetoric in lieu of 10:3 and the second semester freshman electives 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. Studies program emphasizing operations research or engineering management and human factors may be developed jointly by the 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 at the M.S. level, while those desiring some specialization in applied statistics, computing or materials processing may accomplish 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 grade point average of 2.50 or 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 2.30 or 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 sessions 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 of 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 grade point average 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 3.25 on all graduate work taken after the University of Iowa and the demonstration of capability for individual achievement. Upon completion of the course 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 the examination, which includes both written and oral parts, the student will be examined in at least two courses of the program. 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 Div. office, program faculty will periodically offer evening 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 $1950 to $4420 for an academic year of graduate study. Awards are based
on the student’s academic record and upon an assessment of the student’s potential contribution to the research and teaching goals of the program.

Mechanical Engineering

Program chairman: J. Marie Truesdell

Degree offered: B.S., M.S., Ph.D.

In addition to providing the student with a sound preparation for entering the practice of mechanical engineering, an effort is made to provide for breadth in both technical and non-technical areas. This is done by careful planning for each student’s elective courses and by encouraging individual student projects. Areas of concentration offered for graduate study and research include thermal science, energy, mechanical systems, heat transfer, gas dynamics and automatic control.

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 science, systems and the conversion of thermal energy to mechanical energy, mechanical systems and machines, and design and control of these systems. The undergraduate curriculum provides a sufficient number of electives in both the technical and socio-humanistic areas. In consultation with his or her advisor, a student can plan to develop the abilities to meet individual goals within the framework of the curriculum. All upperclassmen are strongly encouraged to undertake individual projects involving either an experimental or analytical design solution to a current problem.

Curriculum

Freshman Year

First Semester

1.1 Principles of Chemistry 1 3 s.h.
10.1 or 10.3 Chemistry 4 s.h.
22M.35M Engineering Calculus I 4 s.h.
580.003 Introduction to Engineering: Design I 2 s.h.
580.003 Introduction to Engineering: Graphics 2 s.h.
Total 15 s.h.

Second Semester

4.6 Elementary Chemistry Laboratory 2 s.h.
10.2 Rheology or free elective 3 s.h.
22M.36 Introduction to Calculus II 4 s.h.
580.002 Introduction to Engineering: Design II 2 s.h.
580.004 Introduction to Engineering: Computations 2 s.h.
560.007 Statics 2 s.h.
Total 15 s.h.

Sophomore Year

First Semester

22M.37 Engineering Calculus III 4 s.h.
560.010 Dynamics 3 s.h.
560.011 Dynamic Systems Analysis I 3 s.h.
560.015 Materials Science I 3 s.h.
520.016 Thermodynamics I 4 s.h.
Total 17 s.h.

Second Semester

22M.38 Engineering Calculus IV 4 s.h.
540.012 Dynamic Systems Analysis II 3 s.h.
540.025 Electromagnetic Theory 4 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

225.39 Probability and Statistics for Engineering and Physical Sciences 3 s.h.
29.82 Physics I 3 s.h.
580.027 Principles of Design I 3 s.h.
520.020 Mechanics of Fluids and Transfer Processes 4 s.h.
528.091 Professional Seminar 0 s.h.
Socio-humanistic elective 4 s.h.
Total 17 s.h.

Second Semester

29.83 Physics II 3 s.h.
580.022 Principles of Design II 3 s.h.
528.080 Experimental Engineering 4 s.h.
528.040 Thermodynamics II 3 s.h.
528.091 Professional Seminar 0 s.h.
Socio-humanistic elective 3 s.h.
Total 16 s.h.

Senior Year

First Semester

528.045 Heat Transfer 3 s.h.
568.062 Mechanical Systems Design I 4 s.h.
528.091 Professional Seminar 0 s.h.
Technical electives 6 s.h.
Socio-humanistic elective 3 s.h.
Total 16 s.h.
Second Semester
528-082 Mechanical Engineering Design II 3 s.h.
528-089 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 adviser and through a review by the examining committee. As soon as possible after admission, each student should select a program faculty member who will act as major adviser to the student. The major adviser will assist the student in planning all aspects of his or her graduate program and usually will serve also as the research adviser. 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, including 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 advisers.

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 already 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 are 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 bachelor's 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 suitable.

Mechanics and Hydraulics
Program chairman: Kwon, Rau

Degree Offered: M.S., Ph.D.

The Program in Mechanics and Hydraulics offers graduate curricula preparing students for professional careers and 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 each interdisciplinary area, including aerodynamics, aeroelasticity, aerodynamic 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 emphasis on computerized 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 acquired by earning 30 semester hours of credit in an approved course of study. Approximately half of these hours are required and the other half is selected by the student with the approval of his or her adviser. 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 subjects 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 its cultural value. Ability to pass the examinations for the first year of a language is accepted in lieu of actual translation. Subjects of study in foreign languages from countries where English is not the language 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 consideration given to 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, constitutes 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 directions 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 had a 3.5 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. Knodel
Associate chairman: Virginia C. Poel

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 prepare excellent in its teaching and scholarly activities, while remaining responsive to the changing engineering needs of society and its demands to 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 undergraduate and graduate students through a series of integrated courses at various levels. In addition, students in all engineering curricula through the core program, the Division offers specialized courses for students majoring in chemical, civil, and mechanical engineering, as campus-wide general courses, and includes the complete interaction between engineering and 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 is 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 intestinal 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; stresses of ice; 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 aerosolized suspensions; radiant heat transfer through real gases; convectional heating; plasma non-equilibrium; remote heat-flux measurements; applications of powder plant waste heat; analysis of powder 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 nutrient 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-disc; scrubbing of hydrogen sulfide from anaerobic digester 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 table, 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 Water Plant and the P.F. Morgan Sanitary Engineering Laboratory.

The research facilities available to the Division's faculty and their graduate students will be broadly divided into three categories. Since most members of the senior research staff of the Institute of Hydraulic Research hold concurrent appointments in the Division of Energy Engineering, the teaching and research functions of the Division is closely connected with the research and consulting activities of the Institute. This is particularly so in the areas of fluid mechanics, hydraulic engineering, flow instrumentation and resources related to dispersion and pollution 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
Division of Energy Engineering

second order partial differential equations. Same as 560:113. Prerequisite: Mathe-
matics 220:36.

528:114 Mathematical Methods in Continuum Mechanics II 3 s.h.
Theory and applications to dynamics of solids and fluids. Significant equations, wave propagation in fluids and solids, variational methods, Ritz method, finite element method. Same as 560:114. Prerequisite: 528:113.

527:115 Analog & Digital Techniques for Data Reduction 3 s.h.
Topics in computer-aided experimentation utilizing analog and digital techniques are presented; including transducers, signal conditioning, analog-to-digital and digital-
to-analog conversion, noise filtering and computer calibrations. Prerequisite: senior or graduate standing in engineering.

525:211 Numerical Methods Analysis 3 s.h.
Partial differential and integral equations by finite differences, finite elements and characteristics; truncation errors, numerical stability, convergence, consistency, absolute errors, accuracy techniques; emphasis on non-linear problems; examples drawn from classic, fluid mechanics, wave propagation in solid media. Same as 560:311. Prerequisite: 525:111 or equivalent.

525:213 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. Applications in trusses, mechanics, vibrations, fluid me-
chanics and heat transfer. Same as 560:313. Prerequisite: 525:112 or equivalent.

Thermal Sciences and Transport Phenomena

529:010 Thermodynamics I 3 s.h.
Basic elements of chemical thermodynamics, including first and second laws, en-
ergy, entropy, irreversibility. Course Properties of pure substances; closed simple systems and one-dimensional steady-flow open systems; engineering applications. Prerequisites: Mathematics 220:36, Chemistry 4:1.

528:040 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-
site: 529:010, Mathematics 220:36.

528:043 Chemical Engineering Thermodynamics 3 s.h.
Applications of thermodynamic principles to chemical and physical processes; prediction of essential properties; phase-equilibria and chemical equilibria applied to processes in chemical and petroleum systems. Same as 542:043. Prerequisite: Chemistry 4:133.

528:048 Heat Transfer 3 s.h.
Fundamentals of analysis of heat transfer by conduction, convection and radia-
tion; analytical and numerical methods of solutions; applications to engineering problems. Prerequisite: 528:040.

529:040 Design for Energy and Momentum Transfer 4 s.h.
Applications of basic elements of chemical and mechanical transport phenomena theory to the design of chemical processes, chemical and mechanical transport phenomena theory to the design of chemical processes, chemical and mechanical transport phenomena theory to the design of chemical processes. Prerequisite: 528:040 or 528:043. Same as 542:043.

529:140 Intermediate Thermodynamics 3 s.h.

529:144 Direct Energy Conversion 2 s.h.
Thermal power generation, nuclear and radio reaction, fluid and solid, controlled fusion, etc. Same as 540:176. Prerequisite: senior or graduate standing in engineering.

529:145 Intermediate Heat Transfer 3 s.h.
Analysis and design of thermal and electrical systems: heat transfer processes; heat transfer in chemical and mechanical systems; temperature distributions; conduction and convection; analytical and numerical methods and applications. Prerequisites: 525:046.

521:148 Biotransport Processes 3 s.h.
Applications of mass transfer, heat and mass transfer principles to biological systems with particular emphasis on human beings. Such topics as fluid mechanics of time-dependent flows in the circulatory system, heat exchange between a biological system and its environment as well as heat transfer in membranes are examined. Prerequisites: 525:048, 550:081.

521:147 Nuclear Reactor Heat Extraction 3 s.h.
Problems related to extraction of heat from neutron-fission power reactors; fluores-
tion of temperature distributions, thermal stress, heat transfer, fluid flow thru pipes for typical systems; considerations of biological shielding and safety with respect to design problems. Prerequisite: 528:040.

525:148 Solar Energy Applications 3 s.h.
Solar radiation, extra terrestrial 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. Prerequisites: 525:040 or consent of instructor.

528:148 Transport Phenomena I 3 s.h.
Unified treatment of momentum, mass, energy transport in chemical engineering problems; use of vector and tensor analysis in expressing equations of continuity, momentum and energy. Same as 560:149. Prerequisites: 525:048, 542:040.

528:149 Advanced Thermodynamics 3 s.h.
Advanced topics in thermodynamics are treated. Examples include kinetic theory of gases and aerosols, equilibrium and nonequilibrium statistical thermodynamics, and irreversible thermodynamics. Prerequisite: 528:140 or equivalent.

528:240 Non equilibrium Thermodynamics I 3 s.h.
Fundamental laws of irreversible phenomena, internal variables, absolute rate theory, relations in internal variable coupled theory. Thermodynamic derivatives of constitutive equations for dissipative systems. Same as 562:245. Prerequisites: 525:144.

528:243 Non-equilibrium Thermodynamics II 3 s.h.
Nonequilibrium treatment of irreversible phenomena; internal variables, absolute rate theory, relations in internal variable coupled theory. Thermodynamic derivatives of constitutive equations for dissipative systems. Same as 562:245. Prerequisites: 525:144.

528:244 Conductive Heat Transfer 3 s.h.
Fundamentals of conductive heat transfer; analysis of conductors in media including hear conductors, convection, conduction and radiation; heat conduction in moving boundaries; analytical and numerical treatment of practical problems. Prerequisite: 525:140 or equivalent.

528:245 Convective Heat Transfer 3 s.h.
Fundamentals of convective heat transfer; analysis of forced and free convection; differencial and integral formulation of boundary layer: heat, mass and momentum transfer in liquid and turbulent flows inside straight tubes and in external surfaces; momentum transfer and free convection at high velocities. Prerequisite: 525:140 or equivalent.

528:247 Radiative Heat Transfer 3 s.h.
Fundamentals of radiant energy transfer and analysis of radiative interchange among surfaces separated by non-participating and participating media; radiation properties of solids and gases; gyromagnetic; radiative radiation and radiation-convec-
tion heat transfer. Prerequisite: 525:140 or equivalent.

528:248 Thermal Conductors I 3 s.h.
Applications of basic design principles and material properties to select materials for a number of thermal conductors. Prerequisite: 525:140 or equivalent.

528:249 Thermal Conductors II 3 s.h.
Applications of basic design principles and material properties to select materials for a number of thermal conductors. Prerequisite: 525:140 or equivalent.

528:340 Environmental Sciences

529:150 Principles of Environmental Engineering 3 s.h.
Physical, chemical and biological characteristics of water and wastewater: water pollution and solid wastes management. Prerequisite: senior or graduate standing in engineering.

529:151 Hydraulics Systems Design in Environmental Engineering

528:152 Principles of hydrologic principles to the design of transport systems in environ-
momental engineering, with emphasis on water quality and wastewater and waste water collection and treatment systems. Prerequisite: 525:063.

528:153 Environmental Chemistry Laboratory 3 s.h.
Laboratory procedures in the physical, organic and biochemical analysis of water, wastewater and solid wastes. Prerequisite: 529:150.

528:154 Environmental Microbiology 3 s.h.

528:155 Limnology 3 s.h.
Physical, chemical and biological characteristics of natural waters with emphasis on the relationships between the plank and the phytoplanktonic aspects of the aquatic environment. Prerequisites: 529:150, 528:153.

528:156 Environmental Operations & Processes 3 s.h.
Theory of physical, chemical and biological waste operations and processes in waste and wastewater treatment. Prerequisites: 529:150, 529:152, 529:156.
Chemical Engineering Laboratory
Located in the Chemistry-Botany Building, this laboratory includes pilot plant equipment for the study of industrialiration, distillation, drying, fluid flow and heat transfer. In addition there are a subcritical nuclear reactor and facilities for bio-technical investigation and research in plastics and other materials. Laboratories for individual research by graduate students are equipped with chromatography, analog computers and other instruments. 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 film 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 fail technique: the behavior and distribution of dislocations as a result of plastic deformation, stacking fault energy, subgrain boundaries formation, radiation damage. Electron fractography and the study of surfaces may be done by use of the replica technique and phase transmission 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 treatment furnaces, a variety of welding equipment, foundry sand testing and molding equipment, pyrometers, nondestructive testers, metallographic microscopes, metal forming equipment, and metallographic specimen mounting presses and polishing, a variety of material 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 MTS 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 these facilities, a modern computerized testing capacity with a thermally 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.

Powder and Particulates Laboratory
A modernly equipped powder laboratory is available containing sampling devices; devices for characterizing bulk properties of powders; various mixers, grinders, mixing equipment; optical microscopes; atomizing furnaces; mounting and polishing equipment. In addition there is access to a scanning electron microscope Quantitative 720 system computer center and special 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 precasting bed and frame which permits construction of precast concrete structural members. A soils laboratory contains densification and triaxial testing equipment of the latest design.

Divisional Financial Aid
5-scholarships are available for graduate students from several sources including assistantships, scholarships and federal grants. Scholarships are available to those of other departments and academic units of the University and are granted on the basis of academic excellence and research interests of the Division. Graduate enrollment is approximately 46 students. Limited financial aid for undergraduate 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

560.007 Fundamentals 2 a.b.

Mechanical engineering; fracture, coupled, equivalent forms and systems, Newton's Laws, equilibrium analysis of particles and rigid bodies; applications. Computer: 228:25.

560.110 Dynamics 3 a.b.

Mechanical engineering; dynamics of particles, rigid bodies, dynamics of systems and rigid bodies in plane motion; applications. Prerequisite: 560.007, 228:25.

560.115 Statics 3 a.b.

Statics of discrete systems, statics of particles, statics of rigid bodies in plane motion; applications. Prerequisite: 560.007, 228:25.

560.177 Methods of Solids 4 a.b.


560.210 Mechanics of Deformable Bodies 4 a.b.

Mechanical engineering; deformation of deformable bodies, stress, stress, strain and force relations. Computer: computer, handbooks, software projects. Prerequisite: 560.207 or 591.017.

Special Program Courses
560.680 Experimental Engineering 4 a.b.

Principles of physical measurement, standards, calibration, correction of errors.


502/150 Introduction to Nuclear Science and Engineering 5 a.b. Production of power from nuclear reactions, basic principles, benefits and costs in society, safety and shielding, environmental concerns. Perspectives: junior winning in engineering or science.

502/151 Analog Computer Lab 1 a.h. Design and testing of analog circuits; use of analog computers to solve engineering problems. Perspectives: 522/151.

502/154 Equilibrium State Processes 3 a.h. Fundamentals of all gaseous operations; unified theories and methodologies of equilibrium processes; applications in distillation, extraction, absorption, boiling, condensing, distillation, perspective: 522/154, 522/049.


502/169 Chemical Engineering Design I 3 a.h. Chemical engineering process design problems involving thermodynamics, reaction engineering, kinetics, reaction engineering, and economics. May be repeated. Perspectives: 522/169, 522/091.

502/180 Meteorological Aspects of Air Pollution 3 a.h. Basic topics in meteorology and climatology; principles of air flow and pollutant movement; impact on community planning and plant design. Same as 522/180. Perspectives: junior standing in engineering or science.


502/244 Nonlinear Thermodynamics II 3 a.h. Quasi-steady treatment of irreversible processes; internal variables, adiabatic processes, applications of thermodynamics to engineering systems. Same as 522/243. Perspectives: 522/243.

502/249 Applications of statistical mechanics to molecular flow; phenomena of transport processes; theory of transport processes; principles of transport processes; principles of transport processes.

502/250 Applications of statistical mechanics to molecular flow; phenomena of transport processes; theory of transport processes; principles of transport processes; principles of transport processes.


502/258 Surface Reactions 3 a.h. Thermodynamics of reaction systems with surface reactions. Perspectives: 522/258.


Mechanics and Mechanical Systems Courses

502/086 Mechanical Systems Design I 4 a.h. Design considerations for mechanical engineering systems; strength and definition properties of mechanical elements; kinematic characteristics of linkages and gear trains; bearing analysis. Perspectives: 502/086.

502/100 Introductory Thermodynamics 3 a.h. Engineering properties of solids, deformation, elasticity, stress, stress-strain relationships, etc. Perspectives: 502/100.


502/112 Intermediate Mechanics II 3 a.h. Analysis of formulated mechanical systems; kinematic analysis of linkage systems, including various transmission systems; force and dynamic systems with emphasis on computer-aided methods. Perspectives: 502/112.


502/150 Intermediate Dynamics 3 a.h. Theoretical and applied vibration and Lagrangian analysis of mechanical systems composed of particle and rigid bodies in equilibrium and in motion. Perspectives: 502/150, 502/112.


502/152 Advanced Systems Design 3 a.h. Advanced topics in mechanical systems design and analysis; design optimization; reliability. Perspectives: 502/152.


502/155 Advanced Systems Design 3 a.h. Advanced topics in mechanical systems design and analysis; design optimization; reliability. Perspectives: 502/155.

Materials Phenomenology and Science Courses

507/076 Materials Science II 3 a.h. To help the student appreciate the materials that can be designed in the atomic...
Division of Systems Engineering

Chairman: J.M. Littler

Assistant Chairmen: J.W. Davis, J.M. Littler, J.R. Slowey

Seminars, Advanced Topics, Research

Seminar 501 Professional Seminar

Lectures and discussions on topics of current interest in civil engineering. Required of all students in the Civil Engineering program. Prerequisite: Junior standing.

Seminar 507 Seminar in Environmental Engineering

Advanced study of environmental engineering. Prerequisites: Consent of instructor.

Seminar 508 Seminar in Industrial Engineering

Advanced study of industrial engineering. Prerequisites: Consent of instructor.

Seminar 509 Seminar in Materials Engineering

Advanced study of materials engineering. Prerequisites: Consent of instructor.

Seminar 510 Seminar in Mechanical Engineering

Advanced study of mechanical engineering. Prerequisites: Consent of instructor.

Seminar 511 Seminar in Nuclear Engineering

Advanced study of nuclear engineering. Prerequisites: Consent of instructor.

Seminar 512 Seminar in Petroleum Engineering

Advanced study of petroleum engineering. Prerequisites: Consent of instructor.

Seminar 513 Seminar in Pharmaceutical Engineering

Advanced study of pharmaceutical engineering. Prerequisites: Consent of instructor.

Seminar 514 Seminar in Systems Engineering

Advanced study of systems engineering. Prerequisites: Consent of instructor.

Division of Systems Engineering

Chairman: J.M. Littler

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Seminars, Advanced Topics, Research

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Seminar 508 Seminar in Industrial Engineering

Advanced study of industrial engineering. Prerequisites: Consent of instructor.

Seminar 509 Seminar in Materials Engineering

Advanced study of materials engineering. Prerequisites: Consent of instructor.

Seminar 510 Seminar in Mechanical Engineering

Advanced study of mechanical engineering. Prerequisites: Consent of instructor.

Seminar 511 Seminar in Nuclear Engineering

Advanced study of nuclear engineering. Prerequisites: Consent of instructor.

Seminar 512 Seminar in Petroleum Engineering

Advanced study of petroleum engineering. Prerequisites: Consent of instructor.

Seminar 513 Seminar in Pharmaceutical Engineering

Advanced study of pharmaceutical engineering. Prerequisites: Consent of instructor.

Seminar 514 Seminar in Systems Engineering

Advanced study of systems engineering. Prerequisites: Consent of instructor.

Division of Systems Engineering

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Seminars, Advanced Topics, Research

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Seminar 509 Seminar in Materials Engineering

Advanced study of materials engineering. Prerequisites: Consent of instructor.

Seminar 510 Seminar in Mechanical Engineering

Advanced study of mechanical engineering. Prerequisites: Consent of instructor.

Seminar 511 Seminar in Nuclear Engineering

Advanced study of nuclear engineering. Prerequisites: Consent of instructor.

Seminar 512 Seminar in Petroleum Engineering

Advanced study of petroleum engineering. Prerequisites: Consent of instructor.

Seminar 513 Seminar in Pharmaceutical Engineering

Advanced study of pharmaceutical engineering. Prerequisites: Consent of instructor.

Seminar 514 Seminar in Systems Engineering

Advanced study of systems engineering. Prerequisites: Consent of instructor.
Division of Systems Engineering

compact autos and the development of computerized systems for
county equipment cost records, legislative districting and a train
system evaluation package.

Facilities

The Division of Systems Engineering is responsible for develop-
ment and supervision of the Engineering College’s Computer
Based Education (CBE) Laboratory. This laboratory provides on-
line interaction with the University’s IBM 360/65 and HP-2000
computer systems via video display and hard copy terminals. The
laboratory also contains another commonly used computer accessory
equipment such as keypunches and line printers, as well as video
equipment for instructional purposes.

The Division occupies newly remodeled fourth floor space of
the Engineering Building. Spacious teaching laboratories and
graduate student offices are provided.

Financial Aids

The Division of Systems Engineering offers a number of quarter-
time and half-time graduate research assistantships through grant
and contract funds available to faculty of the division. Stipends
currently range from $1950 to $4450 for the academic
year. Selection is based on academic competence and the research
needs of the Division. Research support is also available through
Graduate College funds and allied research programs such as the
Institute of Urban and Regional Research. Advanced graduate
students may also qualify for higher stipend instructor positions.

Courses

Core Engineering Program Courses

580/501 Introduction to Engineering: Design I
2 a.h.
Survey of various branches of engineering; the engineering approach to problem
solving; engineering design problems requiring creativity, analysis, and synthesis; and
computer-aided design methods. Fall, Spring. 
580/502 Introduction to Engineering: Design II
2 a.h.
Team approach or solution of a semester long engineering design problem selected by
the student; modeling, simulation, economics, permits, planning and human factors.
Fall, Spring.
580/503 Introduction to Engineering: Graphics
2 a.h.
Basic graphics concepts necessary in contemporary engineering, including ortho-
graphic projection, geometric construction, pictorial representation, auxiliary views,
sectioning, dimensioning, graphic and graphical equations, lines and planes, and
vectors. Fall, Spring.
580/504 Introduction to Engineering: Computation
2 a.h.
Digital computer programming utilizing FORTRAN and other high-level BASICs;
engineering applications using logic circuits, decision and transfer, loops, subpro-
grams, input-output, and flow charts. Fall, Spring.
580/521 Principles of Design I
3 a.h.
Emphasizes three-trimester work projects involving the identification, modeling and
analysis of design problems using optimization principles, methodology and com-
ptradeaided design. Prerequisites: Junior standing. Fall, Spring.
580/522 Principles of Design II
3 a.h.
Emphasizes three-trimester work projects involving the use of digital simulation and
probability and statistics in design. Prerequisites: 580/521. Fall, Spring.
580/577 Engineering Management Sciences
3 a.h.
Aspects of management science particularly suitable for administration of the engi-
neering function; coverage includes decision making, evaluation of technical
options, cost-benefit analysis, linear programming, network analysis, program
scheduling, decisions under risk and uncertainty. Satisfactory standing. 
580/580 Probability and Statistics for Engineering and Physical Sciences
3 a.h.
Probability models, general probability models, random variables, functions of
random variables, expectations, joint distributions, continuous distributions, estima-
tion, hypothesis testing, regression. Prerequisite: 225/226 or equivalent. Same as
225/226. Fall, Spring.

General Courses

587/401 Communication in Industry I
3-4 a.h.
Introduction to communication methods within groups of people, from functions in
large organizations, and in principles involved in effectively communicating informa-
tion in these various systems. Prerequisites: satisfactory completion of 600/620.
Sixth hour required by writing well-prepared and well-supported paper or report.
Prerequisite: Senior standing. Fall, Spring.
587/402 Communication in Industry II
3-4 a.h.
Application of knowledge of group interaction and of principles of human
communication through advising groups about communicating in various engineering
courses; further leveling and inter-disciplinary feedback drawn from seminar meeting held
to exchange of ideas resulting from advising practice and from required reading assigned
by each student; fourth hour earned by writing well-prepared and well-supported paper
or report on study connected with advisory work. Prerequisite: 387/401 and
satisfactory standing. Spring.
587/105 Lettering
3 a.h.
587/106 Technical Graphics for Non-Engineers
3 a.h.
Basic graphics concepts applied in areas of art, geology, interior design, geography,
and to which technical representation enhances the cultural spectrum. Topics
include: orthographic projections, geometric constructions, isometric and oblique
projections, perspective, shading and shadows, geometric and topographical shading.
Fall, Spring.
587/101 Communicating Technical Information
3 a.h.
Discussion and application of principles of interpersonal communications, and review
of the structure and ideas of the English language; consideration of media and forms
appropriate for reporting technical information; practice in speaking and in writing
texts, reports, theses and correspondence. Fall.

Design and Engineering Management Courses

588/501 Principles of Design I
3 a.h.
Emphasizes three-trimester work projects involving the identification, modeling and
analysis of design problems using optimization principles, methodology and com-
ptradeaided design. Prerequisite: Junior standing. Fall, Spring.
588/502 Principles of Design II
3 a.h.
Emphasizes three-trimester work projects involving the use of digital simulation and
probability and statistics in design. Prerequisite: 588/501. Fall, Spring.
588/507 Engineering Management Science
3 a.h.
Aspects of management science particularly suitable for administration of the engi-
neering function; coverage includes decision making, evaluation of technical
options, cost-benefit analysis, linear programming, network analysis, program
scheduling, decisions under risk and uncertainty. Satisfactory standing. Fall.
588/511 Design of Experiments
1 a.h.
Problems of analysis and design encountered in integrating humans into production
processes, examination of methods and measurement. Prerequisites: 588/527 and
588/522. Fall.
588/515/516 Operational Systems Design
3 a.h.
Introduction to the analysis, measurement, design and evaluation of an inte-
grated, systems approach to the total, environmental aspects of total
operations. Prerequisites: 588/511 or 588/512, and senior standing. Fall.
588/518 Engineering Management Science
3 a.h.
Aspects of management science pertinent to the engineering function for advanced
level students; coverage includes decision making, evaluation of technical
options, cost-benefit analysis, linear programming, network analysis, program
scheduling, decisions under risk and uncertainty. Prerequisites: Junior or
Graduate standing. Fall.
588/528/529/527 Engineering Administration
3 a.h.
Hands-on engineering simulation of the total, integrated business science research, inventive
and applied aspects of the engineering function. Prerequisites: 588/527 or equivalent. Spring.
588/531/532/534/535/536/537/538/539 Engineering Administration
3 a.h.
Methods for organizing, planning, and controlling engineering efforts. Individual
assignments required. Prerequisites: 588/528. Summer.

Engineering and Applied Statistics Courses

588/508/509 Probability and Statistics for Engineering and Physical Sciences
3 a.h.
Probability models, general probability models, random variables, functions of
random variables, expectations, joint distributions, continuous distributions, estima-
tion, hypothesis testing, regression. Prerequisite: 225/226 or equivalent. Same as
225/226. Fall, Spring.
Advanced Topics in Systems Engineering. Offerings based on student interest.

Individual Investigations. Offerings based on student interest. Individual investigations by senior undergraduate or graduate students. Permission of a supervising instructor. Fall, Spring.

Graduate Seminar. Offerings based on student interest. Graduate seminar for graduate students in Industrial and Management Engineering. Guest lectures, student reports, and seminars. Fall, Spring.


Advanced Topics: Transportation. Offerings based on student interest. Advanced topics in transportation. Offerings based on student interest.

M.S. Research. Research at the master's level, primarily for the M.S. degree.

Ph.D. Research. Research at the Ph.D. level, primarily for the Ph.D. degree.
Graduate College

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 its 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 concern 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 within 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 strengthening of 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 Business Laws; 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:

- Accounting—M.S., Ph.D.
- Anthropology—M.A., Ph.D.
- Applied Medical Science—Ph.D.
- Art History—M.A., Ph.D.
- Asian Civilization—M.A.
- Astronomy—M.S., Ph.D.
- Biochemistry—M.S., Ph.D.
- Biology (Botany and Zoology)—M.S., Ph.D.
- Business Administration—M.B.A., Ph.D.
- Business Administration (Government)—M.S.A., 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 Literature—M.A.
- Civil Engineering—M.S., Ph.D.
- Classics—M.A., Ph.D.
- Community Dentistry—M.S.
- Comparative Law—M.C.L., M.J.
- Comparative Literature—M.A., Ph.D.
- Comparative Science—M.S., Ph.D.
- Criminal Justice and Corrections—M.A.
- Cultural Anthropology and Linguistics—M.A.
- Daycare Administration—M.A., M.F.A., Ph.D.
- Economics—M.A., Ph.D.
- Educational Administration—M.A., M.A.T., B.S.E., Ph.D.
- Electrical Engineering—M.S., Ph.D.
- English—M.A., M.F.A., Ph.D.
- Environmental Engineering—M.S., Ph.D.
- Fixed Prosthodontics—M.S.
- French—M.A., Ph.D.
- Geology—M.A., Ph.D.
- Geography—M.A., Ph.D.
- Geology—M.A., Ph.D.
- German—M.A., Ph.D.
- Greek—M.A.
- History—M.A., Ph.D.
- Home Economics—M.A., M.S.
- Hospital and Health Administration—M.A., Ph.D.
- Industrial and Management Engineering—M.S., Ph.D.
- Journalism—M.A.
- Latin—M.S.
- Journalism—M.A.
- Linguistics—M.A.
- Mass Communications—Ph.D.
- Mathematics—M.S., Ph.D.
- Mechanical Engineering—M.S., Ph.D.
- Mechanics and Hydraulics—M.S., Ph.D.
- Microbiology—M.A., Ph.D.
- Music—M.A., M.F.A., Ph.D.
- Music Education—M.S.
- Nutrition—M.A.
- Nursing—M.S., Ph.D.
- Occupational Therapy and Rehabilitation—M.S.
- Operating Room Practice—M.S.
- Optometry—M.S.
- Oral Pathology—M.S.
- Oral Surgery—M.D.
- Orthodontics—M.S.
- Orthopedics—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 teachships, 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 its 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 students seeking to register for the first time in the Graduate College of the University of Iowa must maintain a formal admission statement from the Director of Admissions. Applicants may obtain the proper forms from the Director of Admissions. The application must be submitted by the deadline set for the session in which admission is expected. Admission applications must be received by July 1 for fall 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, for applicants 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, depending 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 used to weight the decision on admission of a student is left to the departments.

Research Resources
The many and diverse research activities of the University are centrally administered by the Office of the Vice-President for Educational Development and Research, which has an interlocking relationship with the Graduate College. For further information on the research resources of the University, see "Research Activities."

Financial Assistance
Approximately half of the University's graduate students receive some form of University-administered financial assistance. Eligibility requirements and application procedures are set forth in "Section VII. Graduate Appointments" in "Rules and Regulations of the Graduate College."

These are the primary sources of assistance:
Teaching and Research Assistantships
Available in most departments; stipends range between $2,900 and $4,800 for half-time assistantship; assistantships are also eligible for tuition scholarships; necessitous assistantships' (one-quarter time or more) tuition and fees are reduced to resident rates.

University Teaching-Research Fellowships
For first-year graduate students entering doctoral programs; typical stipends of $5,000 a year on a year-around basis for as many as four years; recipients have teaching and research assignments, but do not carry full course loads at the same time; one year out of four and all summers, recipients have full time to pursue studies, research or writing.

Scholarships
Up to full tuition and fees.
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 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 2.5 grade-point average may register for only 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 2.5 is required for admission to regular 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 combined. 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 certain point 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 departmental or program requirements may be obtained directly from the executive of the department concerned.

For Board of Regents’ formal admission requirements, 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 department of his or her appointment or closely 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 18 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 appointments.) 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 the 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. Retrospective Registration

No form of retrospective 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. Travelling Scholar Program of the Committee on Institutional Cooperation (see "Section III").

2. Research at approved locations under the direction of members of the graduate 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. F." for minimum semester hours required on campus for the master's and doctor's degrees).

5. Residence graduate credit from another Iowa Regents' University (see "Section V. B.").

6. As many as nine semester hours of graduate work taken at the Quad-Cities 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 11.0") and pay established fees ("Section XII. K." for special fees applicable to post-comprehensive registration), which should not be confused with extramural registration for residence credit.)

1. 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. More than one semester 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 corresponding courses without the approval of the executive of his or her major department and of the Graduate Dean.

J. System of Course Numbers
Courses primarily for graduate students are numbered 200 or above in each department. Courses open to and counting credit 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 date 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 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 institution, graduate deans at both institutions will be fully informed by the adviser 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 requiring additional information should inquire at the office of the Graduate College.

C. Conditions
CIC Traveling Scholars will not be limited to two semesters or three quarters on another campus. Each university 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-enter; 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-enter 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 returned to good standing.

C. Restriction on Students on Probation
A student on probation shall not be permitted to take comprehensive or final examinations of any degree or certificate, nor may the student receive any graduate degree or certificate.

D. Departmental Regulations and Dissemination of Information
In addition to the above University-wide requirements, departments may establish further requirements which limit 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 the office of the Graduate 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 examinations, departmental policies with regard to awarding and renewing as-
sionships, site limits on programs of study, departmental reg-
nistration policies, departmental grade-point requirements, require-
ments for changing from one degree program to another within the
department, especially from the master's to the Ph.D., depart-
mental probation and dismissal policies and procedures (see II
(following), 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 depart-
ment 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
its monitoring of a student's progress, conditions such as condi-
tional admission or probation are imposed, the department shall
give at the time of imposition written explanation of this status
and its time limits.

A student who will not be permitted to reregister for failure 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 fail-
ure of a regularly scheduled examination or formal evaluation. If
the student judges the dismissal decision improper, the student
has a right to appeal. Such 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 depart-
mental regulations described above. (See "Section IV.D.")

P. Graduate College Review of Departmental Dismissal
Questions involving judgment of performance will not be re-
viewed beyond the department level. If, however, the student feels
there has been unfairness or some procedural irregularity con-
cerning dismissal, the student may request a review by the Grad-
uate College. This review may be conducted by the Graduate
Dean alone or the Dean may appoint a Graduate College commit-
tee 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 ad-
vanced 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 resi-
dence credit in this institution, provided such work is acceptable
by the student's major department on the basis of the department's
degree requirements and applicability towards 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 or 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 stand-
ard college credits 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 Stu-

1. Students who leave within the first six weeks of the semester
without receiving any 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 report grades only as Satisfactory or Unsatisfactory;
(b) credit is to be assigned on the basis of total registration minus
degrees and seminars; (c) courses are to be counted toward specific
degree requirements only after the student returns and then only
with the department's approval.
5. Students who complete the seventh week receive full credit.
6. Grade reports for the fall semester period: (a) grades are 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. Marks Carrying Advanced Degree Credit

These are A, B, C and S—satisfactory.

B. Marks Carrying No Credit for Advanced Degrees

These are D—poor, F—failed, I—incomplete, W—withdraw
without
discussion, R—registered and U—unsatisfactory.

C. Audit

R is assigned when a student registered for no credit attends an
auditor throughout the course; if the student drops the course
before the close of the term, W is assigned.

Graduate College
D. Incomplete
The grade of I is to be used only when a student's work during a session cannot be evaluated 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 students in 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—incomplete 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 as 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 determined 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 department 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 from letter grade to 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) registration in the Graduate College; (b) cumulative grade-point average of at least 3.0; (c) a GRE score of a GMAT score above a point to be designated by the Graduate Dean; (d) 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 competitive fee for an assistant. 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 an 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 is required of a full-time assistant. Other part-time service is scaled in proportion, and a limited academic schedule is permitted (see Section II.17). 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 applications may be considered at any time. Appointments should be made on the form provided by the Graduate College, and should be accompanied by recommendations and/or 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, scholarships—superior graduate students 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 for dismissal procedures 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 on research programs or part-time 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 end 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 session 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 exam 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 X. L. 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 advisor 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. Department 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-hour 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 requirement. This rule may be waived by the Dean in cases affected by military service.
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 acedococanal 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 two 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 final examination 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 "K. Examining Committee.")

1. 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 course, 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 or both. 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 translation. 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 Fields", "L. Reduction of Old Credits", "H. Master's Degree with Thesis", "J. Final Examination", and "K. Examining Committee."

B. Specialist in Education Degree
This degree is granted upon 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 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 culminates 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
submission of the plan of study.
Other requirements and regulations applicable to the educational specialist degree are the same as prescribed for the one-year master's degree in "Section X.B. Plan of Study"; "C. Major and Related Fields"; "D. Limit on Law, Medical or Dental Courses"; "F. Final Examination"; and "X. Examining Committee."

A master's degree may be earned while in residence for the educational specialist degree provided the student meets all the requirements for the master's degree in question.

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 requirement of 52 semester credit hours may be interpreted 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 five 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.

For other requirements, see "Section X.B. Plan of Study"; "E. Reduction of Old Credits;" "F. Limit on Law, Medical or Dental Courses," and "T. Examining Committee."

Section XII. Doctor's Degree

A. Character of Degree

The University awards two doctorates, the Doctor of Philosophy and the Doctor of Musical Arts. The doctorate is the highest degree awarded by the University. The Doctor of Philosophy degree indicates marked excellence in research or other creative work, and superior comprehensiveness in the discipline. The Doctor of Musical Arts degree indicates marked excellence in performance and pedagogy.

B. Prerequisites

The student must present evidence of having completed a satisfactory amount of undergraduate work in the subject proposed for investigation, or, in the case of deficiencies, must register for prerequisite courses.

C. Residence Requirement

The doctorate is granted primarily on the basis of achievement rather than on the accumulation of semester hours of credit; however, the candidate is required to have completed at least three years of residence in a graduate college. At least part of this residence must be spent in full-time involvement in one's discipline, at this University, beyond the 24 semester hours of graduate work; this requirement can be met either by: (1) enrollment as a full-time student (nine semester hours minimum) in each of two semesters or (2) enrollment for a minimum of six semester hours in each of three semesters during which the student holds at least one-third-time apprenticeship certified by the department as contributing to the student's doctoral program. (For purposes of record and assessment of fees, student registration should reflect accurately the amount and kind of work undertaken in the Graduate College. All doctoral programs, including acceptable transfer credit, will contain a minimum of 72 semester hours of graduate work.)

D. Plan of Study

The development of a plan of study at the doctoral level is the special responsibility of the student working together with his or her advisor. A formal plan of study must accompany the departmental request to the Graduate College for permission to conduct the comprehensive examination. The plan will provide a listing of all graduate courses taken which apply toward the degree and a listing of courses in progress or to be completed after the comprehensive examination.

E. Ad Hoc Interdisciplinary Programs

A student may prepare a proposal for an interdisciplinary course of study, including the plan for the comprehensive examination, under the sponsorship of at least three faculty members and the department most directly concerned, which shall be designated as the sponsoring department. Final approval of such individual programs is granted by the Graduate Dean, who may add members to the student's supervising committee from other closely related departmental faculties. The degree will be awarded in the interdisciplinary field stipulated in the approved program and, parenthetically, the name of the sponsoring department.

F. Reduction of Old Credits

Course work taken more than six or more years prior to the comprehensive examination will be evaluated by the major department in order to determine the amount of credit that shall be allowed for each work. Evaluation of such old credits will be reported to the Graduate College by the departmental executive at the time of submission of the plan of study.

G. Limit on Professional Courses

Work taken by a student in the colleges of Dentistry, Law, or Medicine while enrolled for a professional degree may be credited to a graduate program leading to a professional degree if it is taken after the student has satisfied the requirements for a bachelor's degree at this University. The work accepted from the professional college must be directly related to the student major field of study in the Graduate College, and the plan of study must be approved by the student's advisor and the major department. Work completed while registered for a professional degree in Law, Medicine or Dentistry will not be counted as part of the one academic year which must be spent in residence as a doctoral student on the campus of this University.
H. Joint Program for Master’s and Doctoral Degrees

Those students who expect to continue their training through the doctor’s degree may file 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 do 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.”). 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 lan-
guages 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 filing 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 honor student at or 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 unsatisfac-
tory. The mailing of a satisfactory examination should contain the name of the supervising professor for the candidate’s dissertation.

In the event of a report with two or more votes of "satisfactory with reservations," the exact stipulations of the committee should be recorded in the report 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 satis-

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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 department 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 re-

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nation, the committee may grant the candidate permission to present him/herself 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.

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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 department 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 re-

J. Comprehensive Examination

The comprehensive examination is not a deferred qualifying examination. It is intended to evaluate the candidate’s mastery of honor student at or 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 mailing of a satisfactory examination should contain the name of the supervising professor for the candidate’s dissertation.

In the event of a report with two or more votes of "satisfactory with reservations," the exact stipulations of the committee should be recorded in the report 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 "reservation." If the students are not satisfactory in a comprehensive exami-
nation, the committee may grant the candidate permission to present him/herself 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.
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 session 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 reexamination 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 "XII.I. 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 committee 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.
The University of Iowa College of Law is one of 27 charter members of the Association of American Law Schools and has long been recognized and approved by the American Bar Association’s Council of the Section of Legal Education and Admission to the Bar.

The degree Juris Doctor (J.D.) is the degree normally conferred by the College.

The Curriculum
Iowa’s law program is distinctive in its first-year approach. There is a freshman seminar in which small groups of students have opportunities for more individual expression, closer faculty relationships, the writing of several research papers and a closer approach to graduate-level instruction.

Each first-year course has a specified function in helping students develop analytical abilities and placing the legal process in its social context. All first-year students are introduced to legal research through written assignments, as well as instruction in legal method and in legal bibliography.

During the second year, all students are required to take three courses, a perspective course and a seminar in appellate advocacy. Before they graduate, all must take a second course in constitutional law. All other second- and third-year courses are elective.

Students are encouraged to enroll in independent research with faculty members. Additionally, the College has instituted a second-year seminar to provide a coherent and comprehensive perspective in the law.

Students may also take courses in other colleges of the University. To receive credit for such a course, the student must obtain prior permission of the Dean of Law.

The Joint Program
In addition to its regular programs leading to the Juris Doctor degree, the College offers a joint program leading to the J.D. degree and an advanced degree (M.A., or Ph.D.) from a participating department of the University of Iowa Graduate College.

Under this program, if a student takes a course which is relevant to both degrees, the course can be counted toward the semester-hour requirements for both degrees. In addition to reducing the time required to obtain both degrees, it is hoped the student will be able to contribute to one discipline the insights he or she has gained in the other.

Applicants for this program must meet admission requirements of the Graduate College, in addition to those of the College of Law.

Summer Session
Regular classwork of the summer session will extend over 11 or 12 weeks, with most courses taught in two successive periods of five and one-half weeks each. Six to eight upperclass courses and three to four first-year courses are normally offered. Students who begin their law study with a summer term may complete it in two regular and three summer terms, instead of the usual three calendar years. The work given in the summer is the same in kind and amount as that given in the corresponding subjects in the regular term, and the completion of any course in the summer gives the student full credit toward a degree.

Graduation Requirements
Residence Requirements
To satisfy the residence requirements, a student must complete a minimum of either:

1. six semesters of not less than 12 semester hours each; or
2. five semesters of not less than 12 semester hours each plus two summer sessions of not less than four semester hours each; or
3. four semesters of not less than 12 semester hours each plus two summer sessions of not less than six semester hours each.

Scholastic Requirements
Numerical grades may be translated into letter grades for purposes of comparison as follows:


A student who fails to maintain a cumulative weighted average of 65 after registering for 24 or more semester hours of work shall be ineligible to continue in the College of Law. All other students must maintain a cumulative weighted average of 65 to be eligible to continue in the College.

Students whose cumulative weighted average is below 65 for the first two semesters, but whose weighted average is 65 or better during the second semester, will be reinstated on probation for the third semester. They must have a cumulative weighted average of 65 by the end of the third semester or be ineligible to continue further.

Any upperclass student whose weighted average is below 65 for the full academic year shall be dropped from the College of Law.
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 managed and edited 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,
drawing 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 com-
mittees.

Facilities
The Law Building contains a library and air-conditioned classrooms.
With its collection of approximately 190,000 bound volumes, the
law library is an outstanding research facility. A broad open-stack policy makes it readily available to students.

Taxes 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 upperclassmen
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
Preparatory 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 on all college work undertaken. The applicant must present a baccalaureate degree from an approved college or university before beginning work in the College of Law.

A $10 application fee must accompany applications from prospective students not completing their undergraduate study in residence at The University of Iowa.

Fulfillment of the specific requirements for admission listed above does not ensure admission to the College of Law. From applicants meeting the minimum requirements, the admissions committee of the College will select those who appear to be best qualified for the study and practice of law. The admissions committee may require personal interviews with applicants.

The College participates in the University's Educational Opportunities Program and gives individual consideration to applicants from disadvantaged backgrounds.

**Advanced Standing**

A transfer student may be eligible for admission if he or she has attended a school which is a member of the Association of American Law Schools, is in good standing at the time of withdrawal (evidenced by a letter from the dean of the school from which he or she is transferring), meets the admission requirements for entering students at this school and has done substantially above average work in the law school he or she attended. No more than 30 semester hours of resident credit may be transferred from another school. Where an applicant has completed more than one year of law, advanced standing will be permitted only in exceptional cases, and no more than one year's credit will be granted.

**Advance Deposit**

Accepted applicants are required to make a nonrefundable deposit of $50 by April 1. Applicants who are accepted after April 1 must make the deposit within two weeks after being notified of favorable action on their applications. For those who enroll, the deposit is credited toward the first year at the University.

An applicant who fails to make the deposit within the time specified forfeits his or her place in the entering class. The $50 will be refunded if an applicant cannot enroll because of circumstances beyond the student's control. A student who is admitted but is forced to give up his or her place in the class because of a service obligation will be automatically reenrolled upon timely application at the conclusion of his or her service.

**Physical Report**

Accepted applicants who are new to The University of Iowa must submit a satisfactory physical examination report to the University Student Health Service.

**Courses**

911100 Civil Procedure

After a brief overview of thehornest', the course deals primarily with practive procedures. Major topics covered include: conduct of practice; discovery; pleadings; motion practice; summary judgment and judgment on pleadings; pleading of parties; and liability of attorneys. Designed to give student comprehensive, objective view of vindication of rights under modern practice.

911106 Constitutional Law

Alternates of governmental power according to national constitution; judicial function in constitutional cases; relationships among several branches of national government; federal system; powers delegated to national government; powers reserved to states; role of judicial process in structuring limits within which society operates. Development of legal system and relationships among several institutions within system.

911150 Contracts and Sales Transactions

Purposes, development, scope of Judicial practice accorded parties to contractual agreements, as modified by legislation; creation of contracts, their performance, construction and interpretation, and remedies available upon breach, as well as the Sales Article of Uniform Commercial Code as Article relates to concerned sales transactions; role of law in ordering contractual arrangements, integration between judicial and legislative decisional processes.

911156 Criminal Justice

Considers such questions as what actions should be criminal and why; what steps can be taken to deal most effectively with behavious deemed criminal; role of law in detering such behavior; substantive law of homicide and theft; importance of targeting social problems and how to reduce socially viable legal system.

911160 Criminal Justice

Describes same as for 911156.

911162 Criminal Law

Describes same as for 911156.

911164 Legal Theory

Describes same as for 911156.

911166 Law and Society

Describes same as for 911156.

911168 Law and Economics

Describes same as for 911156.

911170 Professional Responsibility

Describes same as for 911156.

911176 Real Property

Describes same as for 911156.

911180 Torts

Describes same as for 911156.
to resolution of intergroup problems and to planning for the coexistence of such problems.

9:01:24 Insurance

2 a.m.

Principles of general insurance in insurance law, including doctrine of

9:01:49 Introduction to Intellectual Law

2 a.m.

Examination of the patent, copyright, and trade secrets aspects of intellectual property law, examination of the basic principles of

9:01:53 Labor Law

2 a.m.

Rights of employees to organize into labor unions, secured by the National Labor Relations Act, and issues in collective

9:01:59 Discrimination in Employment

2 a.m.

Students in 9:01:52 may enroll for this advanced and credit pass on the course, to include discrimination in the workplace. Alternative legal area for discrimination is discussed.

9:02:04 Corporate Accounting

2 a.m.

Principles of accounting as it applies to corporate legal problems. Course for different methods of income determination and asset valuation for various purposes and taxable entities. Jurisprudence features throughout.

9:02:12 Law and Psychiatry

2 a.m.

Counseling and treatment of mental diseases and disorders in various legal contexts. Medical and clinical aspects of the above.

9:02:16 Legal Counseling and Interviewing

2 a.m.

Interviewing techniques, role of the lawyer in the counseling relationship, and effective communication skills for the lawyer. Preparation for the counseling encounter that is essential for the College of Law. The teaching of this course is based on the student's prior view of the law.

9:02:18 Legal Research

2 a.m.

Use of law and legal instruction for changing social, economic, political and social structures, and the public interest and the American concept of justice. This course is designed for the student who has completed the basic course, to include topics in legal norms, to the extent that they can be taught by the judiciary.

9:02:27 Probationary Judges

2 a.m.

Introduction to the general principles of professional responsibility, including the principles of criminal, civil and administrative law. The course also examines the principles of professional responsibility in various legal contexts.

9:02:32 Criminal Law

2 a.m.

Examination of the elements of crimes and actual demonstrations of trial practice problems. Principles are 9:01:25.

9:02:35 Drug Policy

2 a.m.

Modern state marijuana problems, including the problems of legal and illegal uses of marijuana. The course also examines the principles of legal and policy problems in marijuana regulation.

9:02:37 Criminal Procedure

2 a.m.

Examination and practice in the basic judicial procedures for the handling of cases in the criminal courts. Remedial measures include but not be limited to fundamental principles of the criminal law.

9:02:40 Securities Regulation

2 a.m.

Federal, state and local security and exchange laws, the stock exchange, and the federal securities laws. The course also examines the adequacy of the remedial steps in various cases.

9:02:46 Civil Procedure

2 a.m.

Examination of the rapidly growing volume of civil law problems in this area. Specific problems are discussed in the courtroom, such as civil procedure, discovery, and evidence, and the principles of evidence, rules of evidence, and the rules of evidence.

9:02:48 Bankruptcy

2 a.m.

Examination of medical, sociological and economic problems arising from the use of various law enforcement policies and the social economics of bankruptcy. The course also examines the adequacy of the remedial steps in various cases.
91655 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 tribunals; students are encouraged to begin preparation reading before commencement of the semester, and are required to complete a one-hour credit paper.

91653 Land Use Planning Seminar

Problems arising in controlling use of land through zoning, public and private land arrangements, urban renewal, traffic plans, development of services and subdivisions, development and development and development; mechanisms of control through various governmental agencies, city, regional, state and federal; coordination of control efforts.

91655 Legal History

Examination major episodes which have had at important influences in shaping modern law; development of law by jury; religion of common law, royal courts and the writ system; beginnings of Parliament; contract law and equity; and 18th-century content for supplanting autonomous common law, Parliament, the King, and the other organs of the State, which limit the scope of our common-law concepts of civil liberty. Areas. Attention directed for their role in substantive law applied at particular times in processes of legal development. Special emphasis on the growth and development of law through the courts, and limitations encountered in attempts to resolve critical issues.

91656 Partnership Planning

91655 The Police

Examination the police from a number of different viewpoints. Whether police personnel will be trained and development of police forces, varying and sometimes conflicting rules of police in both urban and rural areas, organization, management, and operations at police departments, police personnel including recruitment, training, and promotions of personnel, police culture, and police community relations including relations between police and minority groups and juveniles. Particular attention to police accountability and methods of controlling police behavior both external and internal.

91656 Problems of Public Law

Selected problems in constitutional law and administrative law. Student interest will largely dictate 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; suppression of powers issues on the case and potential avoid; laws administrative agencies, laws administrative agencies, laws administrative agencies, laws administrative agencies, and administrative law reform in favor, right to a hearing before administrative agencies; public participation in formulation of administrative policy; control over the federal administrative process. Prerequisite or co-requisite: 91:222 Constitutional Law II.

91656 Selected International Law Problems

Intensive study of one or more current problems of international law and policy; conducted on an individual or group study basis, with emphasis on students-selected research and writing.

91656 Native American Law 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; civil, criminal, and other jurisdictional issues for federal reservations; special problems of property laws and land use affecting Indian lands, Indian hunting and fishing rights, the history of federal Indian policy and its impact on modern Indian problems; other self-government, and federal Indian benefits and initiatives.

91654 United States Supreme Court

In-depth study; paper required. Prerequisites: 91:116 and 91:223; 91:225 recommended.

91655 Public Employment Relations Board

In 1974 Iowa enacted the Public Employment Relations Board authorizing collective bargaining for public employees at all levels of government. The seminar will study immensely the statutory provisions and regulations and compare them with the comparable provisions of other public employment collective bargaining; the purpose of the seminar is to inform interested public employees and the National Labor Relations Board. The seminar will focus particularly on relevant provisions of the National Labor Relations Act and the National Labor Relations Board. Students will be encouraged to choose a person topic area under the supervision 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 continuous medical education, in which several thousand practicing physicians update their knowledge and skills through "refresher," short-courses, clinics and conferences each year.

Beyond its academic responsibilities, 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, undergraduate medical students have several opportunities to gain first-hand experience in physician's 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 states 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 holder 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 have been 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 ophthalmology, urology and pathology.

Faculty

All faculty members are full-time, their work in practice and research being part of not a part from their work in 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
provide facilities for teaching all major medical specialties, for residencies in all such specialties and for fellowships in a number of subspecialties. University Hospitals and Clinics serve as a tertiary-care center for the State of Iowa and portions of adjoining states, with most patients being referred for care and treatment not readily available in their home communities. Some 36,000 patients are admitted to the University Hospitals complex each year, while 47 specialty clinics serve another 300,000 ambulatory patients annually. More details concerning University Hospitals and Clinics, Veterans Administration Hospital, and other relevant academic and health service units may be found in the University of Iowa Health Center section of this Catalog.

Learning Resources Unit

The Learning Resources Unit of the College of Medicine is composed of educators and media specialists who serve the facility, staff and administration. The Unit has four major charges: to provide educational consultation, 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 $250 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 $20 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 college, 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.

Eligibility for admission to the College of Medicine is based on academic qualifications alone. The Board of Regents awards degrees in the College of Medicine in accordance with the rules and regulations of the University of Iowa.

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Applicants accepted for admission are required to submit a satisfactory physical examination report to the University Student Health Service within two weeks after notification of acceptance. Applicants must also complete, through Student Health Service, an X-ray film of the chest and successful vaccination against smallpox prior to registration.

Educational Opportunities Program

The Educational Opportunities Program provides financial and academic assistance to educationally disadvantaged students from groups underrepresented in American medicine.

Admission to Advanced Standing

An advanced student may be eligible for advanced standing if he or she meets the admissions requirements; has satisfactorily completed courses qualifying him or her for advanced standing; has achieved high scholastic standing; and submits a statement from dean of the school from which he or she is transferring, showing work done at that school.

Unclassified Students

Applicants for admission to the College of Medicine who are not degree candidates but wish to register for special subjects will be admitted to any lecture or laboratory course only upon supplying with all the regular requirements for admission to such a course, or by action of the faculty upon recommendation of the professor in charge of the course.

Academic Advancement

The promotions committee will, by the dean and consisting of designated members of the faculty under whom the courses have been taken, at the close of the academic year, review the accomplishments of the students and determine their eligibility for advancement. In making its decisions the committee will consider the attainment of the student as evidenced by the grade received in each subject (which should reflect the consensus of the departmental staff), his or her seriousness of purpose, his or her conduct and general fitness for entering the medical profession.

Nondepartmental Courses

50:131 Preceptorship

50:151 Law and Medicine for Physicians' Assistant Students

Acquaint the physician's assistant with fundamental principles of law bearing on professional activities; provide a basic understanding necessary to conduct legal aspects.

50:141 Neuroanatomy and Histology

Introduction to study of neurons, organization and functions of central nervous system. Same as Anatomy 50:141. Physiology and Biophysics 70:102.

50:111 Introduction to Obstetrics Medicine

Fall semester course related to questionnaire and integrating basic science care of patient with clinical experiences of junior and senior years, included are pertinent anatomic and development of skills in history-taking, physical diagnosis, laboratory diagnosis and related material which will prepare students for required clinical rotations.

50:142 Interdisciplinary Elective in Oncology

50:110 Endocrinology for Medical Students

50:131 Introduction to Clinical Medicine for Physician's Assistant Students

50:161 Designing Learning Programs for Health Care Education

Stephans emphasis on development and evaluation of educational programs suggested planning procedure and optimal curricula analyzed and practical applications gained through establishment of working relationship with ongoing educational projects activities individualized to meet various backgrounds, needs and objectives. Same as Education 70:151.

50:142 Advanced Biomedical Studies

An integrative view of the research in medical and health sciences by a cross-disciplinary approach; analysis of appropriate clinical cases in basic science components. Prerequisite: consent of instructor.

50:144 Advanced Biomedical Studies

Correlation and intersite.

50:252 Teaching Learning in Health Careers Education

Role of health careers education as leader and learning catalyst. Individualized student-expert provides wide variety of case studies through discussion, demonstration, observation, micro-experiences and class discussion activities. Prerequisite: 20:61 or equivalent. Same as Education 70:162.

50:273 Health Careers Information and the Health Service Industry

Comprehensive overview of health service industry, particularly as related in both initial preparation and continuing education of health personnel.

50:280 Special Studies on Campus

Anatomy

Department Head: T. H. Williams.


Degree offered: M.E., Ph.D.

The Department performs three major functions: teaching anatomy of the human body to students preparing for careers in the health care professions; providing advanced courses, teaching experience and postgraduate training to students preparing for careers in teaching and research, and conducting original research into biological structures and structure-function relationships. Each of these three functions complements the other two.

Instructing Students of the Health Care Professions

The Department contributes to the preclinical education of health care professionals by preparing courses in gross anatomy, microscopical anatomy and neuroanatomy for medical students; gross anatomy and neuroanatomy for physical therapy students; anatomy and neuroanatomy for dental hygiene students; and anatomy for nursing, pharmacy and dental hygiene students. In most of these courses, the students learn the structure of the human body mainly by working in teaching laboratories—dissecting, examining specimens with a microscope and studying specially developed learning materials. Innovative approaches to the study of anatomy, such as the use of programmed text, videotape and projection slide programs, have been developed by the faculty.

Graduate Study

The main goal of the graduate program is to prepare students for careers in teaching and research. Job opportunities, primarily in medical schools, are excellent for anatomy Ph.D.'s. Consequently, the graduate program emphasizes the training of Ph.D.'s. The Ph.D. degree is offered only to students in health science programs who take time from their preclinical studies to acquire experience in teaching and research. The M.S. is awarded on the basis of satisfactory performance in coursework in one of the major sub-disciplines of anatomy—gross anatomy, microscopical anatomy and
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.)

An applicant's undergraduate background should include advanced 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, letters 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 acquire 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 special consideration to the teaching load during the first year. 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 evaluation 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 advisor and four other faculty members. Research interest 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 the new Biomedical Sciences Building of the Health Sciences Center. These quarters house modern facilities and well-equipped research laboratories. The most modern instrumentation is available, including four high-resolution electron microscopes, Balzer evaporation unit, spectrophotometer, cryostat, an automatic tissue sectioning machine, etc. Research interest is increasingly problem-oriented, rather than discipline-dependent, and is principally in the theme areas mentioned in the previous section.

Courses

Biodynamics Humane Anatomy (HSE 393) 4.0 h. Lectures and laboratory demonstrations on human anatomy. Primary for students of nursing and dental hygiene. Fall and spring semester.

00203 Human Microscopic Anatomy (HSE 393) 4.0 h. Microscopic study of cells, primary tissues and organic systems on touch and related slides, including enteroptaxis. For dental hygiene students only. Fall semester.

01001 Human Gross Anatomy for Dental Students (HSE 393) 4.0 h. Regional dissections, illustrated with sheets and illustrations with major emphasis on head and neck. Includes neuroanatomy. Open to graduate students with consent of instructor. Spring semester.

01003 Principles of Human Anatomy (HSE 393) 3.0 h. Lectures and laboratory demonstrations on human anatomy with particular emphasis on skeletal structures involved in drug response and metabolism. Primarily for pharmacy students. Fall and spring semester.

01003 Gross Anatomy for Medical Students (HSE 393) 8.0 h. Gross anatomy clinic plus dissection room work: histology, demonstration, lecture, and discussion. Includes enteroptaxis. Registration permitted only to medical students. Fall semester.

02050 Microscopic Anatomy for Medical Students (HSE 393) 4.0 h. Microscopic study of cells, fundamental tissues and organ systems. This course is required of medical student registrants only. Graduate students are required to gain approval for equivalent course work. Fall semester.

01004 Human Anatomy (HSE 393) 4.0 h. Regional dissection, lecture and demonstrations with emphasis on areas important in physical therapy. Registration limited to physical therapy students or with consent of instructor. Fall semester.

01009 Human Anatomy and Neuroanatomy (HSE 393) 2.0 h. Continuation of 01008, which is prerequisite. Dissection of head and neck, laboratory and lecture emphasizing cranial, cervical and cranial nerves; theoretical aspects of cranial nerves in the nervous system. Spring semester.

02119 Neurobiology and Behavior (HSE 393) 4.0 h. Emphasis on the application of fundamental knowledge of the structure and function of the nervous system; interdisciplinary approach. Registration limited to graduate students in anatomy and experimental medical student; consent of instructor required for others. Same as ONeurobiology 52115 and Physiology 72110. Fall semester.

01111 Gross Human Anatomy for Physician's Assistant Students (HSE 393) 4.0 h. Gross anatomy preparation for Physician's Assistant Program or consent of instructor. Summer session.

01125 General Microscopic Anatomy for Dental Students (HSE 393) 4.0 h. Dental anatomy: primary tissues and organs. Graduate students must have consent of instructor. Fall semester.

01114 Oral Microscopic Anatomy and Embryology (HSE 393) 2.0 h. Basic organic tissue structure and development on touch and related slides. Fall semester.

01116 Endodontology for Medical students (HSE 393) 2.0 h. Core course in endodontology. Prerequisite: completion of course in anatomy. Corequisite: Endodontology 52116. Spring semester.

01120 Independent Study in Anatomy (HSE 393) 5.0 h. Project related to anatomy assigned with faculty member in-charge. Requires independent study. Any semester.

01200 Special Problems in Anatomy (HSE 393) 4.0 h. Open to anatomy graduate students with suitable background. By arrangement with instructor. Any semester.

02001 Gross Human Anatomy for Graduate Students (HSE 393) 6.0 h. Regional dissection, programmed learning, lecture, demonstrations, tutorials, dissections and films. Includes embryology. Intended for graduate students in anatomy. Prerequisite: consent of instructor. Fall semester.

02002 Gross Human Anatomy for Graduate Students (HSE 393) 8.0 h. Regional dissection, programmed learning, lecture, demonstrations, tutorials, dissections and films. Includes embryology. Intended for graduate students in anatomy. Prerequisite: consent of instructor. Spring semester.

02003 Gross Human Anatomy for Graduate Students (HSE 393) 8.0 h. Regional dissection, programmed learning, lecture, demonstrations, tutorials, dissections and films. Includes embryology. Intended for graduate students in anatomy. Prerequisite: consent of instructor. Fall semester.

02004 Gross Human Anatomy for Graduate Students (HSE 393) 8.0 h. Regional dissection, programmed learning, lecture, demonstrations, tutorials, dissections and films. Includes embryology. Intended for graduate students in anatomy. Prerequisite: consent of instructor. Spring semester.

02005 Gross Human Anatomy for Graduate Students (HSE 393) 8.0 h. Regional dissection, programmed learning, lecture, demonstrations, tutorials, dissections and films. Includes embryology. Intended for graduate students in anatomy. Prerequisite: consent of instructor. Summer session.

01210 Introduction to Research (HSE 393) 2.0 h. Lectures and demonstrations on basic principles of research methodologies. Topics include: experimental techniques, experimental design, use of index references, computer graphic, histology and colloidal chemistry. Spring semester.

02025 Electron Microscopy Theory and Technique (HSE 393) 4.0 h. Prerequisite: permission of instructor. Same as Biology 23218 and Microbiology 63110. Fall semester.
Biochemistry

Department Head: Edward C. Heath


Graduate students: B.A., B.S., Ph.D.

Undergraduate programs

See "Biochemistry" in the Liberal Arts section of the Catalog.

Graduate Programs

The graduate program in biochemistry places dual emphasis on the discrete and master's programs. The Department offers the master's program independently, but master's students 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 graduate program is on the individual student, whose specific needs are met both in the conference-tutorial approach of the seminar coursework and in the broad range of research areas from which he or she may choose a thesis topic.

The only formal course first-year students usually take is an intensive one-year offering in general biochemistry (Biochemistry 99-265 the first semester and 99-266 and 99-267 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 whatever courses he or she and the advisory committee agree upon for his or her program. The student may also take other courses, if in 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 begins full-time research 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 assist 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 glycogenolysis and carbohydrate deficiencies, mechanisms and control of protein synthesis, biochemistry of hormones, characterization of liver and hepatoma enzymes, clinical biochemistry, neurobiochemistry, lipid metabolism, thermodynamic mechanisms, conformational and allosteric investigation of glycolytic enzymes, analysis of enzyme systems utilizing co-enzymes and folic acid coenzymes, enzyme mechanisms, biochemistry of active peptides and biochemical changes during development.

Facilities

The University Health Center's current $300-million expansion program provides 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 interconnected, 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 kitchen and stockroom. Research is facilitated by good technical support in such areas as glassblowing, machine shops, 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, tank, plate and gel electrophoresis equipment, an electron microscope, instrumentation 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, biomedical, physical 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 an I score of 1250 on the combined verbal and quantitative parts of the Graduate Record Examination Aptitude Test.

Courses

99:100 Seminar Undergraduates

3-5 a.h.

Course content is determined; discussion of major research in plant and animal biology. Required of all majors. No prerequisites.

99:120 Biochemistry

1.5 a.h.

One-semester lecture course focusing on biochemistry of living and dead cells in nature. Emphasis is on the use of techniques available to students in the laboratory. Prerequisites: two semesters general chemistry, one semester general biology.

99:122 The Chemistry of Biological Materials

3 a.h.

Chemistry of major functional groups in compounds in biological systems and factors which influence their metabolism; chemistry of biopolymers, role of water, energy and other co-factors. Prerequisite: Chemistry 4:122.

99:128 Introduction

3 a.h.

Molecular dynamics of biological systems; how energy is obtained, stored and utilized by living systems; conventional and modern methods for studying the effects of matter and energy, role of enzymes in catalysis, role of ions in catalysis and regulatory processes of differentiation are discussed. Prerequisite: 99:120.

99:131 Molecular Genetics

4 a.h.

Selected classical genetic phenomena; chromosomes, gene mapping, pathways and control of nucleotide biosynthesis; DNA as genetic material; primary and secondary structure of DNA and RNA; intermediates of DNA, RNA and proteins; interactions of proteins and nucleic acid; transcription and translation control of protein synthesis; molecular biology of differentiation. Prerequisites: 99:120 and 99:132, Zoology 31:176 or equivalent, with consent of instructor. Same as Zoology 31:171.

99:135 Physical Biochemistry

4 a.h.

Theory and interpretation of physical chemical measurements which relate to biochemical systems, topics include thermodynamics, electrochemistry, coulometry, spectrophotometry, mass spectrometry, light scattering and Scatchard analysis. Three lectures, one conference.

99:140 Cellular Biochemistry

4 a.h.

For graduate students and advanced undergraduates; biochemistry and other sciences; quantitative and qualitative experiments on identification, function and characterization of constituents of biochemical systems, use of modern instruments for spectroscopy, electrophoresis, centrifugation and ultracentrifugation studies; experimental design and interpretation explained. Prerequisites: 99:120 and Chemistry 4:6.

99:146 Physical Biological Techniques

4 a.h.

For independent study. Independent experiment designed to accompany 99:153 introduction to biochemistry; current techniques; dehydration; ODC, OSM, IR, UV, visible and fluorescent spectroscopy; rapid and steady-state kinetic; protein and enzyme analysis; paper chromatography; thin-layer chromatography; and applications of computer analysis to biochemical problems. Prerequisites: Biochemistry 99:120, registration in Biochemistry 99:120 or consent of instructor.

99:150 Research, Independent Study

3-4 a.h.

Students pursue individually the independent study of advanced work and research in areas of interest and arrangement made by student and faculty member in advance of enrollment. May be taken for three, four, or five credits.

99:156 Biochemistry Tutorial

3 a.h.

For Health Sciences Students. An introduction to modern biochemistry for students entering the Health Sciences College in the fall semester; topics to be identified. May be taken for three credits.

99:161 Biochemistry for Dental Students

3 a.h.

Introduction to modern biochemistry for dental students who have not had equivalent biochemistry. Course content is determined; discussion of factors; creation of lecture notes; conferences; one or more books; and one or two examinations; other studies' admitted only after consultation with faculty member.

99:162 Biochemistry for Pharmacy Students

3 a.h.

Designed for students in colleges of pharmacy; discussion of current biochemistry. Course content is determined; discussions of lecture notes and conferences; other studies' admitted only after consultation with faculty member.

99:163 Biochemistry for Medical Students

3 a.h.

Designed for medical students; other students admitted only after consultation with staff; lecture, demonstrations and small group conferences; major objective to develop those aspects of scientific and critical thinking ability in relation to biochemical components.

99:164 Biochemistry for Physician's Assistant Students

3 a.h.

Aspects of general biochemistry necessary for understanding the biochemical basis of human disease; analysis of appropriate clinical cases. Taught primarily and
Integrated with Physiology and Biophysics 72:164.

9:00-10:00 Microbiostatistics
10:00-12:00 Microbiological Structure
12:00-1:00 Microbiological Technique
1:00-3:00 Clinical Biochemistry
3:00-5:00 Cell and Tissue Chemistry
5:00-7:00 Dermatology and Syphilology

Dermatology and Syphilology
Department head: Robert G. Caven
Faculty: professors Richard M. Capron, Robert G. Caven, Christian S. Kastenfeld, associate professor Richard L. Zwieback; clinical assistant professors Jesse C. Wernke, Jay C. Thomsen

The scope of the Department of Dermatology are 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 the 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, dermatology research and special studies.

Courses

2.1: Clinical Dermatology
2.2: Dermatology and Medical school year; lecture, independent study materials, clinical experience.

2.3: Dermatology Electives

Research in Dermatology

Dermatology for P.A.

Clinical principles of medical research; clinical or laboratory projects; individual study.

Dermatology Fellows: 2.02

Special Studies on Campus

Dermatology Electives

Endocrinology

Penalty: professors Nicholas J. Halsted (Anatomy and Physiology) and Theodore (Pediatrics; endocrinology and diabetes;), Charles Rus (Pediatrics; endocrinology), Louis V. Orlo (Pharmacology, associates professor, Joseph Brown; Internal Medicine, Assistant professor), James Streeter (Internal Medicine), Robert Thompson (Pediatrics; endocrinology and diabetes); assistant professor David Dossen (Pharmacology and Biophysics)

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 acclimati- zed staff includes approximately 20 Ph.D. programs, in which students whose primary interest is in endocrinology may enroll. Including further offered in endocrinology. As a rule, the course of studies for endocrinology emphasis 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 broadly interdisciplinary with respect to the teaching staff, which 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 complements 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

Endocrinology for Medical Students

2.1: Clinical Dermatology

2.2: Dermatology and Medical school year; lecture, independent study materials, clinical experience.

2.3: Dermatology Electives

Research in Dermatology

Dermatology for P.A.

Clinical principles of medical research; clinical or laboratory projects; individual study.

Dermatology Fellows: 2.02

Special Studies on Campus

Dermatology Electives

Endocrinology

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Endocrinology for Medical Students

2.1: Clinical Dermatology

2.2: Dermatology and Medical school year; lecture, independent study materials, clinical experience.

2.3: Dermatology Electives

Research in Dermatology

Dermatology for P.A.

Clinical principles of medical research; clinical or laboratory projects; individual study.

Dermatology Fellows: 2.02

Special Studies on Campus

Dermatology Electives

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Courses

For course descriptions, see the appropriate department section.

Anatomy
Biochemistry 3 a.h.

Physiology and Biophysics

See "Anatomy" above.

Zoology

27-194 Comparative Physiology 3 a.h.

27-195 Introductory Entomology 2 a.h.

27-192 Entomology Laboratory 2 a.h.

27-226 Seminar: Entomology 2 a.h.

27-227 Seminar: Hormones and Behavior 2 a.h.

Family Practice

Department head: Robert S. Radel


The family practice program was initiated in summer to meet the need for more primary-care physicians in Illinois and throughout the nation.

Appropriate coursework in the Department is included throughout the four-year M.D. program. The Department's 18 elective senior rotations give students opportunities for exposure to various Illinois communities through work in affiliated hospitals and community clinics, in the Department's Oakdale, Williamsburg and University Hospitals offices, and in preceptorships with selected family physicians throughout the state. There is also ample opportunity for independent study during the senior year, and an inter-nation health care elective offers exposure to primary health care systems of other countries.

Residency

The Department directs a three-year residency program, graduate of which are eligible for certification by the American Board of Family Practice. A fourth, or fellowship, year is also available. The residency trains 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 subjects in internal medicine, pediatrics, obstetrics and gynecology, psychiatry, neurology, ophthalmology, otolaryngology, operative medicine, and surgical subspecialties and community medicine. The program currently offers 72 positions for graduates.

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 internate 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 routine—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 Broadview Polk County, Iowa Lutheran and Stelk 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 Outdals Campus, four miles to the northwest, and at Williamsburg, 25 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 practice management, including organizational and administrative decision making, patient record and bookkeeping procedures and chart auditing methodologies as required to manage a private practice.

Courses

115-201 Introduction to Family and Community Medicine 2 a.h.

115-201 Family Practice, Broadview 2 a.h.

115-201 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 during hospitalization without staff. Primary care responsibility is in Family Health Center, under supervision of staff, will be expected of emergency residents. Residents also rotate at 24-hour house staff in city or community practice.

115-201 Family Practice, Des Moines 2 a.h.

115-201 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 during hospitalization with staff. Primary care responsibility is in Family Health Center, under supervision of staff, will be expected of emergency residents. Residents also rotate at 24-hour house staff in city or community practice.

115-201 Family Practice, St. Joseph 2 a.h.

115-201 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 during hospitalization with staff. Primary care responsibility is in Family Health Center, under supervision of staff, will be expected of emergency residents. Residents also rotate at 24-hour house staff in city or community practice.

115-201 Family Practice, Mason City 2 a.h.

115-201 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 during hospitalization with staff. Primary care responsibility is in Family Health Center, under supervision of staff, will be expected of emergency residents. Residents also rotate at 24-hour house staff in city or community practice.

115-201 Family Practice, Muscatine Community Health Center 2 a.h.

115-201 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 during hospitalization with staff. Primary care responsibility is in Family Health Center, under supervision of staff, will be expected of emergency residents. Residents also rotate at 24-hour house staff in city or community practice.

115-201 Family Practice, Red Oak 2 a.h.

115-201 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 during hospitalization with staff. Primary care responsibility is in Family Health Center, under supervision of staff, will be expected of emergency residents. Residents also rotate at 24-hour house staff in city or community practice.

115-201 Family Practice, Webster 2 a.h.

115-201 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 during hospitalization with staff. Primary care responsibility is in Family Health Center, under supervision of staff, will be expected of emergency residents. Residents also rotate at 24-hour house staff in city or community practice.
and 4 weeks prior to beginning of the rotation. Allow a minimum of 4 weeks to complete.

115-999 Special Studies Off Campus are.

Students who have less than 8 weeks may include community hospitals in their courses with prior approval from the Department of Family Practice. Consent Summary of Individually Arranged Elective form (available in Chase's Office) must be submitted 8 weeks prior to beginning of the rotation. Allow a minimum of 4 weeks to complete the form.

Genetics

The Ph.D. Program in Genetics is an interdepartmental program in which members of the departments of Biochemistry, botany, microbiology, and zoology, as well as a number of faculty members in clinical departments, participate. See "Genetics" under "College of Liberal Arts" for a list of participating faculty members, degree requirements and courses offered.

Hospital and Health Administration

Program director: Gerhard Hartman, faculty director: Robert Hartman, associate professor Roger Arion, instructor in law: L. Houston.

Degree offered: M.A., Ph.D.

The Master of Arts

The Master of Arts degree program in hospital and health administration stresses the conceptual unity and genetic 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 organizations theory from both the macro and micro viewpoints. The interdisciplinary approach is a key element in the program. Typically, the student terms 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 evaluation 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 services 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. Between the first and second years, summer assignments 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 conjuction 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 3 s.h.
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.

(*Interdepartmental courses)

This is only one of many possible program structures. Individual programs are determined by the student and his or her advisor, taking into consideration the student's educational background, present competencies, 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 permit, 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 committee 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 1975-76, but applications will be accepted for 1976-77 and accounting 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 understanding 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, community and 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

80:101 Fundamentals of the Modern Hospital

80:102 Fundamentals of Modern Hospital and Health Administration

80:103 Principles of Hospital and Health Administration

80:104 Administrative Aspects of Medicine

80:105 Seminar: Problems of Administrative Behavior in the Modern Hospital

Human Nutrition

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

80:201 Nutrition Seminar 1 s.h.

80:202 Seminar: Problems of current research findings in nutrition, therapeutic and administrative clinics.
Medical Technology

See "Pathology."

Microbiology

Chairman: J. R. Root


Degrees offered: B.S., M.I., 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.

Incoming 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, general, 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 departmental course requirements as determined by the student's advisory committee (minimum requirements: one course in each of the four interdisciplinary areas 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

61:103 Medical Microbiology

Principles and various essential to study of microorganisms, their identification and identification; microorganisms involved in infectious diseases; clinical pathological procedures and current concepts of immunology. 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 mycology, immunology, virology or other areas of discipline.

61:110 Microbiology for Physician's Assistant Students

Introduction course in medical microbiology with emphasis given to the more commonly encountered pathogenic microorganisms and procedures useful in a physician's office. Prerequisite: registration as physician's assistant.

61:147 Survey of Immunology

Introduction to survey of fundamentals of cellular and molecular immunology and applications to clinical problems. Basic principles of cellular and molecular immunology. Prerequisites: 61:110 or 61:122.

61:157 General Microbiology

Fundamental principles of microbial physiology, microbial genetics, virology, immunology and parasitic microbiology. Laboratory includes methods used for including and identifying microorganisms. Prerequisite: Chemistry 4:121.

61:158 Microbiology

Introduction of pathogenic bacteria with emphasis on mechanisms of pathogenicity and
Nuclear Medicine Technology

Director: James K. Christy
Program coordinator: Grace A. Laiben
Research duties
Degree offered: B.S.

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 imagining organs and disease sites have been developed during recent years. There are numerous career opportunities in radiology and nuclear medicine. 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 radiopharmaceuticals in medicine: daily preparation of radiopharmaceuticals for use in patient treatment, 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 any of the above in three, including preparing or data records for physician reviews: using agents tagged with radionuclides in a variety of highly specific and sensitive assays of hormones, drugs in blood, urine, etc.

The Program at Iowa
The program in nuclear medicine technology at Iowa is approved by the Council on Medical Education of the American Medical Association. Fulfillment of the requirements established by the American Nuclear Society includes completion of a three-year, full-time program in the College of Liberal Arts and Sciences.

Nuclear Science and Technology

Director: James K. Christy
Program coordinator: Grace A. Laiben

Research duties
Degree offered: B.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 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 radiation sources, and the use of irradiation devices.

Prerequisites:
A student who has not taken the following courses, or their equivalents, before enrolling at the university 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
- 520:16 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 I-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.
- 22S:120 Probability and Statistics and/or 22S:132 Linear Statistical Models with Applications

Radiation Biology 4 s.h.
Recommended: 77:103 Introductory Radiobiology (biology 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.
Otolaryngology and Maxillofacial Surgery

participate simultaneously in inpatient care, outpatient care, surgery and sciences related to the neurovascular-surgical system, and a five- or six-year program for those interested in full-time academic orthopaedic careers.

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 categorically diversified orthopaedic intern-ship 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, sports medicine, 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 prosthetics.

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 in one of the five orthopaedic laboratories or in a basic science department.

Departmental Laboratories
The orthopaedics laboratories deal with problems in these major subject areas:

Biochemistry—The biochemistry of mucopolysaccharides and collegens, both normal and those altered in epithelium dysplasias and scoliosis.

Biomechanics—In conjunction with the College of Engineering, biomechanical problems of the upper extremity and biomechanics of the hip and the foot, 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 at the nearby Iowa City Veterans Administration Hospital.

The facilities include 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 options deal with such problems as scoliosis, club feet, congenital dislocated hips, neurovascular system, metastatic disease, amputees, hips, knees, hands, necks and trauma.

Approximately 1,500 major operations are performed each year under the supervision 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
78/95 Clinical Orthopaedics  err.
78/95H Fundamentals of Orthopaedics  err.
78/95V Orthopaedics for Physiologist's Assistant Students  err.
78/95D Advanced Coronal Orthopaedics  err.
Open to senior medical student only.
78/95R Musculoskeletal Trauma  err.
Open to senior medical student only.
78/95Q Surplus Care of the Hand  err.
Open to senior medical student only.
78/95H Otorhinolaryngology  2 h.
Exemptions of normal and pathological states; for graduate in medicine and physical education.
78/95V Laboratory Experience  err.
Open to senior medical student only.
78/95E Special Studies on Campus  err.
Open to senior medical student only.
78/95Q Special Studies off Campus  err.
Open to senior medical student only.

Otolaryngology and Maxillofacial Surgery
Department head: Brian F. McCall

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 audiology, dentistry and speech pathology professions.

The Department's main objective is to provide a high level instructional program in otolaryngology and maxillofacial surgery 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 palates; disorders of the vestibular mechanism; facial plastic surgery; pediatric and gynecic bearing 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 defects, inner and head, and research. Another major objective of the Department is to foster research programs designed to yield new knowledge in the field and provide models for student and resident research training.

All student members participate in research and all residents are required, as part of the resident training program, to
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, otolaryngology, clavicle pathogenesis, temporal bone disease, otologic immunology of the head and neck, anatomy of the temporal bone, electrophysiology, audiology, physiology of the inner ear.

The majority of these research programs receive federal support.

Graduate Course in Otologyngology
The program in otologyngology is in accordance with the requirements 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 didactic lectures 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 otologyngology and its related fields.

Upenn successful completion of the four-year course, which must include an acceptable thesis, candidates are awarded the Degree 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 substantial work.

A limited number of resident physicians can be accepted each year. Applicants must be graduates of a recognized college.

A medical school and must have completed one year of general surgical training in an approved program.

**Courses**

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<tr>
<th>Course Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>69.02</td>
<td>Clinical Otoology</td>
<td>2 a.h.</td>
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<tr>
<td>69.10</td>
<td>Clinical Internship in Otoology</td>
<td>ar.</td>
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<td>69.10</td>
<td>Head and Neck Oncology</td>
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<td>69.10</td>
<td>Otoology Course</td>
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<td>69.10</td>
<td>Physiology of Equilibrium</td>
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<tr>
<td>69.20</td>
<td>Basic Principles of Facial Plastic and Reconstructive Surgery</td>
<td>2 a.h.</td>
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<tr>
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<td>Basic Otoology/Neurology Science</td>
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**Laboratory Course Design**

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<th>Credit Hours</th>
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<tr>
<td>69.20</td>
<td>Laboratory Course in Otoology</td>
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**Clinical Conference in Otoology, Neurology and Manifolds**

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<td>69.20</td>
<td>Clinical Conference in Otoology, Neurology and Manifolds</td>
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**Diagnosis and Treatment of Otoology, Neurology and Manifolds**

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<tr>
<td>69.20</td>
<td>Diagnosis and Treatment of Otoology, Neurology and Manifolds</td>
<td>2 a.h.</td>
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**Pathology**

Department Head: George C. Peck

Pathology Department.

The Department offers courses in Pathology to various health science students, a clinical training program in Medical Technology, a Master's Degree program, and specialty training leading
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 bachelor 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 meet 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 54 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, biostatistics and biochemistry, and genetics is strongly recommended.

A cumulative grade-point of 3.0 (A=4.0) is recommended. A minimum science grade-point average 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 final examination for 30 units of activity distributed between both the academic professional curriculum and clinical laboratory rotation. The academic professional curriculum (60 weeks) includes theoretical instruction in clinical laboratory sciences which include lectures, student laboratory experiences, demonstrations and seminars. During the last six months of the clinical program, the student rotates through the clinical mentorship 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 Center is 1,400 and clinical laboratories and research projects total 2.5 million 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 premedicall year medical 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 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: 3.0 total in science core and 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 videotaping, 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 subspecialization in laboratory medicine, and this 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 various laboratory services, including surgical pathology, autopsy pathology, cytology, clinical biochemistry, medical microbiology, hematology and blood bank. Adequate opportunity is afforded for concentrated study in such subspecialties as neuropathology, dermatopathology and gastrointestinal pathology, 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, head and neck, breast and ovary, as well as members who have extensive experience in clinical microbiology, immunochemistry 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 researchships and clerkships are available to postdoctoral students.

Facilities

The Department has laboratories equipped for histopathology, histochemistry, electron microscopy, tissue culture, special chemistry, virology, and blood coagulation, as well as the usual facilities for anatomy and clinical pathology. Our recently remodeled Pathology Learning Center has areas for seminars, independent study, multimedia learning activities and small group discussions.

Courses

GS 544 Introduction to Medical Technology 3 s.h.

Graduate courses are given at the discretion of the diagnostic laboratory personnel. Undergraduate courses, certificated relationships with other University programs. Offered fall and spring.
Pharmacology

70:18 Pediatric Hematology
arr.
Basic mechanisms of hemostasis and clinical approach to hematological problems and neoplasms in children.

70:17 Pediatric Neurology
arr.
Contraceptive use in children, adolescents, and adults; management of common neurological disorders in children; the use of brain imaging in children; and the use of antiepileptic drugs in children.

70:16 Pediatric Cardiology
arr.
Anesthetic considerations for children; management of common cardiac disorders in children; the use of pacemakers and defibrillators in children; and the use of interventional cardiology in children.

70:15 Pediatric Endocrinology
arr.
Anesthetic considerations for children; management of common endocrine disorders in children; the use of insulin and other hormones in children; and the use of interventional endocrinology in children.

70:14 Pediatric Hematology
arr.
Basic mechanisms of hemostasis and clinical approach to hematological problems and neoplasms in children.

70:13 Pediatric Neurology
arr.
Contraceptive use in children, adolescents, and adults; management of common neurological disorders in children; the use of brain imaging in children; and the use of antiepileptic drugs in children.

70:12 Pediatric Cardiology
arr.
Anesthetic considerations for children; management of common cardiac disorders in children; the use of pacemakers and defibrillators in children; and the use of interventional cardiology in children.

70:11 Pediatric Endocrinology
arr.
Anesthetic considerations for children; management of common endocrine disorders in children; the use of insulin and other hormones in children; and the use of interventional endocrinology in children.

70:10 Pediatric Hematology
arr.
Basic mechanisms of hemostasis and clinical approach to hematological problems and neoplasms in children.

70:09 Pediatric Neurology
arr.
Contraceptive use in children, adolescents, and adults; management of common neurological disorders in children; the use of brain imaging in children; and the use of antiepileptic drugs in children.

70:08 Pediatric Cardiology
arr.
Anesthetic considerations for children; management of common cardiac disorders in children; the use of pacemakers and defibrillators in children; and the use of interventional cardiology in children.

70:07 Pediatric Endocrinology
arr.
Anesthetic considerations for children; management of common endocrine disorders in children; the use of insulin and other hormones in children; and the use of interventional endocrinology in children.

70:06 Pediatric Hematology
arr.
Basic mechanisms of hemostasis and clinical approach to hematological problems and neoplasms in children.

70:05 Pediatric Neurology
arr.
Contraceptive use in children, adolescents, and adults; management of common neurological disorders in children; the use of brain imaging in children; and the use of antiepileptic drugs in children.

70:04 Pediatric Cardiology
arr.
Anesthetic considerations for children; management of common cardiac disorders in children; the use of pacemakers and defibrillators in children; and the use of interventional cardiology in children.

70:03 Pediatric Endocrinology
arr.
Anesthetic considerations for children; management of common endocrine disorders in children; the use of insulin and other hormones in children; and the use of interventional endocrinology in children.

70:02 Pediatric Hematology
arr.
Basic mechanisms of hemostasis and clinical approach to hematological problems and neoplasms in children.

70:01 Pediatric Neurology
arr.
Contraceptive use in children, adolescents, and adults; management of common neurological disorders in children; the use of brain imaging in children; and the use of antiepileptic drugs in children.

70:00 Pediatric Cardiology
arr.
Anesthetic considerations for children; management of common cardiac disorders in children; the use of pacemakers and defibrillators in children; and the use of interventional cardiology in children.

70:99 Pediatric Endocrinology
arr.
Anesthetic considerations for children; management of common endocrine disorders in children; the use of insulin and other hormones in children; and the use of interventional endocrinology in children.

Pharmacology

Department head: J.P. Long

Pharmacy: professor Michael Brady, Lawrence Fisher, John Long, James J. Sotol

William Stiles, Thomas Tully, Laura Vous Osros, Harold Williams; professor emeritus Eric Green; associate professors John A. Stamat, Jeffery Butz, Rose Freeman, Robert Harbour, Thomas Stine, Mike Wiegand; visiting professors Anne Auer, Rene Mather, Donald Gebhart

Degrees offered: M.S., Ph.D.

The Department is involved in the professional education of pharmacy, dental and medical students. A recognized graduate program with a full series of courses has been developed. More recently, the educational program has been expanded to include clinical pharmacology and clinical toxicology.

The Department pioneered the offering of pharmacology (71:120 Drugs: Their Nature, Action and Use) to undergraduate students with little or no science background. The lecture-discussion sessions emphasize the mechanisms of drug action and establish a background on rational decisions can be made by students.

Excessive research and teaching programs in the Department include biochemistry and pharmacology and toxicology, drug metabolism, central nervous system and autonomic pharmacology, and the pharmacology of cardiovascular and renal systems. There are several significant interactions with other departments through the University's NSF-funded defenses Development Program in neurology and endocrinology, the Neurobehavioral Studies Program and the Cardiovascular Program Project of the Department of Mental Health. A considerable portion of the Department consists of the Center for Biochemical Pharmacology and Toxicology. Research training in all areas of pharmacology and toxicology is available at the predoctoral and postdoctoral levels. This training is in preparation for the extensive career opportunities available in academic teaching and research in various industrial research laboratories and in industrial research.

Graduate Study

Prerequisites for graduate study include undergraduate background in chemistry, biology and mathematics, and a high level of past performance is expected of all applicants.

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 Coordinator:** Gary L. Scudder  
**Associate Director:** Gary L. Scudder  

**Faculty:**  
- Associate professor: W. Paul  
- Assistant professor: Lisa Norton  
- Instructor: David Waldo  
- Adjunct Instructor: Olivia Therul  
- Graduate student representative: George Super  
- Adjunct Instructor: William Davis

**Advisory committee:**  
- Gary Scudder (chair), Robert Yawniak, Rex  
- Montgomery (College of Medicine), Fred  
- Linen (Hospital Administration). George  
- Super (Physical Therapy), Bagdad Cooper (Orthopedics), Alfred Boyd (Pharmacy).  
- Graduate student representative:  
- Support personnel: Clinical consultation, M.A., Ph.D.

**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. Satisfaction of the requirements of the current offering candidates for the Professional Examination Service (P.B.S.) test for licensure in Iowa are not described.

The two-year professional certification program consists of:

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
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</thead>
<tbody>
<tr>
<td>60:109</td>
<td>60:110</td>
</tr>
<tr>
<td>101:115</td>
<td>72:150</td>
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<tr>
<td>101:111</td>
<td>70:110</td>
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<td>101:131</td>
<td>63:161</td>
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<td>101:141</td>
<td>101:111</td>
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<td>69:293</td>
<td>101:122</td>
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<tr>
<td>206:110</td>
<td>101:190</td>
</tr>
<tr>
<td>206:111</td>
<td>101:110</td>
</tr>
</tbody>
</table>

- **Therapeutic Exercise I**  
- **Clinical Observation**  
- **Emotional Aspects of Disability**  
- **Electrotherapy**  

**Semester III**

| 101:101 | 101:102 |
| 101:111 | 101:111 |
| 101:110 | 301:110 |
| 101:123 | 101:121 |
| 101:110 | 101:111 |

- **Introduction to Clinical Medicine**  
- **Fundamentals of Orthopedics and Clinical Sciences**  
- **Therapeutic Exercise II**  
- **Principles of Neurology and Clinical Sciences**  
- **Scientific Inquiry**  
- **Physical Therapy Administration**  
- **Radiology for Physical Therapists**  
- **Clinical Internship**

**Semester IV**

| 101:120 |
| 101:121 |

- **Clinical Internship**

**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 preprofessional 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 preprofessional 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 level, including a complete introductory course and 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 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 informational 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 Oskaloosa 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 medical care 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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>71:125</td>
<td>Pharmacology for Health Sciences: Physician's Assistant</td>
<td>5 h.</td>
</tr>
<tr>
<td>50:105</td>
<td>Law and Medicine for Physician's Assistant Students</td>
<td>1 h.</td>
</tr>
<tr>
<td>66:111</td>
<td>Gross Human Anatomy for Physician's Assistant Students</td>
<td>6 h.</td>
</tr>
<tr>
<td>61:110</td>
<td>Microbiology for Physician's Assistant Students</td>
<td>3 h.</td>
</tr>
<tr>
<td>69:203</td>
<td>Principles of Human Pathology</td>
<td>3 h.</td>
</tr>
<tr>
<td>69:130</td>
<td>Clinical Pathology for Physician's Assistant Students</td>
<td>2 h.</td>
</tr>
<tr>
<td>72:164</td>
<td>Human Physiology for Physician's Assistant Students</td>
<td>4 h.</td>
</tr>
<tr>
<td>99:164</td>
<td>Biochemistry for Physician's Assistant Students</td>
<td>3 h.</td>
</tr>
<tr>
<td>50:121</td>
<td>Introduction to Medicine for Physician's Assistant Students</td>
<td>3 h.</td>
</tr>
<tr>
<td>117:101</td>
<td>Seminar for Physician's Assistant Students</td>
<td>0.3 h.</td>
</tr>
</tbody>
</table>

**Second Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>70:555</td>
<td>Pediatrics for Physician's Assistant Students</td>
<td>6 h.</td>
</tr>
<tr>
<td>75:555</td>
<td>General Surgery for Physician's Assistant Students</td>
<td>6 h.</td>
</tr>
<tr>
<td>78:555</td>
<td>Internal Medicine for Physician's Assistant Students</td>
<td>6 h.</td>
</tr>
<tr>
<td>115:555</td>
<td>Family Practice for Physician's Assistant Students</td>
<td>6 h.</td>
</tr>
</tbody>
</table>

**Elective Clinical Rotations:**

Four to be selected from the following, to include, if available, the first two:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>66:100</td>
<td>Obstetrics and Gynecology for Physician's Assistant Students</td>
<td>6 h.</td>
</tr>
<tr>
<td>73:100</td>
<td>Psychiatry for Physician's Assistant Students</td>
<td>3-6 h.</td>
</tr>
<tr>
<td>70:101</td>
<td>Child Health Care for Physician's Assistant Students</td>
<td>arr.</td>
</tr>
<tr>
<td>70:102</td>
<td>Pediatric Elective for Physician's Assistant Students</td>
<td>arr.</td>
</tr>
<tr>
<td>75:100</td>
<td>Emergency Room for Physician's Assistant Students</td>
<td>arr.</td>
</tr>
<tr>
<td>76:102</td>
<td>Orthopedics for the Physician's Assistant Students</td>
<td>arr.</td>
</tr>
<tr>
<td>115:500</td>
<td>Family Practice Elective for Physician's Assistant Students</td>
<td>arr.</td>
</tr>
<tr>
<td>78:100</td>
<td>Internal Medicine Elective for Physician's Assistant Students</td>
<td>arr.</td>
</tr>
</tbody>
</table>

**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 uniforms and diagnostic equipment. Microscopes 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-
Physiology and Biophysics

oric, physical education, and the historical-cultural, literature and social science cores.

A complete introductory course in organic chemistry, which would ordinarily follow a complete introductory non-laboratory course in modern general chemistry principles; and

A complete introductory and one advanced course in zoology or animal biology.

It is also strongly recommended, although not required, that the applicant's high school background include algebra, trigonometry and physics.

Applicants who have already completed an associate of arts or a baccalaureate program at an accredited college or university automatically meet the Liberal Arts general education requirements.

The applicant must have achieved at least a 2.5 grade-point average (A=4) 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 considerations. 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 procedure, the physician's assistant application should present a detailed description of the applicant's medical training and experience, and at least three letters of recommendation.

Course

1771/1772 Seminar for Physician's Assistant Students 6.0 a.h.

Lectures, readings and group sessions dealing with topics of specific interest to the physician's assistant and emphasizing those issues not covered elsewhere in the program curriculum. Open only to students in the physician's assistant program.

Physiology and Biophysics

Department head: R. E. Pollner


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 narrowly 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 suited to his or her particular background, need and interest. Required courses are 72:212 Medical Physiology, 72:118 Endocrinology for Medical Students, 72:210 Neurophysiology and Behavior. In addition, students take at least three advanced courses in physiology and biophysics, a course in clinical physiology, and a 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 projects are provided with tuition and stipend support so 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 well 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, neuropsychophysiology, developmental physiology, respiratory physiology, renal physiology, gastrointestinal physiology, environmental physiology, exercise physiology, biophysics of excitation and conduction, biophysics of growth and biomechanical engineering.

Admission

In addition to the University's general graduate admission requirements (see the Graduate College section of the Catalog), a minimum requirements for admission to the graduate program in physiology include a 3.0 undergraduate grade-point average, two semesters and undergraduate coursework in life science subjects, a combined total of six semesters in chemistry (through physical chemistry and physics), and mathematics through calculus.

An applicant deficient in any of the prerequisites may be admitted if he or she can stick up the deficiency during his or her first year in the graduate program.

Course

72:13 Introduction to Human Physiology 4.0 a.h.

Basic concepts of human physiology. Prerequisites: Zoology 72:13, Chemistry 47:7 or equivalent, six courses of history.

72:12 Introduction to Biophysics 3.0 a.h.

Physical interpretation of biological observations, such topics as blackbody, biostatistics, and flow and diffusion in living systems discussed. Recommended prerequisite: one of the two major courses in physics.

72:102 Endocrinology Physiology 4.0 a.h.

Basic concepts of function and disease adaptations in various mammalian species. Prerequisites: 72:13, graduate standing, or consent of instructor.

72:118 Neurophysiology and Behavior 4.0 a.h.

Interdisciplinary study of organization and function of nervous system. Some an
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 achievements in public health work.

In 1955 the Department sponsored the development of the Institute of Agricultural Medicine, 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 profession 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 expanded 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 administration of local health services, description 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 of specific epidemiologic 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, surveys of health service utilization behavior in Iowa communities, cardiovascular disease and hyperlipidemia among pregnant, cancer epidemiology through the Iowa State Cancer Registry and the Iowa Cancer Epidemiology Research Center (both based within the Department), the epidemiology of clavicle disease associated with endoprosthetic E. coli, major participation in evaluation of health services research activities; on a university-wide basis, the study of the 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.

A limited amount of financial assistance is available within the department.

Admission
Application deadlines for the fall and spring semesters 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 of 1050 is needed. Undergraduates major or coursework background required for graduate admission in science or mathematics, depending on graduate program of study. However, possible, a personal interview with the prospective student is desirable. Always required, however, are three letters of recommendation.

Courses
50:101 Health Science I 3 h.
50:102 Health Science II 3 h.
50:106 Health Services 2 3 h.
80:140 Environmental Health Administration 2 h.
90:162 Biostatistics 2 h.
90:164 Biostatistics 1 2 h.
100:180 Community Health 3 h.
120:130 Public Health Aspects of Food and Housing 3 h.
130:138 Principles of Epidemiology 3 h.
130:139 Principles of Epidemiology 2 h.
130:140 Design and Analysis of Experiments in the Biomedical Sciences 3 h.
130:141 Introduction to the Design of Sampling Surveys 2 h.
130:142 Design and Analysis of Experiments in the Biomedical Sciences 2 h.
Radiation Biology

75:226 Radiobiology 4 h.
75:230 Advanced Radiation Problems 4 h.
75:234 Senior Seminar 2 h.
75:236 Advanced Radiation Physics 4 h.
75:238 Research in Radiation Biology 4-6 h.
75:240 Independent Study 1-3 h.
75:245 Special Problems in Radiation Biology 1-4 h.
75:250 Seminar in Radiation Biology 1-3 h.
75:254 Special Projects 1-6 h.
75:260 Independent Study Laboratory 3 h.
75:270 Special Projects Laboratory 1-6 h.

Courses

75:200 Introduction to Radiobiology 4 h.
75:205 Advanced Radiobiology 4 h.
75:210 Introduction to Radiation Biology 3 h.
75:220 Research in Radiobiology 1-3 h.
75:225 Independent Study 1-3 h.
75:240 Advanced Radiation Biophysics 4 h.
75:245 Seminar in Radiation Physics 1-3 h.
75:250 Special Projects in Radiation Biology 1-6 h.
75:260 Independent Study Laboratory 3 h.
75:270 Special Projects Laboratory 1-6 h.

Psychiatry

Department head: George W. Winkler.

Psychiatry: The program of study is designed to prepare graduates for careers in academic and clinical psychiatry.

75:200 Introduction to Psychiatry 4 h.
75:205 Advanced Psychiatry 4 h.
75:210 Research in Psychiatry 3 h.
75:220 Special Problems in Psychiatry 1-3 h.
75:225 Independent Study 1-3 h.
75:240 Advanced Psychiatry Laboratory 3 h.
75:245 Seminar in Psychiatry 1-3 h.
75:250 Special Projects in Psychiatry 1-6 h.
75:260 Independent Study Laboratory 3 h.
75:270 Special Projects Laboratory 1-6 h.

Courses

75:200 Introduction to Psychiatry 4 h.
75:205 Advanced Psychiatry 4 h.
75:210 Research in Psychiatry 3 h.
75:220 Special Problems in Psychiatry 1-3 h.
75:225 Independent Study 1-3 h.
75:240 Advanced Psychiatry Laboratory 3 h.
75:245 Seminar in Psychiatry 1-3 h.
75:250 Special Projects in Psychiatry 1-6 h.
75:260 Independent Study Laboratory 3 h.
75:270 Special Projects Laboratory 1-6 h.

Radiation Biology

Program director: James W. Osborne.

75:200 Introduction to Radiation Biology 4 h.
75:205 Advanced Radiation Biophysics 4 h.
75:210 Research in Radiation Biology 3 h.
75:220 Special Problems in Radiation Biology 1-3 h.
75:225 Independent Study 1-3 h.
75:240 Advanced Radiation Biophysics Laboratory 3 h.
75:245 Seminar in Radiation Physics 1-3 h.
75:250 Special Projects in Radiation Biology 1-6 h.
75:260 Independent Study Laboratory 3 h.
75:270 Special Projects Laboratory 1-6 h.

Undergraduate Programs

There are no undergraduate programs in radiation biology.
Physical Therapy

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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 interviews as 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.
63:261 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.

Required Courses

101:212 Medical Instrumentation 2 s.h.
69:303 Principles of Human Pathology 2 s.h.
101:293 Electromyography in Kinesiology and Biomechanics 3 s.h.
7H:161 Designing Learning Programs for Health Careers Education 3 s.h.
7H:162 Learning Strategies for Career and Education 3 s.h.
7P:248 Data Processing 3 s.h.
7P:150 Educational Measurement for the Classroom Teacher 2-3 s.h.
63:171 Problems in Preventive Medicine 3 s.h.
7V:05 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 2 s.h.
101:327 Research in Therapeutics 2 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 licensure examination for physical therapists.

Facilities

Perm-land 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, oscil- loscopes, electromyographs, electromyographs, force plate, high-speed camera, motion analyzer, accelerometers and force table—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 orthopedists, engineers, cardiologists, physiologists, anatomy, pediatricians and orthotymologists; the master's degree program and the Physical Therapy Clinic interface 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, literature and a master's degree. The purpose of the program is to prepare 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 commences from 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 Methodology and Clinical Reference 3 s.h.
Lectures, demonstrations, case presentations of clinical disorders from textbooks of clinical methodology, clinical signs and symptoms, treatment and prognosis.
101:162 Fundamentals of Orthopaedics and Clinical Reference 3 s.h.
Lectures, demonstrations and case presentations of orthopaedic and clinical disorders from textbooks of orthopaedics, clinical signs and symptoms, treatment and prognosis.
101:163 Scientific Inquiry 1 s.h.
Normal lecture and reading assignments are used to define and evaluate the concepts of the scientific method. Students are required to write and present a paper which...
Surgery

The Faculty
Special faculty strengths are centered in the fields of pathophysi- ology and problems of serious burns, organ transplantation, the surgical control of morbid obesity, inflammatory bowel disease, the pathophysiology of biliary tract disease, pediatric surgery and vascular surgery. These strengths in cardiovascular and neurological sur- gery have particular expertise in the clinical management of the spectrum of diseases in their specialities.

Courses
7.158 Basic Emergency Skills 6 h.8. Surgeon-patient contact in emergency medical techniques; emphasis on practical exercises and application of lectures material.

7.258 Clinical Surgery, 2 components in place: anesthetics, emergency surgery, and trauma. 4 h.

7.259 Advanced Clinical Surgery 4 h.

7.358 Principles of Surgery 3 h.

7.458 Plastic Surgery 3 h.

7.558 Vascular Surgery 3 h.

7.658 Clinical Research and Otolaryngology 3 h.

7.758 Pediatric Surgery 3 h.

7.858 Transplantation Surgery 3 h.

7.958 Research in Surgery 3 h.

Courses in surgery provide opportunities for a unique combination of patient-care oriented experience and basic surgical research designed to give the untrained student an awareness of the place of surgery among the physician's skills.

Facilities
The Department has adequate surgical patients for teaching. Spe- cial areas include the burns 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 these laboratories: Animal Operating, Tissue Culture, Gastroenterology Microbiology, Pe- ripherical Vascular, Transplantation, Organ Preservation, Cardio- vascular, and Neurosurgery (Stenonacis).
Urology

Division head: David A. Cole

Pathology: Pathologists Raymond Briggs, David A. Cole: associate professors William Looney, Charles Hawes: associate professor Steven Loeving; associate Benson Smith

Modern urology is concerned with diseases of the urinary tract of the male and female, and with the male genital tract.

It includes urological nephropathy, disease, hyperfunction, interpretation, the very broad areas of urological oncology, urological endocrinology and the broad area of pediatric urology, in addition to the areas of general urology, such as urinary tract stone, urinary tract infections, diagnostic urology and the results of urinary tract structures.

The Department offers courses in all these fields, at the undergraduate and graduate levels and in continuing education for the delivery of urological care.

In the first year of medicine, 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 immunology, 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 calculated to illustrate the diagnosis and treatment of diseases involving the genitourinary tract in the male and the urinary tract in the female itself.

In the third and fourth years of the curriculum in medicine, the Department offers courses in diagnostic urology, radiologic urology, urological endoscopy and the entire field of urology. In the required third-year clerkship, the Department offers the basics of this field, and in the fourth year it offers advanced elective courses of intensive study in these areas.

Continuing education is offered throughout the year for urology and family practitioners.

These activities are conducted by a well-trained staff assigned in the various areas, whose members have intense interest in certain areas, including pediatric urology, reproductive physiology, urological oncology.

A special area, in which the Department has unique international recognition, has been created for the study of prostatic diseases.

The urological laboratories are active and offer instruction in various areas of research in the areas of urology. Special courses in these areas are available on an elective basis.

Courses

78-106 Clinical Urology 2 a.h.
78-131 Urology endoscopy and course of study on urology; studies; junior medical students responsible for patient care under supervision of residents, attending social activities and assistance in pre- and post-operative care of patients. Experience in clinical and diagnostic urology through visits to Urology Operations Department and Referral Center. Situational case conferences and topics in urology reviewed daily by senior medical staff.

78-105 Urology 12 Ray Interpretation 1 a.h.
78-106 Urology 2 Ray Interpretation 1 a.h.
78-168 Urology General Ray 1 a.h.
78-170 Urology General 1 a.h.
78-110 Urology General 1 a.h.
78-112 Urology General 1 a.h.
78-114 Urology General 1 a.h.
78-116 Urology General 1 a.h.
78-118 Urology General 1 a.h.
78-120 Urology General 1 a.h.
78-122 Urology General 1 a.h.
78-124 Urology General 1 a.h.
78-126 Urology General 1 a.h.
78-128 Urology General 1 a.h.
78-130 Urology General 1 a.h.
78-132 Urology General 1 a.h.
Urology

76:196 Basic Endocrinology and Reproduction

This course will cover topics in the basic endocrinology and reproductive biology of the male. The course will include an introduction to the endocrine system, hormones, and their regulation. Lectures will be supplemented with small group discussions of clinical cases. The course will be taught in a seminar format and will include hands-on laboratory exercises.

76:177 Transplantation Seminar Elective

This course provides an overview of the fundamentals of transplantation in the adult and pediatric patient populations. Lectures will cover the history, immunology, and current techniques of solid organ transplantation. The course will include case studies and guest lectures from experts in the field.

76:288 Special Studies on Campus

This course is an individually planned program of study that is approved by the Department and the Faculty. The course may be taken for a maximum of four credits and requires the completion of a research project or a significant clinical project. Approval must be obtained from the Department before registration.

76:399 Special Studies off Campus

This course provides an opportunity for students to gain clinical experience in a setting outside of New Haven. Students must obtain approval from the Department before registering for this course. The course may be taken for a maximum of four credits and requires the completion of a research project or a significant clinical project.
The College of Nursing is an integral part of the University Health Center, sharing in and contributing to teaching, research and patient-care resources which have earned international recognition. This provides an unusually fine setting for college preparation for nursing, because the educational and clinical resources which are needed to educate nurses are available on or near the campus. This also makes it possible for the faculty and students to participate fully in University life and to contribute their time, interest and abilities to the many general and special activities of the major and modern university. Both the baccalaureate and graduate programs are accredited by the Department of Baccalaureate and Higher Degree Programs of the National League of Nursing, the professional accrediting agency for college and university programs of nursing education.

The University of Iowa baccalaureate program is approved by the Iowa Board of Nursing and its graduates qualify to take the licensure examination required for practice as registered nurses.

Undergraduate Program

Men and women educated as professional nurses are in demand in a variety of jobs and settings, among them community health nursing services, doctors’ offices, clinics, hospitals, armed forces, the Peace Corps, the World Health Organization, the Red Cross, humanitarian and governmental agencies, and professional organizations. A professional nurse may be engaged in clinical nursing, teaching, research or private practice.

A bachelor’s degree program, such as that offered by The University of Iowa, provides college-level preparation for careers in the hospital care of patients and in such community agencies as public health services, schools and industries. In addition, it provides the essential base for graduate study in nursing.

In addition to the advantages of combining general education with specific career preparation, a college or university program offers the advantage—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-satisfaction in life.

The baccalaureate program is designed to provide both liberal and professional education. The basic 280-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 graduate 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 hospital wards 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. Bachelor of Science in Nursing candidates must complete all nursing courses at The University of Iowa. Practical two-year transfer students who want more information about this plan should contact the cooperating institution of their choice.

Registered Nurses

With some modifications, registered nurses who enroll 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 Tests, or completion of a college course in mathematics comparable to or higher than intermediate algebra (Mathematics 224:1); Chemistry—High school chemistry or its equivalent (if taken at the college level it may be included in the 30 semester hours required for admission); Physics—High school physics or its equivalent (if taken at the college level, it may be included in the 30 semester hours required for admission).

Four semester hours in the historical-cultural core area and four 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:

- Animal Biology 5 s.h.
- Chemistry (Organic and Biochemistry) 5 s.h.
- Anatomy 4 s.h.
- Physiology 4 s.h.
- Microbiology 4 s.h.
- Nutrition 3 s.h.
- Psychology 4 s.h.
- Sociology 4 s.h.
- Anthropology 4 s.h.
- Human Development and Behavior 3 s.h.

Standards

To be considered for admission to the College of Nursing, the applicant should have satisfactorily completed college coursework taken.

The American College Tests

All applicants for admission to The University of Iowa must complete the American College Tests. For information on the tests, 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 Advisers

Advisors from the College are available to help prospective nursing students plan their programs, and each student in the College works with a faculty adviser.

Expenses

Students pay the general University fees throughout the program, and purchase their own uniforms. The cost of a uniform order correctly is about $50. 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 Association of 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>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>96:210</td>
<td>Introduction to Methods of Nursing Research</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>96:220</td>
<td>Nursing Research</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>
Medical-Surgical Nursing
96:232-233 Advanced Medical-Surgical Nursing 1-11 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 Non-Thesis Thesis 2 s.h. 2 s.h.
96:242-243 Advanced Nursing of Children I-III, Special Project Nursing of Children 14 s.h. 12 s.h.
Electives (from related areas) 11 s.h.
Thesis 7 s.h.

Mental Health Nursing
96:706 Perspectives in Nursing Non-Thesis Thesis 2 s.h. 2 s.h.
96:250-254 Required Advanced Mental Health Nursing Courses 13 s.h. 13 s.h.
96:255-259 Mental Health Nursing Electives 6 s.h. 3 s.h.
Electives in related area 6 s.h. 3 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 (or other applicants will be considered on an individual basis);

Fulfillment of the legal requirements for the practice of nursing in one state of the United States or in the country in which the basic nursing education was obtained.

Grade-point average of 2.70 in the baccalaureate program or demonstrated ability in graduate courses as stipulated by the Graduate College (conditional status admission to the nursing major may be granted to applicants with a grade-point average of at least 2.50);

Graduate Record Examination (aptitude test) as required by the Graduate College (see Graduate College Information for Prospective Graduate Students bulletin);

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 private pediatricians' 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 preceptors 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 are located 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.
Courses

Undergraduate

98:06 Introduction to Health and Health Care Services
Overview of health and health care systems, with emphasis on concepts and principles of health, various selected effects affecting health, current health care systems and trends in health delivery services.
Preparation: Nursing I.
98:06 Human Development and Behavior
Developmental stages of human organism from conception through senescence. Emphasis on psychological, intellectual, emotional, and social factors. Preparation: Psychology 311 or 313.
98:06 Nursing I
Covers the nursing process with primary emphasis on the assessment phase. Skills with measurement tools, observation and assessment, establishment of effective nurse-patient relationships, increased self-awareness. Addressed expected to make inferences concerning individual's or family's view of health, based on data collected. Learning experiences in a variety of settings with families and individuals of varying ages and at differing stages of development and health.
98:06 Pathology
Introduction to common physiological and psychological disorders of human; emphasis on changes that occur in the human organism during disease and the methods used to correct these changes.
98:06 Nursing II
Health promotion and disease prevention in individuals, families and groups; initiation and maintenance of health throughout life cycle consistent in terms of basic pathophysiology; emphasis on beginning interventions and evaluation skills; anticipatory guidance; counseling and continued assessment in a variety of settings. Preparation: Nursing I.
98:06 Nursing III
Nursing interventions in crisis situations of acute Ill patients; emphasis on understanding effects of stress, coping, role, homeostatic imbalance and other significant factors upon individual within physiological conditions precipitating crisis situations.
98:06 Nursing IV
Analyzing adults and children in coping with health crisis which have long-term implications; particular stress on nursing intervention and evaluation, working with individuals, families and groups in adapting life styles to chronic health problems. Preparation: Nursing III.
98:06 Nursing V
Leadership related to independent nursing practice and interdisciplinary collaboration; group process, decision-making, teaching, strategies of persuasion. Integration of skills, emphasis on creation for creativity and perspectives for professional growth.
98:06 Nursing in the Social Order
Factual information for understanding social and economic roles and status in relationship to current nursing issues and trends; professional nursing's heritage and responsibilities.
98:10 Individual Study
Supervised study and clinical project selected in areas of student.
98:10 Human Sexuality
98:10 Family Dynamics
Interactions within nuclear and extended families, family communication and decision-making. Preparation: Psychology 312, 98:10.
98:10 Family Planning Dynamics
Family planning and contraception with emphasis on current social and economic influences, psychological agents, communication skills and teaching-consulting techniques. Preparation: Psychology 312.
98:10 Loss and Death in Clinical Nursing Practice
98:118 Leadership in Groups
Identification of various types and levels of groups, exposure of observational and interpretive skills of group members; behavior and interaction, recognition and utilization of value systems of group dynamics. Development of beginning skills in leading groups, utilization and evaluation of helpful group leader operations and assessment of one's own basic leadership within a group. Preparation: Psychology 98:10.
98:131 Institutional Gerontology
Analysis of the needs of institutionalized geriatric client and their respective families. Preparation: Psychology 311 or 313.
98:132 Nursing Care of the Hospitalized Orthopedic Patient
Pathophysiological conditions and treatment of the hospitalized orthopedic patient; teaching and research junior in helping the individual and family cope with the existing health problem. Preparation: Psychology 98:10.
98:134 Sensory Deprivation
Formulation of the concept of sensory deprivation with applications to clinical nursing situations. Preparation: Psychology 311 or 313.
98:135 Acute Care of Patients
In-depth study of the knowledge and skills needed to care for patients who have experienced acute medical insults with emphasis on assessment of the acute insult, medical treatment of various medical conditions and rehabilitation aspects. Preparation: Psychology 98:10, 311 or 313.
98:136 Interpretation of Cardiovascular Abnormalities
Introduction to the knowledge and skills necessary for interpreting, recognizing and meeting various cardiac abnormalities. Preparation: Psychology 98:10.
98:137 Oncology Nursing
Development of knowledge and skills in caring for cancer patients with emphasis on incidence, etiology and the underlying pathological processes of cancer, the diagnostic methods, treatment modalities and prevention of complications. Preparation: Psychology 98:10.
98:138 Nursing Care of Adult Patients with Elevated Levels of Awareness
In-depth study of knowledge and skills needed in assessing and caring for patients with altered levels of awareness. Preparation: Psychology 98:10.
98:141 Geriatric or Other Developmental Disabilities
Study of the physical and psychological disabilities, disabilities related to chronic conditions that are seen in older adults. Preparation: Psychology 98:10.
98:142 The Neonatal Infant-Growth, Development and Care
In-depth study of the knowledge and skills needed for the care of the newborn from birth to approximately 2 weeks of age. Preparation: Psychology 98:10, 311 or 313.
98:143 Care of the Extemporaneous Patient
Focus on personal patient and the knowledge and skills needed in anticipatory guidance for health promotion for individuals. Preparation: Psychology 98:10.
98:144 Intensive Care Nursing
In-depth study of knowledge and skills needed for caring for patients in critical care settings. Preparation: Psychology 98:10.
98:145 Theory and Nursing Intervention for Individuals with Depression
Including Suicide Intervention and Attitudes
Therapeutic interventions aimed at reducing depression and how these interventions are related to the positive and negative reactions of these interventions as related to the care of individuals with depression. Preparation: Psychology 98:10.
98:146 Nursing Care of Adult Individuals Exhibiting Bizarre Behavior
Theoretical background on personal dynamics as they are impaired in individuals experiencing bizarre behavior and development of nursing interventions to deal with the disordered behavior population.
98:147 Public Health Nursing
Understanding of the need to provide nursing care to a community agency working with patients on epidemiology, family service and community resources. Preparation: Psychology 98:10.
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 an accredited community or liberal arts college, and four years of pharmacy study.

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 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; eight of these must be taken in the fourth professional year. By choosing appropriate electives, the student may focus upon special areas as clinical or hospital pharmacy or pregraduate study.

The Professional Curriculum

First Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>46:13 Pharmacy Math</td>
<td>46:14 Pharmacy: Orientation</td>
</tr>
<tr>
<td>3 s.h.</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>37:3 Principles of Animal Biology</td>
<td>68:1 Principles of Economics</td>
</tr>
<tr>
<td>5 s.h.</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>4:121 Organic Chemistry I</td>
<td>4:122 Organic Chemistry II</td>
</tr>
<tr>
<td>3 s.h.</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>4:111 Elementary Quantitative Analysis</td>
<td>4:141 Intermediate Chemistry Lab I</td>
</tr>
<tr>
<td>4 s.h.</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>Total semester hours</td>
<td>.5 s.h.</td>
</tr>
<tr>
<td>Semester</td>
<td>Course Title</td>
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<tr>
<td>---------------</td>
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</tr>
<tr>
<td></td>
<td><strong>Principles of Human Anatomy</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Elective</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total semester hours</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Also offered first semester for students on a 5-3 program only. Electives are required. At least 8 semester hours of this total must be taken in the P-4 year.</strong></td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td><strong>Pharmaceutical I</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Biochemistry for Pharmacy Students</strong></td>
</tr>
<tr>
<td></td>
<td><strong>General Microbiology</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Principles of Human Anatomy</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total semester hours</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Also taken in second semester of first year.</strong></td>
</tr>
<tr>
<td><strong>Third Year</strong></td>
<td><strong>Pharmaceutical II</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Pharmaceutical Socioeconomics</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Medicinal Chemistry: Natural Products I</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Intermediate Physiology (Human)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total semester hours</strong></td>
</tr>
<tr>
<td></td>
<td><strong>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-grade-only option, waiver or substitution of courses, cancellation of registration, drop date and correspondence study, see the &quot;College of Pharmacy&quot; section in the current Schedule of Courses.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Admission</strong></td>
</tr>
<tr>
<td></td>
<td><strong>The college-level work outlined below is the minimum academic requirement for admission to the College of Pharmacy:</strong></td>
</tr>
<tr>
<td></td>
<td><strong>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.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Students who have minor deficiencies in meeting the above requirements may be admitted to the College upon recommendation of the Chairman of the Admissions Committee and the approval of the Dean.</strong></td>
</tr>
</tbody>
</table>

### Second Semester

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical Pharmacy: Therapeutics I</strong></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Clinical Pharmacy: Clerkship I</strong></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td>4-6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Total semester hours</strong></td>
<td></td>
<td>8-10</td>
<td></td>
</tr>
</tbody>
</table>

**A minimum of 8 s.h. of electives must be taken in the P-4 year.**

### Professional Electives

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Institutional Practice</strong></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Community Pharmacy Operations</strong></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Pharmaceutical Chemistry: Drug Analysis</strong></td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Senior Seminar</strong></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Non-Prescription Drugs</strong></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Pharmacy: Projects</strong></td>
<td>1-3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Physical Pharmacy</strong></td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Biopharmaceutics</strong></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Industrial Pharmacy Survey</strong></td>
<td>2-3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hospital Pharmacy: Survey</strong></td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hospital Pharmacy: Survey</strong></td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Clinical Pharmacy</strong></td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Clinical Pharmacy: Clerkship I</strong></td>
<td>1-4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Clinical Pharmacy: Psychopharmacology</strong></td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Introduction to Natural Product Research</strong></td>
<td>1-2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### Second Semester

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medicinal Chemistry: Natural Products III</strong></td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Pharmacology for Health Sciences: Pharmacy</strong></td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Pharmaceutical Socioeconomics</strong></td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Total semester hours</strong></td>
<td></td>
<td>15</td>
<td></td>
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</table>

### Fourth Year

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical Pharmacy: Therapeutics I</strong></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Clinical Pharmacy: Clerkship I</strong></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Pharmaceutical IV</strong></td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td>4-5</td>
<td>6</td>
<td></td>
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<tr>
<td><strong>Total semester hours</strong></td>
<td></td>
<td>15-15</td>
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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. Master of Science and Doctor of Philosophy programs are available in pharmacokinetics, medicinal chemistry-natural products, and pharmaceutical socioeconomics. A Master of Science degree is available in clinical-hospital pharmacy.

Advanced study in the pharmaceutical sciences prepares the student for opportunities in research, teaching and/or administration in the fields 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 well as auditorium and library, the building houses well-equipped separate 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 Veterans 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: Methods
Application of systems of weights and measures and mathematical calculations involved in pharmaceutical procedures and practices; includes introductory laboratory in medicine and in application to pharmaceutical problems. 3 a.h.

46:14 Pharmacy: Orientation
Ellipsoid, expansion and development of the science and profession of pharmacy. 3 a.h.

46:23 Pharmacology I
Lecture and laboratory on part 1 measures, characteristics of small protein properties of proteins. Preparatory: 46:13, Chemistry 14:121, Physics 19:3. 3 a.h.

46:24 Pharmacology II
Lecture and laboratory on application of physical and chemical laws to the formulation and preparation of liquid dosage forms, including solutions, emulsions and suspensions. Preparatory: 46:23. 3 a.h.

46:28 Pharmacology III
Pharmacological behavior and physiological and pharmacological factors affecting drug absorption: an approach to drug design and manufacture on drug availability and on product activity. 3 a.h.

46:33 Pharmacology IV
Lecture and laboratory on availability of drugs, various dosage forms such as: solids, solutions and suspensions with emphasis on tablets, liquid and melt substances and on the administration of drugs for the large laboratory emphasis waste and reuse systems, techniques of computing and dispensing and recognition of drug interactions. Preparatory: 46:28. 3 a.h.

Graduate Pharmaceutics

46:101 Pharmacy: Projects
Basic and applied research problems of pharmaceutical significance. Preparation: F-2 or above standing, open to graduate students. 1-3 a.h.

46:103 Physical Pharmacy
Surface and interfacial phenomena, adsorption and crystallization in pharmaceutical systems. 3 a.h.

46:104 Biopharmaceutics
Mechanisms of drug degradation and interrelationships among properties of pharmaceuticals, dosage forms and pharmaceutical effects. Preparation: graduate standing or consent of instructor. 3 a.h.

46:105 Problem of Medication: Survey
Organization, selection and use operations in production of pharmaceuticals. Preparation: 46:24. 3 a.h.

46:202 Pharmacy: Selected Topics
Recent advances and studies in pharmacy. May be repeated for credit. 3 a.h.

46:206 Stability of Pharmaceuticals
Mechanisms of degradation of pharmaceuticals; production of side effects of pharmaceuticals. Preparation: consent of instructor. Preparatory: Chemistry 14:121, Physics 19:3. 3 a.h.

46:271 Quality Control
Lecture and laboratory instrumental analysis as applied to pharmaceuticals, chemical control, theory and applications of spectroscopy, Karl Fischer titrations, spectrophotometric, titrimetric, chromatography, etc. 3 a.h.

46:276 Product Development
Application of pharmaceutical and physiological principles to formulation and design of pharmaceutical dosage forms. 3 a.h.

46:280 Product Development
Continued development 3 a.h.
Undergraduate Clinical-Hospital Pharmacy

4636 Institutional Pharmacy
Planning, organization and administration of pharmaceutical services in hospitals. 3 a.h.
Preparation: Junior or senior standing.

46110 Clinical Pharmacy: Case Study
Introduction to selected diseases and their treatment; clinical pharmacokinetics, principles of drug therapy, laboratory use, medical terminology, abbreviations, and use of computer services. Prerequisite: Physiology 23/131, Pharmacology 71/131.

46111 Clinical Pharmacy: Therapeutics I
Pharmacotherapy of disorders encountered primarily in internal medicine; clinical significance of treatment regimens, analyzed by utilizing clinical case histories. Prerequisite: 46110.

46123 Clinical Pharmacy: Therapeutics II
Pharmacotherapy of disorders commonly encountered in outpatient, clinical significance of treatment regimens. Prerequisite: 46110.

46117 Clinical Pharmacy: Geriatrics
Application of therapeutic principles to patient care through supervised clinical and professional practice experiences in a variety of health care facilities. Prerequisite: 46110.

46118 Clinical Pharmacy: Creative Classroom
Selected experiences in health care facilities. An electives course which may be repeated for credit. Prerequisite: 46110 and consent of instructor.

46130 Clinical Pharmacy: Psychopharmacology
Lecture and laboratory courses concerned with rational use of psychotropic drugs in treatment of psychiatric disorders. Prerequisite: 46110 or graduate standing.

Graduate Clinical-Hospital Pharmacy

46107 Hospital Pharmacy: Survey
Hospital care and American health care system: Financing, planning, administration, organization and management, with particular attention to pharmacy; organizing, staffing and operating hospital pharmacy; particular emphasis on supervision of professional pharmacy residents and graduate pharmacy practice residents. Prerequisite: consent of instructor.

46108 Hospital Pharmacy: Survey
Hospital care and American health care system: Financing, planning, administration, organization and management, with particular attention to pharmacy; organizing, staffing and operating hospital pharmacy; particular emphasis on supervision of professional pharmacy residents and graduate pharmacy practice residents. Prerequisite: consent of instructor.

46114 Advanced Clinical Pharmacy
Application of principles of pharmacology and pharmacodynamics to the management of hospitalized patients; modern therapy in ward rounds and conferences with medical staff, and student patients in various types of drug therapy; emphasis on drug selection, adverse effects of drugs and disease modification of therapy with medical treatment. Prerequisite: 46110 and consent of instructor.

46115 Clinical Pharmacy: Drug Literature Review and Evaluation
Acquaints the pharmacist with the literature of hospital pharmacy practice, including critical review of the literature, emphasis on techniques of evaluating therapeutic literature; summarization, reiteration, concise boiling, et al. Emphasizes critical evaluation of statistics as necessary.

46304 Hospital Pharmacy: Paper-Rating
Theory and application of pro-forma, paper rating and testing of potential design forms.

46305 Hospital Pharmacy: Research
Research

46306 Hospital Pharmacy: Seminar
Topics of current interest in the specialty of hospital pharmacy may be repeated for credit.

46407 Hospital Pharmacy: Directed Study in Administrative Problems
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. Prerequisite: 46106, Introductory Medical and Environmental Health 51/150 or equivalent.
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 the 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, speech, and speech pathology.

There is a $3 enrollment fee. The course fee is $25 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 for correspondence courses concurrently with other academic study under Public Law 50-540. 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 when 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 enrollees. 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."
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 material to a national network of more than 150 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 improve state, city and county governments in Iowa by serving as the primary research and continuing education link between the University and these 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 in 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 governmental committees dealing with major concerns 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 on 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 to encourage students to become involved in political affairs. The Center also sponsors programs to help students increase their knowledge 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 student and administration.

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 vocational technical institutes and The University of Iowa. In those activities involving discipline articulation, the Office extends its activities to the period two- and four-year colleges in the state. Regional and national activities of approval, accreditation and consultation often extend this activity beyond state lines.

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 off campus. Research in progress is on the biology of the 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 area includes the Iowa City section 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 areas.

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 Audio-visual Center of faculty and/or graduate assistants also 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, flipstrip, 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 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 major provider of health services to the community. In its Health Center programs are located in clinical facilities and service agencies where students and practitioners are served by a wide spectrum of human health needs, ranging from basic first-aid to the most advanced diagnostic and treatment procedures, and on to the search for entirely new knowledge, through research.

As soon as they have acquired basic knowledge in their fields, health profession students begin to learn by doing: by following examples and directions set forth by the skilled practitioners who teach as they diagnose, treat, prescribe, operate, and otherwise care for patients. Thousands of individuals from the community, state and region receive direct health services through these processes. Thus The University of Iowa Health Center is simultaneously a center of learning and of service. It is one of the most advanced, comprehensive health science centers in the nation.

Many Health Center skills are shared off-campus through cooperative programs with other Iowa colleges and community colleges, and through a variety of continuing education programs for health practitioners—many of whom also return to the Iowa campus to update their skills through conferences, clinics, and “refreshers” conducted by University health science educators.

University Hospitals and Clinics

General Administrative Staff

Director and assistant executive vice president for health services: John W. Collison

Associate director: Barbara L. Eisen

Special assistant to the director: Douglas R. Williamson

Assistant director: John W. Stanley, Phyllis L. Lusher

Assistant director for planning: Gary L. Pulver

Associate director for legal services: Robert D. Miller

Clinical service heads: anesthesiology, Dr. Jack Meador; nutrition, Dr. Melis L. Lake; orthopedics, Dr. Robert T. Stead; neurosurgery and neurosurgical intensive care unit, Dr. James A. Ciliento; otorhinolaryngology, Dr. Marvin W. Van Allen; ophthalmology, Dr. Robert C. Karp; ophthalmology, Dr. C. W. Horn; pathology, Dr. George W. Seiden; pediatrics, Dr. Fred Smith; psychiatry, Dr. George Winick; radiology, Dr. James H. Corbin; surgery, Dr. John K. Holcomb; urology, Dr. J. W. J. Hulsekamp; veterinary medicine, Dr. L. S. Williams.

The University of Iowa Hospitals and Clinics is the largest of the nation’s university-owned teaching hospitals and is dedicated to the concept of health service education through delivery of highly specialized, tertiary-level care to patients referred to the hospital by physicians and dentists from throughout Iowa and the region. The instruction is the hub of Iowa’s health care delivery system in its role as tertiary care center providing advanced diagnostic and therapeutic services.

University of Iowa Hospitals and Clinics serve as the clinical base of graduate and undergraduate studies for thousands of students in the health disciplines, including medicine, dentistry, 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 sub-specialty positions and research.

An integral part of The University of Iowa, University Hospitals and Clinics is governed by the Iowa State Board of Regents. Through the University of Iowa president, the Regents delegate the responsibility for the operation of the hospitals to the director of University Hospitals, who also serves as assistant executive vice president for health services of the University.

The hospitals’ operational policies are established by the hospital advisory committees, a group comprising the chairs of the hospitals’ clinical services, the hospital director, the dean and an associate dean of the College of Medicine, and two at-large clinical faculty members. The hospital is organized into 15 clinical services, 18 administrative departments, and 47 sub-specialty clinics.

Each of the clinical services of University Hospitals is directed by a chief of service who heads the corresponding academic department in the College of Medicine or the College of Dentistry. Each of these clinical areas has its own inpatient and outpatient services and, where applicable special diagnostic and 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 1918, the State of Iowa had built and opened its own University Hospital, a facility which by 1914 had grown to 240 beds.

Progressive legislation passed by the Iowa General Assembly between 1913 and 1925 which established the state responsibility for providing high-quality health care for its citizens and made possible the construction of a 500-bed general hospital that has grown into the present University Hospitals and Clinics.

A unitly conducted in conjunction with the hospitals’ 75th anniversary celebration was the establishment of a hospital at the University of Iowa, which has provided health care services to nearly 1,000,000 individuals since the existing facility was opened in 1928. Eighty percent of these patients were the patients of 517 different Iowa families, more than half of all Iowa families in existence during those years.

The programs and services of the School of Medicine and the Mayo Clinic at Rochester, Minnesota, are integrated for administration within the University Hospitals. The units function as a single system.

Today there are 1,614 beds within the hospital complex, accommodating about 18,000 admissions annually. In addition, 47 specialty clinics accommodate another 100,000 patients each year. Nearly 15,000 major and 25,000 minor surgical procedures are performed annually in the hospitals’ 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 bone unit, heart catheterization facilities, sexual intensive care units—are easily accessible to low-waist residents in community without such resources. To facilitate use of these and other specialized services, the hospitals operate a unique patient transportation service, with a fleet of 13 vehicles which travel nearly two million passenger miles each year transporting 2,000 passengers, and from University Hospitals and Clinics.

More than 2,500 hospital staff members are involved each day in providing professional and support services needed to care for approximately 2,000 patients. The hospitals’ clinical staff is comprised of more than 355 faculty physicians and dentists assigned among the 16 clinical services. The Home Staff of University Hospitals numbers over 470 resident physicians and dentists. The hospitals’ Department of Nursing comprises some 1,000 persons, more than half of whom are professional nurses.

Other hospital staff members annually provide over 155,000 x-ray examinations and treatments, conduct over two million laboratory tests, fill in over one million prescription orders, render more than 25,000 physical therapy treatments and prepare nearly 34,000 blood and component transfusions.

New intensive care, cardiology and pediatrics units have resulted from recent modernization efforts. A seven-story, $15 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 Midwestern industrialist Roy J. Carver, the new $15 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, orthopaedic inpatient, clinic and faculty offices, and nursing units totaling 148 beds, to replace outdated facilities in Children’s Hospital and Oaklawn Hospital.

University Hospitals and Clinics also collaborate in conducting eight accredited health professional education programs: a nine-month Dietetic Internship Program; a 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 Cytotechnologist Training Program.

University Hospitals and Clinics also provide a clinical setting where students in four health education programs offered by the University of Northern Iowa—Medical Center and Cedar Rapids—have supervised opportunities to apply and integrate knowledge, attitudes and skills learned in the classroom. These programs are one- and two-year combined radiographic and radiologic technology programs; a two-year Orthopaedic Physical Therapy Program; and a one-year Operating Room Technician Program; and a two-year Respiratory Therapy Program.

The University Hospitals and Clinics also provide a clinical setting. Students in four health education programs offered by the University of Northern Iowa—Medical Center and Cedar Rapids—have supervised opportunities to apply and integrate knowledge, attitudes and skills learned in the classroom. These programs are one- and two-year combined radiographic and radiologic technology programs; a two-year Orthopaedic Physical Therapy Program; and a one-year Operating Room Technician Program; and a two-year Respiratory Therapy Program.

The University of Iowa Hospitals and Clinics are sponsored jointly by the Iowa State Department of Health, which provides personnel, salaries and office supplies, and University, which provides office space and equipment.

The University had at the primary purpose is to provide a program of dental health education in the public and private sector of the state. The previous program of the Bureau, known as the Iowa Plan for Dental Health Education, embodies three objectives: dental health education, the prevention of dental disease and the correction of dental defects. As a means of accomplishing the educational objective, authoritative material is developed and provided to the school teacher. The preventive aspect of the program is emphasized through school and home participation in a routine program of oral hygiene and correct dietary habits. The corrective phase is stressed through the use of dental referral cards.

Council on Speech Pathology and Audiology (CPA)

The Council on Speech Pathology and Audiology oversees clinical services in speech pathology and audiology offered in The University of Iowa and the Veterans Administration Hospital.

Health Occupations Education

Through this program, the University collaborates with the State Department of Public Instruction in providing contrasting and advisory services, educating teachers, conducting research and developing curricula and instructional material for health occupations programs conducted for the most part by Iowa’s 15 area community colleges, but also including a growing number of high schools. The Health Occupations Education staff also assists these institutions in staffing and conducting continuing education efforts enrolling nearly 30,000 individuals in more than 1,000 courses each year.

Health Sciences Library

In addition to the 8,500-volume College of Medicine collection covering all branches of medical science, the Health Sciences Library contains the basic collections of the three main I of health profession colleges: Dentistry, Nursing, and Pharmacy. In all, some 130,000 books and 2,500 periodicals are available here. Special features of the library include its “Medline” communication terminal for instant literature searches of the National Library of Medicine data base, and an extensive collection of rare medical books dating back to the 15th century, and its 24-hour study room.

Health Services Research Center

Organized to foster research, education and demonstration projects relate to the health needs of non-metropolitan areas, the Center for Health Services Research, located on the campus of the College of Medicine, Dentistry, Nursing, Pharmacy, Engineering, Business Administration, several social science departments of the College of Liberal Arts, University Hospitals and Clinics, and the Veterans Administration Hospital. This Center administers the Health Services Research Program in Iowa, the Midwest, and the nation as a whole.

Iowa Mental Health Authority

The Iowa Mental Health Authority is sponsored jointly by the Iowa State Department of Human Services, which provides personnel, salaries and office supplies, and University, which provides office space and equipment. The Authority had at the primary purpose is to provide a program of mental health education in the public and private sector of the state. The previous program of the Bureau, known as the Iowa Plan for Mental Health Education, embodies three objectives: mental health education, the prevention of mental illness and the correction of mental defects. As a means of accomplishing the educational objective, authoritative material is developed and provided to the school teacher. The preventive aspect of the program is emphasized through school and home participation in a routine program of oral hygiene and correct dietary habits. The corrective phase is stressed through the use of mental referral cards.
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. Mahle Theatre, Clapp 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 2,384 seats make it one of the United States’ largest modern theaters, its design, coordinating functional with acoustical 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 Louie 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 contains 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 1978 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 promotion of scientific research within the University either by 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 New World 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 Layton Island exhibit in the Riparian Zone, an exhibit of a bird island of the Hawaiian group. Other habitat exhibits include The Boring Sea, the Louisiana Swamp, the Fall Migration and Caves on Student Prairie. The cranes exhibit shows the whooping crane and the rook whoping crane, as they appear on the praire during migration.
The major invertebrate phyla are represented in several exhibits and include such familiar groups as the arthropods, mollusks, echinoderms and coelenterates.

Ethnological 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 specimens.

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 collaboration 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 seeks 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 Advisor 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 abroad 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’s pages on 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 this function, 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 periodicals, help prepare special University publications, answer requests for information and assist writers, photographers and broadcasters who visit the campus.
General Services

Public Information/University Relations publishes Spectator, Faculty Newsletter, Staff Newsletter, Campus Correspondent, Calendar of Events and Programs; 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(s), 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 and abilities.

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 reading 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 carried out by trained 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 intercollegial lesson programs in such activities as karate, tennis, golf, yoga, aquatic, badminton 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, off-campus bicycling, weight training, billiards, spaceball, tennis, frisbee and jog walking. Bicycles, subbogies 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 may leave 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 the 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 bequests, to accept trusts subject to the conditions imposed on them, and to lend, 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 complex. The office functions in the areas of recruitment, interviewing, screening, testing, placement and salary and fringe benefit administration for full-time and part-time, permanent and temporary, non-teaching and nonstudent employees of the University. The University Personnel Office is responsible for 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 continuing 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 advises 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 such 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 (other than those in the colleges of Medicine and Dentistry) who wish to do health-related research. To qualify, the faculty member must hold a full-time appointment as instructor or assistant professor. The funds may be used for any purpose which will further the faculty member's goal to conduct an initial exploration of a hypothesis which he or she believes may lead to the development of a full-fledged program of research.

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 travel and related assistance for specific research projects; for faculty travel related to specific research projects or for the purpose of acquiring skills, knowledge or techniques which will enhance research at the University; and for honors and expenses of visiting lecturers.

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 type writer 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 consulting 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 assistance in the coordination of curricula in areas related to children, advises faculty which of their colleagues to contact to organize inter-related training programs or interdisciplinary research projects in child-related fields, and advises those outside the University who wish to obtain consultation, fellowships in examining education or seek assistance in the preparation of sponsored projects in this area. The Institute keeps abreast of federal, state, and foundation sources of support, and acts 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 editorial assistance to achieve effective organization and technical soundness 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 Microscopy Laboratory
The Laboratory was established in September, 1971, to provide facilities and technical assistance to research programs involving the use of a scanning electron microscope. Located in the Zoology Building, the Laboratory is equipped with a Cambridge Stereoscan 54 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 laboratory helium 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 of Monticello, Iowa) was established in June, 1971, in the University of Iowa's Midwest center for education and research in the causes of and potential causes 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 16 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, by 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 legislators in political development. It provides research services 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 is housed in the Agricultural Medicine Research Facility on the Oxbridge Campus. It is 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 Hydraulic 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 public education activities of the Institute seek to promote citizen understanding of and appreciation for their governments, help public officials better understand their roles and responsibilities, assist governments in their personnel development activities, 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 and 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 Vocational Analysis provides a focus for investigating the potential 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. In research has been disseminated in scholarly journals and in a reprints 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 phase 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 Biomedical Pharmacology is an integral part of the Department of Pharmacology and is devoted to research in biochemical toxicology and pharmacology. Broadly, these include research on the disposition of drugs and polutes, their metabolic rate, the biological adaptation and regulation associated with their use, studies on their teratologic and toxic effects, and their mechanism of action at the molecular level. Doctoral degrees in pharmacology are offered.

**Social Sciences Data Archive**
The Social Science Data Archive is a library of empirical data that can be reanalyzed 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 in 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, Barkley, California 94701. 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 1.

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 as Freshman Honors Scholars and receive the University's $100 Freshman Honors Award.

Basic Educational Opportunity Grants
The maximum BEOG is $1,400 minus the amount of combined 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. SUEOG grants range from $200 to $1,500 per year but cannot exceed one-half of the recipient's total attendance.

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 per 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 $500 per semester to be used for school cost of tuition and books. To be eligible for the loan program, a participating school must have more than 15 hours of contact 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 employees 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 State University of Science and Technology, 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: Max R. Risser
Vice President: William L. Boyd
Director: James C. Spaulding
Director: Thomas H. Walz

Central Administration
President: William L. Boyd
Vice President for Enrollment Management and Dean of the Faculties: May Bradtke
Vice President for Administrative Services: William D. Burness
Vice President for Business and Finance: Don T. Arnold
Vice President for Educational Development and Research: Dean of the Graduate College: Deane C. Sytsma
Vice President for Student Services and Dean of Academic Affairs: Philip G. Hubbell
Coordinator of Student Services: Howard H. Jennings

Academic Affairs
Vice President and Dean of the Faculties: May Bradtke

College of Business Administration
Dean: C. L. Sowers
Center for Labor and Management: Director: Dean Thompson

College of Dentistry
Dean: James H. McClain

College of Education
Dean: Howard B. Jones

College of Engineering
Dean: Robert G. Wood
Institute of Hydraulics Research: Director: John P. Lennox

Graduate College
Dean: Deane C. Sytsma
Director: Robert B. Schaefer

College of Liberal Arts
Dean: Deane C. Sytsma
School of Fine Arts: Director: Dean Thomas
School of Journalism: Dean: J. T. Enright
School of Library Science: Director: Donald O'Keefe

College of Law
Dean: N. E. Wrenn
School of Medicine
Dean: John W. Kirklin
College of Nursing
Dean: Evelyn Ruse
College of Pharmacy
Dean: Dale E. Weyer

Division of Continuing Education
Dean: Robert R. Fry
Accreditation Center: Director: William Ogden
Bureau of Public Service: Director: Richard Nield
Center for Conference and Institutes: Director: J. W. Barry
Center for Credit Programs: Director: Center for International Development: Director: Institute of Public Affairs: Director: D. C. Sytsma: Director: Iowa Industrial Laboratory: Director: Richard V. Berlin:
Radio Station W导 R: Director: Hugh V. Coster

Libraries
Dean of Library Administration: Leslie W. Denby

Summer Session
Director: Roy A. Webb

Educational Development and Research
Vice President: Deane C. Sytsma
Office of Research Services and Administration: Director: Margaret E. Hopkins
Office of Project Development: Director: John D. McNulty
Office of International Education and Services: Director: Stephen M. Amos
Administrative Officers

State Hygienic Laboratory
Director: William J. Rauter

University Hospital School of Nursing
Director: Raymond Reshults

Student Health
Director: Harley G. Peabody

State Services for Crippled Children
Director: John C. MacQuarrie

Administrative Services

Vice-president: William M. Shankhouse

University Personnel Service
Director: Fred H. Duker

Residence Services
Director: Harold D. Livingston

Facilities Planning and Utilization
Director: Richard L. Gibson

Museum of Art
Director: Jan K. Maloney

University Architect
Robert E. Henderson

Environmental Health Services
Director: Franklin J. Klappich

Business and Finance

Vice-president: Ellis T. Judd

Business Office
Business Manager and Treasurer: Ray E. Minneman
Controller and Secretary: Leonard F. Birtka

Physical Plant
Director: Duane A. Mellick

General University

Alumni Association
Executive Director: Joseph W. Meyer

Intercollegiate Athletics for Men
Director: Charles W. Kedzie

Intercollegiate Athletics for Women
Director: Christian Grace

University of Iowa Foundation
Executive Director: Donald D. Wyrick

Computer Center
Director: Howard L. Dockery

Public Information and University Relations
Director: Thomas L. Teets

Institute of Urban and Regional Research
Director: Kenneth J. Dutcher

Student Services
Vice-president: Philip G. Hulm

Admissions
Director: John B. Moore

Registrar
University Registrar and Dean of Ceremonies: W. Abbott Cox

Iowa Center for the Arts
Coordinator: James H. Wharton

Hamlen Auditorium
Director: James H. Wharton

Iowa Memorial Union
Manager: James M. Brain

Dean of Students
Dean: Marion L. Bull

Student Activities
Director: Dean O. White

Career Services and Placement
Coordinator: Corinne Hamilton

University Counseling Service
Director:

Student Financial Aids
Director: John M. Moore

University Examination and Evaluation Services
Director: Douglas B. Whitney

Recreational Services
Director: Harry B. Overacker

University Health Services
Assistant to the President for Health Services: John W. Collicott

University Hospitals and Clinics
Director: John W. Collicott

Psychiatric Hospital
Director: George Wedgwood
Residence

720–1(1262) Classification of residents and nonresi-
dents for admission and fee purposes.

1.4(1) General.

Students attending one of the three major institutions shall be classified as resident or nonresident for admission, fee and tuition purposes by the registrar. The registration shall be based upon information furnished by the student and all other relevant information. The registrar is authorized to require such additional written, oral, or oral evidence as he may require to establish the domicile of a student, including proof of registration, adoption, proof of custody or appointment at a postgraduate institution for which he has reason to suspect that the personagarae without payment of fees.

For purposes of residence and nonresidence classification, the word "parent" as herein used shall include legal guardians or other persons in legal control of the students in all cases where lawful control by any applicant for admission has been proved to persons other than actual parents.

1.4(2) Residence for tuition purposes.

Rules regarding residence for admission, fee and tuition payments are generally divided into two categories: those that apply to students who are under the age of eighteen and those who are eighteen or over.

The requirements in these categories are different. Jurisdiction within the state means adoption of the state as a fixed permanent home by persons present within the state. The two categories are discussed in more detail below.

1.4(3) Students who are minors.

The requirements of a minor shall follow that of the parents at all times, except in extraordinary cases where emancipation can be proved beyond dispute. This residence of the minor during his life, and domicile death, the residence of the parents, in the residence of the emancipated minor, but if the father and the minor have separate places of residence, the minor takes the residence of the parent with whom the minor is domiciled or in which the minor has been domiciled by court order. The parent of a minor applying for admission who is considered resident of Iowa if only he or she is domiciled within the state on the day of the beginning of the semester, quarter or session in which the minor is a first resident at Iowa State University or the same University of Iowa, or University of Northern Iowa, or if the parent resides in such domicile for the parents other than that quality their child for residence purposes.

A minor admitted before he or she reaches majority in Iowa may be classified as resident for the beginning of the current semester or quarter or session in which the student is enrolled if the parent or parents have domicile in Iowa. A minor student whose parents are domiciled in Iowa may be classified as resident for other than the beginning of the current semester or quarter or session in which the student is enrolled if the parent or parents have domicile in Iowa.

A minor residing in another state shall not be considered an resident unless the primary purpose of the student's residence in the state is to attend Iowa State University. A minor living with and being supported by a relative in Iowa who is a resident of Iowa, but is not the student's parent or guardian, may be considered resident for a term of three years. The residence of any person other than the minor for at least three years prior to high school graduation.

1.4(4) Students over eighteen years of age and married students under eighteen years of age.

A student eighteen years of age or older and a married student under eighteen years of age shall be classified as a resident if all the student's parents were residents of Iowa at the time the student reached majority of age or was married and the student the student is domiciled is another state, or (b) who after marriage or reaching majority has established a lawful residence in the state of Iowa by residing in the state for at least six months immediately preceding the beginning of the semester, quarter or session. Such resident shall be considered as a resident at Iowa State University, or at the University of Northern Iowa, or both, unless he or she is in the state for purposes other than to attend college, that he or she is in the state for purposes other than to attend college. The dutiful in residence for admission, fee and tuition purposes by the registrar. The registration shall be based upon information furnished by the student and all other relevant information. The registrar is authorized to require such additional written, oral, or oral evidence as he may require to establish the domicile of a student, including proof of registration, adoption, proof of custody or appointment at a postgraduate institution for which he has reason to suspect that the person is not a resident of Iowa.

Any nonresident student who reaches eighteen years of age or is married while under eighteen years of age shall, when a student at any school or college does not violate by virtue of such statements reside in the state at Iowa State University or the State University of Iowa.

1.4(5) General facts.

The student registers for admission, fee and tuition purposes by the registrar. The registration shall be based upon information furnished by the student and all other relevant information. The registrar is authorized to require such additional written, oral, or oral evidence as he may require to establish the domicile of a student, including proof of registration, adoption, proof of custody or appointment at a postgraduate institution for which he has reason to suspect that the person is not a resident of Iowa.

Any nonresident student who reaches eighteen years of age or is married while under eighteen years of age shall, when a student at any school or college does not violate by virtue of such statements reside in the state at Iowa State University or the State University of Iowa.

Any nonresident student who reaches eighteen years of age or is married while under eighteen years of age shall, when a student at any school or college does not violate by virtue of such statements reside in the state at Iowa State University or the State University of Iowa.

All students classified as nonresidents shall be classified nonresidents for admission, fee and tuition purposes.

A student who is a resident of another state and who has been admitted to Iowa State University or the State University of Iowa shall be considered as a resident unless he or she is in the state for purposes other than to attend college or to reside in the state. The student register shall be based upon information furnished by the student and all other relevant information. The registrar is authorized to require such additional written, oral, or oral evidence as he may require to establish the domicile of a student, including proof of registration, adoption, proof of custody or appointment at a postgraduate institution for which he has reason to suspect that the person is not a resident of Iowa.
Admission of undergraduate students by transfer from other colleges.

1.21 Students from accredited colleges and universities.

Applications for admission to the regular fall session for current or prospective students are accepted by the Registrar. Two years of the student's academic record are also required and may be sent to the Registrar. The deadline for submission of applications is the last day of the regular fall session. The Registrar reserves the right to accept or reject any application.

2.21.1 Examinations.

No student subject to the regular rule may request an exception for the following reasons:

a. A student in good standing with a low, legal guardian, parent, or authority, or reasonable, on which the case will be decided by the Board of Regents.

b. Medical necessity is required for the student's health or for the regular fall session.

c. A minor in the student's family.

2.21.2 Parole rule.

A student in good standing and who has a low, legal guardian, parent, or the case will be decided by the Board of Regents.

3.21.1 Examinations.

No student subject to the regular rule may request an exception for the following reasons:

a. A student in good standing with a low, legal guardian, parent, or the case will be decided by the Board of Regents.

b. Medical necessity is required for the student's health or for the regular fall session.

c. A minor in the student's family.

4.21.1 Examinations.

No student subject to the regular rule may request an exception for the following reasons:

a. A student in good standing with a low, legal guardian, parent, or the case will be decided by the Board of Regents.

b. Medical necessity is required for the student's health or for the regular fall session.

c. A minor in the student's family.

5.21.1 Examinations.

No student subject to the regular rule may request an exception for the following reasons:

a. A student in good standing with a low, legal guardian, parent, or the case will be decided by the Board of Regents.

b. Medical necessity is required for the student's health or for the regular fall session.

c. A minor in the student's family.

6.21.1 Examinations.

No student subject to the regular rule may request an exception for the following reasons:

a. A student in good standing with a low, legal guardian, parent, or the case will be decided by the Board of Regents.

b. Medical necessity is required for the student's health or for the regular fall session.

c. A minor in the student's family.

7.21.1 Examinations.

No student subject to the regular rule may request an exception for the following reasons:

a. A student in good standing with a low, legal guardian, parent, or the case will be decided by the Board of Regents.

b. Medical necessity is required for the student's health or for the regular fall session.

c. A minor in the student's family.

8.21.1 Examinations.

No student subject to the regular rule may request an exception for the following reasons:

a. A student in good standing with a low, legal guardian, parent, or the case will be decided by the Board of Regents.

b. Medical necessity is required for the student's health or for the regular fall session.

c. A minor in the student's family.

9.21.1 Examinations.

No student subject to the regular rule may request an exception for the following reasons:

a. A student in good standing with a low, legal guardian, parent, or the case will be decided by the Board of Regents.

b. Medical necessity is required for the student's health or for the regular fall session.

c. A minor in the student's family.

10.21.1 Examinations.

No student subject to the regular rule may request an exception for the following reasons:

a. A student in good standing with a low, legal guardian, parent, or the case will be decided by the Board of Regents.

b. Medical necessity is required for the student's health or for the regular fall session.

c. A minor in the student's family.
Board of Regents

2.23 Review.
A student aggrieved by any adverse decision with respect to the administration of the policy may request an administrative review of the decision by the University. Such request shall be made in writing and shall state, with particularity, the reasons therefore. Pending administrative review, the student’s registration shall not be denied or canceled. After review, the decision of the University is final, subject to the student’s right to review a decision by the Board of Regents in accordance with procedures established by the Board. Unless otherwise noted by the Board, a request must be in compliance with the policy rules as a condition of continued registration at the University pending Board action on the request for review.

2.24 Definitions.
As used herein, the following terms shall mean:

a. “University” means the State University of Iowa or the appropriate university authorities of the University. Other specific university or college units, if any particular entity or function is prescribed herein, is designated.

b. “Physical education” means the conduct of recreation at the University established by the Board.

c. “Student” means any college-wide student registered for any course or more semester hours who has not previously earned twenty-eight or more semester hours of credit toward a baccalaureate degree in the University.

d. “ Registrant” means any undergraduate student registered for any course or more semester hours who has previously earned sixty or more semester hours of credit toward a baccalaureate degree in the University.

For the academic year 1971-72 the rules that apply only to freshmen students and to sophomores transfer students who have not previously completed at least thirty semester hours shall be in residence at the University.

(Filed June 10, 1971; amended June 14, 1972, July 17, 1972)

720—2.2(262) College of Business Administration.

2.31 Application for admission. Applications for admission to the College of Business Administration shall be submitted to the director of admissions.

Applications are required to apply as early as possible, since this will give the admissions committee more time to review each application. Closing dates for receiving applications will be announced in advance of the opening date of any session.

2.32 Requirements for admission.
For admission to the College of Business Administration as an applicant must have:

a. Satisfactory grade point average on all courses undertaken, and on all courses accepted at The University of Iowa, and on all courses undertaken in institutions of higher learning.

b. A minimum grade point average on the University’s required admission examination.

c. Minimum a satisfactory grade point average on all courses undertaken, and on all courses undertaken at The University of Iowa, and on all courses undertaken in institutions of higher learning.

Applications from students who have minor deficiencies in meeting grade-point average specified above will be reviewed by the admissions committee. If the student meet the stated requirements and the admissions committee feel there is the possibility of improvement, the student may be granted probationary admission.

Applications from students who meet the minimum requirements, the admissions committee of which selects the applicants who, in the committee’s opinion, are most meritorious.

(Filed March 23, 1944; amended March 10, 1965)

720—2.2(262) College of Dentistry.

2.41 Application for admission.
Address of inquiries regarding admission to the Director of Admissions, University of Iowa.

Applications are urged to apply as early as possible, since this will give the admissions committee more time to review each application. Closing dates for receiving applications will be announced in advance of the opening date of any session.

Applications for admission to dentistry are encouraged to complete a program leading to a baccalaureate degree before entering dentistry. Applicants must be eligible for a baccalaureate degree upon the completion of the freshman year in dentistry.

Persons under seventeen years of age who have completed the high school course or who have completed the high school requirements for graduation and have been admitted to the College of Dentistry. From the applicants meeting the minimum requirements, the admissions committee will select the applicants who in their judgment appear to be best qualified for the study and practice of dentistry.

Each applicant must submit an application in the office of the Director of admissions of the completed application form and an official transcript from each college attended.

The college work outlined below will satisfy the required academic requirements for admission to the College of Dentistry.

The college curriculum must include at least three academic years of accredited work comprising at least ninety-six semester hours and including specified required science courses as prescribed by the faculty of the college. Students should be chosen so as to give the applicant a well-rounded educational background. In order to meet minimum and preventing requirements the applicant must achieve a cumulative grade-point average of 2.0. From the score of mathematics, in prescribed content in the subject matter taken in the course of study at the University sought is obtained.

(Filed June 10, 1971; amended February 12, 1972, July 17, 1972)

720—2.5(262) College of Engineering.

2.42 Advanced standing. Applications for admission with advanced standing are handled on an individual basis.

(Filed March 10, 1946)

720—2.5(262) College of Engineering.

Address of inquiries regarding admission to the Director of Admissions, University of Iowa, Iowa City, Iowa.

Closing date for reviewing applications will be announced in advance of the opening date of any session.

2.5(1) Admission of freshmen students. The applicant must submit a formal application and must have the secondary school entrance certificate of high school credits, including a complete application of the requested admission requirements as well as letters of recommendation, transcripts, and certificates of high school graduation. The applicant must also submit verbatim transcripts of all college courses taken. Each applicant must have taken satisfactory courses in the University’s required
admissions examinations, maintained a satisfactory cumulative grade-point average, achieved satisfactory rank in graduating class and successfully completed all prereq-
usite 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: letter grade, grade-point average, class rank, and specific prerequisite courses. These specific determinations
will be published in the University catalog.
These applicants who do not meet minimum admission requirements, the Board of Regents may review the applicants’ records.
2.52) 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 progress in mathematics.
b. Maintained satisfactory scores on the University’s aptitude examination.
c. Maintained a satisfactory cumulative grade-point average in all college work undertaken.
When applicants do not meet the above requirements, the Director of Admissions will review individual records and may offer probationary admission.
[Filed March 24, 1964, amended March 30, 1965]

2.70-2.8.2(693) Graduate College. Graduates of any college or university accredited by regional accrediting associa-
tives may, if the student is registered in the Graduate College, be admitted to the Graduate College. The Graduate College is not the successor of the general degree program in the College of Arts and Sciences. A student may be admitted to the College of Arts and Sciences. In addition to the College of Arts and Sciences.
The candidate for admission must be designated under the name of each individual case.
A student who has not been a student before having satisfied all the requirements for the bachelor’s degree at The University of Iowa may be given a tentative
admission to the Graduate College.

2.71) Application for admission. Applicants desiring admission to the College of Medicine, University of Iowa, Iowa City, Iowa, beginning September may enter the College of Law only in the summer session for the full semester. Each student must submit an application for admission by March 1, preceding the fall semester in which the application is to be made.

0.71.1) To be considered for admission, an applicant should have attained a cumulative grade-point average of at least 3.0 in the senior year of high school or the equivalent of 3.0 in the senior year of college.

2.72) Admission with advanced standing. An applicant must take the Law School Admission Test administered
by the Educational Testing Service, Princeton, New Jersey. and have been
registered in the College of Arts and Sciences. In addition, the student must have completed at least one year of college work or at least 24 semester hours. Moreover, he or she must have a grade-point average of at least 2.0 in the senior year of high school or the equivalent of 2.0 in the senior year of college. The law school admission committee may require personal interviews of applicants.

2.82) Admission to advanced standing. If their work in preprofessional training to enter a college of medicine would have merited advanced standing and the student who is admitted to the College of Medicine.


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2.8.2(693) College of Medicine. 2.8.2(1) Application for admission. All applicants are required to submit an application.

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The committee on admission to advanced standing will decide in each case whether examinations in the various subjects will be required.

Applications will be considered only upon receipt of a statement from the dean or registrar of the college from which the applicant comes, showing the actual amount of time the student has spent in the study of pre-pharmacy. The course taken and the grades received, together with a statement of the work presently in progress upon the course in medicine.

No advanced standing will be granted to students from other than approved medical schools. Students may be granted limited credit upon recommendation of the head of the department concerned for work taken in other than medical schools.

2.8.2(1) Unclassified students.

Applicants for admission to the College of Medicine who are not candidates for a degree but who wish to register for special subjects will be admitted to any lecture or laboratory course only upon complying with the regular requirements for admission to each course, or by virtue of the faculty upon recommendation of the president in charge of the course.


720-2.9(282) College of Nursing.

Applications for admission to the College of Nursing should be submitted to the Director of Admissions, University of Iowa, Iowa City, Iowa. Applicants for admission to the undergraduate program in Nursing must present a minimum of thirty semester hours completed in an accredited college. For admission to the College of Nursing an applicant must have:

1. Completed specific coursework as prescribed by the faculty of the college. The Director of Admissions will provide a list of such coursework.
2. Completed the American College Test.
3. Performed satisfactorily on all entrance examinations.

Applications from students who have three deficiencies in meeting grade-point requirements specified above will be reviewed by the admissions committee of the College, not upon favorable recommendation of the committee, each student may be granted conditional or provisional admission.

Fulfillment of the entrance requirements listed above, however, does not assure admission to the College of Nursing. From those applicants who meet the minimum requirements, the admissions committee will select the applicants who, in their judgment, appear to be the best qualified.


720-2.10(282) College of Pharmacy.

2.10(1) General basis for admission.

Fulfillment of the specific requirements for admission does not assure admission to the College of Pharmacy. From the applicants meeting the specific requirements, the admissions committee will select those applicants who, in their judgment, appear to be the best qualified. Applicants for admission to the College should have graduated from an approved high school or have an equivalent amount of training.

2.10(2) College work.

The college work as outlined below will meet the minimum academic requirements for admission to the College of Pharmacy. The minimum shall include thirty-two semester hours of college-level work in English composition and literature, and two semester hours of credit in speech or an eight-hour laboratory course in communication skills.

Chemistry: four semester hours.

College mathematics, eight semester hours.

Physics or zoology, eight semester hours.

Chemistry: four semester hours.

Students from other institutions may substitute a comparable eight-hour-hour course in biology in lieu of zoology.

Military or air science (if available), two to six semester hours.

Students who present more deficiencies in meeting the above requirements may be admitted to the College of Pharmacy upon the recommendation of the Dean of Admissions and the College of Pharmacy.

2.10(3) Scholarship and application deadline.

To be considered for admission to the College of Pharmacy, students must have earned a 3.0 or "B" average at the college of work undertaken. The maximum grade-point average of 3.0 is based on the entire University of Iowa's grading system in which the grade of "A" is equivalent to four points. Applications for admission and the required official transcript should be filed before March 1 for the class to enter Pharmacy in September.

2.10(4) Required tests.

Applicants for admission are required to take the American College Testing Program.

2.10(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 academic average is acceptable, be admitted and granted advanced standing toward the degree of Bachelor of Science in pharmacy.

720-2.11(282) College of Liberal Arts.

Applicants for admission to Liberal Arts must meet the requirements that are common to the state institutions in Iowa as listed in 1.0(240), 1.0(262) and 1.0(302).

720-2.12(282) College of Education.

Students at the University during pre-professional work in education are registered in the College of Liberal Arts or the College of Pharmacy. Requirements for permission to take teacher-training courses are listed in the University Catalog.
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