Catalog of
The University of Iowa

1972-74

The University Catalog is available for examination in all Iowa high schools, offices of the county superintendents of schools, the public libraries and in each of the junior and community colleges in the state. Copies are also available for examination at the major state government offices in Des Moines and in each office on the University campus in Iowa City. Copies may be ordered from the Office of Administration and Registrar at $1.00 per copy. Reprints of the various college and departmental sections of the Catalog are available without charge on request to the Office of Administration and Registrar.

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SUMMER SESSION
Registration, 8 a.m.
Opening of classes, 7 a.m.
University holiday; offices closed
Close of Summer Session classes, 5 p.m.
Opening of Independent Study Unit for law and graduate students
Close of Independent Study Unit

1973
June 4, Monday
June 5, Tuesday
July 4, Wednesday
July 27, Friday
July 30, Monday
August 24, Friday

1973-74
August 27, Monday
August 30, Thursday
September 3, Monday
October 27, Saturday
November 21, Wednesday
November 22-23, Thursday, Friday
November 27, Monday
December 14, Thursday
December 16, Saturday
December 23, Friday
December 25-26, Monday, Tuesday
January 1, Monday

FIRST SEMESTER
Beginning of Registration, 1 p.m.
Opening of classes, 7:30 a.m.
University holiday; offices closed
Homecoming; classes suspended except for classes meeting on Saturdays only
Beginning of Thanksgiving recess, 10 a.m.
University holiday; offices closed
Resume of classes, 7:30 a.m.
Close of First Semester classes, 10 p.m.
Beginning of Examination Week, 7:30 a.m.
Close of Examination Week
University holiday; offices closed
University holiday; offices closed

1972-73
August 28, Monday
August 31, Thursday
September 4, Monday
October 28, Saturday
November 22, Wednesday
November 23-24, Thursday, Friday
November 27, Monday
December 14, Thursday
December 16, Saturday
December 23, Friday
December 25-26, Monday, Tuesday
January 1, Monday

1973-74
August 27, Monday
August 30, Thursday
September 3, Monday
October 27, Saturday
November 21, Wednesday
November 22-23, Thursday, Friday
November 27, Monday
December 13, Thursday
December 15, Saturday
December 21, Friday
December 24-25, Monday, Tuesday
January 1, Tuesday

SECOND SEMESTER
Beginning of Registration, 8 a.m.
Opening of classes, 7:30 a.m.
Foundation Day
Beginning of spring vacation, 10 a.m.
Saturday-only classes meet
Resumption of classes, 7:30 a.m.
Close of Second Semester classes
Beginning of Examination Week, 7:30 a.m.
Close of Examination Week
University Commencement, 9:30 a.m.
University holiday; offices closed

1972-73
January 11, Thursday
January 15, Monday
February 25, Saturday
March 4, Friday
March 10, Saturday
March 18, Monday
May 4, Friday
May 8, Tuesday
May 16, Wednesday
May 25, Friday
May 28, Monday

1973-74
January 10, Thursday
January 14, Monday
February 25, Saturday
March 8, Friday
March 9, Saturday
March 18, Monday
May 3, Friday
May 7, Tuesday
May 15, Wednesday
May 24, Friday
May 27, Monday

SUMMER SESSION
Registration, 8 a.m.
Opening of classes, 7 a.m.
University holiday; offices closed
Close of Summer Session classes, 5 p.m.
Opening of Independent Study Unit for law and graduate students
Close of Independent Study Unit

1974
June 3, Monday
June 4, Tuesday
July 4, Thursday
July 29, Monday
August 23, Friday

1973-74
August 27, Monday
August 30, Thursday
September 3, Monday
October 27, Saturday
November 21, Wednesday
November 22-23, Thursday, Friday
November 27, Monday
December 13, Thursday
December 15, Saturday
December 21, Friday
December 24-25, Monday, Tuesday
January 1, Tuesday
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The First Iowa General Assembly chartered The University of Iowa February 23, 1847, just two months after Iowa's admission to statehood.

The University now comprises 10 colleges, with a total enrollment of approximately 20,500 students. 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.

The University of Iowa was the first state university in the nation to admit women on an equal basis with men. It founded the first law school west of the Mississippi River. It established one of the first university-based medical centers in the Midwest. It was the first state university in the nation to establish an interfaith school of religion. It was an innovator in accepting creative work—fine art, musical compositions, poetry, drama, fiction—for academic credit. It established Iowa City as a national college-prospect testing center. It was a leader in the development of actuarial science as an essential tool of business administration. As a pioneering participant in space exploration, it has become a center for education and research in astrophysical science.

In these and numerous other ways the University has been and continues to be a creative contributor to the advancement of knowledge and the improvement of life, through teaching, research and public service.

More than two-thirds of the University's undergraduate students are enrolled in the College of Liberal Arts. Students planning to pursue degree programs in the colleges of Business Administration, Dentistry, Education, Law, Medicine, Nursing and Pharmacy qualify for admission to those programs by meeting general graduation requirements in the College of Liberal Arts or in equivalent studies at other institutions. Students declaring engineering majors go directly into the College of Engineering.

The College of Liberal Arts includes schools of Art and Art History; Journalism, Letters, Library Science, Music, Religion and Social Work.

Study toward advanced degrees in all fields is administered by Graduate Colleges whose enrollment is approximately one-fourth of the University's total.

Four-tenths 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 1:1. Almost one-half of the University's entering freshmen have B averages or above in high school. Nearly 90 percent ranked in the upper half of their high school classes, 20 percent in the upper tenth.

More than half plan to go on to advanced study, and about one-fourth plan to go on to graduate work. Half of the University's students have part-time jobs. One-fourth have education loans. One of 10 undergraduates and one of four freshmen have scholarships.

The Faculty
The University's 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 meeting 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
- Engineering—Engineering Council for Professional Development
- Law—American Bar Association
- 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
- Teachers Education—Council for Accreditation of Teacher 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  
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 is comprised 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 best served the University's liberal approach to education. Standards for the conduct of student life are set forth in a code carefully written and regularly reviewed by a committee of students and faculty members. This Code of Student Life reflects the principles expressed in the 1967 Joint Statement on Rights and Freedoms of Students, drafted and endorsed by the National Student Association and the American Association of University Professors. Accordingly, the Code relates only to student misconduct which adversely affects some University process or function, or some other distinct 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, 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 shall work cooperatively with the community in furthering this principle. (See "Board of Regents Statements.")

Admission
Correspondence regarding admission to any college of The University of Iowa should be addressed to the Admissions Office, 1 Jessup Hall, The University of Iowa, Iowa City, Iowa 52240. The first letter should request an application for admission, briefly describe the prospective applicant's high school and 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 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
May 22—Summer Session
August 13—First Semester
January 2—Second Semester

College of Business Administration
May 1—Summer Session
June 1—First Semester
November 15—Second Semester

College of Dentistry
February 15—First Semester only

College of Engineering
May 22—Summer Session
August 13—First Semester
January 2—Second Semester

Graduate College
May 1—Summer Session
July 15—First Semester
December 15—Second Semester

College of Law
April 1—Summer Session
May 1—First Semester only
(to admission Second Semester)

College of Medicine
January 1—First Semester only

College of Nursing
February 15—First Semester
November 15—Second Semester (registered nurses only)
November 15—Summer Session (registered nurses and two-year cooperative program students only)
General Information

College of Pharmacy
August 15—First Semester only

Dental Hygiene Program
April 1—First Semester only

Teacher Education Program
May 15—First Semester
December 15—Second Semester

Foreign Students
Self-financed students located overseas:
January 1—Summer Session
March 1—First Semester
August 1—Second 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—First Semester
December 1—Second Semester

American College Tests
The University of Iowa requires all entering freshmen and undergraduate transfer students to complete the American College Test (ACT) and have their test scores reported to the University before they register for classes.

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 preliminary summer session; and for denying admission to applicants who do not meet minimal standards.

Placement—As a basis for course recommendations; for placing others in sections designed to meet individual needs; and for advising students regarding 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 to Iowa complete the American College Test during the fall prior to his or her anticipated registration.

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

Graduate and Professional College Examinations
Prospective Graduate College applicants should take the Graduate Record Examination (GRE) Aptitude Test or, if applying for admission to a department of the College of Business Administration other than economics, the Admission Test for Graduate Study in Business (ATGB). Prospective applicants to the college of Dentistry, Law, or Medicine are required to take admission tests of the respective colleges.

Application Fee
A $10.00 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 interests of providing optimum health care, Student Health Service strongly recommends that following their admission incoming 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.

Registration
All persons who attend University classes are required to register and pay the established tuition and fees. A graduate student may audit courses with the approval of the instructor and the Dean of the Graduate College. Graduate students who audit courses will be assessed fees based on the lowest credits for which the course is available that semester.

Records
All academic records are maintained by the Office of the Registrar and will not be released without written permission of the student. However, at the end of each semester, grade reports are mailed to parents of all unmarried freshmen under the age of 19 without the students’ written permission. Summary reports are routinely prepared and mailed to the principals of all Iowa selected out-of-state high schools, and to the dean of each Iowa two-year college, describing the progress of each student who came directly from those institutions to the University.

Tuition and Fees
The following is the University’s schedule of tuition and fees, per semester, for the 1972-73 academic year:

<table>
<thead>
<tr>
<th>Resident</th>
<th>Full (9 or more sem. hrs.)</th>
<th>Half (5-8 sem. hrs.)</th>
<th>Quarter (1-4 sem. hrs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Administration</td>
<td>$310</td>
<td>$198</td>
<td>$123</td>
</tr>
<tr>
<td>Dentistry</td>
<td>435</td>
<td>273</td>
<td>165</td>
</tr>
<tr>
<td>Education (see “College of Liberal Arts” and “Graduate College”)</td>
<td>310</td>
<td>198</td>
<td>123</td>
</tr>
<tr>
<td>Engineering</td>
<td>355</td>
<td>225</td>
<td>138</td>
</tr>
<tr>
<td>Graduate</td>
<td>355</td>
<td>225</td>
<td>138</td>
</tr>
<tr>
<td>Law</td>
<td>355</td>
<td>225</td>
<td>138</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>310</td>
<td>198</td>
<td>123</td>
</tr>
</tbody>
</table>
General Information

<table>
<thead>
<tr>
<th>Medicine</th>
<th>435</th>
<th>273</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing</td>
<td>310</td>
<td>198</td>
<td>123</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>310</td>
<td>198</td>
<td>123</td>
</tr>
</tbody>
</table>

Nonresident

<table>
<thead>
<tr>
<th>Full (9 or more sem. hrs.)</th>
<th>Half (6-8 sem. hrs.)</th>
<th>Quarter (1-4 sem. hrs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Administration</td>
<td>625</td>
<td>387</td>
</tr>
<tr>
<td>Dentistry</td>
<td>800</td>
<td>492</td>
</tr>
<tr>
<td>Education (see &quot;College of Liberal Arts&quot; and &quot;Graduate College&quot;)</td>
<td>625</td>
<td>387</td>
</tr>
<tr>
<td>Engineering</td>
<td>600</td>
<td>372</td>
</tr>
<tr>
<td>Law</td>
<td>635</td>
<td>393</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>625</td>
<td>387</td>
</tr>
<tr>
<td>Medicine</td>
<td>800</td>
<td>492</td>
</tr>
<tr>
<td>Nursing</td>
<td>625</td>
<td>387</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>625</td>
<td>387</td>
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</table>

(Criteria used by the University to classify students as residents or nonresidents for admission and fee purposes are fully stated in "Board of Regents Statements.") The University reserves the right to change tuition and fees, with the approval of the Iowa Board of Regents.

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

Procedure for Payment of Student Accounts

Tuition and fees, board, room and other University residence hall or fraternity/sorority housing expenses, and such incidental University expenses as library and parking fees, are payable on an installment basis, with billing the first of October, November and December for the fall semester, and the first of February, March and April for the spring semester. A $5.00 penalty is assessed student accounts not paid by the 12th of the month they are due. Students with accounts overdue on the 20th of the month are reported to the Registrar for cancellation of registration. There is a $10.00 fee for reinstatement.

Foreign Students

With a population in excess of 20,000 students, the University enrolls approximately 400 foreign students from 72 foreign countries. Most of the foreign students at Iowa are studying for professional and graduate degrees. (A foreign student is defined as a student from another country who does not have an immigrant visa or is not in the process of obtaining permanent resident status, and who will register in the University on a non-immigrant visa.)

Admission Standards

In University colleges, schools and departments which do not have sufficient facilities to accept all qualified applicants, admission is competitive and priority is given to the best-qualified applicants. Foreign students must present superior academic and personal qualifications; evidence of the ability to understand and to be understood in English, both oral and written; and proof that they will have sufficient funds available to them for their first year of study.

Test of English as a Foreign Language (TOEFL)

All applicants who are not citizens of the United States are required to submit acceptable scores on the Test of English as a Foreign Language (TOEFL). This regulation is waived if the person holds a diploma or degree from a recognized secondary school or university in the United States, the United Kingdom, Canada (excluding Quebec), Australia or New Zealand. The examination is given at various times of the year and in many centers throughout the world. Information on how and where to take the TOEFL examination may be secured by writing to TOEFL Educational Testing Service, Princeton, New Jersey 08540.

Admission Information

Prospective foreign students are advised to write to the University one year in advance of proposed enrollment. The first letter should include date of birth, educational background including dates and names of degrees earned, schools attended, examinations taken and their results, the semester of proposed enrollment, the desired field of study and the degree objective.

When appropriate, an application for admission will be forwarded by the Office of Admissions and Registrar. Materials are normally sent by surface mail, unless the applicant includes International Postal Reply coupons which allow the University to return the application by air mail.

An admitted foreign student is sent by air mail an admission letter, arrival information and the Certificate of Eligibility (Immigration Form I-20 or DS-560). They are forms required by U.S. Consulates to grant visas to enter the U.S.

Each fall and spring semester foreign student must carry a minimum of 12 semester hours. A graduate foreign student must take a minimum of nine semester hours each course. A degree is awarded in the value of semester hours, but the average is usually three semester hours per course.

Costs

Student living costs are difficult to estimate, because prices change and individual requirements differ. An overall figure for tuition, room and board, books, clothing, laundry, recreation and other expenses is estimated at $3,400 (U.S.) for 12 months for a single student.

Scholarships, Fellowships and Loans

Few scholarships and fellowships are available to foreign students at the University of Iowa. Those that exist are awarded by the student's department and usually require the student to do some teaching or research work. The admission application allows the foreign student to indicate a desire to compete for such scholarships or fellowships.

Loan funds for emergencies may be available only if there is evidence of repayment possibility. Additional information about financial aid is available from the U.S. embassies, consulates or U.S. Information Service libraries.
### General Information

#### Employment
No student should count on earning a major part of his or her expenses while enrolled at the University. First, according to U.S. immigration law, a foreign student is not permitted to work during his or her first academic year, and thereafter the student cannot work more than 20 hours per week. Second, it is especially difficult in Iowa City for any student, native or foreign, to obtain part-time work of a professional nature.

#### Financial Documentation
In order to avoid unnecessary hardship and to comply with U.S. immigration regulations, the University requires that all foreign students provide evidence of ability to meet the educational and living expenses as specified above. An affidavit of support is required of all students, stating the sources of support for their first year of study. If these sources are well-known agencies or organizations, a letter or certified copy of a letter describing the award on their official stationery is required. If these sources are individuals, including the student, this affidavit must be accompanied by a confidential bank statement on the bank's official stationery. Both of these documents should be notarized. These documents should be forwarded to the Foreign Student Advisor, The University of Iowa, Jessup Hall, Iowa City, Iowa 52242.

#### Foreign Student Services
The University's Office of International Education and Services helps foreign students with immigration, personal and academic questions. For a full description of its activities, see "General Services."

#### Numbering of Courses
Each course in the regular University curriculum has an identifying number, preceded by the number of the college, department or program in which the course is administered. For example, "601" is the code for the course numbered 11 in the Department of Chemistry, entitled "Elementary Quantum Analysis." Usually, course numbers below 100 designate "Primarily for Undergraduates"; numbers 100 to 199 designate courses "For Undergraduate and Graduates"; and numbers 200 and above designate course "Primarily for Graduates." The University reserves the right to alter its course offerings without further notice.

#### College of Business Administration
- 6A Accounting
- 6B Business Administration
- 6E Economics
- 6S Office Management

#### College of Dentistry
- 81 Fixed Prosthodontics
- 82 Operative Dentistry and Endodontics
- 83 Dental Technology
- 84 Removable Prosthodontics
- 85 Oral Pathology
- 86 Oral Diagnosis
- 87 Oral Surgery

#### College of Education
- 7A Adult Education
- 7C Counseling and Guidance
- 7D Educational Administration
- 7E Elementary Education
- 7F Social Foundations and Comparative Education
- 7H Higher Education
- 7P Educational Psychology, Measurement and Statistics
- 7S Secondary Education
- 7U Special Education
- 7V Educational Media
- 7X Education Interdivisional

#### College of Engineering
- 51 Engineering
- 52 Chemical Engineering
- 53 Civil Engineering
- 55 Electrical Engineering
- 56 Industrial and Management Engineering
- 58 Mechanical Engineering
- 59 Mechanics and Hydraulics

#### College of Law

#### College of Liberal Arts
- 0 Nondepartmental Courses
- 1E Art Education
- 1M Art History
- 1S Art Studio
- 2 Botany
- 3 Speech Pathology and Audiology
- 4 Chemistry
- 5 Child Behavior and Development
- 8 English
- 9 French
- 10 Basic Skills Courses
- 11 Core Courses
- 12 Geology
- 13 German
- 14 Greek
- 16 History
- 17 Home Economics
- 18 Italian
- 19 Journalism
- 20 Latin
- 21 Library Science
- 22C Computer Science
- 23D Mathematics
- 22S Statistics
University of Iowa freshmen and sophomore students under 21 and unmarried are required to live in University residence halls. Exemptions may be requested for such reasons as: living at home, medical necessity, mandatory religious obligations, bona fide employment, fraternity or sorority membership, residence in University of Iowa Residence Halls for four semesters or status as a veteran of the U.S. armed forces.

Exemption forms should be obtained from the University Housing Office and completed and returned to that office immediately. They must be received at least 30 days before the beginning of the semester or session for which the exemption is requested. Detailed information regarding specific exemptions is available from the University Housing Office.

Accommodations for juniors, seniors, and graduate students are available in University residence halls, as well as in private-operated off-campus units.

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

"It is and shall be the firm policy of the University that householders shall rent to all students on the basis of their individual merits as persons, without calculation or discrimination on the basis of race, creed, color or national origin." Iowa City has a fair-housing ordinance providing for equality of opportunity to secure housing without discrimination due to race, religion or ancestry, except in certain instances involving owner-occupied dwelling units. A Human Relations Commission is responsible for the observance of this ordinance and for the initiation of refusal 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 and triple rooms with full or partial board are available in the Grand Avenue Residence Halls (west campus), which include Hillcrest, Quadrangle, South Quadrangle and Roway Hall 1 and 2; and in the Clinton Street Residence Halls (east campus), which include Burge Hall, Currier Hall, Daum House and Stanley Hall. A room-only option is available in the South Quadrangle residence hall. Students not living in residence halls may contract for full or partial board.

There are lounges, study rooms, borrowing libraries and recreation rooms in or available to each residence hall; the University Library maintains reserve book stations in the residence halls. Each residence hall is equipped with small living units. Each hall has a full-time hall resident, and there is a student resident advisor in each living unit. Each unit has its own student governing body and is represented in the government of its residence hall.

Student-initiated residence hall programs and activities provide a wide range of opportunity to pursue social, cultural, recreational and athletic interests.

Graduate Students
Graduate students and students over 21 requesting residence hall accommodations are assigned to areas reserved for them in designated residence halls.

Applications and Assignment
Prospective students receive University residence hall application forms with their admission application forms. A prospective student who wants residence hall housing should read the contract carefully, supply all information requested and return the completed contract to the Office of Admissions with the completed admission application. Applications for residence hall housing are not considered until the application has been accepted by the University.

Students are encouraged to choose their own roommates. Prospective roommates must request assignment together when they apply. The assignment of roommates will not be made until all of the prospective roommates' application materials have been received. Roommate assignment is made without regard to race, color, nationality or religion.

Students already living in University residence halls are given preference in the assignment of accommodations for the following year.

A University residence hall contract is binding for the academic year, unless the student cancels his or her registration or submits a written notice of cancellation of the residence hall contract to the University Housing Office by June 1 for the academic year, January 1 for the spring semester or May 15 for the summer session.

Room Rates—The basic rate for University residence hall housing for the 1971-72 academic year was $1.14 for a double or $1.27 for a single room, with full board. Rates for the several available arrangements and tenure options vary according to the accommodations, and all rates are subject to change annually.

Married Student Housing
There are 749 University-operated apartments available to married students.

Hawkeye Drive Apartments

192 two-bedroom units, unfurnished, except for electric range and refrigerator. Units rented for $105 per month for the 1971-72 academic year. Rent does not include electricity and telephone.
Housing

Hewieye Court Apartments
216 one-bedroom units, 288 two-bedroom units, unfurnished, except for electric range and refrigerator. Each unit has its own gas furnace and electric water heater. Rates for 1972–73 are $92.00 for one bedroom, $112 for two bedrooms, unfurnished. Rent does not include gas, electricity or telephone.

Parklane Apartments
Forty one-bedroom and 1 ½ efficiency units, all unfurnished, except for electric range and refrigerator. Each unit has its own gas heater. Rates for 1972–73 are $87.00 for one-bedroom units, $70.00 for efficiency units. Rent does not include gas, electricity or telephone.

Prospective students are invited to apply for married-student housing before they complete admission, but will not be assigned housing until they have been admitted to the University.

An advance payment of $25.00 is required for all apartments. Any of the above rates are subject to change annually.

Graduate teaching assistants, who have half-time appointment and enrollment for at least five semester hours of coursework each semester, are eligible for teaching assistant priorities at student rates in apartments.

Married-student apartments are assigned in the order applications are received. Assignments are contingent on the applicants meeting all University admission requirements.

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 problem and provides a tenants’ handbook to help inform individuals of the law and of the rights of tenants.

Fraternities
Twenty undergraduate and seven professional fraternities operate chapter houses at Iowa. House accommodations 35 to 45 men. Undergraduate fraternities are Alpha Kappa, Alpha Episcopius Phi, Alpha Tau Omega, 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 Episcopius, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Sigma Pi and Tau Kappa Epsilon. One additional fraternity is currently being organized, Theta Xi Colony.

Professional fraternities operating chapter houses include Alpha Chi Sigma (chemistry), Alpha Kappa Kappa (medic anxious), Delta Sigma Delta (dentistry), Nu Sigma Nu (medicine), Phi Beta Pi (medicine), Phi Kappa Tau (dentistry) and Phi Kappa Gamma (dentistry).

Sororities
The 15 national sororities active at Iowa are Alpha Chi Omega, Alpha Delta Pi, Alpha Episcopius Phi, 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.
Services for Students

Admissions, Records and Convocations
The Dean of Admissions and Records is responsible for coordinating the services of the Office of Admissions and the Registrar’s Office, maintaining enrollment profiles and developing enrollment projections, conducting commencements and convocation ceremonies, and publishing the University Catalog.

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. Other responsibilities of this office include the orientation of new students and foreign student admission counseling.

Registrar
The Office of the Registrar determines the residence status of each student, assesses fees, issues University identification cards, supervises registration procedures, 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, helps students veterans with University application and enrollment procedures, and provides administrative supervision of students under vocational rehabilitation.

High School-College Relations
Administered as 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.

Educational Opportunities Program
Also administered as a part of the Office of Admissions, this office identifies students from educationally and economically disadvantaged backgrounds, and arranges financial and academic assistance on the basis of individual need for admitted students. The program originated as the Martin Luther King Scholarship Program.

Special Support Services
Established especially for veterans, members of minority groups, low-income students and special-admission students, this office provides assistance with special needs including requests for tutors, lecture notes, study sessions, financial aid and vocational counseling.

Student Financial Aids
The Office of Student Financial Aids administers the University’s extensive general program of scholarships, grants, loans and part-time job placement.

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 area of their choice. Students in the professional colleges are advised by the college dean or their designated representatives. Graduate students are advised by their department heads and the Graduate College Dean. In addition to academic advising, advisers also serve as general consultants to students, and refer those with special problems to the appropriate areas.

Evaluation and Examination Service
Evaluation and Examination Service administers many of the University’s required and optional tests for entering students. It is also a center for many national testing programs, including the American College Tests, Medical College Admission Test, Graduate Record Examination, Admission Test for Graduate Study in Business, Graduate School Foreign Language Test, Law School Admission Test, Test of English as a Foreign Language and National Teacher Examination.

Evaluation and Examination Service duplicates, scores and analyzes many course examinations. It helps faculty members develop and improve their classroom tests by evaluating the results of examinations. It also helps faculty or student groups which have particular project requests, such as teacher or course evaluation. Additionally, Evaluation and Examination Service conducts some institutional research projects.

Student Health Services
All students currently registered at the University are eligible for Student Health Services. There is no charge for consultations during regular office hours; calls after office hours are subject to nominal fees. Student Injuries is provided without charge to students requiring medical supervision and nursing care. If the student needs hospitalization, such service is available on a clinical-pay basis.

Supplemental student insurance is available on a year-to-year basis at a minimal group-plan cost. A special policy is available for coverage of emergency and/or hospital stays for students’ dependents, at the hospital and by physicians of their choice. These policies are offered at the beginning of the academic year.

Dental Service
The University of Iowa College of Dentistry is primarily a teach-
ig clinic, the purpose of which is to educate and train future dentists. Students are accorded the same opportunity for treatment as all other patients.

It should be emphasized that the College of Dentistry is not a part of the University Student Health Service and does not render service under the student health hospitalization fund. Fees are established for all services rendered and may be paid by either cash or Master Charge.

Speech and Hearing Clinic
Speech and hearing tests are given to all incoming undergraduate students. Any University student with speech or hearing problems may receive needed clinical services from the Speech and Hearing Clinic without charge. Services include diagnostic examinations, consultations, individual conferences, individual therapy sessions, group instruction in small workshop groups and referral to other clinics as needed.

Iowa Memorial Union
The Iowa Memorial Union is the center of the University's co-curricular activities. It houses the Student Development Center, Student Activities Center, University Counseling Service, Career Counseling and Placement Office, U of I Foundation and Alumni Association offices. Its facilities include a variety of food services, a bowling and billiards area, a barber shop and beauty salon, a creative crafts center, a book store, a sundries store, a television room, lounges, meeting rooms,auditoriums for lectures and concerts, art and sculpture display areas, and, in the adjoining Iowa House, 112 guest rooms for parents, alumni, conference and workshop participants and other visitors to the campus.

Student Development Center
The Student Development Center is a general counseling agency and clearinghouse of information for students. Students wanting any kind of information on having problems of a social or extracurricular nature can get help from this office, either directly or by referral.

Staff members work with individuals and with student groups and organizations, including fraternities, sororities and residence hall governing bodies.

University 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.

Placement Services
The University's Career Counseling and Placement Office, Educational Placement Office and College of Engineering Placement Bureau cooperate with the colleges and departments in counseling students about employment, helping them locate positions and arranging interviews. A small fee is charged for preparation of the student's credentials.

Student 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.

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. Operating policies are determined by the Board of Control of Athletics, which is composed of 13 members from the University's teaching and administrative staff, two University alumni and one representative of the University Staff Council.

Division of Recreational Services
Every interested student, male and female, has the opportunity to compete in more than 20 different intramural sports and recreational activities. The Division of Recreational Services also offers a wide range of recreational lesson programs in such activities as karate, tennis, golf, scuba diving and gymnastics. Informal activities are provided for students, faculty, staff members and their spouses and families. Activities include basketball, badminton, volleyball, table tennis, swimming, handball, paddleball, squash, canoeing, ice skating, golf, archery, weight training, billiards, squash, tennis, fencing and judo.

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 not currently or too experimental for initiation as part of the regular University curriculum. Students may coordinate as well as participate in most ASF courses. Courses taken for no credit are free. Regular tuition is charged for credit courses.
Administrative Staff
Dean Leah W. Dungan
University Librarian: Dula M. Beres
Assistant University Librarian: Richard M. Kubit
Assistant University Librarian: Wayne Rustay
Administrative Assistant: Lowell D. Dahlberg
Bibliographer: Frank R. Harms
Assistant Director: Eernestine Grace Van Worrall

General Facilities
The University's Main Library and its 14 departmental libraries house a total of more than 1.5 million volumes.
About half of the collection is in the Main Library whose capacity has been doubled by an addition occupied in 1972. This additional space includes new facilities for the School of Library Science, a new undergraduate library on the second floor containing reader desks and a separate collection of some 30,000 books selected for use by undergraduate students, and a new and enlarged study area for graduate students on the fourth and fifth floors.
The Law Library, containing approximately 144,000 volumes, is one of the strongest university law libraries in the Midwest.
The Art Library contains approximately 26,000 volumes; Botany-Chemistry, 47,000; Biology, 11,000; Dentistry, 10,600; Education-Psychology, 9,500; Engineering, 36,500; Geology, 20,400; Library Science, 6,000; Mathematics, 24,300; Medical, 92,600; Music, 41,800; Pharmacy, 10,500; Physics, 22,500; Speech Pathology, 4,250; and Zoology, 20,750.
In addition, the collections of the State Historical Society and the Public Library in Iowa City are available to students and staff members of the University.

Special Resources
Main Library facilities include microform reading rooms; listening rooms for collections of recorded drama, poetry and speech; seminar and conference rooms; a map center; carrels for graduate students; and individual study rooms for faculty members engaged in research. Other services include the reserved book stations for undergraduate students in the Burge and Quadrangle dormitories.
The Human Relations Area Files consist of full data on a sample of societies throughout the world, are designed to facilitate comparative studies of social and cultural behavior.
The University's Lee Hunt Library, brought together by Luther A. Brewer of Cedar Rapids, Iowa, is considered one of the most complete in existence. It contains 2,385 separate volumes, 1,924 manuscripts and manuscript letters written by Hunt or to him by his many famous literary friends; almost 100 association volumes; and nearly 600 editions of Hunt's writings.
The Mark Twain Memorial Library contains approximately 3,700 volumes, of which 3,000 were bequeathed to the University by Mrs. Harry Leaveson in memory of her husband, formerly a lecturer in the College of Medicine. The collection is particularly rich in first editions, including many superb bindings made especially for Mrs. Leaveson.
The John Springer Collection of books on typography was given to the University by John Springer, a long-time Iowa City printer. The collection includes 1,800 volumes containing 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 cartoons in 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 twentieth century. A subject index to this collection enhances its usefulness for reference and research.
The Butler-Lincoln Collection, gathered by Judge James W. Bolinger of Davenport, Iowa, consists of about 4,220 books and pamphlets devoted to Abraham Lincoln. The collection is one of the best libraries of Lincoln in the United States. A number of items are in it concerning John Wilkes Booth and the trial of his fellow conspirators, while another large group of books contains reminiscences of people who knew Lincoln. Lastly, a number of broadsides relating to Iowa and the Civil War period have been added to the collection, developing yet another phase of Lincoln's period in American history.
The Borden Collection comprises approximately 290 volumes of poetry, biography and criticism, and 600 manuscripts or letters relating to the contemporary English poet Edmund Blunden.
The French Revolution 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 Iowa Authors Collection includes approximately 5,070 books written by Iowans and more than 440 manuscripts.
The "A" Collection is a gathering of 13,170 easily, rare or special works on diverse subjects, including books of the fifteenth and sixteenth centuries, early Americans, Roxburgh Club Publications, rare and unique bookplates.
The Manuscripts Collection includes more than 5,500 individually cataloged letters or manuscript items of English and American authors or historical figures, especially of the nineteenth and twentieth centuries, in addition to 215 inventoried collections of personal papers and correspondence files relating to midwestern economic, political and agricultural history.
The Map Collection contains 56,800 maps, 57,932 indexed aerial photographs, and 1,832 atlases, gazetteers and related reference items.
The University Archives preserve materials relating to the history of the University. The collection of University publications from 1825 to 1980, originally assembled by Dean Amos N. Currier, is today supplemented by 450 file drawers of correspondence and records; approximately 1,750 shelf-feet of records, papers and publications; and an extensive collection of photographs dating back to 1911.

Other special collections include the Harvey Ingham Collection of books dealing with the American Indian; the Levi G. Leonard Collection of manuscripts and documents dealing with railroading in the Midwest, particularly the Union Pacific; the History of Hydraulics Collection; the Edwin Ford Piper Collection of ballots and Folk songs; and the Chautauqua Collection donated by Harry P. Hartman, manager of the Redpath Bureau. The Chautauqua Collection contains several thousand letters and documents descriptive of the Chautauqua movement.

Staff
Acquisitions: Barbara K. Onderek, Head; E. Ann Ford; Kath- leen B. Wachol. Cataloging: David A. Aamoth; Ruth E. Christ; Mary G. Clark; Kathy Ann Edwards; Karen A. Fischer; Judith K. Gracey; Vivian E. Hickman; Karl K. Kahler; Tatjana Lorkovic; George P. Mulally; Mary E. Noe; Rosemary E. Ross; An- nettie M. Park; Emeritus; Yong Khyi Nyi Mei; Emeritus. Circulation: David D. Hudson, Head; Linda M. Sardarov. Browning Room Librarians: Lillian M. Sega, Reserved Books Librarian: Chris Hinson, Head Emeritus. Government Publications: Carolyn W. Kohler, Head; Mary Lee Biser; William H. Hunkins; Mary R. McIlroy. Reference: Julia Stilling, Head; Frank C. Allen; Rebecca L. Johnson; Dorothy M. Kentel; Linda A. Martinez; Keith A. Ragett; Jean S. Schaal; Ada M. Stoflet. Sociology: Helen S. Clark, Head; Jim E. Cole; Mary E. Horton; Evelyn S. Murphy; Anne D. Roberts; Charline E. Soile. Special Collections: Francis J. Parka, Head; Richard S. Green; Robert A. McCown; Karl M. Rogers; Irene Steidl, Emeritus.

Departmental Libraries: Art, Harlan L. Stiford; Botany, Chemistry, Pauline L. Muus; Business Administration, Peter J. Hartford; Dental, Margaret R. Janzen; Education-Psychology, Anne G. Evans, Sharon B. Morin, Jane M. Phillips; Geology, Vera J. Baconn; Library Science, Karen S. Hildebrand; Mathematics, Marjorie G. Wilhite; Medical, Robert V. Cryer, Edwin A. Holton, Julie Van Berg; Music, Rita B. Benzon, Elizabeth L. McWilliams, Pharmacy, Sandra Ballrauch; Physics and Zoology, Jack B. Dickey; Speech Pathology, Carol Vogt.
The primary function of the College of Liberal Arts is to provide a liberal education—to encourage the student in the fullest possible development of his or her intellectual abilities, his or her capacities as a person and as a member of society. While the long-range goal is that of producing an intellectually, spiritually, physically, emotionally and aesthetically well-rounded individual, the College seeks to accomplish this primarily by emphasis on intellectual achievement. Through its curriculum and related activities, the College assists the student in the continued development of fundamental intellectual skills, particularly in writing, reading, speaking and quantitative thinking. It guides the student toward a mastery of reading ideas, significant facts and methods of work in such fields as the sciences, social sciences, language and literature, fine arts, history, and philosophy. It aids the student in the development of a resourceful and independent mind, the ability to use as well as to accumulate knowledge. Finally, it attempts to provide the student with experiences which will be conducive to the development of strength of character and a sense of personal responsibility.

The College of Liberal Arts offers programs leading to the degrees Bachelor of Arts (B.A.), Bachelor of Science (B.S.), Bachelor of Music (B.M.), Bachelor of Fine Arts (B.F.A.) and Bachelor of General Studies (B.G.S.).

The College awards bachelor's degrees in these areas:

- American Civilization
- Anthropology
- Art and Art History
- Astronomy
- Biochemistry
- Botany
- Chemistry
- Child Behavior and Development
- Chinese Language and Civilization
- Classics
- Dental Hygiene
- Economics*
- Elementary Education*
- English
- European Literature and Thought
- French
- General Science*
- General Studies*
- Geography
- Geology
- German
- Greek
- History
- Home Economics
- Italian*
- Japanese Language and Civilization
- Journalism
- Latin
- Linguistics
- Letters
- Mathematical Sciences
- Medical Technology*
- Microbiology
- Music
- Philosophy
- Physical Education for Men
- Physical Education for Women
- Physics
- Political Science
- Portuguese
- Psychology
- Recreation Leadership
- Religion
- Russian
- Social Studies
- Social Work
- Sociology
- Spanish
- Speech and Dramatic Art
- Speech Pathology and Audiology
- Special Education
- Zoology

The Graduate College awards advanced degrees in all of the above areas, except those marked with asterisks, and in these other College of Liberal Arts areas:

- Chemical Physics
- Comparative Literature
- Computer Science
- Cultural Anthropology and Linguistics
- Hospital and Health Administration
- Law Enforcement and Correction
- Library Science
- Museum Training
- Nuclear Science
- Science Education
- Speech Pathology and Audiology
- Statistics
- Urban and Regional Planning
The College of Liberal Arts

Schools and Divisions

There are seven schools and two divisions within the College of Liberal Arts.

The Division of Fine Arts includes the School of Art and Art History, School of Music and Department of Speech and Dramatic Art.

The Division of Mathematical Sciences comprises the departments of Computer Science, Mathematics and Statistics, the latter including the program in actuarial science. The departments share a common undergraduate program affording a variety of course selections which lead to and may include advanced work in one or more areas of specialization.

The School of Journalism offers courses leading to the Bachelor of Arts, Master of Arts and Doctor of Philosophy degrees. The Certificate of Journalism is awarded to qualified undergraduates.

The School of Letters is a federation of the departments of East Asian Languages and Literatures, Classics, English, French, Italian, German, Russian, Spanish, Portuguese, Linguistics, and Speech and Dramatic Art and the programs in American Civilization, Comparative Literature, Modern Letters, International Writing, Translation and Writers Workshop. The Windhover Press is also part of the School. The School strengthens the degree programs in its component academic units through cooperative planning and joint appointments, makes it possible for a student to pursue a program in two or more language areas, and serves the University as a whole through interdepartmental course offerings in literature for nonmajors by sponsoring lectures and conferences on literary topics and by bringing distinguished scholars and writers to the campus for conferences with students and faculty members.

The School of Library Science provides a basic course of study leading to the Master of Arts in Library Science degree. It also offers a certificate program for school librarians.

The School of Religion offers undergraduate and advanced degrees and programs and provides elective courses for nonmajors. The board in control of the School is composed of members of the University’s teaching and administrative staffs and of representatives of the religious communities of Iowa.

The School of Social Work offers programs leading to the Bachelor of Science and Master of Social Work degrees.

Advanced Placement

Under the Advanced Placement Program of the College Entrance Examination Board, high school seniors may take comprehensive advanced examinations in a number of subjects. The College of Liberal Arts grants college credit and, where appropriate, advanced placement of students who pass these examinations. For information, write to the College Entrance Examination Board, 475 Riverside Drive, New York City 10027.

The Advanced Standing Program 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 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, he or she advanced Standing English teacher should send a statement to the Director of Admissions that the student has satisfactorily completed such preparation. For information about the Advanced Standing Program in English, write to the Rhetoric Program Coordinator, The University of Iowa.

Credit by Examination

A student may earn up to 32 semester hours of credit, or exemption without credit, in the general education program of the College, or in certain introductory departmental courses, through tests offered in the College-Level Examination Program of the College Entrance Examination Board. Information about the tests and permission to take them may be obtained from the Liberal Arts Advisory Office.

Pass-Fail Courses

The College permits enrollment in any course on a pass-fail basis, provided the course is outside the student’s major field and the student’s advisor and the course instructor approve. Not more than two pass-fail courses may be elected in a semester, and not more than 32 semester hours of work on a pass-fail basis will be accepted toward graduation. Pass credits are not figured into the student’s grade-point average.

Second Grade Only Option

If a student registers during his or her next term in residence (or the next term in which the course is offered) for a course completed in the immediately preceding term, only the grade and credit of the second registration will be counted in the grade-point average.

The Honors Program

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 enhance their studies in Honors seminars, independent research and other special activities, and to earn the baccalaureate degree "with Honors." Entering freshmen whose records indicate they would benefit from the Honors Program are invited to participate. However, the Program is open to all interested and qualified students.

The Preprofessional Program

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 College of Medicine or Dentistry, or the medical technology, physical therapy or dental hygiene programs, for which a bachelor’s degree is the 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.

The Liberal Arts Advisory Office

The College of Liberal Arts Advisory Office assigns faculty ad-
visits to students enrolled in the College. These advisers help students with registration and in the progressive development of their educational programs. A student planning to enter a preprofessional program is assigned a special adviser in that area. Academic advisers also serve as general consultants to students and refer those with special problems to appropriate areas. The Advisory Office staff is available for conferences with students who have questions or problems on academic matters.

The Liberal Arts Advisory Office also administers the Credit by Examination program and takes care of other academic affairs of the College.

Admission Requirements

A student seeking admission to the College of Liberal Arts must meet the requirements set forth in this section and, in addition, must meet any special requirements for the curriculum of his or her choice.

Entering Freshmen

An applicant seeking admission as an entering freshman must have the high school from which he or she graduated provide a certificate of high school credits, including a complete statement of high school record, class rank, 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 not in the upper one-half of his or her graduating class may be required to take special examinations, and, after a review of his or her qualifications, may be admitted unconditionally, admitted on probation, required to enroll for a trial period during a preceding summer session or denied admission.

A graduate of an accredited high school in another state must meet at least the same standards as a graduate of an Iowa high school. The options for admissions by probation or trial enrollment may not be open to these students.

A graduate of a nonapproved high school must submit all data requested above, and must take examinations which demonstrate his or her general competence to do college work.

An applicant who is not a high school graduate must submit all data requested above, take examinations to demonstrate general competence to do college work and provide evidence of specific competence for admission to a given curriculum.

Undergraduate Students Transferring from Other Colleges

Students from Accredited Colleges and Universities

Transcripts of records are given full value if they come from colleges or universities accredited by the North Central Association of Colleges and Secondary Schools or similar regional associations. The recommended standards contained in the current issue of the Report of Credit 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 may require to support his or her application for admission.

A transfer applicant is expected to have maintained a C average (2.0 in a 4-point system) for all college work attempted and must not be under suspension from the last college attended. Transfer applicants who are not residents of Iowa are expected to have maintained a 2.25 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.

In general, transfer applicants under academic suspension 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 last date of attendance. When eligible for consideration the applicant will be considered on 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.

A graduate of an accredited junior college who holds an A.A. degree shall have met all of the core and basic skills requirements of the College of Liberal Arts except the language requirement.

A maximum of 62 semester hours (or the equivalent) will be accepted by transfer credit for the first two years of enrollment in a junior college.

Students from Nonaccredited Colleges

The College may refuse to recognize credit from a nonaccredited college or may admit the applicant on a provisional basis and provide a system for the validation of some or all of the credit. The validation period shall not be less than one semester and shall generally be for 15 semester hours. The College will specify to the student the terms of the validation process at the time of provisional admission. Each student from a nonaccredited college is considered on his or her merits, and admission or rejection is at the discretion of the admissions officer.

Students who transfer from junior colleges must earn a minimum of 62 semester hours in the College of Liberal Arts to qualify for a degree, regardless of the number of transfer credits they have earned. A maximum of 30 semester hours earned through correspon-
Academic Standards

Marking System

The University of Iowa uses the following marking system:

<table>
<thead>
<tr>
<th>Mark</th>
<th>Definition</th>
<th>Grade Points for Each Semester Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Superior</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>Above Average</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>Average</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>Below Average-Passing</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>Failing</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>0</td>
</tr>
<tr>
<td>W</td>
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<td>0</td>
</tr>
<tr>
<td>P</td>
<td>Passing</td>
<td>0</td>
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<tr>
<td>O</td>
<td>No Report</td>
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</tbody>
</table>

The cumulative grade-point average is computed by multiplying the hours of credit in each course by the appropriate grade-point totaling the grade-points earned to date and dividing the sum by the number of hours undertaken, excluding courses in which the student received W or F. An Incomplete must be completed during the next session of the student’s registration, in order not to revert to a grade of F. A zero must be replaced by a grade during the next semester’s work, in order for it not to revert to a grade of F.

Classification of Students

Freshman—Less than 28 semester hours
Sophomore—28 to 55 semester hours
Junior—36 to 89 semester hours
Senior—90 or more semester hours

Scholarship Requirements

Generally, to qualify for graduation, a student must have at least a C (2.0) average in all college work attempted, in all work at The University of Iowa and in all work attempted in his or her major field at Iowa and elsewhere.

Minimum semester and cumulative grade-point requirements for good standing in the College of Liberal Arts are 1.5 for freshmen, 1.6 for sophomores, 1.75 for juniors, 1.9 for seniors.

Entering freshmen admitted on probation must attain good standing during the first semester. Freshmen who are admitted in good standing but fail to maintain it during the first semester must regain it during the second semester. Upperclassmen may be allowed two successive semesters on probation.

Students who are dropped from the College for the first time may apply for readmission after one year. Those who are dropped a second time are not eligible to apply for readmission until five years later.

Graduation Requirements

At least 124 semester hours of credit at The University of Iowa are required for the baccalaureate graduation of students who enter as freshmen. Hour requirements for transfer students will be indicated in their Admission Statements. A year’s work is considered to be a minimum of 30 semester hours. At least the last 30 semester hours or 45 of the last 60 semester hours of credit must be earned in residence in the College of Liberal Arts at Iowa.

The Basic Program

The College of Liberal Arts curriculum requires that before graduation all students attain acceptable levels of performance in:

- Basic skills
  - Rhetoric (reading, writing, speaking)
  - Physical education
  - Mathematics
- Core areas (literature, social science, natural science, histori-cal-cultural)
  - Foreign language
- Area of concentration (including work in the major field and such courses in related fields as are advised by the major department)

Methods by Which Requirements May Be Satisfied

Rhetoric

All students must register at their first enrollment for rhetoric, as assigned on the Admission Statement, and must continue to enroll each semester until the proficiency tests are passed. Students assigned to 105A Rhetoric may attempt the course and speech tests before taking the course but must enroll for 105A until they learn the results of the tests. By satisfactorily passing the tests, a student can earn up to four semester hours of credit.

Transfer students have the option of satisfying the rhetoric requirement by submitting, at the time of enrollment, eight semester hours of rhetoric credit earned at another institution in a course comparable to the rhetoric course at The University of Iowa, by transferring six semester hours of credit in speech from another institution of good standing, by transferring six semester hours in English composition and either completing two semester hours of credit in speech (362/363) at the University or satisfactorily passing the speech test for transfer students. A student who transfers less than six semester hours in composition must register for the rhetoric course indicated on his or her Admission Statement and must continue until the requirement is satisfied.

Students transferring 40 semester hours or more of advanced standing are exempt from the rhetoric requirement. A maximum of eight semester hours of credit in the Rhetoric Program will be counted toward the baccalaureate degree.

Physical Skills

The University’s physical skills requirement may be met by earning, during the freshman year, four semester hours of physical education skills courses, or by passing the comprehensive test in physical education skills. This test is given each semester at announced times during the closing week of the term. Up to four semester hours of credit may be awarded for successful completion of the test.
Freshmen who elect to meet the requirements by examination, who failed to pass, must register for physical education skills for at least one semester prior to repeating the examination. Students who have not passed the test or met the requirements before the beginning of the sophomore year must register for the course during the sophomore year. Students who wish to do so may take the sophomore course for zero credit.

Petition may meet the physical skills requirement by presenting to the Office of the Registrar official evidence of having completed the basic training program in some branch of the armed forces.

Transfer students may meet the physical skills requirement by transferring 40 semester hours of advanced standing by transferring four semester hours for the equivalent of college credit in physical education and satisfactorily completing the appropriate two-hour U of I course in physical education skills.

A maximum of four semester hours in physical education skills will be counted toward the bachelor's degree. Students who have passed their twenty-third birthdays prior to admission are excused from the physical education skills requirement.

Mathematics

The mathematics requirement may be met by presenting at least two and one-half years of high school mathematics, exclusive of such courses as business arithmetic and consumer mathematics; by satisfactory accomplishment in the placement test in mathematics; or by satisfactorily completing a college-level mathematics course acceptable to the Department of Mathematics.

Historical-Cultural, Natural Science, Social Science and Literature Core Requirements

All students must meet the core requirements by satisfactorily completing each of the four courses in one of the eight-semester-hour core courses offered in the core area. However, with the approval of the department, students may be excused from the core requirement in the major area. The student may also be excused by earning eight or more semester hours of credit in approved departmental courses in one or more departments in the area where such courses are offered, or by achieving a satisfactory score on a comprehensive examination in the core subject.

Literature core courses may not be taken until the Rhetoric Program requirements are satisfied.

General Examinations of the College-Level Examination Program are offered for fulfillment of core requirements and for college credit. There are three tests, covering humanities, natural science and social science. They are administered by the University Examination Service. Registration for these exams must be completed in the Liberal Arts Advisory Office. Information regarding specific student eligibility for the tests may be obtained from that office.

Transfer students have the option of meeting the natural science, social science and historical-cultural core requirements by submitting, at the time of entrance from another institution, acceptable credit for an eight-semester-hour course comparable to the requirements as at The University of Iowa, from among the following subject areas:

- Historical-Cultural—history, philosophy, religion, American civilization, and/or the history and appreciation of art, music or drama
- Natural Sciences—astronomy, biochemistry, botany, chemistry, geology, mathematics, microbiology, physiology and/or zoology
- Social Sciences—anthropology, economics, geography, political science, psychology and sociology

A transfer student may meet the literature core requirement by submitting, at the time of entrance, six semester hours of college credit in literature from another institution; or three semester hours of college credit in literature from another institution and completing four semester hours in a literature core course at the University of Iowa. Students transferring less than three semester hours must complete the remaining semester hours in the literature core area.

Foreign Languages

Candidates for the Bachelor of Arts degree are required to complete at least four semesters of study in one foreign language. This requirement may also be satisfied by completion of four years of high school study in one language; by the completion of a combination of high school and college study equivalent to four semesters of college-level study; or by satisfactory performance in an achievement examination measuring proficiency equivalent to that attained in four semesters of college study in one language. A student who has completed two years of high school language study and who elects the beginning course in the same language in college will have added to his or her graduation requirements the number of semester hours assigned to that course.

Candidates for the Bachelor of Fine Arts, Bachelor of Music and Bachelor of Science degrees must complete at least eight semester hours of approved college-level study in one foreign language or an equivalent combination of high school and college study. Candidates for the Bachelor of General Studies degree have no foreign language requirement.

Bachelor of General Studies Degree

The requirements for the B.G.S. degree are completion at the University of Iowa of 60 semester hours of courses numbered 100 and above, not to include more than 20 hours from one department; and, unless exempt, completion of the appropriate rhetoric course. There are no specific core course requirements for this degree. All rules and regulations of the College of Liberal Arts apply to the B.G.S. degree (e.g. total hours, residence, deadline, academic standards, pass-fail, credit by examination, correspondence study, work in other colleges, etc.), except as specified above.

Area of Concentration Major

The head of the department or chairman of the area in which the student wishes to concentrate his or her studies specifies the requirements in this area.

Maximum Credit in One Department

Not more than 30 semester hours of credit may be earned in one department.
Basic Skills

The Rhetoric Program

The purpose of the College of Liberal Arts rhetoric skills require-
ment is to ensure, as far as possible, that incoming undergradu-
ates develop the reading, writing and speaking skills they need to
get the most out of university education and adult life. The
Rhetoric Program is designed to serve this purpose in ways
which help students adjust to university life.

All entering freshmen and all undergraduate transfer students
who have not already met the requirement are assigned either
to the two-semester "main course" or the one-semester advanced
course in rhetoric. Assignments are based on high school rec-
ords, American College Test scores and, for transfer students,
coursework completed at other institutions.

Some students are reassigned on the basis of their first two
weeks of rhetoric coursework. Others are reassigned or excused
on the basis of their scores in rhetoric examination tests offered
during the first week of the semester.

The Rhetoric Program also offers special, individual assis-
tance in its reading, writing and speech laboratories.

181R Rhetoric Main Course
Introduction to reading, writing and speaking
4 a.h.

183R Rhetoric Main Course
Continuation of 181R, prerequisite: 181R
4 a.h.

183R Rhetoric Advanced Course
An intensive, one-semester course in reading, writing and speaking; open only to
those who give evidence of sufficiently high degree of competence in the
Rhetoric Beginning Writing
2 a.h.

Intensive, one-semester course in writing; open only to new students who, through
placement examination or during of work, satisfy written requirements in speak-
ning but not in writing.

189R Rhetoric Individual Instruction in Writing
2 a.h.

Open to any student needing extensive help—not only freshmen reassigned by
their rhetoric instructors, but apprenticeship interested in writing who feel they
are not making satisfactory progress in the main course, or graduate students (or
students) who need more writing experience that they receive in English for
Foreign Students 161/160

Physical Education Skills

The physical education skills and elective physical education programs
are designed to contribute to students' liberal education and
and well-rounded development by ensuring that, before gradu-
atting, they have a basic knowledge of the body function in
relation to exercise and at least a minimum level of skill in a
variety of physical activities which may be useful throughout life
for recreation and to maintain a reasonable degree of physical
fitness.

The instructional program in physical education skills pro-

vides for a wide variety of activities, including physical condi-
tioning, archery, badminton, bowling, canoeing, casting and
angling, diving, fencing, flag football, golf, gymnastics, handball,
ice hockey, judo, lacrosse, life saving, paddleball, home recrea-
tion games, rifley, rugby, soccer, skating, softball, squash, swim-
manship, table tennis, tennis, track and field, volleyball,
tumbling, volleyball, water polo, water safety instructorship,
weight training, wrestling. The program also gives the student
an opportunity to correct physical defects which respond to
therapeutic exercises.

Elective Physical Education

The elective physical education program offers courses in the
Core Courses

112 Medieval and Renaissance Literature 4 a.h.
  Selective from: Beowulf, Chaucer, Shakespeare, Milton and others
114 The Tragedy Experience 4 a.h.
  Major representation of tragic visions of man’s experience in six major prose and drama from classical times to our own
115 The Idea of Comedy 4 a.h.
  Varieties of comic view of life past and present, including satire, burlesque, farce, nonsense, in prose and verse
116 Narratives Literature 4 a.h.
  Selected masterpieces as well as recent developments in the art of storytelling in both poetry and prose
117 Lyric Poetry 4 a.h.
  Poetry from major periods of development as well as contemporary verse, with emphasis on form, language and major formal patterns of poetry
118 Dramatic Literature 4 a.h.
  Selected plays from Shakespeare’s time to present with some consideration of dramatic structure and form in other genres

Social Science
Anthropology, economics, geography, political science, psychology and sociology courses which will satisfy the social science core requirement are listed in the Schedule of Courses.

Natural Science
Life Sciences
1121 Human Biology 4 a.h.
  Topics in human evolution, reproduction, genetics and microbiology of our biological systems from cells to behavior; our place in and problems with our environment; inner, laboratory, reading and discussion; independent of 1122
1122 Ecology and Evolution 4 a.h.
  An overview of disciplines of evolution and of diversity of living things, their patterns on earth, their organization in ecological systems and dynamics of evolutionary processes; lecture, laboratory, reading and discussion; independent of 1122

Earth History and Resources
1123 Earth History and Resources (first half) 4 a.h.
  Not open to those who have had 113, 115 or 115
1124 Earth History and Resources (second half) 4 a.h.
  Not open to those who have had 112; essential and modern environments and role within earth and processes by which they evolved; evolution of organisms and man’s current use and misuse of present environments; laboratory and discussion; independent of the other; two lectures, two laboratory-discussion meetings per week

Physical Sciences
1126 Chemistry and Physics of the Environment 4 a.h.
  Fundamental discussion and classification of chemistry and physics of ecology of our planet; air, earth, water and some mineral elements, functions of pollutants in man, chemistry and physics of balance of nature; all relevant principles of physics and chemistry in elementary level; no prerequisites; examination; lectures and discussion, one semester; open to freshmen

Historical and Cultural Studies
1128 Problems in Human History 4 a.h.
  Introduction to learning about past and its meaning for present; various topics in world history; emphasis on events of innovating and forming ideas about evidence, as well as on critical evaluation of what historians have already written about the subject
1131 Western Civilization: Middle Ages to 1915 4 a.h.
  Evolution of Western civilization with emphasis on social, political, economic and cultural development of Europe, as related to problems of our own era
1132 Western Civilization: 1916 to Present 4 a.h.
  Evolution of Western civilization with emphasis on social, political, economic and cultural development of Europe, as related to problems of our own era
1133 Philosophy of Man (first semester) 4 a.h.
  Some major philosophical changes of man and society from Plato to present

Physical Education Skills for Men
1931 Physical Education Skills for Men 1 a.h.
  Required foundation of physical education activities, instruction and training in sports skills, exercise, and personal fitness. Required of all male students in Liberal Arts who are unable to satisfy written and proficiency test history in sports skills and physical conditioning
1932 Physical Education Skills for Men 1 a.h.
  Continuation of 1931
1933 Physical Education Skills for Men 1 a.h.
  Continuation of 1932
1934 Physical Education Skills for Men 1 a.h.
  Continuation of 1933
1935 Physical Education Skills for Men 0 a.h.
  Open only to students who elect to take physical education without credit
1936 Physical Education Skills for Men 0 a.h.
  Continuation of 1935

Physical Education Skills for Women
1931 Physical Education Skills for Women 2 a.h.
  Intensive work in selected activities from the group of sports, dance, aquatics and gymnastics, emphasis on movement principle
1932 Physical Education Skills for Women 2 a.h.
  Continuation of 1931
1933 Physical Education Skills for Women 0 a.h.
  For first semester Sophomore students electing to take physical education without credit
1934 Physical Education Skills for Women 1 a.h.
  Open by permission only

Core Courses
Except where noted, both semesters of a course must be completed if it is to satisfy the core course requirement of the College of Liberal Arts. Exceptions are made for transfer students who need only one one-semester course to finish a requirement. Students who have completed requirements in any area may take its core courses as one-semester electives.

Literature
The core requirement in Literature may be satisfied by taking 111, the basic course, and following it with one of the second-semester alternatives. Writing ability as required by the Rhetoric Program is a prerequisite. English majors are exempt from core literature. Others wishing to fulfill the requirement by examination should contact the Liberal Arts Advisory Office. Core courses in literature may also be taken for elective credit.

Most sections meet three times a week for discussion, ask for substantial independent reading and stress writing as a tool for learning as well as expression. Selecting literature from the student's own lifetime as well as great works of the past, these core courses treat literature as a shared experience which rests on definable assumptions, uses characteristic sets of conventions, and is accessible to different kinds of interpretation.

111 Interpretation of Literature 4 a.h.
  Interpretive strategies available to makers of poetry, narrative and drama, with some consideration of film as literary medium
1112 Biblical and Classical Literature 4 a.h.
  Selections from Old and New Testament literature, Homer, Greek dramatists, Plato, Virgil and others
The Committee on Afro-American Studies also sponsors the Afro-American Cultural Center.

Staff: Professor Belding, Lane, Duffy, Schoor, Retish (Education); Hubbard (Engineering); Koveshy (Business Administration); Van Dyke (Political Science); Corrigan, Farber (American Civilization); Turner, Hostin, Abrams (English); Carter (Anthropology); McNally (Geography); Moss (History)

Courses Priority Confirmed with the Afro-American Experience

American Civilization
- 49.15 Black Poetry Workshop 3 cr.
- 48.11 Contemporary Black Experience 3 cr.
- 48.119-15 Afro-American Literature 1-5 cr.
Same as English 81.15-16
- 48.150 20th Century Afro-American Fiction 3 cr.
- 46.105 Afro-American History (1819-1866) 3 cr.
Same as History 16.197
- 46.107 Afro-American History (1866-present) 3 cr.
Same as History 16.116
- 46.175 Black Action Theater 3 cr.
- 46.180 Afro-American Drama 3 cr.
- 46.215 The Culture of Black America: An Interdisciplinary Approach 3 cr.
An overview of the social, economic, political and religious experiences with which informed the black American
- 46.11 Seminar: Women in Afro-American Culture etc. art: Exploration and appreciation of social and historical dimensions which permeate and influence processes of racial discrimination
- 46.212 Blues in the New World 3 cr.
Same as Anthropology 113.113
- 46.215 Politics and the Black Writer 3 cr.
- 46.410 Seminar: Afro-American Literature 3 cr.

Anthropology
- 113.105 Spanish Speaking Peoples of the United States 3 cr.
- 113.119 Social Anthropology of the Caribbean 3 cr.
- 113.127 Urban Anthropology 3 cr.
- 113.129 Peoples of Africa 3 cr.
- 113.143 Peoples and Cultures of North Africa and the Middle East 3 cr.

Art
- 46.102 Primitive Art: Africa 3 cr.

Business Administration
- 68.100 Individual Rights in an Industrial Society 3 cr.
- 68.205 Environmental Economics and Society 3 cr.
- 68.233 Employment Relations and Public Policy 3 cr.

Economics
- 68.137 Economics of Urban Problems 3 cr.

Education
- 79.104 Education in Newly-Developed Countries 2 or 3 cr.
- 79.120 Educational Sociology 2 or 3 cr.
Same as TD-160

- 79.117 Replacement of the School-Age Child 3 cr.
- 79.139 Teaching the Educationally Disadvantaged 2 or 3 cr.

Afro-American Studies
Program Chairman: Charlotte T. Deere
Degrees offered: B.A., B.A.C.H., Ph.D. in Afro-American Studies, with concentr- ation in Afro-American Studies;

Vigorous efforts are being made to develop a satisfactory cur- riculum and attract capable faculty to portray the experience of black people in America. This program is concerned as well with the history and culture of black people in Africa and the Caribbean, and it also focuses on the contemporary racial crisis with a commitment to the eradication of prejudice and stereotyping.

A curriculum is designed to place the black experience in its historical context. It recognizes the need for both black and white participation, and it will provide training in a field that has been ignored for too many years. The ultimate objective is to provide University students with an understanding of the black man's contribution to American civilization—past and present.

Afro-American Studies has been organized to further research and teaching in the area of black culture. The student wishing to specialize in Afro-American studies will emphasize this area in his or her graduate coursework, offer it as an examination field at the time of comprehensive examinations and write an interdisciplinary dissertation on some aspect of Afro-American culture. The program plans call for a four-stage development combining present courses with new courses. The curriculum is being developed with the four phases for the purpose of providing students and faculty members to add and delete courses systematically.
American Civilization

Geography

44:191 Africo 3 a.h.

History

16:51 Survey of American History 1492-1877 3 or 4 a.h.
16:52 Survey of American History (1877-present) 3 or 4 a.h.

Sociology

*34:158 Race and Ethnic Relations 3 a.h.
*34:179 African Social Structure and Change 3 a.h.
Same as 16:212

Urban and Regional Planning

150:102 Urban Politics 3 a.h.
150:204 Planning of Metropolitan Areas 4 a.h.

*See course for Afro-American Studies

American Civilization

Program Chairman: Alexander G. Kern

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

At both the undergraduate and graduate levels, the program in American Civilization provides a wide cultural background in American studies and a proportionate amount of specialization in line with the student's individual interests. The courses offer information on the social and cultural development, the artistic and literary growth, and the distinctive ideals and values of American civilization.

The undergraduate program offers an excellent nonprofessional, liberal education for improved citizenship and rounded personal development. It can also serve as preparation for high school teaching in American literature, American history and the social sciences; and it can furnish a solid basis for graduate study in American civilization, English, history or law.

The graduate program emphasizes the interdisciplinary approach to total American culture as the integrating background for more specific emphasis in selected areas from such as the following: Afro-American contributions, the fine arts, history, literature, music, philosophy, popular culture, religion, the social sciences and women's studies.

Undergraduate Study

The 16 semester courses required for a major are to be selected from:

Group A

Four semesters of American history:


Group B

Two semesters in two of these subject areas:
American Civilization

Group C
Four semester courses in American literature

Group D
451 American Civilization (survey) 3 s.h.
4520 Senior Colloquium 2 s.h.

Two of these:
45150 Individual Rights in an Industrial Society 3 s.h.
45152 American Folk Literature 3 s.h.
45153 Significant Books in American Civilization 3 s.h.
45161 Human Rights and the Law in America 3 s.h.
45265-6 Afro-American History 3 s.h.
45135 American Civilization in the 20s and 30s 3 s.h.
45197 Interpretation of American Civilization 3 s.h.
45198 Literature and the Film 3 s.h.
45191 Introduction to Graduate Study in American Civilization 3 s.h.

These lists are not complete; a considerable variety of undergraduate programs can be formulated within the required groups.

The Master of Arts Program
On the master's level the program attempts to study the total culture of the United States in historical perspective, and the student is examined in both the history of American civilization and the methods and bibliography of this study, with emphasis on social, intellectual and literary expression.

Requirements for the Master of Arts degree in American Civilization:
1. thirty-eight semester hours of graduate work beyond the B.A., distributed about equally among American literature and history, and methods of studying American civilization;
2. a study of a selected list of works important for an understanding of American civilization;
3. an examination over both items above;
4. completion of two successful oral papers which demonstrate command of methods and materials.

The Doctoral Program
Coursework and Independent Study
Through a balanced and integrated program of courses and readings, the Ph.D. candidate will progress from the broad survey knowledge at the master's level to a depth of understanding of the literature, history, social sciences, fine arts and philosophy of the United States (together with their European backgrounds, including English literature). The student will also be responsible for knowledge of any subjects his thesis committee deems valuable for the completion of his dissertation.

Qualification
Before being admitted to candidacy for the degree, the student must demonstrate his training and ability.

Comprehensive Examinations
Since American civilization is too broad a subject to be mastered completely, each student must offer three approved fields for the written portion of the comprehensive examination. These are to include all of American literature, one field of American history as defined by the Department of History and a third field involving a further discipline.

A wide range of choices is possible from such areas as social science, one of the arts, philosophy, religion. Afro-American studies, popular culture, women's studies and film. Accordingly, with the advice and consent of his or her adviser and the department concerned, the student must select an acceptable body of work to be covered in this area of the comprehensive examination.

In addition, on the oral portion of the examination the candidate must demonstrate an acceptably solid command of the total culture of one of the following periods:
- American Colonial Civilization to 1750
- American Civilization 1750-1835
- American Civilization 1836-1876
- American Civilization 1877-1914
- American Civilization 1914 to the present

Thesis
The student must present a satisfactory thesis on a topic which concerns more than one of the above fields. Before the thesis topic is approved, the student must explain his project to a committee and convince the members that the topic is one which can be successfully completed.

Final Oral Examination
This examination will be predominately over the field of the thesis.

Languages
Certification of an acceptable competence in two modern languages or in one language and one research tool area, such as bibliography or fluency in one language demonstrated by taking a literature course in that language is required of all students. This requirement should be satisfied as early as possible and certainly before the student takes the comprehensive examination.

Staff
professor Baender, Corrigan, Gerber, Kern, Oster, Paul, Sayre, Whitaker, Morris, Davis, Turner (English); Dykes, DeGred, Hawley, James, Neal, Persons, Roberts, Kon, Kon, (History); Alexander, Cuffter, Seiberling (Art); Addis, Burkina, Bergman (Philosophy); Davis, Johnson, Schmolz, van Dyke (Political Science); Gonzalez, Holm, Goldberg, McLaugh (Anthropology); Sanders (Sociology); Duffy (Education), Reiter, MacCain (Speech and Drama); Hubard, Meyers (Engineering); Kovensky (Business Administration); Versch (Law)

Courses Primarily for Undergraduates
4511 American Civilization I 3 s.h.
4521 American Civilization II 3 s.h.
4541 American Civilization IV 3 s.h.
4511 Contemporary Black Experience 3 s.h.
### Anthropology

**Course Descriptions**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>4858</td>
<td>Senior Colloquium: Exploration of broad culture of an era in historical perspective by applying discipline of history, literature, art, philosophy, and social sciences</td>
<td>3 a.h.</td>
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<tr>
<td>4921</td>
<td>Honors Colloquium: Prehistory</td>
<td>3 a.h.</td>
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<tr>
<td>4926</td>
<td>Honors Project: Archeology</td>
<td>3 a.h.</td>
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<tr>
<td>4928</td>
<td>Interdisciplinary Project for Undergraduates</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>4932</td>
<td>Readings in American Civilization</td>
<td>3 a.h.</td>
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### courses for Undergraduates and Graduates

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<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>46110</td>
<td>Technology and Responsibility</td>
<td>3 a.h.</td>
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<tr>
<td>48527</td>
<td>Science in Civil Society During 533-377 and 512-85</td>
<td>3 a.h.</td>
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<tr>
<td>46115</td>
<td>Afro-American Literature</td>
<td>3 a.h.</td>
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<td>46116</td>
<td>Afro-American Literature II</td>
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<td>46117</td>
<td>Afro-American Literature III</td>
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<td>Afro-American Literature IV</td>
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<td>Afro-American Literature V</td>
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<td>46121</td>
<td>Afro-American Literature VII</td>
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<td>46122</td>
<td>Afro-American Literature VIII</td>
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<td>46123</td>
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**Special Programs**

Design for maximum development of superior students' abilities and interests, the Honors Program in anthropology is open to students who have met the regular requirements of the course and have had an average of 3.0 overall and 3.5 in the major in anthropology. In addition to the regular requirements for a major in anthropology, Honors students must complete the Department's Honors Seminar and Honors Research courses and serve as tutors for the anthropology course of their major, the World's People.

**Field Research**

Opportunities are available for students to participate in anthropological field research either at a site near Mexico City or at various sites in Iowa. Under the direction of University and state anthropologists, they acquire on-the-job knowledge of archaeological techniques and methods of "reading" artifacts.

**Graduate Programs**

Students applying for admission to the graduate program in anthropology will be considered righteous of the field of their previous training. Applicants may enter the anthropology graduate program with a B.A. degree or with advanced standing. A candidate for admission must submit a completed University application form, transcripts of all previous graduate and under-
Anthropology

graduate work, three letters of recommendation, and scores from the aptitude portion of the Graduate Record Examination.

All entering graduate students, whether enrolled in the M.A. or Ph.D. programs are required to take the Departmental qualifying examination during the second semester of residence.

M.A. Program

The M.A. program is general in nature, equipping one to deal with any aspect of anthropology at an introductory level. Although most students choose one of the traditional subfields of anthropology for special emphasis, further specialization is neither expected nor encouraged.

The Department of Anthropology offers two programs leading to the M.A. degree, with or without thesis. The latter program is considered a terminal degree and ordinarily will preclude the student's consideration for candidacy for the Ph.D.

In either program the candidate must take the qualifying graduate examination in anthropology in the second semester of residence. The main purpose of the qualifying examination and evaluation procedure is to determine whether or not a student is qualified to become a professional anthropologist and, if qualified, whether at the M.A. or Ph.D. level. Since the examination is administered quite early in the student's graduate program, previous experience will be considered in evaluating performance. The exam comprises two parts. The first covers all aspects of anthropology: biological, cultural, archaeological and linguistic. The second focuses on the student's area of concentration, either social anthropology-ethnology or archaeology. Those who pass the qualifying examination with distinction may be permitted to bypass the master's degree and proceed directly to the Ph.D.

The number of credit hours required for the M.A. varies from 30 to 38 semester units, depending on previous anthropological training. It is expected that the student will be particularly strong in one subfield of anthropology but still adequate in other areas. Although the student is not required to complete all courses in one subfield, it is expected that he will complete at least three courses in each of the four primary areas of concentration. The program must also include an approved course in statistics or methodology. All courses must be completed with a grade of "B" or better to meet the distribution requirement.

Ph.D. Program

Graduate training in anthropology at the Ph.D. level leads to professional competence in both scholarly research and teaching. It represents a balance between a general knowledge in all the subfields of anthropology and a professional level of specialization in one of these subfields or a combination of two or three subfields.

Total credit units are 90-96. Full admission to the Ph.D. program is contingent on the successful completion of the qualifying examination required of all graduate students in the Department. Distribution requirements are specified in terms of levels of competence and specialization rather than in terms of completed courses. In the comprehensive examination (to be taken in the sixth to seventh months of their Ph.D. program), the student will be tested for general knowledge in the various subfields of anthropology: ethnology-social anthropology; archaeology, linguistic anthropology and physical anthropology, as well as more comprehensively in the specialization he or she has selected. The distribution requirement for the Ph.D. includes the mastery of two research skills, a geographic-culture area and an anthropological research topic.

Ph.D. in Cultural Anthropology and Linguistics

The Ph.D. in cultural anthropology and linguistics prepares the student for professional teaching and research in the linguistic and non-linguistic aspect 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 only explicit requirements are the completion of two appropriate research tools from a list which includes foreign languages, statistics, symbolic logic and computer programming, and a satisfactory completion of a basic series of courses in linguistics and in anthropology courses in general linguistic theory, phonetics, grammatical analysis, phonological analysis, and historical-comparative linguistics and in anthropological history, theory or methods, social anthropology, social institutions, and an ethnographic area, and a satisfactory completion of a set of interdisciplinary courses in language and culture. Ethnolinguistic field methods and ethnolinguistics theory.

Beyond this basic training, the candidate for the Ph.D. in cultural anthropology and linguistics may concentrate in one of the two areas with further work, or strike a balance between the two. At the completion of the core program, each student's achievement will be evaluated by an examining committee of the two departments, and appropriate recommendations will be made.

It is not necessary that the student entering the program have taken an undergraduate major in either anthropology or linguistics. However, it is desirable that the student has had the equivalent of one year of introductory courses in linguistics and anthropology (103/202 and 113/301), these must be made up as deficiencies.

The student may take the M.A. degree in either anthropology or linguistics before proceeding to the joint Ph.D. Previous work in one of the two areas at the M.A. level may be applied toward the joint doctorate program requirements in the division.

Research Skills

Masters of two skills appropriate to the student's research interests are required of all students. Although one of these is normally a foreign language, two skills other than language are permissible if appropriate to the student's program. Among the skills acceptable, in addition to the language, are a second language, fluency approaching that of a native speaker in the first language, mathematics, logic, statistics, computer programming, geology, survey techniques, paleontology or ecological techniques.

The student must demonstrate knowledge of the ethnography of one of the major culture areas as defined by the Department.
It pioneered the artist-teacher concept, appointing its teachers on the quality of their work rather than the number of their academic degrees. It was one of the first university-based art schools to bring established professional artists—Grant Wood, among them—to its faculty. With the School of Letters and the School of Music, the School of Art and Art History made Iowa one of the first universities to accept creative works for academic credit. It was among the first, if not the first, of the schools of art at which studio art and art history are joint studies reflecting the concept that the young artist will benefit from a formal study of the traditions of art, and the prospective historian from personal experience with the creative process.

The school achieved national recognition for its large exhibitions of contemporary American painting and sculpture. A number of its graduates enjoy success as practicing professional artists and art historians. Most have become teachers. Currently there are more applicants than jobs in teaching, and that situation appears likely to persist. However, Iowa graduates continue to be placed in acceptable positions.

There is no "commercial" art offered in the Iowa program, and few of the school's graduates enter that field. An undergraduate major in art history is, in most instances, a preparation for work toward an advanced degree, either in art history—where most positions require an advanced degree—or in a related field, such as museum work.

All undergraduate programs in art at Iowa develop the major at the broad setting of a liberal education. The student earns one-half to two-thirds of his or her credits in non-art courses, beginning with the College of Liberal Arts general graduation requirements—historic, mathematics and physical skills, a foreign language, and introductory coursework in literature, social science, natural science and the historical-cultural area. The major requirements in art are broad and flexible. They discourage specialization. The art history major requires at least 24 credits in courses in art history and in at least three 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.

The Art Forms Program
Since 1969 the foundation work in studio has been organized as the Art Forms Program. The first year combines drawing and painting, basic design, it moves from representational drawing and two-dimensional design projects into major theory experiments with three-dimensional materials, processes and structures, some print projects and painting in various media. There is also a supplementary program of lectures, films and guest projects.

During the third semester, students draw from microscopes in biology laboratories, work in the College of Medicine's anatomy laboratories and are encouraged to pursue individual or collaborative projects. The fourth year is oriented toward three-dimensional work. Students conceive and execute individual projects in new and traditional materials, become involved with film and videotape, and evaluate and document their own work.

The Bachelor of Arts Degree: Studio Art Major
In addition to the general College of Liberal Arts graduation requirements, the Bachelor of Arts degree with a studio art major requires from 32-38 semester hours of studio work, 18 to 20 semester hours of coursework in art history, and at least two semesters of study in a second foreign language (one of the two is usually German) and 15 semester hours of coursework in classics, drama, history, literature, music, philosophy, religion, and zoology and/or anthropology.

Not less than 38 nor more than 50 credits earned in art courses can be counted toward the 124 credits total required for graduation with the Bachelor of Arts degree in studio art or art history.

The Bachelor of Fine Arts Degree
The program leading to the Bachelor of Fine Arts degree gives greater emphasis to studio work. The general requirements are the same as for the Bachelor of Arts degree, except that the foreign language requirement is reduced from 12 to 8 semester hours.

The major requirements are 11 semester hours of art history, 10 semester hours of basic studio work and 26 semester hours of intermediate and advanced studio work. The latter may be earned in one major and three minor studio areas, or in one or more fully developed major and two minor areas.

The Art Education Major
The B.A. in art education is a joint offering of the College of Education and the College of Liberal Arts. For this degree the student may have all the courses required of an art major taking a B.A. in studio art, except the literature and foreign language requirements. Students having outstanding performance in art history may be encouraged by the art history faculty to take an Honors Program in that field.

Admission
All high school graduates qualifying for admission to the University are thereby eligible for admission to the School of Art and Art History. Students planning to major in studio art may have a portfolio of their work reviewed and commented upon by a faculty committee. Students planning to major in art education or the history of art may arrange pre-registration conferences with an advisor in those areas by applying at the main office in the Art Building.

Graduate Programs
Almost all the students receiving graduate degrees in the School of Art are taught. Very few become full-time professionals artists, and, in the art history field, even immediately after1 months' work although opportunities in the latter may increase in the future. As with most career-oriented programs, those at the graduate
Art Education
The M.A. candidate in art education will take courses in that field and in art history and studio. While teacher certification is required, course emphasis is determined by the student, in consultation with a faculty advisor. The written thesis may result from research in art history or art education or, if it accompanies a studio thesis, may be a brief descriptive statement.

Facilities
The building housing the School of Art is located in the University's Center of Fine Arts complex on the west bank of the Iowa River. The Center also includes the new Museum of Art, the University Theatre and the new Music Building and Hancher Auditorium. A recently-constructed wing of the School of Art building provides a large undergraduate painting studio, one of the world's most complete isoplane print shops, and an art history lecture hall, as well as School offices.

Other School of Art facilities include a smelting furnace for bronze casting, a well-equipped darkroom, kilns sufficiently large to fire full-size ceramic sculptures, and a large shop for woodworking, metalworking and industrial design. These are also glass and metal casting furnaces and video equipment and advanced spray equipment for the application of plastic form and fiberglass in multimedia work. Additionally, of course, there are many studios of various sizes.

The School's library is one of the best in the nation, in size and function. It contains more than 35,000 volumes. The School's visual resources include more than 140,000 slides used in art history classes, and students have access to an additional 70,000 photographs and study aids.

While not a School of Art facility, the University's Center for New Performing Arts involves School of Art 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.

The Faculty
The School's faculty is composed of dedicated teachers who are active scholars and artists. The publications of art historians result from wide-ranging research projects, including recent research in the Far East, North Africa and Europe, as well as the Americas. Members of the studio faculty participate in national and international exhibitions. The art education faculty are involved both in studio and scholarly evaluation of educational programs.

Staff: Professor Alexander, Berkeley, Quinter; Francesca, Lasansky; Lechay*; Schultz, Seiberling, Tomassini, Wilke; associate professors Bieger, Broder, Meyers.** Patrick,** Tucker, Wilson, visiting artists Schmiedt, Tynack; visiting professors Begley, Choo, DePaso, Porter, Redmond, Rizzuto, Rogers, Walker, Woodham; internships with Mr. de Rosenbaum Library; Art Library; Harlan Sifford Curator, Visual Materials: Carolyn Milligan

* On leave, fall semester 1971
** On leave, spring semester, 1972-73
Botany

Department Chairperson: Richard L. Mullany
Degrees offered: B.A., M.S., Ph.D.

Botany is a science contributing to our understanding of plants, their structure, function, distribution on the earth, diversity, behavior and relation to human affairs. 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, the chemistry of natural products, ecology, medicine, pharmacy and zoology.

Some recent graduates of the B.A. program at Iowa have entered careers as technicians in pharmaceutical research laboratories, in plant breeding stations and in seed production laboratories. Most of those who have gone on to advanced degrees are in the teaching profession. One is a curator of horticulture with the New York Botanical Garden, where he participates in regular plant exploration trips in the Arctic and in tropical South America. One is in the United States Forest Service in Montana. Another is a research associate in the United States Forest Products Laboratory at Madison, Wisconsin. Four are scientists at the National Fungus Collections Laboratory in the U.S.D.A. These few examples illustrate the variety of professions open to botany graduates.

The Bachelor of Arts Degree

In addition to the general requirements of the College of Liberal Arts (see "College of Liberal Arts," students majoring in botany are required to take:

Mathematics through 220/220 Elementary Functions
4:1.4 and 4:6 General Chemistry
4:121-2 and 4:141 Organic Chemistry

Twenty-four semester hours of botany to include:

2:1 Introduction to Botany 5 s.h.
2:12 Plant Composition of Land Plants 3 s.h.
2:12 Algae and Fungi 3 s.h.
2:13 Biology of the Local Flora 3 s.h.
2:102 or 1110 Genetics 3 or 4 s.h.

At least seven semester hours are to be selected from other botany courses numbered above 100.


Students preparing to teach in secondary schools should consult the College of Education regarding requirements for teacher certification.

The Honors Program

An undergraduate program leading to graduation "with Honors" provides opportunities for participation in independent research projects guided by professional staff members. Prerequisites for admission to the program are senior standing and cumulative grade-point averages of 3.0 overall and 3.5 in botany. In addition to the regular requirements for the B.A. degree, Honors students must complete three semester hours of research in botany.
Botany

2124 Honours in Botany during the senior year, meets the grade-point average required for admission to the program and passes all Honours 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.

Admission

See "Graduate College."

General Requirements

All students should become thoroughly familiar with the requirements of the Graduate College; responsibility for compliance with these requirements rests with the student. Students who have not had the verbal and quantitative parts of the Graduate Record Examination are required to take these tests during the first semester of residence. In addition, those who plan to apply for a fellowship are advised to take the advanced biology part of the Graduate Record Examination.

Departmental Requirements

Candidates for advanced degrees in botany are required to perform some service as teaching or research assistants. If the enrolling 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. Coursework 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.

The Master's Degree in Botany

Advanced study may be undertaken with emphasis in anatomy, botany, cytology, cell biology, ecology, genetics, molecular biology, mycology, palaeobotany, physiology, psychology, or taxonomy. The master's degree may be attained by completing at least 30 semester hours of graduate study, including six semester hours in 2225 Research. The preparation of a thesis is optional.

Each student must:

1. Submit a program of study approved by a guidance committee comprising three members of the graduate faculty, one of whom may be from another department. Normally, as a guidance procedure, the program of study should be prepared during the first semester in residence as a regular graduate student.
2. Complete at least 16 semester hours of graduate courses in botany, as prescribed by the guidance committee. No more than six semester hours of 2225 Research and 2229 Thesis may be used to fulfill this requirement.
3. Achieve a grade-point average of 3.0 on all courses—either

than Research—attempted up to the time of the final examination.

Take a written examination during the term in which he or
she is enrolled. This is followed within a week by an oral
examination. These examinations cover the courses and
preparation experience the student has had up to this point.

The Master's Degree in Biology for Science Teachers,

Emphasis in Botany

A student electing this degree must complete at least 30 semester hours of graduate work, including the preparation of an acceptable thesis, or 36 semester hours without thesis. Undergraduate preparation must include eight semester hours of botany and eight semester hours of zoology; a general biology course may not be submitted as part of this requirement.

Graduation requirements:

Thesis—14-16 semester hours of botany including 2225 Research, eight semester hours of zoology electives, and four to eight semester hours of electives in cognate fields.

Without thesis—20-24 semester hours of botany including 2225 Research, eight to 15 semester hours of zoology electives, and four to eight semester hours in cognate fields.

The candidate must have at least a 3.0 grade-point average on all courses attempted at the time of the final examination.

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. With the aid of his or her major professor, the student should enter directly into planning for the degree and submit a program of study to a guidance committee comprising the major professor and two other members of the graduate faculty, one of whom may be from another department. Normally, the program of study for the Ph.D. is prepared during the first semester in residence following the award of a master's degree. The guidance committee determines the formal courses or proficiency requirements which the candidate must meet. The background of the candidate, his or her educational and career goals, and his or her current or prospective research interest are taken into consideration. The committee also establishes which portion of the formal coursework or specific problems (such as an ability to read certain foreign languages) will be demanded of the student before he or she is admitted to the comprehensive examination.

The candidate must take both written and oral comprehensive examinations covering his or her fields of concentration and research. Preparation for comprehensive examination affords an opportunity for the student to review and establish continuity of thought concerning the basic ideas and disciplines in his or her profession.

At least 72 semester hours of graduate credit are required, including courses taken for the master's degree.

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 therein. The doctoral thesis should be an original contribution to the general body of knowledge. In addition to its research contribution, it should contain a discussion
of related knowledge and the candidate's interpretations, specula-
tions and generalizations about his or her specific topic.

Special Facilities and Activities
Students conducting experiments or research projects requiring the use of plants also have access to greenhouses and special culture rooms with controlled environments. A remodeled plant physiology laboratory is available, with associated greenhouses.

There is an excellent departmental library in the building.

A number of research laboratories are equipped with standard growth chambers and more sophisticated apparatus. A new electron microscope is in operation. Students and staff may use the Scanning Electron Microscope Laboratory in the Zoology Building.

A herbarium for research and archival study includes collections 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 Bryophytes and the Martin collections 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 sta-
tion at Iowa Lakeside Laboratory (see "Extension Division") on West Lake Okoboji in northwestern Iowa affords excellent con-
ditions for summer study in field biology, limnology, physiology, aquatic ecology and plant taxonomy. Students frequently partici-
pate in field expeditions in the Canadian Northwest, Mexico and Central America.

Qualified graduate students frequently use the University Computer Center in their research projects.

Faculty
The academic staff of the Department of Botany consists of 12 full-time faculty members and several half-time graduate teaching assistants. Each is involved in teaching both undergraduate and graduate courses, plus tutorial counseling of students con-
ducting independent projects. The specialties of our faculty include a wide range of disciplines in the plant sciences, in addi-
tion to considerable collaboration in research and teaching with colleagues in cognate areas such as biochemistry, geology, mi-
robiology and zoology.

Staff: professor Hubary, Mair, Ronchis, associate professor Cresto, Dan, Juan M. Martinez, assistant professors Carlson, Schallion, Sjoholm, Surzycki

Librarians-in-Charge, Botany Library: Pauline L. Mann

Courses Primarily for Undergraduates

2.1 Introduction to Botany 8 a.b.
Cultural experience with biology of plant life; structure, function, reproduction and inheritance in plants; open to all students; recommended for students in general science, botany and those preparing to teach science; three lectures and two laboratory periods per week; may be continued by 211 or 212 or 213 to satisfy the natural science core requirement.

2.11 Evolution of Land Plants 3 a.b.
Naturally occurring plants belonging to the structures, evolution and major taxonomic groups; three lectures and two laboratory periods per week; prerequisite: 2.1 or equivalent.

2.12 algae and Fungi 3 a.b.
Biology of the major groups; their development, comparative morphological and evolutionary relationships; two lectures and one laboratory period per week; prerequisite: 2.1 or equivalent.

2.13 Biology of the Lowlands 3 a.b.
Identifications, nomenclature and reproduction of angiosperms and gymnosperms of lowland deciduous forest types; the ecology of woodland and prairie vegetation stresses; two lectures and one laboratory period per week; field work within limits; prerequisite: 2.1 or equivalent.

Courses for Undergraduates and Graduates

2.101 Plant Taxonomy 2 or 4 a.b.
Botanical taxonomy as illustrated by study of variation within and rela-
tionship between selected families and orders of angiosperms; prerequisite: 2.1 or equivalent.

2.102 Systematics 3 or 4 a.b.
Structure, behavior and function of hereditary material; laboratory/exercises basic pattern of inheritance; optional for nonmajors; lecture and laboratory, two ses-
sional units each as Zoology 2.01 or Zoology 2.13 or equivalent.

2.103 Fundamental Genetics 2 or 4 a.b.
Nature and function of genetic mechanisms; three lectures and one laboratory; laboratory illustrates application of genetic analysis; optional for research majors as Zoology 2.15 or prerequisite; 2.1 or Zoology 2.13 or equivalent.

2.104 Cytogenetics 2 a.b.
Structure and function of chromosomes; process of meiosis; chromosomes and their role in heredity; structure and function of genetic mechanisms; genetics and the eukaryote cell; two sessions; two laboratories; prerequisite: 2.10 or Zoology 2.13 or equivalent.

2.105 Physiology 4 a.b.
Structure and reproduction of algae, freshwater and marine, including cytology and physiology of representative major taxonomic groups; lecture, laboratory and field trips; prerequisite: 2.1 or equivalent.

2.106 Bryology 4 a.b.
Lecture, laboratory and field work dealing with development, structure and evalu-
aton of mosses and liverworts; prerequisite: 2.1 or equivalent.

2.107 mycology 4 a.b.
Mycology, cytology and taxonomy of fungi with study of representative groups; prerequisite: 2.1 or equivalent.

2.108 Experimental Mycology 6 a.b.
Preliminary investigations in the study of fungi for growth and morphological investigations; prerequisite: a course in botany or biology and a year or organic chemistry or chem-istry of instructor.

2.109 Plant Physiology 6 a.b.
Lecture and laboratory; experimental study of functions in plant cells, physiology, development, growth and development of seed plants; prerequisite: 2.1 or organic chemistry; prerequisite: 2.1 or equivalent; a course in genetics is helpful.

2.110 Plant Physiology 6 a.b.
Lecture and laboratory; experimental study of vascular systems, metabolism, growth and development of seed plants; prerequisite: 2.1 and organic chemistry; prerequisite: 2.1 or equivalent; a course in genetics is helpful.

2.111 Plant Anatomy 2 a.b.
Adaptation and interaction between organisms and the environment: water trans-
fer in plant systems; interactions, climax, history of changes, geometrical differentiation, tissues and tissues systems, patterns and patterns systems, lecture, laboratory and field trips; prerequisite: 2.1 or equivalent; a course in genetics is helpful.

2.112 Plant Anatomy 2 a.b.
Modern concept of functional tissue system of und plants; structural development and differentiation of cell types satisfying these needs; relationships between structure and function; prerequisite: 2.1 or equivalent.

2.113 Ultrastructural Plant Cytology 6 a.b.
Lecture and laboratory work on the cells and cellular organisms with emphasis on their relationship to the plant's anatomy to their function; inclusion of cellular compo-
ents and structures and the cytoplasmic evidence obtained by light and electron microscopy; prerequisite: 2.1 or equivalent.

2.114 Plant Morphology 6 a.b.
Lecture and practical instruction in preparation of permanent microscope slides; use of microscopes in the teaching plant material; standard cytological techniques, necessary for research in various fields of biology; prerequisite: 2.1 or equivalent.

2.115 Plant Mucilaginous Microorganisms 4 a.b.
Special procedures; preparation of permanent microscope slides from tissues not available in paraffin; processing of unscheduled tissues with staining microtechniques; microorganisms technique and methods: root zone propagation; cellulose methods; modern microscopic and microtechniques; prerequisite: 2.1 or equivalent and courses of re-
levance; alternate years.
Chemistry

Students majoring in chemistry must meet the basic skills and core course requirements for a liberal arts degree, and complete a structured program of chemistry courses. Before the junior year, the student will take from 16 to 18 hours of chemistry courses, and other courses necessary to do advanced work in chemistry. A special undergraduate advisor is available to help students work out 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, 4:2 or 4:5 Principles of Chemistry
4:6 Elementary Chemistry Laboratory
4:1, 112, 122 Organic Chemistry
4:111, 112 Analytical Chemistry
4:131, 132 Physical Chemistry
4:141, 142 Intermediate Chemistry Laboratory
4:143, 144 Advanced Chemistry Laboratory
4:170 Advanced Inorganic Chemistry
4:161 Introductory to Senior Research
4:162 Senior Research
4:50 Chemistry Orientation

* May be satisfied by examination

Mathematics

Selected courses to include integral calculus.

Physics

Two semesters (either 29:1, 2 or 29:17, 18; 29:17, 18 are recommended).

Foreign Languages

German 13:1, 12, 21, or two semesters of German and two semesters of either French or Russian.

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, botany, zoology, geology, physiology.

The Bachelor of Arts Degree

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

Chemistry Courses

4:1, 4:2 or 4:5 Principles of Chemistry
4:6 Elementary Chemistry Laboratory
4:121, 122 Organic Chemistry
4:111, 112 Analytical Chemistry
4:131, 132 Physical Chemistry
4:141 Intermediate Chemistry Laboratory
4:143 Advanced Chemistry Laboratory
4:50 Chemistry Orientation

* May be satisfied by examination

Mathematics

Selected courses to include integral calculus.

Physics

Two semesters (either 29:1, 2 or 29:17, 18; 29:17, 18 are recommended).

Foreign Languages

A minimum of 12 semester hours 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. The requirements for a minor in mathematics may be satisfied by an additional advanced course in mathematics. A minor in physics requires a minimum of 10 additional semester hours in physics.

(See College of Education.)

One- and Two-Year Curricula in Chemistry

The following courses are available to students who desire a two-year curriculum in chemistry.

4:1, 4:2 or 4:5 Principles of Chemistry
4:6 Elementary Chemistry Laboratory
4:7, 8 General Chemistry
4:9 General Chemistry Laboratory
4:11 Elementary Quantitative Analysis
4:121, 122 Organic Chemistry
4:141, 142 Intermediate Chemistry Laboratory

Courses 4:1, 4 or 4:5 and 4:6 (or 4:7, 8 and 9) and 4:121, 122, 141 are designed to fulfill a background in general and in organic chemistry. Chemistry 4:7, 8 and 9 are recommended if a one-year curriculum in chemistry is desired.

* May be satisfied by examination
Graduate Study in Chemistry

Admission

The Department of Chemistry requires the completion of a bachelor's degree in chemistry for admission to graduate study in chemistry. Students with a bachelor's degree in engineering, mathematics or physics may also work in chemical physics. The requirements for admission prescribed by the Graduate College must also be fulfilled.

Program

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 the areas of chemistry. This can be accomplished by receiving a minimum of 270 grade-point average in the courses listed below or by examination. Candidates for the M.S. degree are required to obtain a minimum grade point average of 3.0 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
4:173 Advanced Physical Chemistry

Entering students will be given the opportunity to take exemption examinations to demonstrate competence in the areas listed above. These exams will be given at the beginning of the academic year and will cover material equivalent to that given in the courses listed.

Students with undergraduate majors in chemistry, mathematics or physics may elect certain courses in the major area of specialization. Programs of study leading to advanced degrees are administered jointly by the departments of Chemistry and Physics. Selected courses in chemistry, mathematics and physics are substituted for the above required courses. Course requirements can be obtained by writing to the chairman, Department of Chemistry.

M.S. with Thesis

A Master of Science degree with thesis is offered in the fields represented above. A program of courses consisting of a minimum of 30 semester hours is required. Eight semester hours of the 30 may be in research. Research work for the master's degree is under the direction of a staff member and is started in the second semester of residence.

M.S. without Thesis

A program of courses consisting of a minimum of 30 semester hours is required for the master's degree without thesis. A student electing this program selects an adviser in his or her major field of interest and fulfills all the requirements stated above with the exception of research work and the thesis.

Ph.D.

A program of study for the Ph.D. degree in the fields previously listed consists of a minimum of 72 semester hours of graduate work. Graduate study takes for the master's degree the form of 32 semester hours. The program of study includes the areas specified courses and courses in the major or minor field of interest. The related field may be in chemistry or in some other area.

Each candidate for the Ph.D. degree must select a research problem in consultation with his or her research director. The problem must be investigated diligently and carried to a suitable state of completion so that it demonstrates marked capacity and originality in research. A thesis covering the research work is written in the form specified by the Graduate College as evidence of a completed research project.

Examinations

Although research rather than subjective examinations (except in courses) is emphasized, a minimum number of oral examinations is required for the various advanced degrees. The oral examination for the M.S. degree with thesis consists of a defense of the written thesis. A minimum grade point average of 2.5 is required to advance to the master's examination. The examination for the M.S. degree without thesis covers graduate coursework. The Ph.D. oral comprehensive examination may also serve as the oral examination for the M.S. degree.

An oral comprehensive examination in defense of a prepared research proposition is required for candidacy for the Ph.D. degree. Students who have demonstrated the required competence in the major area of chemistry and who have maintained a minimum grade point average of 2.70 are admitted to the oral examination upon presentation and preliminary approval of their research proposal. Six months after the Ph.D. oral comprehensive examination, another examination is given to evaluate the candidate's research progress. A final oral examination is required of all candidates for the Ph.D. degree. The Ph.D. thesis and a manuscript of the thesis (written in the correct style for a chemistry journal) must be defended satisfactorily before an examining committee. The Ph.D. examining committee, composed of five members of the graduate faculty, is the final authority in recommending conferral of the Ph.D.

Languages

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

Teaching

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

P.L.D. in Applied Mathematics

The Department of Chemistry cooperates in interdisciplinary
doctrinal programs in Applied Mathematical Sciences. See "Division of Mathematical Sciences."

Facilities
The Department of Chemistry is housed in a five-story building and a new, 1963 five-story annex and auditorium addition. The building contains 22 undergraduate laboratories, 48 graduate research laboratories, six storerooms, three shops and a number of special-purpose instruction rooms. Modern equipment worth over $2 million is available for research.

The Department's excellent library facilities are available to all students. The library contains all standard reference works, textbooks, complete volumes of journals and subscriptions to 150 current scientific journals.

The University Computer Center is also available to chemistry students. In fact, some advanced courses require the student to use the Center.

Staff: professors Banting, Burdick, Burton, Doyle, Duke, Gordon, Hsui, Plummer, Still, Wawonnek; professor emeritus Shimer; associate professors Bennett, Buchan, Cester, Crouse, van Deusen, Davis, Eyman, Frank, Friedman; associate professor Emeritus Corning, assistant professors Coffman, Nair, Sanda, Swalelley, Talty

Courses Primarily for Undergraduates
4/1 Principles of Chemistry I 3 or 4 a.h.
For beginning students who plan to take more than two semesters of chemistry; two lectures and one discussion weekly; engineering students register for four semester hours, which include one laboratory period each week.

4/2 Principles of Chemistry II 3 or 4 a.h.
For beginning students who plan to take more than two semesters of chemistry and who have had a good high school chemistry course; two lectures and one discussion weekly; prerequisite: passing score on a chemistry examination for which an additional three semester hours of integrated credit will be awarded at a minimum of three semester hours of advanced college placement credit from high school chemistry.

4/3 Elementary Chemistry Laboratory 3 a.h.
One lecture and one laboratory weekly; prerequisite: 4/1 or 4/4. (4, 4.5 or 4.7) 4/3 General Chemistry I 3 a.h.
For beginning students who plan to take one or two semesters of chemistry; three lectures and one optional discussion weekly.

4/4 General Chemistry Laboratory 3 a.h.
Elementary organic chemistry, for students who plan to take one or two semesters of chemistry; three lectures and one optional laboratory weekly; prerequisite: 4/1 or 4/4 or 4/5 or 4/7.

4/5 General Chemistry Laboratory 3 or 5 a.h.
One lecture and one or two laboratory periods weekly; prerequisite: or completion of 4/4.

4/11 Elementary Quantitative Analysis 4 a.h.
Principles and techniques of quantitative analysis; two lectures and two laboratory periods weekly; prerequisites: 4/4.

4/20 Chemistry Orientation 0 a.h.
Chemistry curricula, methods of study, chemical professions; field of chemical specialization, present and future developments, required for all majors in chemistry each semester; one meeting per month as arranged; no prerequisite.

4/21 Development of Ideas in Chemistry 4 a.h.
Development of ideas from historical and modern chemistry; traced logically, chronologically and from a humanistic point of view; elective for non-majors. Three lectures and one laboratory weekly.

4/22 Chemistry In Our Lives 3 a.h.
Contemporary topics involving chemistry, particularly those in which chemical developments after our way of life, three lectures weekly.

4/100 Inorganic Syntheses 2 or 3 a.h.
Preparation of a variety of inorganic compounds; two laboratory periods weekly; prerequisite: 4/20.

3/100 Introductory Organic Chemistry 3 a.h.
An introduction to organic chemistry with emphasis on biomolecules; required for high school biology teachers; three lectures weekly.

3/110 Analytical Chemistry I 3 a.h.
Chemical analysis and qualitative and quantitative methods of analysis; three lectures weekly; for B.S. and B.A. majors in chemistry; prerequisite: 4/11.

3/110 Analytical Chemistry II 3 a.h.
Chemical analysis and qualitative and quantitative methods of analysis; two lectures and one or two laboratory weekly; prerequisite: 4/11.

3/120 Organic Chemistry I 3 a.h.
General principles illustrated by preparations and study of typical representative of aliphatic and aromatic series; three lectures weekly; prerequisites: 4/4 and 4/5.

3/120 Organic Chemistry II 3 a.h.
Continuation of 4/110, which is prerequisite.

3/125 Introduction to Organic Research 3 or 5 a.h.
Synthesis and purification of organic compounds; methods and techniques of structure determination; two conferences and one to three laboratory periods weekly; prerequisites: 4/12 and 4/12.

3/125 Organic Qualitative Analysis 3 or 4 a.h.
Identification of pure organic compounds and mixtures; two lectures and two laboratory periods weekly; prerequisites: 4/12, 4/12, 4/12.

3/125 Introduction to Polymer Chemistry 3 a.h.
Modern methods in the study of structures, properties, synthesis and characterization of polymer; prerequisites: 4/12, 4/12, 4/12.

3/125 Advanced Physical Chemistry I 3 a.h.
Elements of theoretical chemistry, elective for premedicated students and senior physics majors; three lectures weekly; prerequisite: 4/12.

3/125 Physical Chemistry I 3 a.h.
Application of laws of physics to chemical phenomena; three lectures weekly; prerequisite: Physics 201B. Mathematics 223M or 228M.

3/125 Physical Chemistry II 3 a.h.
Continuation of 4/110, which is prerequisite.

3/125 Introduction to Symmetry in Quantum Chemistry 3 a.h.
Elementary symmetry arguments applied to quantum chemistry problems; prerequisite: 4/12.

3/125 Intermediate Chemistry Laboratory I 2 a.h.
Preparation, purification, identification and analysis of chemical compounds, primarily organic compounds; one lecture and two laboratory periods weekly; prerequisite: 4/12.

3/125 Intermediate Chemistry Laboratory II 2 a.h.
Continuation of 4/12, which is prerequisite; one lecture and two laboratory periods weekly.

3/125 Advanced Chemistry Laboratory I 2 or 3 a.h.
Physical and analytical methods; one lecture and two laboratory periods weekly; prerequisites: 4/11 and 4/12.

3/125 Advanced Chemistry Laboratory II 3 a.h.
Continuation of 4/13, which is prerequisite; one lecture and two laboratory periods weekly.

8/1 Introduction to Senior Research 1 a.h.
Information on from chemical literature and patents; preparation and analysis of chemical research problems; one meeting weekly; may repeat once for credit; prerequisite: senior standing in chemistry.

8/12 Senior Research 1 a.h.
May be repeated for credit; prerequisite: senior standing in chemistry.

8/176 Advanced Inorganic Chemistry 3 a.h.
Advanced topics in inorganic chemistry; three lectures weekly; prerequisite: 4/12.

8/177 Advanced Analytical Chemistry 3 a.h.
Discipline of inorganic analysis; two lectures and one laboratory weekly; prerequisite: 4/12, 4/12.

8/177 Analytical Chemistry 3 a.h.
Continuation of 4/11, which is prerequisite.

8/197 General Organic Chemistry 2 a.h.
General organic chemistry for advanced students; three lectures weekly; prerequisite: 4/12.

8/197 Advanced Physical Chemistry 3 a.h.
Physicochemical principles for advanced students; three lectures weekly; prerequisite: 4/12.

8/197 Chemical Pedagogy 3 a.h.
Techniques and practices of presenting chemical principles and techniques of self
Child behavior and Development

Seminars in Chemistry
The following courses present discussions of latest advances in the various fields of chemistry, prerequisite consent of instructor.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4581</td>
<td>Seminar: Analytical Chemistry</td>
<td>0 or 1 cr.</td>
</tr>
<tr>
<td>4582</td>
<td>Seminar: Inorganic Chemistry</td>
<td>0 or 1 cr.</td>
</tr>
<tr>
<td>4583</td>
<td>Seminar: Organic Chemistry</td>
<td>0 or 1 cr.</td>
</tr>
<tr>
<td>4584</td>
<td>Seminar: Physical Chemistry</td>
<td>0 or 1 cr.</td>
</tr>
</tbody>
</table>

Research in Chemistry
The following courses present thesis work for advanced degrees; consent of instructor and laboratory work strongly; prerequisite consent of Department and major advisor.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4591</td>
<td>Research: Analytical Chemistry</td>
<td>1-9 cr.</td>
</tr>
<tr>
<td>4592</td>
<td>Research: Inorganic Chemistry</td>
<td>1-9 cr.</td>
</tr>
<tr>
<td>4593</td>
<td>Research: Organic Chemistry</td>
<td>1-9 cr.</td>
</tr>
<tr>
<td>4594</td>
<td>Research: Physical Chemistry</td>
<td>1-9 cr.</td>
</tr>
</tbody>
</table>

Child Behavior and Development (Institute of Child Behavior and Development)

Acting Director: Howard V. Meredith
Degrees offered: B.A., M.A., Ph.D.

A primary function of the Institute is the training of students for research and teaching careers in the field of child development. In discharging this function the Institute offers programs leading to the B.A. degree in child development, the M.A. degree in preschool education, the M.A. degree in child behavior and the Ph.D. degree in child psychology.

Undergraduate Major

The B.A. program in child development serves a twofold purpose. For students not planning to continue academic training beyond the bachelor's level, it provides a scientifically-oriented liberal arts education focusing on accumulated knowledge regarding infant and child behavior. For students who plan to obtain subsequent graduate training in child psychology and related fields, it provides a scholarly foundation of method and content. Career opportunities are scarce for students at the B.A. level. At the M.A. level there is a variety of employment opportunities, and career opportunities are plentiful for students earning the Ph.D. degree.

Majors in the B.A. program gain experience in working with children in research settings and may elect practicum participation in one of the Institute preschool groups. In the course of meeting the general requirements of the College of Liberal Arts, students satisfy the following curricular specifications:

- Prerequisites:
  - 311: Elementary Psychology
  - 22M/30: Elementary Functions (or equivalent)
- and any two of the following:
  - 291: College Physics
  - 292: College Physics
  - 4/7: General Chemistry I
  - 4/8: General Chemistry II
  - 37: Principles of Human Genetics
- Required coursework:
  - 591: Introduction to Child Psychology
**Graduate Majors**

M.A. in Preschool Education

This M.A. program, which normally takes two years to complete, provides information regarding child behavior theory, opportunity for applying this knowledge in a laboratory preschool, practice in teaching children and working with their parents, and experience in preschool administration and supervision of teachers in training. In addition to the requirements listed below, the student may elect a variety of courses in such areas as kindergarten methods, special education, personality development and socialization. The program prepares students for careers as administrators and teachers in institutions concerned with education of preschool-aged children. Career opportunities also exist in social agencies, state departments of education and university academic departments.

**Required courses**

- 5:201 Introduction to Child Psychology
- 5:202 Methodological Problems in Child Development (register for 5:199)
- 5:203 Laboratory in Child Psychology
- 5:215 Seminar Child Development Research
- 5:230 Preschool Education
- 5:231 Seminar Curriculum Development in the Preschool
- 5:234 Advanced Practicum in Preschool Education
- 5:301 Research in Child Development
- 5:337 Method at Early Childhood Education I
- 5:343 Introduction to Statistical Methods

**Elective course (12 semester hours required from those listed below)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:201</td>
<td>Child Development</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:154</td>
<td>Sensation and Perception in Children</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:215</td>
<td>Social Behavior of Children</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:235</td>
<td>Psychopathology of Children</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:240</td>
<td>Learning in Children</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:241</td>
<td>Motivational Determinants of Child Behavior</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:242</td>
<td>Visual Psychophysics of Children</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:245</td>
<td>Verbal Processes in Children</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:249</td>
<td>Discrimination Learning in Children</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:282</td>
<td>Infant Learning and Perception</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>17:116</td>
<td>Nutrition Work with Children</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

**M.A. in Child Behavior**

This M.A. program provides the student with advanced training in each of several content areas of child psychology and substantial opportunity for participation in research activities. The program, which normally requires two years to complete, is designed to prepare students as junior collaborators in psychological research with children. Graduates are qualified for positions such as laboratory supervisor, research associate and technical or research assistant. They may also be prepared to serve as instructors in undergraduate courses in child psychology. Students who complete this program with demonstrated ability for further study gain training that is appropriate for pursuit of doctoral work in child psychology.

**Required courses**

- 5:201 Methodological Problems in Child Development
- 5:215 Seminar Child Development Research
- 5:240 Learning in Children
- 5:301 Research in Child Development
- 3:143 Introduction to Statistical Methods
- 22S:148 Advanced Statistical Methods
- 22S:159 Design of Experiments
- 3:232 History and Systems of Psychology
- 3:135 Laboratory Techniques

**Elective course (nine semester hours required from those listed below)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:218</td>
<td>Social Behavior of Children</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:235</td>
<td>Psychopathology of Children</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:241</td>
<td>Motivational Determinants of Child Behavior</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>5:242</td>
<td>Visual Psychophysics of Children</td>
<td>3 s.h.</td>
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<tr>
<td>5:245</td>
<td>Verbal Processes in Children</td>
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<td>5:249</td>
<td>Discrimination Learning in Children</td>
<td>3 s.h.</td>
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<tr>
<td>5:282</td>
<td>Infant Learning and Perception</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>17:116</td>
<td>Nutrition Work with Children</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>
Child Behavior  and Development

5249 Discrimination Learning in Children  3 s.h.
5282 Infant Learning and Perception  3 s.h.

RecommenIation for the granting of the M.A. degree in child behavior requires completion of 36 semester hours of graduate study with a minimum grade-point average of 2.5, preparation of an acceptable thesis and satisfactory performance on a final examination consisting of written and oral parts.

Ph.D. in Child Psychology

The Ph.D. program, which normally takes three to four years to complete, involves a major in experimental child psychology and substantial coursework in general experimental psychology in the Department of Psychology. There is no language requirement. Following completion of core courses in research methodology, quantitative methods, philosophy of science and general psychology, the student and his or her advisor jointly plan a program of studies designed to provide specialized training in areas of child psychology of particular interest to the student, including learning and cognition, motivation, memory processes, social development, sensation and perception, and psychophysiology. Emphasis is placed throughout on the normal child. Classroom and library activities are complemented by the In-Service Training Program, through which the student receives personalized research experience participating in faculty projects. Collaborative and independent investigations in addition to the Ph.D. dissertation are encouraged. The training given graduates of this program prepares them to teach and to conduct research oriented toward either basic or applied problems in a wide variety of settings, including college and university academic departments, research units in hospitals and clinics, and government agencies.

Required courses

5201 Methodological Problems in Child Development  3 s.h.
5215 Seminar in Child Development Research  0 s.h.
5240 Learning in Children  3 s.h.
5241 Motivational Determinants of Child Behavior  3 s.h.

5248 Advanced Statistics: Methods  4 s.h.
5248 Advanced Statistics: Methods  4 s.h.
5248 Advanced Statistics: Methods  4 s.h.
22M 197 Readings in Mathematics: Calculus I  3 s.h.
226 209 Philosophy of Science  2 s.h.
31 232 Conditioning and Learning  3 s.h.
31 232 History and Systems of Psychology  3 s.h.

One of the following

22M 197 Readings in Mathematics: Calculus II  3 s.h.
226 157 Current Methods  3 s.h.
31 455 Quantitative Methods in Psychology  3 s.h.

Two of the following

5217 Social Behavior of Children  3 s.h.
5222 Perceptual Processes in Children  3 s.h.
5235 Psychophysiology of Children  3 s.h.
5243 Verbal Processes in Children  3 s.h.

One of the following

5244 Mathematical Models of Child Behavior  3 s.h.
5249 Discrimination Learning in Children  3 s.h.

Admission to Ph.D. candidacy requires a minimum grade-point average of 3.0 for all graduate courses taken, completion of an M.A. research thesis or the equivalent, satisfaction of research skill requirements in mathematics and philosophy of science, passing of a comprehensive doctoral examination and presentation of an acceptable prospectus for the Ph.D. dissertation. Recommendation for the granting of the doctoral degree requires 90 semester hours of graduate credit with a minimum grade-point average of 3.0, completion of all phases of the curricular program selected, preparation of an original research dissertation and satisfactory defense of the dissertation before an Institute faculty-student seminar and a Graduate College examining committee.

Graduate Admission Requirements and Procedures

Applicants to the three graduate programs are evaluated with respect to previous academic record, performance on the verbal and quantitative portions of the Graduate Record Examination and letters of reference. In general, applicants who have maintained less than a 3.0 undergraduate grade-point average (on a 4-point scale) are considered only if other information indicates a strong potential for graduate study. The corresponding requirement is 2.75 for the two M.A. programs.

Graduate students are admitted at the same time to the Graduate College and to the Institute. Application for admission to the Graduate College is made to the Director of Admissions, The University of Iowa, Iowa City 52240. The applicant must submit a formal application and official transcripts of all previous academic work, as well as scores on the Graduate Record Examination Aptitude Test. Application for admission to the Institute is made to the chairman of admissions, Institute of Child Behavior and Development, The University of Iowa, Iowa City 52240. The applicant must submit formal applications to a curricular program, official college transcripts, declaration of purpose in pursuing graduate work and the names of three professors who can write pertinent letters of recommendation.

Prospective applicants may obtain all necessary application forms and information on graduate assistantships and other types of student support by writing the chairman of admissions at the Institute.

Facilities

East Hall, which houses the Institute administrative, faculty and graduate student offices, also contains the Education-Psychology Library, the Institute's own library and stop facilities, and laboratories for research with infants and children. The University Pre-school Laboratories, located four blocks from East Hall and operated by Institute personnel, provide both teaching and research facilities. The annual enrollment exceeds 100 children who constitute a readily accessible population of preschool-aged subjects. The Institute maintains several mobile trailers used for research with school children of all ages to whom access is given through the cooperation of numerous public and private schools in the Iowa City area.

The Institute maintains a well-equipped workshop staffed with skilled personnel to fabricate and construct all research apparatus. The preschool complex includes numerous laboratory rooms equipped with one-way vision facilities. A wide variety of timing, recording, stimulus production and computational
The remaining hours are usually filled by third-year Greek, "Homer and Herodot," and fourth-year Greek, "Greece and Persia," and "Ptolemaic Egypt." A student majoring in Greek would graduate knowing not only how to read the Greek language, but also knowing some of the major works of Greek literature and something of the history of ancient Greece and the Near East of the seventh through the fifth centuries B.C., when most of the modern notions of political, artistic and social life began.

Major in Latin
Thirty semester hours minimum are required, of which 24 must be in Latin language courses above 20/215, 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 133 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 of six semester hours each and three hours of composition. The classics major combines, 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. Undergraduates in Latin, Greek, or classics are exempted from four semester hours of the literature core requirement but must complete 11/10. (For the general requirements of the College of Liberal Arts, see "College of Liberal Arts: For the requirements of the Iowa Teacher's Certificate, see College of Education.")

Honors
For exceptional students, two courses are offered in Honors Reading, one each semester of the senior year, for three semester hours of credit each semester. These credits are not in addition to the 30 (or 36) semester hours required of majors in the Department. 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. There are no admission requirements for any degree program offered by the Department.

Graduate Program
For the general requirements of the Graduate College, including the comprehensive examinations, see "Graduate College." The graduate students in classics may include in their program no more than six semester hours of courses numbered 103-160 and six semester hours of courses numbered 161-199.
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 no Greek are normally expected to include at least elementary Greek in their programs.

In addition, the course 14:201 or 20:201 Proseminar: Introduction to Advanced Study (three semester hours) is required.

Special programs will be arranged for candidates who wish to prepare for teaching the classics in English (general education courses, world literature, etc.).

Ph.D. in Classics
Completion of 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 in a reading list prepared by the student and his or her advisor and approved by the Department; a tested reading knowledge of German and French; passing three written comprehensive examinations on ancient history, a special field, and Greek or Latin literature, and a two-hour oral examination on Greek or Latin literature; writing and defending a dissertation embodying original research or interpretation of a classical subject.

Required courses are:
14:201 or 20:201 Proseminar: Introduction to Advanced Study 3 s.h.

One of each of the following two areas:
a. Ancient Art or Philosophy 3 s.h.
b. Ancient Linguistics or Paleography 3 s.h.
Latin Seminar 6 s.h.
Greek Seminar 6 s.h.

One of the seminars (six semester hours) will normally be taken after the writing of 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 the curriculum.

The Department itself has a varied collection of slides on classical subjects and a small library of its own.

Associated with the Department is the Classical Museum which contains a valuable collection of coins, vases and figurines in bronze from Myceneae, Pompelium and Herculaneum.

The University of Iowa is a supporting institution of the American School of Classical Studies at Athens and the American Academy in Rome, thereby making the facilities of those schools available to its faculty and graduate students.

The University of Iowa is also a contributing member of an international group which is sponsoring the uncovering of and publication of information about the ancient monasteries of Tunisia. Annually a team from The University of Iowa goes to Tunisia to work on this project.

The Faculty
Members of the Classics Department faculty are regular contributors to the leading classical and archeological periodicals and are authors of many books interpreting the ancient world.

They are recognized nationally and internationally and reflect the diverse possibilities which exist in the field of classics for the study of literature, history, or ancient art and archeology.

Staff: professors Goldstein, Horrobin, professor emeritus Nyberg; associate professors Alexander, Holtsmark; assistant professors Bush, Flickinger, Gardner, Jackson

Greek
Courses for Undergraduates Only

Students wishing to satisfy the B.A. foreign language requirement by studying Greek should take the following sequence of courses: 14:1, 2, 11, 12.

14:1 Elementary Greek 4 s.h.
Fundamentals of Accent Greek and basic concepts of Greek civilization; five meetings per week.

14:2 Elementary Greek 4 s.h.
Continuation of 14:1; selections from Greek authors are read.

14:3 New Testament in Greek 2 s.h.
Reading and interpretation of the selected passages from the Gospel may be taken with or after 14:2.

14:11 Second-Year Greek 3 s.h.
Reading of selected texts of Greek prose and poetry; prerequisites: 14:2 or equivalent.

14:12 Second-Year Greek 3 s.h.
Continuation of 14:11, which is prerequisite.

Courses for Undergraduates and Graduates

14:121 Homer and Hesiod I 3 s.h.
For third-year Greek students, selected works from Homer's Illiad and Odyssey and from Homer's Works and Days and Thespian-rod in Greek, complete works read in English.

14:122 Homer and Hesiod II 3 s.h.
Continuation of 14:121, which is prerequisite.

14:181 Homer and Pindar 3 s.h.
For students in fourth year of Greek; covers leading to Pindarian Lawrence; sequence of the ideas, form and content of a number of Pindarian poems, Analysis: poems and selections from Homeric and Greek poetry, supplementary readings.

14:195 Fifth-Century Athens 3 s.h.
Continuation of 14:181, which is prerequisite; changing intellectual climate of late fifth century BC with emphasis on the Attic orators and their place in the western tradition.

14:171 Greek Elementary Composition 3 s.h.
Review of morphology and syntax, Greek sentence structure and composition of short passages in Greek.

14:172 Advanced Greek Composition 3 s.h.
Prerequisite in writing a short paragraph prose with style of Lyric and Democritus as models.

14:199 Helenistic Greek Historical Texts 3 s.h.
Readings in Politics and Macroscope.

14:192 Hellenistic History 3 s.h.
Special topics on a special author or topic leading to several short papers in first semester, a long paper in second semester, both courses required for Honors eligibility.

14:198 Private Tutorial 1 to 3 s.h.
For Classics majors who have completed four years of Greek or equivalent.

14:199 Private Assignments cr, wtr.
Supervised individual study for advanced students who are not majors in the Department; may be repeated.

Courses for Graduate Students

14:201 Proseminar: Introduction to Advanced Study 3 s.h.
Advanced methods and disciplines: bibliography, textual criticism, paleography, history of classical scholarship; required of all graduate students.

14:205 Advanced Reading cr, wtr.
Open only to graduate students in the Department.

14:209 Indo-European Philosophy 3 s.h.
Examinations of comparative method as applied specifically to Greek and Latin, and study of phonological and morphological laws, some or all
Comparative Literature
Program Chairman: Alan F. Nagel
Department of Classics, M.A., Ph.D.

The purpose of the Comparative Literature Program is to present literature as an interdisciplinary and international study and to provide a basis for intensive work in literature, literary theory and critical method. The Program does not offer an undergraduate major; undergraduates interested in comparative studies are encouraged to investigate the major in Letters, which is closely coordinated with Comparative Literature.

Admission
Interested students who meet the requirements for admission to graduate study in the University should consult Professor F. Nagel, chairman of the committee. Formal application is made to the University Office of Admissions.

Master of Arts Degree
The optional degree of Master of Arts in comparative literature may be granted to a student in the Program when he or she has completed 45 semester hours of graduate coursework at least 24 of them at the University of Iowa, with a grade-point average of 3.25 or better and in accordance with a plan of study approved by the Comparative Literature examining committee, and when he or she has passed the qualifying examinations for the Ph.D. in comparative literature and has been admitted to the doctoral program.

Doctor of Philosophy Degree
A student seeking a dissertation in comparative literature will study one literature in depth for a major professional concentration and, for a minor, choose a limited area of specialization in two other literatures. A third portion of the program is devoted to comparative study which brings the major and minor into one focus. A total of 90 semester hours (including any work done for the M.A. degree) is required.

Languages
A study of literature across linguistic boundaries requires special training in languages. Accordingly, a thorough knowledge of at least two foreign languages is essential to the literary curriculum. Entering students should have advanced knowledge of one foreign language (approximately three years of college work or the equivalent). They are expected to be able to communicate in this language, in all its forms, within two years after admission to the program. A high degree of competence should also be developed in using and analyzing texts in the second foreign language. Some reading skills must be demonstrated in a third foreign language.

Doctoral candidates ordinarily offer courses in Old English, Old or Middle High German, Old Norse, Old French, Old Spanish, etc., in a classical language and literature. They may, under permission of the University, offer a literary course in a fourth modern foreign language if they wish.

Course of Study
The major should comprise about half of the student's program. Majors are offered in classics, English, French, German, Italian and Spanish. Courses should range over the entire history of that literature and should also involve a case study of the most important literary genres. The minor, requiring the study of at least two additional literatures, permits several choices: a student
may elect to study a segment of literary history, an aspect of Classical literature, a Medieval literature, a genre (e.g., novel, drama), an understanding of the works of a particular writer, a focus on a single work, a study of a particular period or region, a focus on a particular literary form or genre, a focus on a particular theme or subject, a focus on a particular method or technique, or a focus on a particular critical theory. Qualification courses in the area of specialization are available in English, French, German, Italian, Russian, and Spanish, as well as in Latin and Greek.

Comparative study consists of work in comparative literature courses and seminars. A reasonable knowledge of literary traditions and an understanding of the comparative method in scholarship and criticism should be obtained in these courses. Although the student's training in comparative literature involves an understanding of the European tradition as a whole, it is expected that he or she will apply the comparative method within his or her area of concentration (e.g., French, English or German novel, or the eighteenth century or Romanticism). Particular programs for each student will be worked out with faculty advisers.

Examinations

By the end of his or her first year of graduate work, the student should be qualified as a candidate for the doctorate. Qualification consists of an examination or essay composed in the foreign language of the student's choice on a literary work written in that language and an oral examination (also in the foreign language) of the work in question; and an oral examination designed to test the student's grasp of comparative critical principles and likelihood of success in further work within the comparative discipline.

At the end of the student's regular course of study he or she will take a comprehensive examination consisting of a written and an oral part. The oral examination is devoted partly to further elaboration of questions asked in the written exam.

In addition, the student will be given two weeks' time to outline his or her projected dissertation and compile a bibliography for it. He or she will, at the end of this period, defend his or her project before the Program committee.

Dissertation

The candidate's dissertation should demonstrate his or her ability to write a substantial piece of scholarship or criticism and his or her proficiency in the designated foreign language. A dissertation of a scholarly or critical nature is expected; however, in the case of certain literary works of high critical complexity, preceded by a critical introduction, may be acceptable as a dissertation. The final oral examinations center on the dissertation and its background.

Staff: professors Bernoci, Hayman, Martinez-Bonw, associate professors Deligios, Spivak, assistant professors Kuczala, Nagel

Faculty assisting in the Program: professors Aipol (French and Italian), Brown (English), Cortes (French and Italian), Dusiak (English), Fernandez (Spanish and Portuguese), Feisling (German), Hispanic (Classics), Irish (English), Morley (English), O'Gorman (French and Italian), Whalen (English), Williams (English); associate professors Chamberlin (English), J. Hornsby (French and Italian), Kral (Speech and Dramatic Art), Luxemburg (Russian), Woerner (English)

Courses

Students in comparative literature are expected to concentrate on their studies primarily in department courses. Students may choose and should show evidence of considerable work in foreign literature taught in the original. In addition, the seminars and seminars listed below may be studied in similar literatures.

Upper Division

48/103 European Renaissance 3 s.h.
48/106 European Literature of the 18th Century 3 s.h.
48/113 Theory and Technique of Oral Literature 3 s.h.
48/143 Literary Genres in European Literature 3 s.h.
48/189 Individual Study or, 1 s.h.

Primarily for Graduate Students

48/204 Modern and Middle Eastern 3 s.h.
48/217 International 3 s.h.
48/205 Age of Enlightenment 3 s.h.
48/206 European Renaissance 3 s.h.
48/207 European Romanticism 3 s.h.
48/208 European Poetry 3 s.h.
48/211 Renaissance 3 s.h.
48/212 Middle Eastern Literature 3 s.h.
48/213 African Literature 3 s.h.
48/214 Latin American Literature 3 s.h.
48/215 English Literature 3 s.h.
48/216 French Literature 3 s.h.
48/217 German Literature 3 s.h.
48/218 Italian Literature 3 s.h.
48/219 Russian Literature 3 s.h.
48/220 Japanese Literature 3 s.h.
48/221 Spanish Literature 3 s.h.
48/222 Czech Literature 3 s.h.
48/223 Polish Literature 3 s.h.
48/224 Hungarian Literature 3 s.h.
48/225 Slovak Literature 3 s.h.
48/226 Slovene Literature 3 s.h.
Dental Hygiene

48:290 Critical Theory: Plato to the Romantics 3 s.h.
Theory of literature: emphasis on philosophical implications of theories arrived at in classical antiquity, Renaissance, and Neoclassical Europe up to the age of Romanticism.

48:294 Critical Theory: Cartesian to Crane 3 s.h.
Theory of literature from Romanticism to present.

Comparative Seminars

48:395 Comparative Approaches or, arr.
Setting for testing and evaluation of methods available to literary analysis; may form part of a sequence; see 40:305 below.

48:395 Comparative Approaches II or, arr.

48:395 Seminar: Literature: Native American or, arr.
The concept of "nation," its application to literary relations between writers, movements, and national trends in various countries.

48:395 Seminar: Special Topics in Medieval and Renaissance Literature or, arr.
Comparative problems in Medieval and Renaissance literature; topics differ from year to year.

48:395 Seminar: Stylistics or, arr.
Special Topics in Historical Literature or, arr.
Studies in American and high modem literature, with particular emphasis on Creek and Lake influence on European Renaissance.

48:395 Seminar: Teaching of Comparative Literature or, arr.
Methods and problems in teaching of comparative literature; class discussions, directed readings, and occasional participation in teaching comparative literature courses under supervision and with consent of regular instructors.

48:395 Seminar: Special Topics in Modern Literature or, arr.
Topics in recent and contemporary literature in England, the United States and on European continent.

48:395 Seminar: Special Projects or, arr.

48:395 Thesis or, arr.

Computer Science

See "Mathematical Sciences"

Dental Hygiene

Department Chair: Pauline Breeze
Degrees offered: B.S., M.S.

Undergraduate Program

The dental hygiene student should be knowledgeable of the basic, social, dental, and clinical sciences in contributing to the attainment of oral health for all people. Qualification by education and licensure, the dental hygienist provides patient treatment as prescribed by the dentist. These services include control of states and deposits from the teeth, application of agents which make teeth resistant to decay, retention of clinical and laboratory tests for interpretation by the dentist, and individual and community educational activities for prevention and control of dental disease. The dental hygiene major may pursue personal interest through employment in dental office practice, elementary and secondary schools, hospitals and schools for the handicapped, community, state and federal service, industry, dental hygiene education, dental research, and foreign service.

Unlike traditional programs, the Iowa curriculum is designed to integrate related subjects to provide sequential lecture, laboratory and clinical experiences. For example, content traditionally presented as separate courses in oral prophylaxis technique, head, neck and dental anatomy, and dental materials are combined into a related junior core of learning. Additional courses taken during the junior year are therapeutics, endodontology, radiology and periodontology.

During one semester of the senior year, students advance clinical skills in the comprehensive dental clinic. They perform clinical service working as members of dental teams. A dental office "practice" is simulated to provide a more realistic learning environment, not only for the hygiene student in performing clinical skills but for both the hygiene and dental student in realizing the potential value of the dental team approach. Such clinical involvement enables the dental hygiene student to participate more effectively as a member of the dental team. Weekly lectures and seminars are scheduled to re-enforce clinical learning.

Senior students not participating in the clinical dental hygiene core are enrolled in a community dental health course. Courses traditionally taught as isolated subject-oriented units, such as dental health education, public health and audiovisual media, are incorporated into an integrative 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, theories of learning and methods of teaching to community dental health activities.

Special Programs

The College of Dentistry is conducting a five-year experimental program in dental hygiene which will extend through the 1975-76 academic year. The study is designed to test the feasibility of teaching expanded duties in dental hygiene, apart from the dentistry and periodontology. Twelve students are selected from each junior class to enter the program.

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). To fulfill the 80 semester hours of college coursework 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;
- four semester hours of inorganic chemistry;
- four semester hours of organic chemistry (course to include: biochemistry);
- four semester hours of microbiology;
- three semester hours of nutrition;
- four semester hours of psychology; and
- four semester hours of sociology.

The dental hygiene major is completed as upper division credit. Students who have completed an associate degree program in
dental hygiene and wish to pursue a bachelor's degree must therefore select a related field as the upper division area of study. Students beginning 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. Generally, transfer students are interviewed by the Dental Hygiene admissions committee after submitting their application.

Graduate Program

The University of Iowa College of Dentistry's graduate program in dental hygiene was developed in response to the fast-growing demand for qualified educators in dental hygiene. It is one of four established dental hygiene graduate programs in the nation.

With increasing pressure from the public generally and dentistry particularly for the enrollment of undergraduate students in dental hygiene and with national increase in number of dental hygiene programs, opportunities for qualified dental hygiene educators are immeasurable.

Although a majority of the students who complete the master's degree program in Iowa enter the teaching or administrative areas of dental hygiene education, others have pursued related areas of interest, including public health service and doctoral studies.

The curriculum is designed to enable the graduate to formulate educational policies, objectives and curricula and to plan, supervise and evaluate teaching activities; understand the principles of curriculum development, select and apply a variety of methods to achieve particular educational aims, facilitate the supervision of students and collaboration of faculty personnel and understand and apply group learning processes; understand the role of research in graduate and professional institution effectiveness and educational accomplishments and involves others in productive decision-making processes; and interpret and apply research findings and conduct and report original research. Two full semesters and a summer session are required to complete the program. In addition to professional courses in the College of Dentistry, the program includes supplementary courses in the colleges of Liberal Arts, Medicine and Education. Approximately one-third of the courses are in education, one-third in dental hygiene and one-third in elective subjects.

Courses in education include tests and measurements, statistics, problems in college teaching and administration in higher education. Courses in dental hygiene include preparation, application and evaluation in teaching clinical dental hygiene; analysis of current research in the development of motor coordination and manual skills; changing concepts in dental hygiene education and administration; and an original research project of either a scientific or educational nature. The program's flexibility permits the student to pursue a minor in an area of particular interest. Electives may be taken in nutrition, speech pathology, sociology, or in the biological or medical sciences.

Special Programs

United States Public Health Service traineeships are available to qualified applicants enrolled in the Dental Hygiene graduate program at Iowa. Traineeships cover the initial cost of transportation to the University, in the nation, a yearly tax-exempt stipend and a dependency allowance.

If the recipient is unable to complete the required 38 semester hours in two semesters and a summer session, the traineeship may be extended. A prospective traineeship recipient must be admitted to The University of Iowa Graduate College and the Dental Hygiene graduate program before applying for a traineeship.

Admission Requirements

To be admitted for study toward the Master of Science degree in dental hygiene at The University of Iowa, in accordance with the general admission requirements of The University of Iowa Graduate College, the applicant must have:

• a bachelor's degree from an accredited college or university, with content equivalent to that required at Iowa;

• a 2.5 minimum grade-point average (4 = A) for all previous college work;

• previous practical experience in some aspect of dental hygiene; and

• satisfactory performance levels on the Aptitude Test of the Graduate Record Examination (GRE).

Staff: associate professor Brine; assistant professors Buchanan, Sisty, Williams; instructors Burns, Mescher, Schwind, Taylor

Courses for Undergraduates

681/682 Dental Hygiene Core I

Team teaching approach used to integrate basic dental hygiene theory and clinical skills; didactic material and practical experiences related to complete oral prophylaxis, emergency procedures, oral inspection, principles of instrumentation and patient communication; basic, rough and dental anatomy and properties of dental materials integrated throughout course; clinical experience includes practice on student volunteers and clinical patients

683/684 Oral Hygiene

Lectures, readings, seminars and clinical experiences related to theory and practice of dental hygiene, approximately 30 hours per week spent in clinical setting; students advance clinical skills in oral prophylaxis, subgingival curette, finishing alloy restoration, dietary counseling and oral health care interventions; lectures and discussions on ethics and practice management, including dental hygiene licensure, ethics and jurisprudence, office procedures, and research control and scientific method in each clinical related topic as one physiological devices, dietary counseling for plaque control and clinical supervision procedures current with clinical experiences

685/686 Clinical Dental Hygiene

Lectures, readings, seminars and clinical experiences related to theory and practice of dental hygiene, approximately 30 hours per week spent in clinical setting; students advance clinical skills in oral prophylaxis, subgingival curette, finishing alloy restoration, dietary counseling and oral health care interventions; lectures and discussions on ethics and practice management, including dental hygiene licensure, ethics and jurisprudence, office procedures, and research control and scientific method in each clinical related topic as one physiological devices, dietary counseling for plaque control and clinical supervision procedures current with clinical experiences

687/688 Community Dental Health

Didactic presentations, readings, discussions and field experiences related to theory and practice of community dental health; lectures are devoted to learning principles of communication theory, science and utilization of educational media and operation of audiovisual equipment; public health structure, organization, funding, demographics and dental epidemiology; and community field experiences; students with physical or psychological barriers provide opportunity to develop special techniques for teaching preventive measures and providing clinical service; scheduled weekly group discussions continue pertinent scientific literature, clinical

689/690 Oral Health Needs of Special Populations

689/691 Independent Study

Designed for students who want to pursue additional study or to explore career interest in dental hygiene education, research or public health
Courses for Graduates

58.291 Directed Teaching Experience or arr.
Application of learning theories in setting of dental hygiene; students share responsibility with faculty in preparation of educational objectives, didactic materials and test items for a selection of topics; course provides a learning environment for graduate students to pursue experience in lecture, laboratory and/or clinic setting.
3 s.h.

58.292 Directed Teaching Experience or arr.
Consent of both student and faculty is required to select a consensus area different from their last area of teaching experience
3 s.h.

58.299 Research/Dental Hygiene
Application of research methodology through development of an original research project
3 s.h.

58.299 Practicum I
6 s.h.
Incorporation of changing concepts in dental and dental hygiene education; courses include comparison of growth and diversity of programs in dental hygiene institutions in relation to confined trends, types of programs and institutional affiliations, and student selected criteria.

58.299 Practicum II
3 s.h.
Curriculum design applied to organization, development and evaluation of curricula in dental hygiene education; in addition to elements of curriculum development, course content includes identification of physical facilities, faculty and administrators, operational costs and sources of funding for programs in dental hygiene.

East Asian Languages and Literatures

Department Chairman: Hue-Ling Nieh
Degrees offered: B.A. in Chinese or Japanese, M.A. in Chinese

Undergraduate Programs

The Department offers training in spoken and written Chinese and Japanese languages, and instruction in the classical and modern periods of literature in both languages. Some courses are offered in literature in translation. The Department also contributes to the training of students in other fields requiring a knowledge of Chinese or Japanese.

The student completing a major may expect to acquire sufficient knowledge of Chinese or Japanese languages to prepare him or her for graduate study or for work in other disciplines demanding a knowledge of these languages.

Undergraduate majors are expected to complete a program of one or two semester hours in Chinese or Japanese languages, literature, civilization, and an external concentration. The minor enables the student to achieve a certain degree of concentration in an established discipline, enhancing both his or her intellectual development and vocational preparation. Some students take advantage of the external concentration to work out a double major program.

Major in Chinese Language and Literature

These are the course requirements for a major in Chinese language and literature:

Language

30 s.h.

39.001 Elementary Chinese
6 s.h.

39.002 Elementary Chinese
6 s.h.

39.103 Second-Year Chinese
6 s.h.

39.104 Second-Year Chinese
6 s.h.

Besides the above courses, two courses from the following are required:

39.107 Readings in Modern Chinese
3 s.h.

39.108 Readings in Classical Chinese
3 s.h.

39.109 Readings in Documentary Chinese
3 s.h.

39.114 Study of the Written Character
3 s.h.

39.141 Survey of Chinese Literature I
3 s.h.

39.142 Survey of Chinese Literature II
3 s.h.

39.143 Contemporary Chinese Literature
3 s.h.

39.144 Chinese Poetry
3 s.h.

39.145 Poetry in Chinese Painting
3 s.h.

39.146 Classical Chinese Fiction
3 s.h.

39.148 Chinese Drama
3 s.h.

39.149 Chinese Theatre
3 s.h.

39.151 Modern Chinese Fiction
3 s.h.

39.152 Civilization
6 s.h.

39.155 Asian Civilization: China
3 s.h.

39.139 History of the Chinese Language
3 s.h.

39.133 History of China in Circa 1840
3 s.h.

39.134 History of Modern China
3 s.h.

39.135 Ethnology of China
3 s.h.

39.137 Chinese Calligraphy and Painting
1 s.h.

39.138 Chinese Calligraphy and Painting
1 s.h.

39.159 Art of China
3 s.h.

39.161 Religion in China
3 s.h.

39.174 Introduction to Chinese Philosophy
2-3 s.h.

External Concentration (Recommended)

6-9 s.h.

Majors are encouraged to take courses in Japanese language and literature, and courses in a cognate sequence excluding those listed above, in one of the following fields: anthropology, art, Greek and Roman classics, economics, education, English, French, geography, German, history, journalism, linguistics, philosophy, political science, religion, Russian, sociology or Spanish.

Major in Japanese Language and Literature

These are the course requirements for a major in Japanese language and literature:

Language

30 s.h.

39.121 Elementary Japanese
6 s.h.

39.122 Elementary Japanese
6 s.h.

39.123 Second-Year Japanese
6 s.h.

39.124 Second-Year Japanese
6 s.h.

Besides the above courses, two courses from the following are required:

39.128 Readings in Classical Japanese
3 s.h.

39.129 Advanced Readings in Modern Japanese
3 s.h.

39.113 Japanese Speech
3 s.h.

39.115 Japanese Composition
1 s.h.

39.119 Japanese-English Translation
3 s.h.

Literature

6 s.h.

39.143 Survey of Classical Japanese Fiction
3 s.h.

39.144 Survey of Classical Japanese Poetry
3 s.h.

39.145 Survey of Modern Japanese Fiction
3 s.h.

39.146 Survey of Modern Japanese Poetry
3 s.h.

39.150 Japanese Literature and the West
3 s.h.

39.123 Japanese Dramatic Literature
3 s.h.

One course of Classical Chinese Literature

6 s.h.

39.056 Asian Civilization: Japan
3 s.h.

39.114 Study of the Written Character
3 s.h.
East Asian Languages and Literature

393:138 The Structure of Japanese
3 s.h.
393:153 History of Japan to 1867 A.D.
3 s.h.
393:154 History of Modern Japan
3 s.h.
393:155 Ethnicity of Japan
3 s.h.
393:156 Art and Architecture of Japan
3 s.h.
393:179 Japanese Thought
3 s.h.
393:161 Religion in Japan
3 s.h.

External Examination (Recommended) 6-9 s.h.

Honors
To become a candidate for Honors in Chinese or Japanese language and literature, the student must be a major in the field, have at least a 3.0 cumulative grade-point average and be recommended for Honors study by his or her adviser.

An Honors candidate must complete the two-semester sequence 393:191 and 393:192 Undergraduate Honors Tutorial (Chinese) or 393:191 and 393:192 Undergraduate Honors Tutorial (Japanese) during the junior year; enroll in 393:195 Senior Honors Thesis (Chinese) or 393:195 Senior Honors Thesis (Japanese) during the senior year and prepare a thesis on the language or literature in his or her major field, under supervision of an adviser; and maintain at least a 3.0 average for all Honors courses and all coursework taken the senior year.

A student who fulfills these requirements will receive the B.A. degree with "Honors."  

M.A. Program in Chinese Language and Literature
Graduate study in Chinese Language and Literature 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 a career in business that requires a general knowledge of Chinese language and culture along with a broad regional background. Therefore, two programs leading to the M.A. degree are offered: Program A provides specialized training in Chinese language, literature and civilization, with a thesis; Program B is a prescribed curricular program, without thesis, permitting a student to select courses of study over a wider choice to provide the best possible training for the type of work he or she plans to do.

Applicants for graduate study should have completed an undergraduate major in Chinese language and literature or its equivalent, and taken the Graduate Record Examination Aptitude Test. Students with deficiencies in their undergraduate major are expected to make up such deficiencies, in addition to carrying the graduate study program, and to spend a longer term of study. Intensive summer institutes of Chinese and Japanese afford a good opportunity for making up deficiencies in those languages.

Mastery of the Chinese language is an essential requirement for the master's degree. Normally students who have had two years of Chinese language instruction in their undergraduate courses are expected to fulfill the language requirement by taking Chinese for one additional year.

Program A comprises 30 semester hours of coursework, with the M.A. thesis counting for no more than four hours. The thesis could be a twisted piece of original research involving the use of Chinese language material, or it could be a piece of annotated translation, accompanied by notes and an interpretative essay, of a significant Chinese work.

Program B, without thesis, comprises 36 semester hours of coursework and would lead to a terminal M.A. degree.

A comprehensive examination is administered during the candidate's last semester of registration, and an oral examination given on the thesis where a thesis is included in the program. All candidates are expected to fulfill the general requirements of the Graduate College.

The following are typical programs of graduate study for the two programs:

Program A (M.A. with thesis)
Advanced Chinese (beyond the first two years) 9 s.h.
Seminar: Methods of Sociological Research 3-6 s.h.
One of the following courses: Introduction to Chinese Linguistics History of the Chinese Language Seminar in Chinese Linguistics 6-11 s.h.
Advanced courses in Chinese literature and civilization 4 s.h.
Thesis 4 s.h.

Total 30 s.h.

Program B (M.A. without thesis)
Advanced Chinese (beyond the first two years) 9 s.h.
Seminar: Methods of Sociological Research 3 s.h.
Advanced courses in Chinese literature and civilization 9-12 s.h.
One of the following courses: Introduction to Chinese Linguistics History of the Chinese Language Seminar in Chinese Linguistics 3-6 s.h.
Additional courses in education, history, philosophy, art, journalism, linguistics, etc., depending upon the student's interest and objective. 4 s.h.

Total 36 s.h.

Ph.D. Minor in Chinese
Requirement for a Chinese minor are 12 credits in graduate standing. Transfer students may offer up to six credits in coursework from other institutions; however, under such circumstances the student may be required to undergo a special examination.

The Oriental Library Collection
The Oriental Library Collection located in the Main University Library was begun when the Chinese Language and Area Center was first established. The current holding is estimated at Chinese, 20,000 volumes; Japanese, 4,000; Korean, 300. Besides basic reference
Courses Primarily for Undergraduates

East Asian Languages and Literature 51

Courses Primarily for Undergraduates

Note: Opportunities and graduate students may receive credit for courses below if they have the necessary background and permission. For information, contact the instructor of the course.

30.065 Asian Civilization: Japan 3.s.h.
30.098 Introduction to Oriental Art 3.s.h.
30.099 Living Religions of the East 2.s.h.
30.116 Religion in modern practice in India, China and Japan: seminar as Religion 30.344

Special Department Strengths

Both classical and modern periods of literature are represented, with certain special courses of a unique nature.

Unique Aspects

In part through the International Writing Program, unusual Asian scholars and writers visit the campus. Students in the Department benefit from their lectures and discussions.

The CIC Far Eastern Language Summer Institute

Under the sponsorship of the Midwest Council on Institutional Cooperation (CIC), consisting of representatives from the universities of Chicago, Illinois, Indiana, Iowa, Michigan, Michigan State, Minnesota, Northwestern, Ohio State, Purdue and Wisconsin, the Far Eastern Language Summer Institute has been conducted on a rotating basis for a number of years. Intensive courses in Chinese and Japanese at all levels, as well as courses in linguistics, dialectics, etc., pertaining to the two languages, are available. The faculty is drawn from the Chinese and Japanese teaching staffs of the Midwestern CIC institutions, to whom specialists from universities outside these are added. Scholarships aid are available to qualified students at both graduate and undergraduate levels.

Center for East Asian Studies

The Center at The University of Iowa was one of the first 55 such centers established in major universities in the country, with federal aid provided by the National Defense Education Act. This financial aid has resulted in the strengthening of the faculty and course offerings of oriental studies in this Department and in several other departments of the University, notably the School of Art and Art History, the School of Religion and the departments of Anthropology, Geography, History, Political Science and Sociology. Under the coordination of the Curator, our students show increased interest in the cultures and societies of East Asia, due to the current developments in that area.

Staff: professors emeriti Kuo, Mei, Lee, associate professors Chiang, Nieh, Sgo; assistant professors Ting, Lacerqua Ayouna, Kawakami, Kaiser; instructor-Cheng: international faculty Baird (Religion), Barrett (Anthropology), Regen (Art), Hamilton (History). Howren (Linguistics), Kim (Political Science), Large (History), Pachow (Religion). Reese (Spanish), Roeser (Arts). Wumberley (Anthropology).

Chinese Language

30.101 Elementary Chinese 8.s.h.
30.102 Elementary Chinese 8.s.h.
30.103 Continuation of 30.101, which is prerequisite 8.s.h.
30.105 Second-Year Chinese 6.s.h.
30.106 Second-Year Chinese Continuation of 30.105 6.s.h.
30.107 Readings in Modern Chinese 6.s.h.
30.108 Readings in Classical Chinese 8.s.h.
30.110 Readings in Documentary Chinese 6.s.h.
30.118 Readings in Newspaper Chinese 6.s.h.
30.119 Readings in Advanced Conversation 6.s.h.
30.114 Study of the Written Character 6.s.h.
30.115 Advanced Composition 8.s.h.
30.116 Chinese-English Translation 3.s.h.
30.131 Language Laboratory Procedures 1.s.h.
30.132 Survey of Chinese Literature 3.s.h.
30.133 Survey of Classical Chinese Literature 3.s.h.
30.134 Survey of Chinese Literature I 3.s.h.
30.135 Survey of Chinese Literature II 3.s.h.
30.137 Survey of Chinese Literature IV 3.s.h.
30.138 Survey of Chinese Literature V 3.s.h.
30.139 Survey of Chinese Literature VI 3.s.h.
30.141 Survey of Chinese Literature VIII 3.s.h.
30.142 Survey of Chinese Literature IX 3.s.h.
30.143 Survey of Chinese Literature X 3.s.h.
30.144 Survey of Chinese Literature XI 3.s.h.
30.145 Survey of Chinese Literature XII 3.s.h.
30.146 Survey of Chinese Literature XIII 3.s.h.
30.147 Survey of Chinese Literature XIV 3.s.h.
30.148 Survey of Chinese Literature XV 3.s.h.
30.149 Survey of Chinese Literature XVI 3.s.h.
30.150 Survey of Chinese Literature XVII 3.s.h.
30.151 Survey of Chinese Literature XVIII 3.s.h.
30.152 Survey of Chinese Literature XIX 3.s.h.
30.153 Survey of Chinese Literature XX 3.s.h.
30.154 Survey of Chinese Literature XXI 3.s.h.
30.155 Survey of Chinese Literature XXII 3.s.h.
30.156 Survey of Chinese Literature XXIII 3.s.h.
30.157 Survey of Chinese Literature XXIV 3.s.h.
30.158 Survey of Chinese Literature XXV 3.s.h.
30.159 Survey of Chinese Literature XXVI 3.s.h.
30.160 Survey of Chinese Literature XXVII 3.s.h.
30.161 Survey of Chinese Literature XXVIII 3.s.h.
30.162 Survey of Chinese Literature XXIX 3.s.h.
Economics is the study of how people determine what they will produce, consume, buy and sell. It is also connected with the coordination of such activities between individuals and groups within and across societies. Economics examines such problems as unemployment, economic growth and development, inflation, the balance of trade and economic welfare.

The University of Iowa offers three undergraduate degrees in economics. One, the Bachelor of Business Administration, is offered through the College of Business Administration and is described in that section of the Catalog.

The Bachelor of Arts degree in economics is designed to allow the student maximum flexibility in attaining a well-rounded liberal arts education. The Bachelor of Science degree has more mathematical content and is designed to meet the needs of students considering postgraduate work in economics or related business and technical fields. The Bachelor of Science degree is also recommended for Honors students.

Program for the B.A. Degree

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

- Courses Outside the Department
  225:23 Elementary Probability and Statistics 3 s.h.
  225:7 and 225:8 Quantitative Methods I and II 8 s.h.

Courses in Economics

- 20 semester hours of credit in 100-level courses, including 68:103 or 68:102 Microeconomics and 68:103 or 68:104 Macroeconomics. Most 100-level courses in economics have as prerequisites either 68:1 and 68:2 Principles of Economics, or senior standing. 68:1 and 68:2 will satisfy the social science core requirement. Credit gained in 68:106 cannot be counted toward the 20 semester hours of 100-level economics courses required for the B.A. degree.

Program for the B.S. Degree

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

- Courses Outside the Department
  225:23 and 225:26 Calculus
  225:120 Probability and Statistics

- Courses in Economics
  20 semester hours of 100-level economics courses, including 68:102, 68:104 and 68:181. 68:1 and 68:2 will satisfy the social science core requirement. Credit earned in 68:106 cannot be counted toward the 20-semester requirement.

Honors in Economics

The Department of Economics offers an undergraduate degree "with Honors in economics." Students interested in this program should consult the chairman to obtain a prospectus.

Graduate Study

Various programs of graduate study in the Department of Economics are outlined in "Economics" under "College of Business Administration."

For students interested in economics, "Economics" listing under the "College of Business Administration."

Education

See "College of Education" under the "College of Business Administration."

The English Major

The general purpose of the English major is to provide a program of humane learning, principally through the study of language and literature and the discipline of writing. The chief aim of the study of literature, the largest part of the major, is to help the student enlarge his experience and thus to liberate him from the parochial outlook of his own time and place. The study of literature should provide a constantly increasing awareness of form and value in human experience, as shaped by language.

The chief aim of the discipline of writing is to help the student explore the relationship between experience and meaning, as these are structured by language, and to encourage him to define his ideas and his relationships with other human beings as precisely and forcefully as possible.

The chief aim of the study of language is to help the student
The major accepts a major responsibility for training teachers of English at all levels, the elementary school through graduate school. At the master's level programs are appropriate for the different interests of teachers in secondary schools, two-year colleges, and four-year colleges. The Department also participates in the work of the Master of Arts in Teaching program of the College of Education. Although doctoral study is primarily scholarly and creative, the Department requires that all of its Ph.D.s have supervised experience in teaching and shares with the College of Education the responsibility for training teachers and researchers in English education.

Students planning courses to help them in their first teaching experiences should remember that they will have to be able to work with details of expression in English. They will probably need advanced training in writing--narrative, poetry and fiction are all important--or rhetoric or linguistics or all of them. Their literary study should emphasize a range of close reading experiences in different kinds of literature as well as the methods 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, those undertaking a career in teaching should remember that an undergraduate degree represents minimal training for good teachers, so they should plan a program which will permit graduate study at a later time.

English majors whose working for teacher certification must devote one semester of the year to professional training, apart from coursework in the English Department. The Department also participates in a joint major in English and elementary education. Advisers for this program are specialists in elementary education and can provide students about appropriate and permissible change in English requirements. Students who cannot complete the English major as well as the co-major in elementary education may concentrate in English by choosing at least 20 semester hours of work in English from the list of courses required in the major. Although students majoring in English are excused from the literature core courses, students submitting a concentration must take them.

Students who are seeking certification for secondary teaching inflect either than English may seek minor certification in English. Such certification is appropriate for students majoring in speech or journalism. Such a student must complete 20 semester hours of English, including two or more 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 nineteenth or twentieth centuries. In addition to the 20 semester hours of English, the student is required to take Methods of 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.
The Citation for Excellence in Creative Writing

The Citation for Excellence in Creative Writing is awarded to the regular English major to encourage some students to improve at poetry or fiction writing. It is open to any major who is admitted to the Undergraduate Workshop.

Any major may apply to his program credit for up to four semester hours in 8:11 Fiction Writing and four semester hours in 8:82 Poetry Writing, but only students who are admitted on a competitive basis to the Undergraduate Poetry or Fiction Workshops (8:83 and 8:86) may be considered for citations. Students in these workshops, if they wish the citation, must submit a collection of poems or stories to the Undergraduate Creative Writing committee at least six weeks before the end of their final semester. Otherwise, their programs follow the same patterns and procedures as those taken by the regular majors.

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 the more elementary courses, requires registration in a special honors seminar and requires the writing of an undergraduate thesis. Each student works out his program with his advisor. Since almost all Honors candidates continue on for graduate work, many of the programs have a pregraduate-school cast to them.

The Literature Seminars

One course deals with a generous selection of masterpieces of English literature from Chaucer to 1900; another concentrates on American literature and British literature since 1900. Students register for 12 hours of credit in one semester. In this way, they read as much as would be contained in four ordinary courses. Classes meet for 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 each week, practice oral reading and productions of scenes from plays and often write parodies, imitations, and other exercises as means of increasing their sensitivity to literary styles.

Some of the educational advantages of these seminars are: the usual fragmentation of material is replaced, through comparisons, by integration; historical, cultural, and critical and creative considerations illuminate one another; learning becomes a cooperative venture; and students benefit from the plurality of instructional approaches and from intellectual engagement with one another.

Graduate Programs

The aims of the masters' programs are much the same as those for the undergraduate program, except that they are more demanding and professional. For those who want such training, the Department undertakes to prepare students in its masters' program for teaching English in high schools and community colleges. For those wishing to continue as candidates for the Ph.D., it undertakes to provide the necessary breadth of background for such study.

The purpose of the Ph.D. program is almost totally professional. Those almost all of those who have finished the program have become college and university teachers. The Department's clear obligation is to train Ph.D. candidates for teaching, publication, and service which will be required of them as faculty members in other departments of English. While here they are regarded by the faculty as junior colleagues in varying stages of progress toward entering the profession full time.

Master of Arts

Requirements for the Master of Arts are 30 semester hours, at least 24 of which must be earned in residence; one departmental seminar with a grade of B or A; and satisfactory performance in a four-hour written examination over a reading list. Candidates for the Ph.D. must complete the examination for the Ph.D., admission to candidacy for the Ph.D., and completion of 45 semester hours with a grade-point average no lower than 3.25 and satisfactory performance on an examination.

Master of Arts and Specialist in Education

This is a two-year, 60-hour program for those wishing to prepare themselves for teaching in community colleges. It was planned in consultation with teachers and administrators of several community colleges and the College of Education; it is maintained with these advisers. The program includes five hours of work in linguistics, 15 hours in literature, six hours in advanced writing, and 24 hours in professional courses taught by specialists in English and in education. One semester of the four is spent as an intern in a community college, such as Dade (Miami), Forest Park (St. Louis), Kirkwood (Cedar Rapids) or Muscatine.

Master of Fine Arts

Requirements for this degree are flexible, but they ordinarily include 48 semester hours of work, chiefly in the Writers Workshop; a book-length collection of poems or short stories, a novel, or a play or work in some other appropriate form; and an examination in modern literature in the form which the student himself is employing.

Doctor of Philosophy

Requirements include formal admission to candidacy by a vote of the Department; a high level of competence in two foreign languages and their literatures; a comprehensive examination (written and oral) covering two historical periods of English and/or American literature and one special subject; distributed coursework in three other historical areas; three seminars; coursework in linguistics and the history of criticism; a dissertation which may be either a scholarly study or a piece of imaginative writing; and a final examination in defense of the dissertation. All doctoral candidates are required to gain teaching experience, preferably in the Rhetoric and Core Literatures programs of the College of Liberal Arts.
Courses
Courses below 100 are primarily for undergraduate English majors. Courses numbered 100-199 are general interest courses for nonspecialists as well as for undergraduate majors and English graduate students wishing to fill out gaps in their undergraduate programs. Courses numbered 200-299 are designed for graduate students planning to teach in high school or junior college, but appropriate for any person wishing to have guided and extensive reading within a specific area. Courses numbered 300-499 are primarily for students working toward the Ph.D., but appropriate for students working toward a master's degree and intending in the future to continue toward the higher degree. A complete description of all courses to be offered in a given semester may be obtained in the English Department office immediately preceding the beginning of that semester.

For Undergraduates

General Interest Courses
Beginning fiction courses, primarily for freshmen not majoring in English, although credit may be applied to the requirements for the major:
E 1 Modern Fiction 3 h.
E 2 Modern Prose and Poetry 3 h.
E 3 Modern Drama 3 h.
E 4 Literature of the Americas 3 h.
E 5 English Literature 3 h.
E 6 British Literature 3 h.
E 7 Bibliography 3 h.
E 8 Shakespeare 3 h.

Introductory Courses in Critical Reading
Limited enrollment courses primarily for majors, but open to any undergraduate; some texts used carefully to illustrate representative problems in interpreting and evaluating literature: 101 and 103. Assemble upon submission of writing as well as reading literature:
G 1 Understanding Fiction 2 h.
G 2 Understanding Poetry 2 h.
G 3 Understanding Drama 2 h.

Representative Works Courses
Basic limited-enrollment courses primarily for majors, but available for any undergraduate; each course consists of 30 to 50 major works from time based in course title, works chosen for their interest, their representatives of literature of time and their use in enhancing one's skill in reading:
G 1 Representative English Works of the Renaissance 3 h.
G 2 Representative English Works, 1500-1600 3 h.
G 3 Representative English Works, 1600-1800 3 h.
G 4 Representative English Works, 1800-1900 3 h.
G 5 Representative English Works Since 1890 3 h.

Major Authors Courses
Basic limited enrollment courses primarily for majors, but appropriate for any undergraduate combinations of titles changed regularly within each requirement by several major works by permission of instructor, student may repeat registration for same course number if authors have been changed:
G 7 Chaucer 3 h.
G 8 Shakespeare 3 h.
G 9 Milton 3 h.
G 10 Dryden 3 h.
G 11 Swift 2 or 3 h.
G 12 Pope and Swift 2 or 3 h.
G 13 Dryden and Swift 2 or 3 h.
G 14 Dryden and Steele 2 or 3 h.
G 15 Steele and Addison 2 or 3 h.
G 16 Addison and Swift 2 or 3 h.
G 17 Swift and Johnson 2 or 3 h.
G 18 Johnson and Fielding 2 or 3 h.
G 19 Fielding and Henry Fielding 2 or 3 h.

Expository Writing Courses
Emphasizing composition in writing for all undergraduate prerequisites successful completion of English 105 should be in writing. Instructor should be substituted for Writing Workshop office prior to registration:
G 21 Expository Writing 3 h.
G 22 Theory of Rhetoric 3 h.

Creative Writing Workshops
Open to undergraduate only by permission of instructor; manuscripts should be submitted to Writing Workshop office prior to registration:
G 23 Undergraduate Writers Workshop: Fiction 2 or 3 h.
G 24 Undergraduate Writers Workshop: Poetry 2 or 3 h.

Honor Courses
Entrance limited to students in the undergraduate honors program and to others by special permission of instructor:
G 25 Honors Proseminar 3 h.
G 26 Honors Proseminar 3 h.

Literature Seminar Courses
Limited enrollment, two-semester literature courses emphasizing the reading of whole texts, discussion. 10 to 12 papers or other work as detailed in separate Department announcements. Pre-registration required. Literature Seminar 1 satisfies all major requirements for literature before 1800; students should have taken at least one course-level literature course before registering in either course:
G 27, 28, 29, 30 English Literature Before 1800 12 h.
G 27, 28, 29, 30 American and Contemporary British Literature 12 h.

Independent Study Courses
Must be arranged by the student with instructor of choice prior to registration; ordinarily the student should consult instructor from whom he or she has previously taken a course:
G 31 Undergraduate Honors Project 2 or 3 h.
G 32 Special Project for Undergraduates 2 or 3 h.

For Undergraduates and Graduates

Literature and Culture Courses
Primarily for undergraduates and beginning graduate students, these lecture courses designed to either major works and authors within the context of the social, political, intellectual and aesthetic movements of their time. Literary history forms part of the work, but main goal is to show literature in the whole course of the cultural in this period. Students who have established backgrounds in history or related arts especially welcome undergraduate majors in English urged to include at least one course of this type in their total hour of major:
G 102 Literature and the Culture of the Renaissance 4 h.
G 103 Literature and the Culture of 18th Century England 4 h.
G 104 Literature and the Culture of 19th Century England 4 h.
### Advanced Linguistics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8990</td>
<td>Modem English Language and Literature</td>
<td>3</td>
</tr>
<tr>
<td>8997</td>
<td>Graduate Linguistics 103/104</td>
<td>3</td>
</tr>
<tr>
<td>8998</td>
<td>Research Problems in English Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>8999</td>
<td>Introduction to Language Data Processing</td>
<td>3</td>
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#### Bibliography

<table>
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<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>9900</td>
<td>Literary Tools and Research Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

### Seminar Seminars

Represent the most advanced work in English and American literature in a related discipline. A seminar in a given semester may vary from semester to semester; courses in this area open only to candidates for the Ph.D. and further graduate students with equivalent background; knowledge, presence of instructor required for registration.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>8902</td>
<td>Medieval Literature</td>
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<tr>
<td>8903</td>
<td>Middle English Literature</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8904</td>
<td>Chaucer</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8905</td>
<td>Renaissance Humanistic Literature</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8906</td>
<td>Renaissance Dramatic Literature</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8911</td>
<td>Shakespeare</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8912</td>
<td>17th-Century Humanistic Literature</td>
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<td>8913</td>
<td>17th-Century Dramatic Literature</td>
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<td>8914</td>
<td>17th-Century Comic Literature</td>
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<td>8915</td>
<td>Elizabethan Theatre History</td>
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<td>8916</td>
<td>Milton</td>
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<td>8917</td>
<td>Metaphysical Prose</td>
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<td>8918</td>
<td>Metaphysical Poetry</td>
<td>cr. arr.</td>
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<td>8919</td>
<td>Classical Prose</td>
<td>cr. arr.</td>
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<td>8920</td>
<td>Classical Poetry</td>
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<td>8921</td>
<td>Drama</td>
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<td>8922</td>
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<td>8924</td>
<td>Romance</td>
<td>cr. arr.</td>
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<tr>
<td>8925</td>
<td>Renaissance and Romantic Literature</td>
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</tr>
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<td>8926</td>
<td>Shakespeare and Romantic Literature</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8927</td>
<td>Modern Letters</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8928</td>
<td>Social and Cultural History</td>
<td>cr. arr.</td>
</tr>
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<td>8929</td>
<td>18th-Century Fiction</td>
<td>cr. arr.</td>
</tr>
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<td>8930</td>
<td>18th-Century British Literature</td>
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<td>18th-Century English Literature</td>
<td>cr. arr.</td>
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<td>8932</td>
<td>19th-Century British Poetry</td>
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<td>8933</td>
<td>19th-Century American Literature</td>
<td>cr. arr.</td>
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<tr>
<td>8934</td>
<td>American Transatlantic Literature</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8935</td>
<td>American Romantic Literature of the 19th Century</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8937</td>
<td>American Realistic Literature of the 19th Century</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8940</td>
<td>Modern Letters</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8941</td>
<td>American Culture and Literature</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8942</td>
<td>American Civilization I-IV</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8943</td>
<td>Problems in Postmodern</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8944</td>
<td>Contemporary Literature</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8945</td>
<td>Studies in World</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8946</td>
<td>Modern</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8947</td>
<td>English Literature</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8948</td>
<td>Literature and Other Intellectual Disciplines</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8949</td>
<td>Analytical Bibliography and Technical Criticism</td>
<td>cr. arr.</td>
</tr>
</tbody>
</table>

### Independent Study

Students registering for independent study courses must have consent of instructor for topic and number of credit hours prior to registration.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8900</td>
<td>Readings in Medieval Literature</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>8901</td>
<td>Readings in 17th-Century Literature</td>
<td>cr. arr.</td>
</tr>
</tbody>
</table>

### European Literature and Thought

#### Program Chairman

<table>
<thead>
<tr>
<th>Title</th>
<th>Degree offered: I.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Literature and Thought</td>
<td></td>
</tr>
</tbody>
</table>

European literature and thought courses are open to juniors, seniors and graduate students from any department. A variety of options is brought to bear upon ideas under question. No technical background in history, philosophy or literature is necessary. Classes meet three hours a week, and each course may be taken independently.

These courses are conducted by round-table discussion. Some of the important issues of contemporary literature are explored and evaluated through a basic 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, drawing on their specialized knowledge and particular methods.

### Undergraduate Major

A major in European literature and thought serves as a basis for a liberal education and equips a student for further work in the special arts of his choice. The major is set up to provide breadth of specialization and is ordinarily obtained under the specialization requirements of a single department.

Most students can major in this area and still have room for earning teaching certificates in one or more related departments.

Many can satisfy the requirements for a double major, in this program and in some single department also.

### Requirements for the Major

These specific requirements are in addition to the general requirements of the College of Liberal Arts:

- European literature and thought (round-table courses) 12 s.h.
- History, social sciences 12 s.h.
- Philosophy, religion, history of science 12 s.h.
- Literature of England and of the Continent 12 s.h.
- Fine arts (excluding studio courses) 3 s.h.
- Foreign language: European; one semester beyond the second year (Courses in foreign languages in the original literature may also be used to satisfy the requirement in literature) 3 s.h.

Students considering a major in European literature and thought should consult with the chairman before the end of the sophomore year.
Honors

The degree of Bachelor of Arts with Honors may be earned by superior students who undertake a further program of independent study. To be admitted as a candidate for Honors, the student must have the endorsement of the chairman of the program in European literature and thought.

Staff: professors Aspet (French and Italian), Baker (English), Berges (Law), Davis (Political Science), Duke (Chemistry), Feithling (German), Harlow (Business Administration), Obrecht (Music), Scharfanek (Religion), Soehlberg (Art), Stott (Psychology), Wahlke (Political Science), Wilmer (Sociology), associate professors Cameron (Speech and Dramatic Art), Bingle (Zoology), Hopkins (Law), Hamly (English), ter Haeuw (German); assistant professor Klein (Physics)

Courses

33101 The Pursuit of Happiness 2 to 4 a.h.

The pursuit of happiness in various types of human experience by Aristotle, Freud, Collie, Montaigne, Voltaire, Dewey, Sartre, etc.

33102 The Good Society 2 to 4 a.h.

The pursuit of happiness and its realization as seen in works by Plato, Sartre, Machiavel, Shakespeare, Locke, G. W. F. Hegel, Marx, recent fiction and modern writers.

33103 Values in the Contemporary World 2 to 4 a.h.

The pursuit of happiness and its realization as seen in modern works and novels.

33104 Science and the Nature of Man 2 to 4 a.h.

The pursuit of scientific in social and humanistic thought.

33105 The Arts and the Body 2 to 4 a.h.

The pursuit of happiness and in a variety of media, including music, dance, poetry, and more.

33106 Roots of Modern Culture 2 to 4 a.h.

The pursuit of the self in modern European and Russian literature.

33107 Special Projects cr. arr.

The pursuit of special projects and Independent Study for Honors.

French and Italian

Department Chairman: John T. Rothe, Jr.

Degrees offered: A.B. (French or Italian), B.A. (French), B.F. (French)

The purpose of the undergraduate program is to give the student a firm foundation in the language, literature and culture of the countries represented. The four-year sequence of language courses offers training in the skills necessary to speak, read, write and understand the language at a high level of competence. The specialized courses in literature and civilization, taught in the foreign language, introduce the student to the intellectual and cultural climate of France and Italy and provide a historical perspective on contemporary life.

About half of the French majors combine study in their specialized area with secondary education and secure jobs in high school teaching. Others enter various professional careers, business and government service, professional schools (such as law and library science) and graduate school in a branch of the humanities like French, political science or comparative literature. The latter group almost invariably prefer for the M.A. or Ph.D. with junior/community college, college or university teaching as a goal.

Graduate Program

The M.A. and Ph.D. in French are professional degrees which prepare the candidate for teaching at the college or university level.

Appointments

Teaching, research and laboratory assistantships are available to qualified graduate students. A certain number of EPDA fellowships in French (for prospective community college teachers), teaching/research fellowships, and University scholarship fellowships are also available. Inquiries should be addressed to the Department Head.

Several exchange assistantship agreements with the French Ministry of Public Education and the Université de Poitiers make it possible to provide a limited number of graduate students one year residence in France.

Requirements

Candidates for advanced degrees must have completed the equivalent of the undergraduate major in French. Deficiencies in previous training may be removed by taking appropriate courses.

Master of Arts

Three different programs are offered leading to the Master of Arts.
Master of Arts with Thesis
This program requires a minimum of 30 semester hours, of which six may be taken in 9:277 (thesis supervision), the passing of a written and oral examination, and the defense of a thesis. The course of study must include four semester courses in literature at the graduate level, 9:137 French Renaissance and Reformation, and 9:209 and 9:210 Advanced Composition and Conversation. Candidates may occasionally take courses in related fields.

Master of Arts without Thesis
The requirements for this program are identical to those for the M.A. with thesis, except that the candidate must fulfill the 30-semester-hour requirement in regular coursework.

Master of Arts in French Education
This is an advanced degree 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 a minimum of nine semester hours of graduate coursework in French literature. Other suggested courses include 9:153 and 9:154 fourth-year Composition and Conversation, 9:209 and 9:210 Advanced Composition and Conversation, 9:113 and 9:114 French Civilization, 9:110 Methods: High School Modern Foreign Language, 9:131 Language Laboratory Procedures, 9:172 Contemporary France, and 9:157 and 9:158 French Pronunciation and Distinct. Candidates must pass a final examination in French education and related fields.

Doctor of Philosophy
The Ph.D. degree in French is awarded, after completion of at least three years of graduate work, of which one must be spent in residence at the University, the passing of a comprehensive examination and the oral defense of a dissertation. The doctorate is granted primarily on the basis of achievement rather than on the accumulation of semester hours of credit. Candidates must demonstrate early their ability to undertake independent investigation by completing two research papers in connection with courses taken.

Specific requirements for the Ph.D. in French must include 9:251 and 9:252 Old French, proficiency in a foreign language other than French, and competence in a second related field defined as three graduate courses (minimum of eight semester hours) in that field. The choice of language and the specific courses in the related field are to be determined by the Department according to individual needs.

In pursuing the program, coursework and individual reading must be designated to in-part a good knowledge of the history of the French language, its literature and related civilization from medieval to modern times; provide adequate experience in a related area of the humanities; and develop the capacity for critical analysis of literary texts. Graduate students working toward an advanced degree are required to spend one year in teaching as graduate assistants in the Department.

The Faculty
Faculty members in French and Italian bring to the classroom a wide variety of teaching experience and in many cases are recognized nationally and internationally in their fields of specialization. Each period of French literature—from medieval to contemporary—is represented by at least one scholar whose publications enable him to direct classes and dissertations in his or her field. The Department is particularly strong in contemporary French literature, with three senior faculty members in that field. Biographies of three of the 13 graduate faculty are published in the Directory of American Scholars (Volume III, 1969).

Staff, professors: Aapd, Carles, O’Gorman; professors emeriti Cram, LeVaux, Rasmussen; associate professors Greene, Horsey, Ikley, Nelson, de St. Victor; assistant professors Sartis, Tate, Wayne; assistant professor emeritus Kassouf, J. Ignatius Reaseq Laboratory Director: Winston J. Rease

French Courses
Primarily for Undergraduates
Students who have had no experience with French through study or foreign residence are required to take placement tests. If students with two years of high school French place in 9:1, their semester hours will be added to their graduation requirement.

A student may not receive, for either credit or quality points, an elementary course if he has already completed a higher level course for which the elementary course or its equivalent is a prerequisite.

8:1 Elementary French: 4 h.
For students who take no knowledge of French.
6:0 Elementary French Preparatory: 9 or equivalent.
6:03 French Literature of Commitment: 3 h.
Basic, 11:16, given entirely in English; may be taken as part of core literature.
11:1 Intermediate French: 3 h.
Recommended for students who plan to complete their study of French with second year, prerequisite: 6:0 or equivalent.
11:2 Intermediate French: 3 h.
Completion of 11:1, prerequisite: 9:1 or equivalent.
9:03 French Pronunciation: 3 h.
Recommended for students who wish to continue study of French or who wish to improve their active command of the language; prerequisite: 6:0 or equivalent.
9:08 Second-Year Composition and Conversation: 4 h.
Recommended for students who wish to continue study of French or wish to improve their active command of the language; prerequisite: 9:1 or equivalent.
9:27 Second-Year Composition and Conversation: 4 h.
Completion of 9:25, prerequisite: 9:1 or equivalent.
8:01 Ph.D. French: no cr.
For candidates for degree in other departments who want reading ability in French.
8:02 Ph.D. French II: no cr.
8:03 Ph.D. French III: no cr.
8:04 Ph.D. French IV: no cr.
8:27 Spanish Work: 3 h. or equivalent.
Translation: 9:2 or equivalent.

For Undergraduates and Graduates
8:108 Introduction to French Literature: 3 h.
French course intended for and of eighteenth-century; given in French for French majors, in English for others; prerequisite: 9:1, 9:32 or equivalent.
8:108 Extension to French Literature: 3 h.
Completion of 9:25, may be taken as independent unit; from statements necessity to present.
**General Science**

Program Head: Robert E. Yager

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

The general science major is designed primarily for students interested in a professional area requiring a background in more than one science discipline. Specific programs exist for each professional area which meet the same basic requirements for graduation. Students not interested in one of the professional areas must meet with an advisor to structure a specific program. Completion of random courses will not meet the requirements.

Minimum requirements for the general science degree involve selection of courses from three of these science departments: Chemistry, Geology, Physiology/Astronomy, Botany, Zoology and Mathematics.

Two options are available: completion of 20 semester hours in one department and eight semester hours in each of two other departments or completion of 16 semester hours in one department, 12 semester hours in a second department and eight in a third. Earth science and life science core courses may not be used as part of the 12-, 16- or 20-semester-hour sequence, but either may be used to fulfill an eight-semester-hour requirement. At least 10 semester hours must be completed in residence.

The B.A. requires completion of a minimum of four semesters of college-level study totaling not less than 12 semester hours in German, French or Russian. The B.S. requires eight semester hours of one of these three languages. The student’s advisor can approve the selection of another language if there are circumstances making such a choice desirable. Students in the B.S. program must complete a minimum of 40 semester hours of science credit.

### Engineering-General Science Combination

(B.S. in engineering; B.A. in liberal arts)

Coordinator: Donald H. Madden

#### Mathematics

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>222M:20 Elementary Functions</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>223M:25-6 Calculus I-II</td>
<td>8 s.h.</td>
</tr>
<tr>
<td>Electives in mathematics (as prescribed by the various departments of the College of Engineering)</td>
<td>5 s.h.</td>
</tr>
</tbody>
</table>

#### Physics

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>19:17-18 Introductory Physics I and II</td>
<td>1 s.h.</td>
</tr>
</tbody>
</table>

#### Chemistry

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:1 and 4:4 Principles of Chemistry</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>4:6, 13 Elementary Chemistry Laboratory</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>

(An additional course in chemistry or physics may be substituted for an equivalent course in mathematics.)

Total required course 36 s.h.

### Medical Technology

Directors: John A. Koepke (VA Hospital), Michael L. O’Connor (University Hospitals)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:1 and 4:4 Principles of Chemistry I and II</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>4:11 Elementary Quantitative Analysis</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>4:11-122 Organic Chemistry I-II</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>37:118 Principles of Animal Biology</td>
<td>5 s.h.</td>
</tr>
<tr>
<td>37:118 Parvovirology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>3 Elective in zoology</td>
<td>3 to 4 s.h.</td>
</tr>
</tbody>
</table>

### Mathematician

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>22M:3 College Algebra</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>22M:42 Introduction to Statistical Methods</td>
<td>3 s.h.</td>
</tr>
</tbody>
</table>

(More advanced mathematics courses may be substituted)

### Nuclear Medical Technology

Coordinator: R. E. Peterson

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:1 and 4:4 Principles of Chemistry I-II</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>4:11 Quantitative Analysis</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>4:121-122 Organic Chemistry I-II</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>37:7 Principles of Animal Biology</td>
<td>5 s.h.</td>
</tr>
<tr>
<td>37:101 Principles of Human Genetics</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>or 37:110 Fundamental Genetics</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

### Physics

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>29:1-2 College Physics</td>
<td>8 s.h.</td>
</tr>
</tbody>
</table>

### Mathematics

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>22M:1-3 Mathematical Techniques I-II</td>
<td>6 s.h.</td>
</tr>
</tbody>
</table>

(More advanced mathematics courses may be substituted)

### Other Science Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>60:1 Elementary Human Anatomy</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>729:61 Introduction to Human Physiology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>77:303 Introductory Radiation Biology</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>99:161 Biochemistry</td>
<td>4 or 5 s.h.</td>
</tr>
</tbody>
</table>

Total required courses 54—56 s.h.

### Physical Therapy

Coordinator: Terry B. Jones

Two options available: completion of 20 semester hours in one science area and eight semester hours in each of two other areas; or completion of 16 semester hours in one science, 12 semester...
hours in a second science and eight semester hours in a third; required science courses total 36 semester hours for the B.A. degree and 40 semester hours for the B.S. degree.

### Required Courses

**Chemistry**
- 41 and 44 Principles of Chemistry I-II 6 s.h.
- 46 Elementary Chemistry Laboratory 2 s.h.

**Zoology**
- 37.5 Principles of Animal Biology 5 s.h.
- 37.101 Principles of Human Genetics 3 s.h.

**Physics**
- 29.1-2 College Physics 8 s.h.

### Elective Courses in Required Sciences

**Chemistry**
- 4.7-8 General Chemistry 6 s.h.
- 4.9 General Chemistry Laboratory 2-3 s.h.
- 4.12 Chemistry in Our Lives 3 s.h.
- 4.11 Elementary Quantitative Analysis 4 s.h.
- 412-122 Organic Chemistry I-II 6 s.h.

**Zoology**
- 37.102 Principles of Modern Embryology 4 s.h.
- 37.109-110 Fundamental Genetics 5-8 s.h.
- 37.103 Comparative Vertebrate Anatomy 4 s.h.
- 37.112 Microscopic Anatomy 4 s.h.
- 37.121 Parasitology 4 s.h.
- 60.109 Human Anatomy 4 s.h.
- 72.151 Intermediate Physiology 5 s.h.

### Pre-Dentistry

Coordinator: James Faller

**Required Courses**

(FOR APPLICATION TO THE UNIVERSITY OF IOWA COLLEGE OF DENTISTRY)

**Chemistry**
- 41 and 44 Principles of Chemistry I-II 6 s.h.
- 46 Elementary Chemistry Laboratory 2 s.h.
- 412-112 Organic Chemistry I-II 6 s.h.
- 4141 Intermediate Chemistry Laboratory I 2 s.h.

**Physics**
- 29.1-2 College Physics 8 s.h.

**Biology**
- 37.3 Principles of Animal Biology 5 s.h.

Electives: Any course(s) in zoology or botany to total at least an additional 3 s.h.
- Total required courses 32 s.h.

### Pre-Medicine

Coordinator: James J. Rauker

**Chemistry**
- 41 and 44 Principles of Chemistry I-II 6 s.h.
- 46 Elementary Chemistry Laboratory 2 s.h.
- 412-122 Organic Chemistry I-II 6 s.h.
- 4141 Intermediate Chemistry Laboratory I 2 s.h.

Qualified students may substitute 4.5 Principles of Chemistry for 41 and 44.

**Physics**
- 29.1 and 29.2 College Physics 8 s.h.

Upon completion of Principles of Animal Biology, a student must also complete one advanced course in zoology from the list below to meet the minimum requirements for admission to The University of Iowa College of Medicine. (See admission requirements listed under “College of Medicine”)

- 37.102 Principles of Modern Embryology 4 s.h.
- 37.103 Comparative Vertebrate Anatomy 4 s.h.
- 37.105 General Physiology 4 s.h.
- 37.107 Invertebrate Zoology 4 s.h.
- 37.109 Genetics 4 s.h.
- 37.110 Fundamental Genetics 4 s.h.
- 37.120 Protozoology 4 s.h.

In addition to meeting the minimum requirements for admission to medical school, students must add four semester hours of chemistry or three semester hours of zoology or four semester hours of physics to satisfy the requirements of the B.A. in general science (Total of 36 s.h.)

Students who wish to earn a B.A. degree are required to earn an additional four semester hours of science credit, resulting in a total of 40 s.h. Mathematics (required for medical school admission, but not for a general science major) For students with four years of high school mathematics: 22M.20 Elementary Functions 3 s.h.

(More advanced courses in mathematics should be substituted if prerequisites can be met.)

### Pre-Veterinary Science

Coordinator: James J. Rauker

**Chemistry**
- 41 and 44 Principles of Chemistry I-II 6 s.h.
- 46 Elementary Chemistry Laboratory 2 s.h.
- 412-122 Organic Chemistry I-II 6 s.h.
- 4141 Intermediate Chemistry Laboratory I 2 s.h.

**Physics**
- 29.1-2 College Physics 8 s.h.

**Zoology**
- 37.3 Principles of Animal Biology 5 s.h.
- 37.110 Fundamental Genetics 4 s.h.
Botany
2:1 Introduction to Botany 5 s.h.

Science Teaching
Coordinator: Robert E. Yager

Biology Emphasis
Botany and Zoology
2:1 Introduction to Botany 5 s.h.
37:3 Principles of Animal Biology 5 s.h.
Electives in botany and zoology (at least three semester hours in each department) 18 s.h.

Chemistry
4:1 and 4:2 Principles of Chemistry I-II 6 s.h.
4:1-122 Organic Chemistry I-II 6 s.h.
6:1 Principles of Geology (Physical) 2 s.h.
or
12:3 Principles of Geology (Historical) 2 s.h.
29:1 College Physics 4 s.h.
97:128 Meaning of Science 2 s.h.
97:130 History of Science 2 s.h.
Total required courses 52 s.h.

Earth Sciences Emphasis
Geology
12:3, 11:23 Principles of Geology (Physical) 2 s.h.
12:4, 11:24 Principles of Geology (Historical) 2 s.h.
12:9 Geology of Iowa 2 s.h.
12:42 Mineralogy 3 s.h.
12:121 Principles of Paleontology 3 s.h.
12:161 Principles of Stratigraphy 3 s.h.
12:171 Geomorphology 4 s.h.

Chemistry
4:1 and 4:2 Principles of Chemistry I-II 6 s.h.
or
11:1 Quantitative Analysis 4 s.h.

Physics
29:1-2 College Physics 8 s.h.
29:61-62 General Astronomy 8 s.h.

Other

Chemistry Emphasis
Physics and Astronomy
4:1 and 4:4 Principles of Chemistry I-II 6 s.h.
4:6 Elementary Chemistry Laboratory 2 s.h.
4:8 General Chemistry II 3 s.h.
4:9 General Chemistry Laboratory 2 s.h.
4:11 Quantitative Analysis 4 s.h.
or
4:1-132 Physical Chemistry I-II 6 s.h.

Mathematics
22M:3 Mathematical Techniques II 3 s.h.
22M:20 Elementary Functions 3 s.h.
or
22M:25-26 Calculus I-II 8 s.h.

Physics
29:1 College Physics 4 s.h.
or
29:17 Introductory Physics I 4 s.h.
29:2 College Physics 4 s.h.
or
29:18 Introductory Physics II 4 s.h.
79:19 Introductory Physics III 4 s.h.
or
29:27 Electrical Measurements 3 s.h.
29:129 Electricity and Magnetism 3 s.h.
or
Electives in Physics or Mathematics 6 s.h.

Other

Mathematics
22M:3 Mathematical Techniques II 3 s.h.
22M:20 Elementary Functions 3 s.h.
or
22M:25-26 Calculus I-II 8 s.h.

Physics
29:1 College Physics 4 s.h.
or
29:17 Introductory Physics I 4 s.h.
29:2 College Physics 4 s.h.
or
29:18 Introductory Physics II 4 s.h.
79:19 Introductory Physics III 4 s.h.
or
29:27 Electrical Measurements 3 s.h.
29:129 Electricity and Magnetism 3 s.h.
or
Electives in Physics or Mathematics 6 s.h.

Other

Mathematics
22M:3 Mathematical Techniques II 3 s.h.
22M:20 Elementary Functions 3 s.h.
or
22M:25-26 Calculus I-II 8 s.h.

Physics
29:1 College Physics 4 s.h.
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79:19 Introductory Physics III 4 s.h.
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22M:3 Mathematical Techniques II 3 s.h.
22M:20 Elementary Functions 3 s.h.
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29:129 Electricity and Magnetism 3 s.h.
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Other

Mathematics
22M:3 Mathematical Techniques II 3 s.h.
22M:20 Elementary Functions 3 s.h.
or
22M:25-26 Calculus I-II 8 s.h.

Physics
29:1 College Physics 4 s.h.
or
29:17 Introductory Physics I 4 s.h.
29:2 College Physics 4 s.h.
or
29:18 Introductory Physics II 4 s.h.
79:19 Introductory Physics III 4 s.h.
or
29:27 Electrical Measurements 3 s.h.
29:129 Electricity and Magnetism 3 s.h.
or
Electives in Physics or Mathematics 6 s.h.

Other

Mathematics
22M:3 Mathematical Techniques II 3 s.h.
22M:20 Elementary Functions 3 s.h.
or
22M:25-26 Calculus I-II 8 s.h.

Physics
29:1 College Physics 4 s.h.
or
29:17 Introductory Physics I 4 s.h.
29:2 College Physics 4 s.h.
or
29:18 Introductory Physics II 4 s.h.
79:19 Introductory Physics III 4 s.h.
or
29:27 Electrical Measurements 3 s.h.
29:129 Electricity and Magnetism 3 s.h.
or
Electives in Physics or Mathematics 6 s.h.

Other

Mathematics
22M:3 Mathematical Techniques II 3 s.h.
22M:20 Elementary Functions 3 s.h.
or
22M:25-26 Calculus I-II 8 s.h.

Physics
29:1 College Physics 4 s.h.
or
29:17 Introductory Physics I 4 s.h.
29:2 College Physics 4 s.h.
or
29:18 Introductory Physics II 4 s.h.
79:19 Introductory Physics III 4 s.h.
or
29:27 Electrical Measurements 3 s.h.
29:129 Electricity and Magnetism 3 s.h.
or
Electives in Physics or Mathematics 6 s.h.

Other

Mathematics
22M:3 Mathematical Techniques II 3 s.h.
22M:20 Elementary Functions 3 s.h.
## Minors In Science Teaching

**Coordinator:** Robert E. Yager

Five teaching minors in science are available for persons majoring in other academic areas; only these combinations of courses qualify a person for certification in the area specified with each heading.

### Biology—22 s.h.
- 2:1 Introduction to Botany 5 s.h.
- 37:3 Principles of Audible Biology 5 s.h.
- 97:128 Meaning of Science 2 s.h.
- 97:130 History of Science 2 s.h.
- Electives in Botany and Zoology 8 s.h.

### Chemistry—22 s.h.
- 4:1 and 4:4 Principles of Chemistry I—II 6 s.h.
- 4:6 Elementary Chemistry Laboratory 2 s.h.
- 4:11 Quantitative Analysis 4 s.h.
- 4:121 Organic Chemistry I 3 s.h.
- 4:131 Physical Chemistry 3 s.h.
- 97:128 Meaning of Science 2 s.h.
- 97:130 History of Science 2 s.h.

### Physical Science—24 s.h.
- 4:1 and 4:4 Principles of Chemistry I—II 6 s.h.
- 4:6 Elementary Chemistry Laboratory 2 s.h.
- 29:1 and 2 College Physics 8 s.h.
- Electives in Chemistry or Physics 6 s.h.
- 97:128 Meaning of Science 2 s.h.
- 97:130 History of Science 2 s.h.

### General Science—26 s.h.
- 2:1 Introduction to Botany 5 s.h.
- 37:3 Principles of Audible Biology 5 s.h.
- 29:61 General Astronomy 4 s.h.
- 12:3 Principles of Geology (Physical) 2 s.h.
- 12:4 Principles of Geology (Historical) 2 s.h.
- 97:128 Meaning of Science 2 s.h.
- 97:130 History of Science 2 s.h.

### Earth Science—18 s.h.
- 12:3 Principles of Geology (Physical) 2 s.h.
- 12:4 Principles of Geology (Historical) 2 s.h.
- 12:5 Historical Geology Laboratory 1 s.h.
- 12:6 Historical Geology Laboratory 1 s.h.
- 29:61 General Astronomy 4 s.h.
- 29:62 General Astronomy 4 s.h.
- Electives in Geology 2 s.h.
- 97:128 Meaning of Science 2 s.h.
- 97:130 History of Science 2 s.h.

### Staff:
- Professor Yager, associate professors Coisman, Phillips; assistant professors Sharp, Townsend; adjunct assistant professor Glass

## Courses Primarily for Undergraduates

### 97:82 Investigations in Science 5 s.h.
- Special projects in the ability secondary school students to read, write, and think critically, and the development and use of research skills.

### 97:84 Science Survey 4 s.h.
- An introduction to the methods of scientific inquiry and the scientific method.

### 97:86 Science Foundations I 4 s.h.
- An introduction to the methods of scientific inquiry and the scientific method.

### 97:88 Science Foundations II 4 s.h.
- An introduction to the methods of scientific inquiry and the scientific method.

### 97:112 Advanced Science Foundations 4 s.h.
- Advanced study of the major areas of the physical and life sciences.

### 97:119 Directed Study 2 or 3 s.h.
- Directed study of a topic in science.

### 97:120 History of Science 2 or 3 s.h.
- Historical study of the development of science.

### 97:130 History of Science 2 s.h.
- History of science from the ancient world to the present.

### 97:140 Problems in Integrating Teaching of Environmental Science 3 s.h.
- Problems in the teaching of environmental science.

### Genetics

**Program Chairman:** Dawson Mohler

Genetics is an interdisciplinary program of the departments of Biochemistry, Botany, Microbiology and Zoology. The M.S. and Ph.D. degrees are taken in one of the participating departments; degrees are not offered in genetics.

Because genetics courses are offered in traditional divisions in biology, each student's program is built of appropriate courses in the several departments that are offered. The Mohler research study is frequently interested in the development of facilities for genetics in two or more departments.

**Undergraduate students** who want to prepare for graduate study in genetics should complete an undergraduate degree with a major or emphasis in science. Facilities of calculus in undergraduate study are recommended. Most of the present students in the interdisciplinary program were prepared in botany and zoology.

Aided by a Biological Sciences Development Award from the National Science Foundation, the University has recently increased its faculty in genetics. The program depends primarily on...
upon these several geneticists, especially for teaching, but it involves a number of other scientists whose research includes geography.

The program is administered by an interdisciplinary committee.

Staff: professor Brounner (Zoology), Frankel (Zoology), Milkman (Zoology), Mokler (Zoology), Wiesner (Psychiatry), Zellweger (Pediatrics), associate professor Chalkley (Biochemistry), Cowway (Biochemistry), Six (Microbiology); associate professors Carlson (Botany), Fels (Microbiology), Gussin (Zoology), Hegmann (Zoology), Surzycki (Botany), Walker (Microbiology)

Courses

Biochemistry
6:151 Molecular Genetics
3 or 4 s.h.
Sem as Zoology 37:171

Botany
2:120 Genetcs
2 or 4 s.h.
Same as Zoology 37:120

2:123 Physiological Genetcs
3 or 4 s.h.
Sem as Zoology 37:123

Zoology
2:180 Genetics of Cell Organels
2 s.h.
or, or.

2:181 Eucaryotic Cell Biology

Microbiology
6:137 Topics in Microbial Genetics
2 s.h.
6:170 Molecular Mechanisms in Heredity
2 s.h.

Zoology
37:191 Principles of Human Genetics
3 s.h.
37:193 Genetics
3 or 4 s.h.
Sem as Botany 2:302

37:210 Fundamental Genetics
3 or 4 s.h.
Sem as Botany 2:303

37:251 Evolution
4 s.h.

37:280 Advanced Genetics
4 s.h.

37:282 Population Genetics
4 s.h.

37:283 Behavioral Genetics
3 s.h.

37:285 Quantitative Genetics
3 s.h.

37:288 Biological Genetics Seminar
2 s.h.

Geography

Department Chairman Clyde F. Kahn
Degrees offered: B.A., B.E., M.A., Ph.D.

Vanished is the legendary encyclopedia geographer crammed with isolated bits of information ranging from the capital city of Mauritania to the annual Yukon valley apple production or the height of the highest mountain in Outer Mongolia. Modern geography is concerned more with the spatial aspects of human behavior than with the memorization of rainfall data, crop production or the length of rivers. Students who elect courses in geography soon find that geographic insights and methods of inquiry are related to the solution of many of the complex problems confronting modern society, such as air and water pollution, traffic jams, the development of ghettos in large cities, rapidly increasing population and conflicts between nations. An increasing number of undergratuates is discovering that a major in geography provides them with concepts and methods for orienting cities, market regions, school districts or other human institutions.

Much of modern geography is problem-oriented. It is scientific as well as humanistic in its approach to the solution of these problems. It is involved with two basic considerations: the best means to obtain accurate facts or data; and the tools and techniques necessary for analyzing these data so to check if they verify or alter existing explanations for the facts as they are observed.

Modern technology has come to the aid of the professor in achieving both of these goals. Satellite instrumentation, such as radar, infra-red and visible light cameras, are being used to gather information for understanding and solving a wide range of human problems. The computer has proved to be a priceless aid in analyzing these data, which are influencing the planning of urban areas, the development of better policies and practices for the use of resources, the solution of pollution and other environment-man problems, the easing of internal and international conflicts, and many other endeavors. Today's geography is man-centered and contributes to the decision-making processes involved in determining how man can improve the quality of life in this complex age.

Career opportunities for undergraduate majors in geography exist in various branches of government and in business. There is a demand for persons capable of dealing with resource management, economic development, market area analysis and other problems related to the distribution and spatial intersection 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 man's perception of and his subsequent interactions with the natural environment. Courses in geography are commonly required of students preparing to enter the teaching profession 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, hospital administration and transportation engineering.

The Undergraduate Program

The Geography faculty has attempted to build an undergraduate program which contributes to the liberal education of all undergraduate students; it provides innovative and relevant preparation for undergraduate majors for careers in which an understanding of geography is basic; and it joins in significant interdisciplinary programs involving regional, urban and environmental components.

A number of geographic themes and principles compose the intellectual framework of the discipline and serve as unifying threads through all courses constituting the Department's program. The stress is on the spatial aspects of human behavior, environment-man relations, the spatial organization of territory for achieving institutional goals and the geography of particular parts of the world, such as newly developed regions.
Students electing to 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.

Geography courses open to undergraduate students may be taken in any order or simultaneously; no undergraduate course in geography has any prerequisites. Most courses below the 100 level are open to freshmen.

Undergraduate students may be admitted to the major program in geography after conferring with the Department chairman.

Students majoring in geography must meet the general College of Liberal Arts skills and core requirements. Credits earned in five geography courses—44:1 Geography and Human Activities, 44:2 Natural Environment and Man, 44:11 Introduction to Geographical Data Processing, 44:19 Natural Environmental Issues, and 44:30 Introduction to Economic Geography—may be applied toward the social science core requirement.

The Bachelor of Arts and Bachelor of Science degree programs both require 26 semester hours of coursework in geography, including the Undergraduate Seminar and at least 12 semester hours in 100-level courses.

It is recommended that all complete Geography and Human Activities, and Natural Environment and Man. With the help of their advisers, students may plan study programs which best suit their individual needs.

For example, those considering careers in urban planning, or who expect to work in an urban environment, might well take a cluster of courses including Introduction to Urban Geography, 44:113 Political Behavior and Urban Spatial Structure, 44:135 Internal Spatial Structure of Urban Areas, 44:136 Geographic Analysis of Urban Areas, 44:137 City Growth and Development, and other courses related to the study of urban structure and function.

Students interested in problems relating to ecology might elect Natural Environment and Man, Introduction to Social Geography, Natural Environmental Issues, 44:101 Introduction to Weather and Climate, 44:116 Political Ecology, 44:120 Natural Hazards, and 44:122 Natural Habitats of the United States.

All undergraduate students majoring in geography must take a course in statistics, such as 22S04 Introduction to Statistical Methods, or its equivalent, such as 44:108 Quantitative Methods or 34:11 Theory, Research and Statistics.

Students in the B.A. program must also complete 22M:25 Calculus I or its equivalent.

Students who wish professional careers in geography are urged to complete the B.S. program. Those contemplating careers in foreign service should complete three years' study of the appropriate language.

The Association of the American Geographers publishes a monthly bulletin, Jobs in Geography.

The Graduate Program

The rules of the Department at the graduate level are to prepare graduate students to carry on creative and productive research in geography involving the use of theory, modeling and formal verification methods; to prepare students at both the M.A. and Ph.D. levels for positions to which they aspire in research, teaching or some area of applied geography; and to help students develop their ability to apply knowledge of facts, theories and methodologies 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 man and his environment.

To develop concepts, models and theories which facilitate the study of these basic aspects of geography, the Department offers a graduate program of courses and seminars at the intermediate and advanced levels and directs research efforts of qualified students. In addition, courses have been developed to provide graduate students with the technical skills necessary for geographic analysis of human activities and the environments in which they take place. Special attention is given to the utilization of theory and the construction of models in analyzing human behavior in urban areas and in selected regions.

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-senior years; his or her score 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 continue his or her study of geography at The University of Iowa. Students with undergraduate grade-point averages between 2.5 and 2.75 will be admitted for the M.A. degree on condition that they maintain a G.P.A. of 3.00 or better on their first 12 hours of graduate work, as approved by the Department, in order to remain as graduate students. 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.

All M.A. students are required to complete a minimum of 30 semester hours of graduate work, including 44:108 Quantitative Methods I, 44:201 and 44:202 Geographical Analysis I and II. 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 M.A. degree with thesis. The remainder of both M.A. programs may be composed of graduate level courses or research seminars, as approved by the faculty.

All M.A. students must pass a final examination. Students whose objective is the Ph.D. degree are required to complete 44:108 Quantitative Methods, 44:201-202 Geographical Analysis I and II, and 208 Advanced Quantitative Methods, preferably during the first year in residence. However, the student may meet these course requirements with a satisfactory
performance in written examinations during the first week of the first semester for which he or she registers.

All doctoral students must also 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 44200 each semester while in residence. During the academic year, one semester hour of credit will be awarded each semester on an S/U basis for this course. The remainder of the Ph.D. program includes appropriate graduate courses, seminars and research in geography, depending on the interest of the student; courses in disciplines closely related to the student’s objectives and interests; and courses which satisfy the test requirement.

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. During the second year in residence, if possible, the doctoral student should declare a specific field of specialization within his or her general area of interest.

Preferably during his or her second year in residence, and no later than the fifth semester, the doctoral student must, with the approval of his or her adviser, submit one of his or her own research papers to the faculty, who will pass upon the merits of the research demonstrated therein. Such a paper is commonly referred to as a Qualifying Paper.

Research test requirements for the Ph.D. candidates are of two kinds. One is the course 44-208 Advanced Quantitative Methods, 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.

To become a candidate for the Ph.D. degree, the student is required to pass a comprehensive examination consisting of written and oral parts, in which he or she demonstrates analytical proficiency with respect to his or her major area of specialization and a general knowledge of the discipline, including both content and methodology. Upon passing the comprehensive examination, the doctoral candidate will prepare a research design to be presented before the staff seminars. After the design is approved by the faculty, the candidate is expected to conduct the necessary research and analysis, and to present his or her findings in an appropriate 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.

Innovations in Teaching

During the past year or two, faculty members have initiated some interesting changes in their teaching strategies, in order to improve their instruction and to develop greater student interest and participation.

Courses have been re-oriented, from an emphasis on a body of knowledge, to be learned to the development of problem-solving abilities. Attempts are being made to break with the well-established teaching procedures, such as the "lecture-read-test" syndrome.

In some instances, lectures are 40%-50 longer the focus of a course. Rather, lectures are built around the activities to be performed in the discussion-laboratory periods. So, too, are the reading assignments. In other instances, the lectures, laboratories, discussions, readings, papers and examinations are being used in such a way as to achieve new goals. There is also interest in the development of a series of computer-program units for use in several undergraduate courses. As a result of these innovations, several courses have been ranked above average in the Course-Instructor Evaluation program sponsored by the Student Association Senate during recent years, and enrollments in all courses have increased.

Research Productivity

Since its origin, the Iowa Department of Geography has made significant contributions to the advancement of research in geography and is continuing to do so. It was among the first in the country to adapt the scientific method to geographic research; to use quantitative methods in the analysis of the location and distribution of natural and cultural phenomena over the earth’s surface; and to develop mathematical models and geographic theory. In most instances, the research program of the Department produces immediate, feedback-to-the-instructional program. Thus, the content of both undergraduate and graduate courses reflects the latest advances in the discipline, both in content and methodology.

Rating of Department

In its recent evaluation of graduate departments, the American Council on Education ranked the Iowa Department of Geography as "strong." The Department was also included in the list of 15 "leading" departments of geography in the nation.

The Faculty

Individual faculty members participate in University, local, state, national and international groups whenever significant use can be made of their special professional commitments. They give time and energy to professional organizations and have served as executive officers, as members of governing boards and as review and consulting editors for the Association of American Geographers, the National Council for Geographic Education, the Regional Science Association, the International Geographical Union and the National Council for the Social Studies.

Relations with Other Departments

In both their instructional and research efforts, members of the Geography faculty work closely with their colleagues in other departments within the College of Liberal Arts, as well as in other divisions of the University, and especially with the Institute of Urban and Regional Research. The Department's interest in problems relating to the environment use man, for example, has led to cooperation in the establishment of interdisciplinary courses and research projects with other departments in both the natural and social sciences, as well as in the schools of Engineering, Medicine and Law.
The Map Library

Housed on the third floor of the Main Library, the Map Library contains more than 36,000 maps, a total of 1,820 atlases and reference volumes, and about 3,000 aerial photographs, primarily of Iowa. The map collection in the Library is a depository library for maps of the U.S. Army Topographic Command, formerly Army Map Service. The Geography Library contains approximately 40,000 maps, including both geographic 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 supply of aerial photographs for use by students in working out laboratory exercises.

In recent years, the Department has been fortunate in receiving grants for supporting research and service activities. Many of these grants include funds for supporting research and other activities.

Staff: professors Kohl, Horton; associate professors Dunker, Lindberg, McNulty, Reynolds, Rusthon, Salibary; assistant professor Gainer, Marion

Courses for Undergraduates

461 Introduction to Human Geography

Application of geographic principles to contemporary social, economic and political problems; urban growth; problems of ghettos; diffusion of innovations; territoriality and premillenium; open in freshmen.

462 Natural Environment and Man

Spatial distribution of the world's natural resources, including climate, water, landforms, soils, vegetation, and minerals; man's role in defining nature; more regional problems in resources use, environmental pollution, and natural hazards; open to freshmen.

464 Introduction to Social Geography

Problem related to distribution and growth of populations; man in relation to his natural environment; spatial aspects of social systems, including education, religion, recreation, recreational and social services; diffusion of ideas and goods over space; social change and social policy; closed; open to freshmen.

465 Natural Environmental Issues

Issues arising from man's use of natural resources and related problems relating from exploiting world population; air, water, and land pollution; population pressure on agricultural resources; pressure on forest and water resources; pressure on marine resources; environmental resource requirements; open to all.

466 Introduction to Economic Geography

Location and spatial organization of world's major types of economic activities, including transportation, manufacturing, service occupations and patterns; open to all.

468 Introduction to Urban Geography

Processes of urbanization and city growth; spatial structure and function of cities; generalization of contemporary urban problems; the city and its environment; open to all.

469 Undergraduate Seminar for Geography Majors

Nature of geography as professional field; geographic methods of analysis; research in geography; methods of research paper; required of all undergraduate majors; open to undergraduate majors in geography; prerequisite approval of faculty member with whom student wishes to study.

468B The World of Wine

Production, distribution and consumption of wine throughout the world, with emphasis on quality of wine as related to landforms, soils, weather, conditions and age; three-week field trip of 100 to 125 European countries planned for those who wish to study this area; credit awarded for three weeks immediately following the end of spring semester exam period in May; open only to juniors and seniors.

468G Geography of the Third World

Geography processes and patterns of underdeveloped; spatial implications of political events and international development; concept of spatial planning in third world; open only to juniors and seniors.

469 Geography of a Divided World

World divided by differences in natural, economic, social and political values and systems; major regional areas of the world, as characterized by their reactions to impact of revolution-evolution—changes now in process, open only to juniors and seniors.

Courses for Undergraduates and Graduates

4610 Readings in Geography

4610 Introduction to Weather and Climate

Spatial distribution of weather elements, wind circulation, air masses, storms and general world climate patterns, including air pressure and climatic zones; laboratory work in study of weather maps and climate data

4616 Geography in the Social Curriculum

Concepts and content of geography essential to effective educational programs; methods of geography instruction; use of audio-visual media in teaching geography

4616 Quantitative Methods I

Mathematical and statistical techniques in current research in geography

4619 Political Geography in Cities

Political organization of urban areas and the problems and impact of urban sprawl and conflict situations in metropolitan areas

4619 Political Geography

Social aspects of urban areas, relationships between the political behavior of individuals, groups and agencies, and the structure of their social, cultural, political and economic environments; theory of political and spatial organization based on assumptions of political and economic systems

4619 Issues arising from man's use of the natural environment, and related problems relating from exploiting world population; air, water, land pollution; pressure on agricultural resources; pressure on forest and water resources; pressure on marine resources; pressure on environmental resources; open to all.

4620 Natural Hazards

Non-environmental 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 like the occurrence of evacuation to long-term responses like the forecasting, flood control, saving and insurance.

4610 Stream Processes and Landforms

Hydrology of drainage basins, and role of running water and mass movement in shaping form of land surface

4612 Natural Resources of the United States

Nature, pattern and interdependence of elements of the natural resource base; land, water and air as habitats for man and biological communities

4610 Location of Economic Activities

Relation of economic activity to location of economic activities; problems of providing services to dispersed and isolated agrarian populations, United States; methods and techniques of analysis and related to spatial distribution of economic activities, manufacturing and service activities in both world and national markets

4610 Trade and Industry

Theory and practice of manufacturing, and its application to different industrial types and economic systems by location of selected economic activities

4610 Urban Geography

Methods of urban growth and urban forms; spatial patterns of selected activities; processes that influence these patterns; current problems

4610 The Urban System

Residential segregation of minority groups; spatial structure of " ghetto" types; urban environment and the quality of life in the neighborhoods; spatial analysis of problems of economic and social areas

4610 City and Environment

Processes and policy considerations related to urban growth, change, employers and urban conditions; environmental quality of neighborhoods, spatial aspects of problems in urban morphology and activity patterns within cities

4610 Spatial

Theoretical, methodological and substantive findings concerning spatial organization of human activities using computer systems; spatial diffusion of innovations; spatial distribution of neighborhoods in cities; spatial choice patterns of individuals; spatial preferences and second homes, open only to seniors.

4610 Spatial

Methods of analysis of regional economic and social development in the United States and Canada

4610 Affric

Spatial aspects of development in Africa, geographical interpretation of economic problems confronting African nations

4610 Perspective on Man-Environment Issues

Theoretical relations between man's social behavior and biological and physical aspects of the environment
Liberal Arts

Students majoring in geology must meet the general requirements of the College of Liberal Arts in rhetoric and physical skills, mathematics, foreign language; and the literature, historical-cultural, social science and natural science core areas. It is recommended that they satisfy the language requirement with French, German or Russian; and the social science core requirement with approved courses in economics, geography and/or anthropology. Most students meet the Liberal Arts requirements in less than the 62 hours allowed.

Geology Course

These are in addition to the College of Liberal Arts' general requirements:

11:23 Earth History and Resources 4 s.h.
11:24 Man and His Physical Environment 4
and
2 two seminars of freshman geology 6-8
12:42 Mineralogy 3
12:52 Elementary Petrology and Geochemistry 3
12:112 Geological Field Methods 1
12:113 Summer Field Course 6
12:121 Principles of Paleontology 3
12:191 Structural Geology 4
12:198 Senior Seminar 1
and two elective geology courses 6

Supporting Sciences

The geology major requires at least 10 semester hours of college-level mathematics, including either one semester of calculus or 223E:35 Engineering Mathematics I (computer science or statistics courses may be counted toward the 10-hour requirement) and eight hours of physics, eight hours of chemistry and five hours of college-level zoology or botany.

Research

Many students in the junior or senior year are ready to pursue some aspect of original investigation for credit. Those who are interested may arrange for a faculty member or graduate student with an ongoing research project to implement a small-scale project involving a combination of field work and laboratory and library investigations. Such work is in addition to the required 30 semester hours of geology courses.

The Bachelor of Arts Degree

Requirements are the same for the B.A. as for the B.S. degree, except that two years of foreign language are required instead of one.

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.

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.

All graduate students in geology are required to perform teaching, research or other appropriate services for the Department, as part of the degree program.

The Master of Science Degree

The M.S. degree programs are designed to complete the student's broad, fundamental background in geology and the supporting sciences. They prepare the student for a professional career in geology, or for more advanced and specialized studies - otherwise, certain situations and with faculty approval the student may pursue a specialized program at the master's level. The Department chairman assigns each entering graduate student to a faculty advisor and designates two additional faculty members to form the student's advisory committee. The committee is responsible for approving a suitable program of coursework, guiding the student in the development of research plans and, before the end of the student's first year of residence, approving his or her thesis topic, if he or she is taking the degree with thesis.

The degree requires at least 30 semester hours of credit in graduate-level coursework, including not more than eight semester hours of thesis and research credit, and at least 24 hours in residence at Iowa.

Master's degree candidates complete at least one-half of the Ph.D. language and tool requirements as part of the master's program. Coursework taken to satisfy these requirements does not count toward the semester-hour requirements for the degree.

To qualify for the final master's examination, the candidate must have at least a 2.75 (4.0) 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 subspecialties and scientific skills. Mapping these is considered particularly appropriate if the area is wisely chosen. 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 involved and its value and broader application and implications. No college credit is granted for this activity.

The M.S. degree without thesis requires at least 38 semester hours of graduate coursework, of which at least eight hours must be earned in other departments of the University.

The facility 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 (North Science)

This program enables students to combine certification to teach secondary school with participation in a specialized graduate curriculum. A certificate in the College of Education, the M.A.T. degree requires at least 20 semester hours of graduate study in professional 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 achievement of competence in two languages or in one language and one tool, or achievement of proficiency in one language.

Competence is normally achieved by satisfactory completion of a one-year sequence of appropriate courses, proficiency by satisfactory completion of a two-year sequence.

French, German and Russian are languages which meet Departmental requirements; statistics and computer science are suitable tool areas. In exceptional circumstances the faculty may approve other languages or tool areas.

Courses in such related disciplines as botany, chemistry, physics and zoology are not regarded as satisfying tool requirements, although they may provide indispensable background for the various tasks of geological specialization.

Coursework taken to satisfy language and tool requirements may not be applied to credit requirements for the degree.

Within broad limits, the student's course selection should reflect his or her own needs, interests and abilities. These are minimum requirements:

Satisfaction of course requirements for the M.S. degree in geology at Iowa. Where appropriate, additional work in one area may be approved as satisfying requirements in another.

An appropriate graduate course in another discipline. Courses crosslisted between Geology and other departments are not generally considered to meet this requirement.

At least 24 semester hours of graduate coursework, exclusive of credits for dissertation research and beyond coursework applied toward the M.S. degree.

The comprehensive examination covers—in depth—all subdivisions of one major field and one subdivision in each of three other major fields. It is also possible 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
Geology
Igneous and Metamorphic Petrology
Experimental Petrology

Structural Geology
Geotectonics
Structural Analysis
Remote Sensing
Stratigraphy
Physical Stratigraphy
Biostratigraphy
Depositional Environments
Sedimentary Petrology
Sedimentation
Sandstone and Carbonate Petrology
Physical Stratigraphy
Plutonism Studies
Petroleum Geology
Vitrinite Palaeontology
Palynology
Palaeontology
Palaeobotany
Palaeozoology
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
Students benefit greatly from the presence on campus of the Iowa Geological Survey and the State Archeologist. The Department has joint professorships with the Survey and the Department of Botany. Students sometimes work during summers and the school year on projects for the Survey—surveying, keeping well records, drafting and doing special projects.

There is cooperation between the Geology, Geography, Archeology, Chemistry and Physiology departments in service, ex-
pertise, joint instruction and equipment.

Field Trips
Field trips are integral parts of several courses in geology. Week-
end general-interest events are frequent. Iowa City is situated in the midst of the richly fossiliferous Paleozoic bedrock. Marine and terrestrial fossil assemblages, extensive reefs and unique geode sites are available within a few hours' drive. All four Pleistocene glaciations are represented in Iowa and each offers distinctive landforms and fossil assemblages.
Spring recess provides time for longer trips which are available to all geology students. In recent years these have included the Grand Canyon, the Florida Keys, the southern Appalachians, the Big Bend Region of Texas and the Ozarks. Advanced courses for seniors and graduate students regularly visit Colorado, Ontario, Kansas, Oklahoma and California.

The Senior Seminar
All geology majors take part in a once-a-week senior 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 can 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. Typical joint majors include chemistry, physics, zoology and anthropology.

Original Research
Many students in the junior or senior year are ready to pursue original research for credit. They 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 investigations. 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.

Staff: professors Furrish, Ginnett, Hopkin, Tuttle, adjoint professors Strehlitzer, Tatsch, Tuttle, professor emeritus Tester; associate professors Clark, Heckel, Klappr, McCormick, Semick, Swigg; assistant professors Baker, Carman, Drake, Schaller; research associate Strimple.

Laboratory Manager: Roger C. Rudelle
Librarian: Vera Bacon
Technician: Kenneth H. Kern

Courses Primarily for Undergraduates
121 Lectures in Earth History and Resources 2 h.
122 Men and His Physical Environment 2 h.

We open to those who have had 112d, 113a and b examine seniors and modern environments on and within earth and processes by which they evolved; evolution of organisms and man's current use and misuse of present environments.

123 Principles of Physical Geology 5 h.

Introductory course focusing on processes that have operated during and are shaping our physical environment; composition and blockstructure of the earth from remote to planetary level; concepts of evolution and human resources; processes of weathering, erosion, rock deformation, volcanism, magmatism, tectonics, metamorphism and continental drift considered; open to all who have had previous geology course in geology or earth science.

124 Principles of Historical Geology 2 h.

Continuation of 123, but may take an independent study; earth history through the last 200 million years; evolution of selected animal and plant groups; survey of geologically important lands; open to all students who have not had a college course in historical geology.

125 Introduction to Geology 4 h.

Lecture and laboratory for students interested in learning physical aspects of earth; topics include rocks and minerals, weathering, clastic, igneous, sedimentary, volcanic, glaciers, paleoclimatic and stratigraphic and petrologic evidence; those who have had 123a, 123b or 123.

126 Geology of Iowa 2 h.

Survey of geosynclines in the state; for students who have had previous course in geology.

127 Notes and Field Trips 2 h.

Prerequisite: consent of the Department

12/15 Methods of Geologic Interpretation 1 h.

Institutional methods utilized in elementary geology; literature review of presentation techniques; instructional drill in an elementary laboratory; may be repeated; consent of instructor.

12/17 Field Trip 2 h.

Seventy to eighty days during spring months in areas of geologic interest; prerequisite: consent of instructor; sections 1, central Florida; sections 2, northern Arizona; sections 3, Big Bend, Texas; sections 4, southern Appalachian.

12/18 Terrane Analysis 3 h.

Techniques of regional analysis and structural analysis, and the potential of using the principles of terrane analysis for geologic reconstructions.

12/19 Photogeology and Geologic Map Interpretation 3 h.

Prerequisite: college geology or course of instructor.

12/20 Geology of Iowa 2 or 3 h.

Survey of geologic features of the state; for students with previous course in geology; sections 1, eastern Iowa; sections 2, western Iowa; open to those who have had 12/15.

12/21 Geologic Remote Sensing 1 h.

Theory of remote sensing and selected techniques using electromagnetic processes; from atmospheric through microwave; application of remote sensing to environmental and geological problems; laboratory deals with remote sensing methods, data analysis and interpretation; prerequisite: college physics and geology, 12/10 or consent of instructor.

12/22 Field Trip 2 h.

Prerequisite: college physics and geology.

12/23 Field Trip Methods 1 h.

Field practices with basic instruments and techniques of geologic mapping; prerequisite: college physics and geology.

12/24 Summer Field Course 8 h.

Training in geologic mapping and study of rock units and geologic structure in the Washake and Ulva Mountains, Park City, Utah; prerequisite: 12/22, 12/23 and 12/23.

12/25 Geology and Ground Water 5 h.

Geologic occurrence and geographic distribution of ground water; principles controlling quantity, recharge, quality and recovery; theory and problems of movement and recovery; principles of use and conservation of ground water; prerequisite: consent of instructor.

7.0 h.

Seventy to eighty days during spring months in areas of geologic interest; prerequisite: consent of instructor; sections 1, central Florida; sections 2, northern Arizona; sections 3, Big Bend, Texas; sections 4, southern Appalachian; sections 5, central and western Montana; open to graduates only; may be repeated.

12/28 Directed Study 2 h.

Prerequisite: consent of the Department; may be repeated.

12/29 Principles of Paleobiology 5 h.

Nature, origins and use of the principles of paleontology; selection and recognition of selected animal groups; field and laboratory studies of taxa of greater geologic significance; prerequisite: college earth science or geology or consent of instructor; open to graduate in geology or botany without prerequisite.
German

12/271 Advanced Geomorphology 3 s.h.
Prerequisite: 12/271

12/273 Field Geomorphology 5 s.h.
One-week field trip to selected areas of geomorphic interest; permit classes to consider regional aspects, prerequisite: 12/271, 12/74, 12/271

12/294 Seminar: Economic Geology 2 s.h.
Superior development and initiation of mineral deposits; prerequisite: 12/182 or 12/184, consent of instructor, alternate years

12/396 Economic Geology: Petroleum 2 s.h.
Methods of exploration and development: typical structural anomalies and reservoirs, offered in alternate years; prerequisite: 12/182 and 12/72

12/393 Geothermometry 2 s.h.
Origin of continental, ocean andogenic belts, based on geophysical, geochemical and geologic evidence; offered in 1972-74 and in alternate years; prerequisite: 12/181, 12/182, recommended: one year of geology

12/390 Advanced Physical Geology 3 s.h.
Mechanisms of formation of rock complexes and physical processes in geology; offered in 1972-73 and in alternate years; prerequisite: one year of calculus

12/296 Seminar: Structural Geology 2 s.h.
Offered in 1973-74 and in alternate years; may be repeated; prerequisite consent of instructor

12/390 Research: Summer Field and Laboratory or. arr.
May be repeated

12/391 Research: General Geology or. arr.
May be repeated

12/19 Research: Ground Water or. arr.
May be repeated

12/290 Research: Paleontolgy or. arr.
May be repeated

12/291 Research: Micropaleontology or. arr.
May be repeated

12/390 Research: Sedimentology and Sedimentary Petrology or. arr.
May be repeated

12/390 Research: Mineralogy or. arr.
May be repeated

12/390 Research: Petrology or. arr.
May be repeated

12/19 Research: Biostratigraphy or. arr.
May be repeated

12/390 Research: Geomorphology and Pleistocene Geology or. arr.
May be repeated

12/390 Research: Economic Geology or. arr.
May be repeated

12/390 Research: Geophysics or. arr.
May be repeated

12/390 Research: Structural Geology or. arr.
May be repeated

12/390 Research: Geologic Remote Sensing or. arr.
May be repeated

German

Department Head: Edward Durewicz
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.

University graduates with a major in German frequently enter the teaching profession. (For teacher certification requirements, see "College of Education.") They may also find positions in government, foreign service and commercial enterprise, where their specialization of the language and literature, the history and culture of Germany is indispensable.

Undergraduate Requirements

Students majoring in German are normally required to complete, in addition to the general requirements of the College of Liberal Arts (see "College of Liberal Arts"), a minimum of 24 semester hours of coursework in the Department beyond the 15-semester hour basic program. The following courses of a minor, or the equivalent is required of majors who have had no previous experience with the German language:

The Basic Program

First and Second Year

13/11 First Semester German 3 s.h.
13/12 Second Semester German 3 s.h.
13/21 Third Semester German 3 s.h.
13/22 Fourth Semester German—Reading 3 s.h.
13/23 Fourth Semester German—Composition and Conversation 3 s.h.
13/22 and 13/23 may be taken concurrently, if desired, or
taught in Third Year

13/31 German Classics 3 s.h.
13/32 German Classics 3 s.h.
13/33 Intermediate Composition and Conversation 3 s.h.
13/34 Intermediate Composition and Conversation 3 s.h.

Fourth Year

13/101 Advanced Composition and Conversation 3 s.h.
13/105 German Cultural History 3 s.h.
13/111 Survey of German Literature 3 s.h.
13/112 Survey of German Literature 3 s.h.

An eight-week intensive course, 13/111, is offered each fall semester for students who seek the teaching certificate and are enrolled for the professional semester in the College of Education.

Courses are to be taken in sequence after initial placement, unless permission to vary 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 either semester of 16/149-150 History of Germany but preferably both.

If a student who handles German with native proficiency wishes to major in German, he or she may do so, but since most of the undergraduate course requirements are waived in such a case, it will be necessary for him or her to declare German as a second major. The student is expected to earn a complete first major in a subject in which he or she has no such obvious advantage over his or her peers.

Teacher Certification

In view of the requirements of the College of Education for teacher certification, which are subject to change and which could conflict at times with the sequential requirements of the major in German, it is strongly advised that the student consult with the Departmental chairman or undergraduate advisor to help ensure the successful completion of his or her program.
The Teaching Minor
In addition to the basic program of the first and second year, above, the following courses or their equivalents constitute a teaching minor in German:
13:31 German Classics
13:32 German Literature
13:33 Intermediate Composition and Conversation
13:34 Intermediate Composition and Conversation
13:103 Advanced Composition and Conversation

Honors in German
German majors of junior or senior standing with an overall grade-point average of at least 3.0 and a 3.5 grade-point average in German may elect to in this program. The student chooses an instructor in the field of his or her special interest, under whom he or she works. An extensive reading program, discussions, regular reports and a semester paper are required for each work unit (two semester hours). A total of six to eight semester hours may be taken in this program. Also, graduate courses and seminars are open to the student judged to be ready for them. A comprehensive examination in the senior year terminates the program.

Special Facilities
Students have the opportunity to improve their comprehension and command of the language by working with recorded materials in the Language Laboratory. An extensive collection of works and periodicals in the University Library facilitates research in all major areas of German literature and Germanic linguistics.

Graduate Study Requirements
Master of Arts Degree in German

M.A. with Thesis
Graduate students of German who demonstrate an interest in and potential for productive scholarship on the graduate level and who plan to continue to the doctorate should elect the program with thesis. A minimum of 30 semester hours or the equivalent of graduate-level work beyond that which normally constitutes an undergraduate major in German at The University of Iowa (see above) is required. If the candidate for the M.A. degree in German has not already had these undergraduate courses or their equivalents, he or she will include them in his or her program along with the other required courses as listed below in the required courses for the Master of Arts degree in German. The candidate will receive graduate credit for such undergraduate work, but this credit will not normally be counted toward the degree. Additional courses are selected with the approval of the candidate. Of the minimum 30 semester hours required for the degree, some graduate work may be taken outside the Department with the approval of the graduate adviser in such related subjects as philosophy, history, linguistics, or other languages, etc. Normally two semester hours of credit may be received for satisfactory completion of a thesis. The thesis may be either linguistic or literary and is subject to the approval of the faculty. Those students planning to go on to the Ph.D. degree are required to write a thesis unless departmental approval to do otherwise is granted.

Before the M.A. exams 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. Without Thesis
A graduate student who desires his or her program to be completed 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 calculated to provide the student with training for the work he or she plans to do 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 as electives those courses which will best prepare them for their teaching careers, etc.

Required Courses: Master of Arts Degree in German

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Notes</th>
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<tr>
<td>13:102</td>
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<td>13:103</td>
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<td>13:111</td>
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<td>13:112</td>
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<td>13:201</td>
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<tr>
<td>13:202</td>
<td>3 s.h.</td>
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<tr>
<td>13:285</td>
<td>3 s.h.</td>
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<td>13:241</td>
<td>3 s.h.</td>
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<td>13:243</td>
<td>3 s.h.</td>
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<tr>
<td>13:245</td>
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*The candidate will receive graduate credit for these courses, but this credit will not normally be counted toward the degree.

All M.A. and Ph.D. candidates must include 13:285 in their graduate work.

Doctor of Philosophy Degree in German

The Ph.D. degree is awarded upon the satisfactory completion of 15 graduate semester courses or their equivalents beyond the requirements for the M.A. degree and fulfillment of the requirements for the Graduate College (see "Graduate College"). The candidate may concentrate in either Germanic linguistics or German literature. The Ph.D. program will normally include the coursework listed below, or their approved equivalents, and at least two advanced seminars. The remainder of the program is planned by the candidate in consultation with the graduate adviser in such a way as to assure satisfactory balance and concentration. The student may earn up to 15 semester hours of credit for satisfactory completion of the Ph.D. dissertation. Some graduate courses outside the Department in related subjects may be counted toward the degree with the approval of the graduate adviser. Each candidate is required to demonstrate adequate teaching ability in German. Wherever possible the Department will afford the opportunity
and privilege to deserving graduate students to gain valuable teaching experience under supervision by making available such awards as teaching-research fellowships, teaching assistantships, tuition scholarships, etc.

A reading knowledge of French or Russian, and of a modern Scandinavian language or Dutch is required of all doctoral candi-
didates in Germanic linguistics; a candidate concentrating in literature must demonstrate a reading knowledge of French and
of another language which has been certified by his or her adviser
as pertinent to the research interests of the student. Competence
in these languages may be demonstrated by two years of college
study or four years of high school study, with a grade of "B" or
higher in each of the languages or through testing by the
Department. The requirements must be met before the compre-
sensive exams can be administered.

Required Courses: Doctor of Philosophy Degree, Concentra-
tion in German Literature

13:102 3 s.h. 13:251 3 s.h.
13:103 3 s.h. 13:261 3 s.h.
13:117 3 s.h. 13:271 3 s.h.
13:118 3 s.h. 13:281 3 s.h.
13:201 3 s.h. 13:291 3 s.h.
13:202 3 s.h. 13:292 3 s.h.
13:241 3 s.h. 13:294 3 s.h.
13:244 3 s.h. 13:295 3 s.h.
13:245 3 s.h.

Required Courses: Doctor of Philosophy Degree, Concentra-
tion in Germanic Linguistics

13:102 3 s.h. 13:251
13:103 3 s.h. 13:261 3 s.h. (any one)
13:105 3 s.h. 13:271
13:111 3 s.h. 13:281
13:112 3 s.h. 13:282 3 s.h. (any one)
13:201 3 s.h. 13:286
13:202 3 s.h. 13:291
13:241 3 s.h. 13:294 3 s.h. (any one)
13:243 3 s.h. 13:295
13:245 3 s.h. 103:112 3 s.h.
13:246 3 s.h. 103:113 3 s.h.
13:247 3 s.h. 103:250 3 s.h.
13:248 3 s.h. 103:251 3 s.h.
13:285 3 s.h.

Concentration in one period of German literature 9 s.h.

* The candidate will receive graduate credit for these courses, but this credit will not normally be counted toward the degree.

Staff: professors Dormetzy, Fehling; professor emeritus Funke; associate professor Sandrock, ter Haar, Zagel; associate professor Emeritus Lyrie; assistant professors Donner, Ngels, Parfen, Runge, Wilkening

Courses

Normally, for purposes of quick 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
two years of high school German language instruction is or-
dinarily expected to register for the second year of college Ger-
man (13:21), but if such a student is not sufficiently prepared
for 13:21, he or she can secure permission to register for 13:12,
or even 13:11. If the latter occurs, however, three semester hours
are added to his or her general graduation requirement. Profi-
ciency-placement exams are given to students in whose cases the
routine procedure above does not seem suitable.

Students electing to satisfy an eight-semester-hour minimum
foreign language requirement in German (i.e., B.S., B.F.A. or
B.M. degree candidates) may do so by completing the basic
course which consists of the following sequence: 13:11, 13:12 and
13:21, for a total of nine semester hours.

Students who elect to satisfy in German their 12-semester-
hour minimum foreign language requirement for the B.A.
degree, may do so by completing, in addition to the
nine-semester-hour basic course sequence above, a fourth-semester-
hour course. For this fourth-semester course the student has
an option of taking either 13:22 or 13:23.

A student may not take or repeat, for either credit or quality
points, any course if he or she has already completed a higher-
level course which assumed the earlier course, or its equivalent,
to be a prerequisite.

Primarily for Undergraduates

13:11 First-semester German 9 s.h.

First unit of three-semester course sequence; emphasis on reading and basic struc-
ture of German language.

13:12 Second-semester German 9 s.h.

Second unit of three-semester course sequence; study of basic structure of German
language continued; emphasis on vocabulary building and reading ability.

13:17 German Heroes and Erotic Literature of the Middle Ages 4 s.h.

Masterpieces of this period, including, among others, The Nibelungenlied and Tristan
read in English translation; satisfies second-semester core requirement in literature; also
designed for language majors and may be taken by other interested undergraduates;
11/17

13:21 Third-semester German 9 s.h.

Third unit of three-semester course sequence; basic structure of German language
comprehensively reviewed; emphasis on simple conversation, composition and essay
writing.

Note: A student who has left off all three of the units of the basic course sequence
or equivalent has an option of taking either 13:22 or 13:23 for his or her fourth
semester; courses 13:22 and 13:23 to be taken concurrently or in any order.

13:29 Fourth-semester German; Reading 9 s.h.

Standard fourth-semester course for students satisfying foreign language require-
ment for B.A. degree; dual block of German literature; reading of short but
representative literary works.

13:29 Fourth-semester German; Elementary Composition and Conversa-
tion 9 s.h.

Fourth-semester course which also satisfies foreign language requirement for B.A.
degree; recommended for students who wish further training in active use of the
language, i.e., written composition, delivering speeches, carrying on conversations in
German.

13:31 German Classics 9 s.h.

Representative works of Lessing, Goethe and Schiller studied in their relation to
Classical and modern German literature; prerequisite: 13:22 or equivalent; 10/17

13:32 German Classics 2 s.h.

Continuation of 13:31: representative works of nineteenth and twentieth-century
authors; prerequisite: 13:31 or equivalent; note: 10/12

13:33 Intermediate Composition and Conversations 9 s.h.

Practice in translation of assigned English texts, Mazeping of German texts, and
oral reports. Structure of German in normal conversation, among others.

13:34 Intermediate Composition and Conversations 2 s.h.

Structure of German in normal conversation, among others.

13:37 German Classics 2 s.h.

Continuation of 13:31: representative works of nineteenth and twentieth-century
authors; prerequisite: 13:31 or equivalent; note: 10/12

German

13:39 German Classics 2 s.h.

Continuation of 13:31: representative works of nineteenth and twentieth-century
authors; prerequisite: 13:31 or equivalent; note: 10/12

13:40 Intermediate Composition and Conversations 2 s.h.

Structure of German in normal conversation, among others.
13/34 Intermediate Composition and Conversation 1 3 a.h.

Continuation of 13/33, with more emphasis on original composition and comprehen-
siveness of presentation: prerequisite: 13/33 or equivalent

13/151 Ph.D. Reading 3 a.h.

13/321 and 13/322 comprise four-credit service courses for graduate students seeking research test competency in German as required by their respective departments: 13/321 intended for those students who have had no previous experience in German literature; 13/322 intended for those students who have had some prior experience with the language. 13/321, however, students with adequate experience may enter this course which is oriented toward research for senior theses, prerequisites: 13/321 or equivalent.

13/320 Senior Honors Program in German 2-4 a.h.

Or: 13/250 Austrian Literature 3 a.h.

Readings from significant Austrian works of the 18th- and 19th-centu-
yes

For Undergraduates and Graduates 2-4 a.h.

13/100 Individual German 2-4 a.h.

Open only to German majors and minors: prerequisites: 13/100 or equivalent

13/101 Advanced Composition and Conversation 3 a.h.

For undergraduates: German majors and minors: prerequisite: 13/34 or equivalent

13/102 Advanced Conversation and Composition 3 a.h.

Prerequisites: for 13/102, students who have completed 13/100; prerequisite: 13/100 or equivalent

13/149 German Phonology 3 a.h.

Analysis of structure of sound-system of German language and introduction to problems of German morphology and syntax; basic literature course; same as 132/149

13/103 German Cultural History 3 a.h.

Cultural history of Germany from earliest beginnings to present, with special emphasis on developments of art, philosophy and literature

13/107 Teaching of German 0 to 8 a.h.

On-chip training course for graduate student assistants in the Department

13/111 Survey of German Literature 5 a.h.

Survey of the development of German literature from earliest times to 1775; prerequisite: 13/32 or equivalent

13/112 Survey of German Literature 5 a.h.

Survey of German literature from 1775 to present; prerequisites: 13/111 or equivalent

13/118 German Literature in Translation 3 a.h.

Readings in German literature in translation; prerequisite: satisfactory completion of Literature core requirement: same as 132/118

13/119 Vividsl Language in Translation 5 a.h.

World literature, with special emphasis on the literature of the 18th and 19th centuries: prerequisite: at least junior standing and consent of instructor

13/120 Modern High School Modern Foreign Languages 3 a.h.

Same as Education 75-330

13/131 Heinseacles, Spengel, Thoma More 3 a.h.

Above-mentioned as critics of modern culture, ability to read German desirable, but not required

13/132 Rilke, George, Hofmannsthal 3 a.h.

Three poets studied as group and as individual artists, with special attention to their natural and representative works

13/133 Kafka, Brecht, Millat 3 a.h.

Three authors studied as representative of twentieth-century Austrian literature; class conducted in English and readings done in translation by those not majoring in German

13/139 Breath 3 a.h.

Critical analysis of his plays, poetry and aesthetic, and of his influence on modern drama; same as 307/332

13/158 The Past Tradition 3 a.h.

Development of drama in modern literature, concentrating on Goethe's Faust: critical analysis of Part I and last act of Part II, with special emphasis on philosophical and aesthetic aspects

Primarily for Grad/ent 5 a.h.

13/200 Advanced Studies 3 a.h.

Special problems of German literature and linguistics: open to German majors in German

13/301 German Prosopon 3 a.h.

For first-year graduate students; general introduction to graduate study in area of German literature and Germanic linguistics; bibliography, methods of research, theses preparation and writing, and specific problems introduced; 13/302 German Prosopon

13/302 Continuation of 13/301 3 a.h.

Development of novel and representative novels analyzed; good reading knowledge of German required

13/328 The German Novel in 3 a.h.

The 19th century

13/329 German Literature in the 20th Century 3 a.h.

Early periods of German literature from 1900 to 2000; critical analysis of representative poems together with study of German critics and criti-
cators of poetry during this period

13/324 The German Drama 3 a.h.

Development of German drama and representative drama analyzed; good reading knowledge of German required

13/325 The German Drama 3 a.h.

The 20th century

13/326 The German Drama 3 a.h.

The 21st century

13/327 The German Revue 3 a.h.

Origin and history of revue in Germany from Goethe to Karl Marx: critical analysis of representative works with emphasis on characterizations and artistic development of genre

13/154 History of the German Language 3 a.h.

Development of German language and dialects from prehistoric times to present, same as 132/154

13/343 Middle High German 3 a.h.

Grammar and syntax of High German language in period from eleventh to fourteenth centuries; primarily for students concentrating in Legislation, same as 132/343

13/344 Middle High German Literature 3 a.h.

Primarily for students concentrating in Legislation

13/345 Middle High German Literature 3 a.h.

High German drama in its medieval recorded forms and cultural, political and social influence exerted upon them from medieval and without German-speaking areas, eight to eleventh centuries; selected readings from literature of period; same as 132/345

13/346 Old Saxon 3 a.h.

Study of language of older Low German documents, and of historical practices of Low German with respect to other Germanic languages; prerequisite: Gothic or Old High German or Old English; same as 153/346

13/347 Gothic 3 a.h.

Study of importance for understanding of historical development of Gothic languages; introduction to comparative Indo-European linguistics

13/249 History of the Scandinavian Languages 3 a.h.

Scandinavian language from earliest times to present; extensive readings in linguistic texts in Danish, Swedish and Norwegian; prerequisite: one course in Old German

13/351 Early German Literature 3 a.h.

Begins up to German literature and thought; study of its most representative works

13/250 The Age of Enlightenment and the Period of Sturm and Drang 3 a.h.

13/252 The Age of Enlightenment and the Period of Sturm and Drang 3 a.h.

Continuation of 13/250, may be taken as separate unit

13/358 History of Chemistry up to J. J. Wiedemann, J. W. Goethe, F. Schiller, J. Paul, P. Haeckel, etc. 3 a.h.

13/258 Goethe 3 a.h.

13/263 France and Spain in English and Spanish literature, historical, philosophical and philosophical studies; his position in his own time and place

13/264 Germany 3 a.h.

13/265 Germany 3 a.h.

13/266 Germany 3 a.h.

13/267 Germany 3 a.h.

13/268 Germany 3 a.h.
To enroll under Plan B, the major program for teachers, the student must secure approval from his or her adviser.

The honors major (Plan C) is open to students who meet the standards of the Honors Program and have been admitted by its director. The major requirements contain few limitations, except those designed to bring honors majors together in small classes and to encourage individual study in consultation with an advisor. The thesis requirement makes it especially important for the student to find a congenial adviser. The honors major is most useful to those who have interests they want to pursue on their own, but it has also proved highly effective in preparation for law school and graduate work in history.

The requirements for the bachelor's degree with a major in history are as follows:

**General Major in History (Plan A)**
- Satisfaction of Historical-Cultural Core requirement; prospective history majors are advised, but not required, to complete this requirement by taking 11:29-30 Problems in Human History or 11:31-32 Western Civilization
- A minimum of 24 semester hours in courses offered by the Department of History; no more than 12 semester hours of American history will count toward fulfilling this requirement
- A minimum of 16 to 18 semester hours in related courses outside the Department of History: anthropology, economics, fine arts (excluding studio courses), geography, literature (excluding workshop courses), philosophy, political science, psychology, religion, and sociology, alternatively, the completion of a second major (besides history) in one of the above areas will satisfy this requirement; core courses or courses taken to satisfy core requirements will not be counted toward the fulfillment of the related area requirement

**Prospective Teachers in History (Plan B)**
- Core courses; any two chosen from 11:29-30 Problems in Human History and 11:31-2 History of Western Civilization (or equivalents, for transfer students)
- At least 18 semester hours of work in courses offered by the History department, of which 12 semester hours are in the ancient world and medieval Europe, and American 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**

**History Honors Major (Plan C)**

This program leads to the Bachelor of Arts degree with Honors. The Department will admit to this program students with a grade-point average of 3.0 or above. Applications should normally be made at the beginning of the junior year. Requirements are:

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**Greek**

See "Classics"
History

• A minimum of 24 semester hours of work in history, with at least nine hours in the Department's honors offerings, which may include as many as six hours of honors thesis credit.

• Course outside the Department as for the general major (Plan A).

• Successful completion and oral defense of an honors thesis.

Graduate Study

The graduate degree programs prepare students to teach in high schools or colleges. Those who pursue these degrees, however, often go into such occupations as archival work, library work, historical site preservation and display, publishing and various kinds of commercial research. Some enter the program leading to degrees in both law and history. The Departmental office keeps track of special training programs in museum or archival skills which graduate students can use as supplementary training.

The standard subjects—history of the United States and Western Europe—are offered in many subvariants differing in time periods, topics and the research interests of the faculty. In Far Eastern, Slavic European, ancient and Latin American subjects there are fewer courses, and prospective students should make certain their topics can be realized here. The simplest way to do this is to look over the research and teaching interests of the faculty as indicated in the Guide to Graduate Study sent to all applicants for admission. Several members of the staff are interested in quantitative methods of research, an ever larger number work in intellectual history and the relation of thought to society.

Graduate Admission

All applicants for admission, whether for the M.A. or Ph.D. program, must meet the general requirements for admission set by the Graduate College. In addition, they must pass the Graduate Record Examination Aptitude Test, have an official report of their performance in that examination forwarded to the Graduate Admission Office and submit a specimen of their writing—such as a term paper, seminar paper or M.A. thesis—to the History Department. All applications for graduate awards and/or admission are due February 15 for the fall semester or November 10 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.

Graduate Degree Requirements

Master's Degree

No special courses are required for admission to candidacy for this degree. As soon as possible in the first semester of his or her residence, the candidate should select a field of special interest and consult with a faculty member in that field, who will act as his or her supervisor. A plan of study approved by the supervisor and the Departmental executive must be filed with the Graduate College during the semester in which the degree is to be granted and before the final examination.

Plan A—This program is for students professionally interested in historical research who mean to continue to do further work in history leading to a doctor's degree. It requires a minimum of 30 semester hours of credit, including the completion of a research essay.

The candidate must elect at least 24 semester hours of work in history.

The candidate must earn at least six semester hours credit in a second division, including either a seminar or a readings course.

The essay in the major division is based on original research and prepared under the direction of the supervisor. It may not exceed 15,000 words unless the supervisor judges that a longer treatment is necessary; it may be as short as the supervisor thinks sufficient. Work on the essay will normally begin in the seminar in the major division and will be continued with Individual Study, in which rewriting will be completed under the close editorial scrutiny of the supervisor. In exceptional classes where the essay completed in seminar is judged to be of outstanding quality, other courses may be substituted for Individual Study.

Plan B—This plan, for those desiring only a master's degree, requires a minimum of 30 semester hours credit. Students who complete the M.A. under this plan may not become candidates for the doctorate in history. The work must be planned as early as possible in the first semester by the candidate in consultation with his or her adviser.

The candidate must earn at least 24 semester hours of credit in history.

The work in history must include at least 12 semester hours in one division of history. These hours must include at least one readings or seminar course.

The candidate's program must also include at least six semester hours each in two other divisions in history, or six hours in one other division in history and six hours in a related department. These hours must include at least one readings or seminar course in history.

After completing these requirements, or in the semester in which he or she expects to complete them, the candidate must present himself or herself to the Department for an oral and written comprehensive examination in his or her major division by three members of the Department. In the event of an unsatisfactory performance, the examiners may allow one resubmission.

Doctor of Philosophy

Students who earn the M.A. under Plan A at Iaue are admitted to the Ph.D. program upon the favorable recommendation of the examining committee. Students who earn the M.A. at another university must meet the general requirements for admission to the Graduate College and must submit a specimen of their writing, such as a seminar paper or an M.A. thesis, to the History Department.

The candidate must earn at least 72 semester hours of credit.
including credit for work done toward the master's degree. The 72 seminar hours must include at least 18 semester hours in 200-level courses in history, except from these credits. At least 12 of these 18 hours must be completed before taking the comprehensive examination, and at least 12 of these 18 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 methods of historical research, in courses specifically approved by the Department to satisfy this requirement (currently 16:298:299 and 26:111). Otherwise the candi-
date, in consultation with their supervisor, is free to distribute work in whichever way will best prepare him or her for the comprehensive examination and for writing the dissertation.

As soon as possible in the first semester of his or her residence as a Ph.D. candidate, the student should consult with the faculty member who seems most likely to become the dissertation super-
visor. The Department has no common language requirement for the Ph.D., but since the supervisor may and in many cases will 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 student and the supervisor should agree very early what these requirements will be. The candidate may not complete his or her comprehensive examination until these requirements have been satisfied.

In consultation with his or her supervisor, the student should invite one or more other faculty members to join with the super-
visor to constitute a committee of direction. The committee is to consist of the faculty members who are prepared to examine the candidate in each of the several fields of study which he or she will present in the comprehensive examination. When it is formed, the committee's first task will be to set the terms and conditions of the comprehensive. The common conditions re-
quired by the Department are that the candidate must be exam-
ined in writing in four distinct fields, at least three of them in history, the fields in history must be chosen from at least two different divisions (below), and a single oral examination must be held, covering all four of the fields presented.

The World
Medieval Europe
Europe, 1000 to 1815
Europe, 1815 to present
Russia and the Soviet Union
United States History
Latin American History
British Empire and Commonwealth
Chinese History
Japanese History

The committee may define and limit the individual fields for which the comprehensive examination is held, especially for each field, the number of pages or the form of the written examination, which may take the form of a syllabus, a critical bibliography, a topical paper, or in some form or combination of these or other forms which the commit-
tee deems suitable. The oral examination will focus on issues and problems arising from the written examination pages. Once he or she has undertaken the examination, the candidate must complete it; if he or she does not do so he or she will be considered to have failed.

The Ph.D. program is designed to be completed in four or five years from the commencement of graduate study. In any event, students must complete all degree requirements within five years from the end of the semester in which the comprehensive exami-
nation was passed, or failing this, must repeat the comprehensive examination.

Special Facilities
The University Library provides materials for graduate work in all fields of history offered by the Department, though often these must be supplemented by interlibrary loans or by the use of other libraries. The library is strong in all aspects of U.S. history. It houses the Henry A. Wallace papers and related collections, as well as other unique 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 Presi-
dential Library in West Branch 10 miles away possess additional research materials of great value.

Qualified graduate students are invited to apply for fellow-
ships and assistantships. Inquiries should be directed to the De-
partmental office.

Staff: professors Aydlette, Gelfand, Gevey, Goldenstein, Hale, Hawley, Horwitz, James, Laffoe, Mead, Palantiki, Person, Rohrbough, Schommer, Spitzer, Sutherland; professor emeri-
tus Livingstone; associate professors DiStefano, Hensman, Kerber, Larmour; assistant professor Large; instructors James, Moses

Courses Primarily for Undergraduates
16:51 Survey of American History, 1492-1877 3 or 4 s.h.
16:52 American and social topics in Jewish and United States from Age of Discovery through Civil War and Reconstruction; open to freshmen
16:62 Survey of American History, 1877-Present 3 or 4 s.h.
16:63 Survey of American history and social history of United States from 1877 to present
16:72 Religion in American History, 1872-1960 3 s.h.
16:73 Religion in American History 1800-1960 3 s.h.
16:74 Religion in American History 1600-1800 3 s.h.
16:75 Religion in American History 1600-1650 3 s.h.
16:92 Medieval European Society: Special Topics 2 or 3 s.h.
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History

18:104 Mythom, Persecution and National Revolt in Ancient Empires 3 a.h.
Study of these phenomena in Neo-Babylonian, Persian and Hellenistic empires, and in Italy under Roman Republic.
2 a.h.

18:105 Revolt of Reading at the 1600s in Rome, history of translations, of methods used in ancient times for the suppression, prohibiting or requiring versions involving the use of one or more languages, and the roles played by these individuals in the development of modern languages. 3 a.h.

18:111 Survey of Medieval Civilization 3 a.h.
Europe from the demise of Rome Empire to High Middle Ages; cultural, political and economic foundations of Western civilization; open to freshmen. 18:112 Survey of Medieval Civilization 3 a.h.
Europe from High Middle Ages to Renaissance, with emphasis on medieval thought and institutions. 18:113 Economic and Social History of Medieval Europe 2 or 3 a.h.
Prerequisites: Junior or senior standing and general acquaintance with medieval history. 18:114 Foundations of English Law 3 a.h.
From origins of the common law in early modern times, not open to freshmen. 18:115 Medieval England, c. 400-1210 2 or 3 a.h.
Prerequisites: Junior or senior standing. 18:116 Medieval England, 1215-1485 2 or 3 a.h.
Prerequisites: Junior or senior standing. 18:117 History of the Medieval Church 2 or 3 a.h.
Prerequisites: Junior or senior standing. 18:118 The Rise and Fall of Fascism 2 or 3 a.h.
Evolution of French social and political institutions, 1600-1223; prerequisites: Junior or senior standing. 18:119 Late Medieval France 2 or 3 a.h.
Evolution of French monarchs from feudal to national states, 1222-1515; prerequisites: prior course in medieval history or literature.
Home Economics

Department Chairman: Margaret G. Ozburn
Degrees offered: B.A., B.S., M.A., M.S., M.T.

The Department offers courses which contribute to the liberal education of University students, as well as those included in the major. Concentrations in one or more areas of home economics makes it possible for undergraduate majors to develop some depth of specialization. The home economics core provides opportunities for professional orientation and some understanding of relationships among the various areas of specialization within home economics.

Home economics as a career offers 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.

Undergraduate Requirements

In meeting the general requirements of the College of Liberal Arts, students majoring in home economics should choose courses in other departments which are prerequisites for home economics courses. In addition to Liberal Arts core requirements, students are expected to complete the home economics core, made up of 17-190 Marriage and Family Interaction and one course from each subject area within the Department, and to satisfy requirements in one area of specialization.

The Bachelor of Arts

Each student may select one of the following programs, on the basis of interest and professional goals.

Family Development

These courses are required: 17-10 Growth and Development of the Young Child; 17-113 Clothing Economics; 17-112 Family Economics; 17-113 Textile Design I; 17-114 Interior Decoration II; 17-115 Directed Studies in Related Arts; 17-120 Advanced Nutrition; 31-1 Elementary Psychology, 34-1 Introduction to Sociology, a course in family sociology, and a course in economics.

Students seeking certification to teach home economics must also complete the requirements of the College of Education.

In the other areas of home economics the requirements are 17-131 Introduction to Food Study, or 17-131 Food Study and 17-132 Food Study Laboratory; 17-41 Principles of Nutrition, or 17-142 Nutrition; and 17-20 Design for the Home, 17-70 Clothing, 17-81 Textiles, 17-133 Meal Management and 17-165 Family Housing.

The student should select additional courses in home economics and education in consultation with the faculty advisor. Experience can be arranged for students interested in working with handicapped children and other special groups.

Food and Nutrition

This program comprises 17-131, 17-132, 17-134 Experimental Food I and 17-142, plus courses relating to an emphasis on food, nutrition or dietetics.

Related Art and Housing

Required courses are 17-50, 17-54 Interior Decoration I, 17-80 Introduction to Textiles, or 17-11, 17-112, 17-15 Survey of Traditional Interiors: 17-160 Textile Design I: Printing and Dyeing, 17-165: 18-1 or 18-2 Elements of Art, and 18-20 Basic Design; and 68-1 or 68-2 Principles of Economics.

Electives in home economics, studio art, art history, marketing, communications, advertising, sociology, anthropology, psychology, and urban and regional planning are recommended, depending on the student's professional goals.

Textiles and Clothing

Required courses are 17-70, 17-72 Clothing Design and Selection; 17-81, 17-171 Costume Design; 17-73; 17-182 Advanced Textiles; 17-183 Textile Economics; and 34-1.

Depending on the student's professional goals, courses in busi-
The Bachelor of Science

Food and Nutrition

Programs leading to this degree are recommended for students contemplating graduate study and for students interested in research positions in colleges and universities or in industrial, government or medical laboratories.

In addition to home economics coursework required for the B.A., students in the B.S. program take 17:135 Physical Growth and Nutrition and other courses appropriate to their professional interests; a second year of foreign language; 23ME 25 Calculus I; 4121 Organic Chemistry I; 99:120 Chemistry of Biological Materials; 99:130 Metabolism; 99:140 Experimental Biochemistry; 61:157 General Microbiology; 29:1 and 29:2 College Physics; and 72:13 Introduction to Human Physiology.

Textile Science

This program prepares students for graduate studies in textiles or for positions in the textile industry. It comprises the general College of Liberal Arts requirements for the B.S. degree; the same home economics course requirements as for the B.A. degree; and courses in chemistry, physics, mathematics and textile science. Supplementary coursework may be taken in engineering, computer science, statistics and microbiology.

Programs for Teaching Majors

Three options are available to students who want to teach home economics in secondary schools.

Undergraduates would complete the secondary teacher education sequence, which includes requirements of the College of Education and those specified for certification in the family development section for the B.A. degree.

Students with the B.A. or B.S. degree may enroll in the certification only program in order to meet certification requirements. Courses for this program are selected according to the student's professional goals and in consultation with the faculty advisor.

Students with an undergraduate degree in a non-teaching home economics major may complete the Master of Arts in Teaching program. Requirements for this degree are described in the section on graduate programs in home economics.

The Honors Program

Honors work in home economics consists of 17:191 Seminar and 17:192 Problems, in which students do creative work or a research project. To be eligible for Honors, a 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 3.2 in all home economics courses; and at least 12 semester hours in home economics. A written report or Honor Thesis and an examination are required. Honors credit is earned under the direction of the advisor, the chairman of the Department and another member of the faculty serve as a committee for evaluation of the student's work.

The Graduate Program

In addition to the general requirements of the Graduate College, degree candidates must complete specific requirements of the Department, which include written and oral comprehensive examinations.

Master of Arts and Master of Science

For either of these two degrees, students must complete at least 30 semester hours of graduate work with a thesis, or 38 semester hours of graduate coursework without a thesis, in addition to adequate prerequisites for the degree. The designation of the degree depends on the area of major work.

The thesis plan is recommended for students interested in preparing for teaching and research in colleges and universities, for positions in industry and for continued study beyond the master's degree. The thesis may be undertaken in the Department of Home Economics or in cooperation with related departments or colleges.

Master of Arts in Teaching

This program is designed for students who have an undergraduate degree in home economics. The program includes 18 hours in home economics and the professional sequence required by the College of Education. Comprehensive examinations are given at the completion of the program.

Staff: professors Whitehead, Hoffman, Osman; assistant professors Woodruff, associate professors Keyes, Osborn; associate professor Smith; assistant professors Mohamed, Parzen, Skjøvel, Stevens, Wolfson, lecturers Jenkins, Schell, instructors Bodir, Barringer, Cannon, Dorfman, Fowles, Hass, Savage, Williams

Courses Primarily for Undergraduates

17:10 Growth and Development of the Young Child 3 s.h.
Growth and development of young children, emphasis on factors underlying growth and change.
17:21 Introductory Food Study 3 s.h.
Basic principles in preparation of food products.
17:41 Principles of Nutrition 3 s.h.
Relation of nutrition to health; food preferences; functions of nutrients in the body; guiding for good nutrition, conquest of foods.
17:60 Design for the Home 3 s.h.
Application of design principles to selection and arrangement of residential interiors and furnishings; lecture and studio problems.
17:64 Interior Decoration 1 3 s.h.
Planning of dwellings and their furnishings correlating social, psychological, cultural, economic and aesthetic factors; color and color graphism given emphasis; prerequisite: 17:54 or consent of instructor
17:70 Clothing 3 s.h.
Clothing construction methods, pattern alteration, fitting problems.
17:71 Intermediate Clothing 3 s.h.
Conservation of clothing using a variety of fabrics, designs and techniques; selection of fabrics as a social form; prerequisite: 17:54 or consent of instructor
17:73 Clothing Design and Selection 3 s.h.
Principle of design applied to current fashions in a modern environment; process of clothing selection for men and women.
17:80 Textile Fibers, Production and Properties 3 s.h.
Chemical structure, physical and chemical properties of natural and man-made fibers, yarn structure and fabric construction, textile dyeing and finishes, laboratory microscopic and chemical analysis of fibers, prerequisite: Chemistry 41
Courses for Undergraduates and Graduates

11117 Administration of Family Resources 3 s.h.
Philosophy, goals and principles of family and home management; use of time, energy, money and other resources, with emphasis on group-dynamics in making decisions.

11718 Family Economics 3 s.h.
Principles of family financial planning; prerequisites: Economics 661 or consent of instructor.

11719 Family Management and Recreation 3 s.h.
Concentration on marriage and family recreation, including study of resource allocation, marriage and family recreation; prerequisites: Psychology 113 and Sociology 241, or consent of instructor.

11720 Parent-Child Relationship I 3 s.h.
Systemic and application of research in child rearing and parent-child relationship.

11721 Parent-Child Relationship II 3 s.h.
Systemic and application of research related to parent-child relations in various family situations.

11726 Directed Studies in Family Development 0-6 s.h.
Individual problems for advanced undergraduate and graduate students; prerequisites: consent of instructor.

11730 Methods in Home Economics 3 s.h.
Philosophy, goals, and methods in home economics; same as Education 70:125.

11731 Home Economics Curriculum 3 s.h.
Factors influencing home economics curricula for various programs; principles of curriculum planning.

11732 Materials and Methods in Family Life Education 3 s.h.
Principles of family life education; sources and methods of preparing family life education materials in elementary school, junior high, high school and adult education; same as Education 70:125.

11733 Methods for Instructional Problems in Food and Nutrition 3 s.h.
Use of current research findings in food and nutrition, primarily for secondary school, university and community education.

11734 Nutrition Work with Children 3 s.h.
Essentials of effective nutrition education with children; problems of child nutrition; approaches and techniques currently used; prerequisite: 11741 or consent of instructor; same as Education 70:132.

11735 Food Study 3 s.h.
Food components and their use in preparation of foods; prerequisite: Chemistry 4:6 or 4:60.

11736 Food Study Laboratory 3 s.h.
Laboratory work in food preparation in accordance with 11735; prerequisite: Chemistry 6:4 or 6:410; or prerequisite: 11741.

11737 Meat Management 3 s.h.
Study of the livestock industry; selected topics for individuals, families or groups; prerequisites: 11731, or 11741 and 11742, and 11743.

11738 Experimental Food I 3 s.h.
Experimental study of factors affecting productivity of foods; prerequisites: 11731 and 11741, or prerequisite: Biochemistry 59:122.

11739 Experimental Food II 3 s.h.
Continuation of 11738; prerequisite is also prerequisite.

11740 Institution Management 3 s.h.
Quantitative food production and service, equipment selection, maintenance, nutrition, observance and practice in university residence halls; prerequisite: 11735 or consent of instructor.

11743 Quantity Food Purchasing, Preparation and Management of Food and Food Services 3 s.h.
Observation of university residence halls; prerequisite: 11741 or consent of instructor.

11747 Directed Studies in Food and Nutrition 0-6 s.h.
Prerequisite: Previous work in family and home economics; prerequisite: statistics.

11748 Workshop: Current Topics in Food and Nutrition 3 s.h.
Practical application of food and nutrition with discussion of the scientific principles on which they are based; seminar sessions only.

11750 Nutrition of Infancy 3 s.h.
Prerequisites: 11743 and Permission of instructor.

11751 Nutrition of Childhood 3 s.h.
Prerequisites: 11743 and Permission of instructor.

11752 Diets in Special Problems 3 s.h.
Observation of diabetics and special problems in selected areas of nutrition.

11753 Diet Therapy 3 s.h.
Therapeutic use of diet in metabolic disturbances and in certain diseases given in the Department of Nutrition, University Hospitals, to users requirements of American Dietetic Association for student dietitian; prerequisite: Biochemistry 59:120 or consent of instructor.

11754 Physical Growth and Nutrition 3 s.h.
Advanced design projects for regional and international nutrition; standard textbooks and current literature included; prerequisite: 11744 and Nutrition 41:125.

11755 Survey of Traditional Diets 3 s.h.
Survey of traditional diets of home furniture-making; Egyptian period to 1600, correlation with architecture and culture of ancient society.

11756 Survey of Modern Diets 3 s.h.
Development of modern home furnishings, correlation with culture and architecture of industrial society.

11759 Directed Studies in Related Art 0-12 s.h.
Advanced study of interior or textile design; prerequisite senior or graduate standing and consent of instructor.

11760 Textile Design I: Printing and Dyeing 3 s.h.
Introductory problem in fabric design, blockprinting, silk-screening, batik, dye and fiber formulas, fabric and studio projects; prerequisites: 1161 or 1162, 1150 or consent of instructor.

11761 Textile Design II: Weaving 3 s.h.
Design and execution of handwoven fabrics through experimentation with color, shape and weaving processes; prerequisites: 1160 or 1162, 1150 or consent of instructor; same as Art 16:120.

11764 Textile Design II: Forms and Fibers 3 s.h.
Two and three dimensional design problems using cut-stitch, applique and "off-the-text" treatments; prerequisites: 1161 or 1162, 1150 or consent of instructor.

11770 Advanced Clothing 3 s.h.
Basic anthropometric and aesthetic principles of residential environments.

11810 Advanced Engineering 3 s.h.
Mathematical design and construction techniques utilized in designing garments; prerequisite: 11743.

11771 Costume Design 3 s.h.
Techniques of design and illustration, historical and current influences; prerequisite: Art 15:1 or 15:70 or consent of instructor.

11772 Dressing Economies 3 s.h.
History and analysis of the ready-to-wear industry; production and distribution; patterns of clothing consumption; industry standards from trade and government sources; prerequisites: 661 or 2 consent of instructor.

11789 Directed Studies in Textiles and Clothing 0-6 s.h.
Prerequisite: seniors or graduate standing and consent of instructor.

11790 Advanced Textiles 3 s.h.
The structure of fibers, their classification, structure and methods of application; laboratory: experimental analysis of textile fibers, use of dyeing and textile properties of fibers, yarns and fabrics.

11791 Advanced Textiles 3 s.h.
Textiles; study of materials with respect to their classification, structure and methods of application; laboratory: experimental analysis of textile fibers, use of dyeing and textile properties of fibers, yarns and fabrics.

11796 Textile Economics 3 s.h.
History of textiles; current developments and problems in domestic production and weaving; prerequisites: 661 or 2 consent of instructor.

11797 Seminar in Home Economics 0-6 s.h.
Exploration of the historical scope of home economics, its origins, development, philosophy, current factors influencing curricula in higher education; reading and research paper.

11782 Senior Seminar in Home Economics Research 0-6 s.h.
Research work in area of choice open to both majors and seniors.

11798 Seminar in Home Economics 3 s.h.
Research work in area of choice open to both majors and seniors.

Courses Primarily for Graduates

11786 Food Family Dynamics 0-6 s.h.
Reading and discussion of current literature in family interaction.

11787 Directed Studies in Family Studies 0-12 s.h.
Individual research problems of advanced students; prerequisites or consent.

117930  
Hospital and Health Administration

Program Director: Gerhard Hartman
Degrees offered: M.A., PH.D.

As hospital and health administration embraces many fields of academic preparation, the program has primary identification with the College of Medicine and the Graduate College but utilizes the facilities and resources of the entire University.

Many significant phases of hospital and health administration present problems profoundly different from those usually con- fronted in business, education or government. Certain vital as- pects of hospital and health administration, such as policy, procedural, technical and public relations problems which are unique; it is precisely for this reason that this program was originally instituted.

Programs of Study

Master of Arts

The Master of Arts program requires a minimum of 60 on- campus semester hours of academic work during four semesters and completion of a thesis during the second year of study. After receiving the degree, and when deemed professionally advanta- geous, the student is offered the opportunity to undertake a postgraduate assistantship in a carefully selected hospital or health institution under the direction of a qualified administra- tor.

While the curriculum stresses the conceptual unity and gen- eral nature of the administrative decision-making process, courses are designed to acquaint the student with the institu- tional environment of contemporary hospitals and health organi- zations. Administrative problems unique to health admin- istration are stressed. Techniques of motivating goal-oriented behavior are considered, and organizational theory is examined as it pertains to the provision of hospital and medical care.

The first-year curriculum is designed to help the student de- velop a frame of reference which will enable him or her to relate past experiences and undergraduate education to the specialized program of graduate study in the hospital and health-care set- ting. The case-study and role-playing approach are used in the seminar setting, and subject matter is drawn from all administra- tive specialties. Problems are posed in terms of situations which typify health-care institutions.

In order to help the student place contemporary health-care institutions in a meaningful perspective, emphasis is placed upon the history and evolution of formal health organization, and upon trends and developments on the international health scene. During each semester the student is expected to complete major written projects as well as to defend his or her arguments orally.

During the second academic year, greater emphasis is given to individual study. Plans of study are developed to broaden and deepen the student's understanding of the planning of health services and medical care administration while increasing understand- ing of essential social science research techniques.

The program of study culminates with preparation of the master's thesis. Research and writing of the thesis is under- taken during the third and fourth semesters.

Since the curriculum in hospital and health administration is based on the concept of the generic nature of administration, the plans of study emphasize an interdisciplinary approach. In addi- tion to the study in hospital and health administration, students' programs include courses from the departments of Sociology, Political Science, Philosophy and Psychology, the School of Journalism, the College of Education, and Education and Engineering. Additionally, master's candidates are expected to meet a three-semester-hour requirement in statistics.

Upon satisfactory completion of the two-year on-campus aca- demic sequence and graduation, each student will be placed with a hospital or health organization as a postgraduate assistant in the capacity of an executive or administrative trainee.
Doctor of Philosophy
The academic program at the doctoral level is highly individualized. Students admitted to this program will normally be motivated by a desire to learn the advanced aspects of hospital and health administration with the intention of teaching and engaging in research. Students may pursue doctoral study directly after completion of the bachelor's degree or the master's degree, whether in hospital administration or another appropriate field. Students have been accepted with and without previous hospital operational experience. Those students who expect to continue their training through the doctoral degree may file a joint program for the master's and doctor's degree.

Staff: professors Hartman, assistant professors Amidon, Brown, Toercher, instructors Alper, Dole, Johnson

Leave

Courses
80:101 Fundamentals of the Modern Hospital or ar.
Organization in theoretical aspects and operations of all types of modern hospitals and health administration, location and practice
80:102 Fundamentals of Modern Hospital and Health Administration or ar.
Coordination of 80:101 and 80:102
80:103 Principles of Hospital and Health Administration or ar.
Emphasis on development of understanding of human situations and skills required for effective administration of hospitals and health organizations, faculty, medicine, and field trips
80:104 The Hospital in Modern Society or ar.
Develops conceptual skills required by hospital administrators
80:105 Administrative Aspects of Medicine 2 a.h.
Lectures and discussions to assist students to research problems peculiar to medical care administration
80:106 Advanced Hospital and Health Administration 2 or 3 a.h.
Interpretation and utilization of major features in hospital accounting, statistics, law, public relations, personnel management and community relations
80:117 Seminar: Problems of Administrative Behavior in the Modern Health Organization 3 a.h.
Case study of institutions, role-playing and similar approaches to develop student's administrative skills
80:118 Problems of Administrative Behavior in the Modern Health Organization 3 a.h.
Coordination of 80:107 and 80:108
80:109 Current Developments in Hospital and Health Administration 2 a.h.
Examination of current issues in the health care field, problem solving, case studies and approaches to hospital and health-care administration emphasized, seminars, lectures and field trips
80:111 Theoretical Hospital and Health Administration ar.
Original study and presentation of problems in hospital administration
80:120 Labor Relations in Health-Care Facilities 3 a.h.
Health manpower structure, labor law for health-care facilities, conflict management, motivated and organized (theory of labor in health-care areas
80:123 Financial Management of Health-Care Organizations 3 a.h.
Analysis of financial management problems in health-care facilities with emphasis on quantitative and long-range financial requirements, administrative evaluation of financial alternatives, controls of costs, budgeting, rate establishment and financial aspects of third-party payment
80:124 Health Care in America 3 a.h.
Evolution of governmental role in the health-care system
80:125 Contemporary Health-Care Issues 3 a.h.
Preparation in health and medical care presented, with special emphasis on current trends in hospital institution, publications, availability, and need for health-care delivery services within the hospital milieu
80:126 Seminar: Hospital and Health Administration or ar.
80:203 Advanced Hospital and Health Organization and Management or ar.
Comprehensive course covering all phases of hospital operations and planning
80:204 Advanced Hospital and Health Organization and Management or ar.
80:205 Research: Hospital Administration or ar.
80:206 Research: Hospital and Health Administration or ar.
80:207 Individual Study or ar.
80:208 Clinical Education in Hospital Administration or ar.
80:209 Clinical Education in Hospital and Health Administration or ar.
Coordination of 80:204 and 80:208
80:205 Medical Students Information for Hospital and Health Administrators 3 a.h.
Restricted to second-year medical students in hospital administration and from related areas such as business administration, sociology, public health and education

Italian
See "French and Italian"

Journalism
Director of School Malcolm E. MacLean, Jr., Associate Director: Albert D. Tidwell
Degree offered: B.A., M.A., Ph.D. (in mass communications)

Undergraduate Program
Most important positions today require skill and responsibility in communication. The well-being of our communities and institutions depends on accurate and responsible communications. The quality of our government depends on how well the print and broadcast media inform the electorate. Wherever a journalist chooses to work, he or she will be in a vital role—a role requiring an extensive knowledge of the diversity of human experience. Competent journalists must understand themselves, their relationship to an event, their actual reporting of their information and the effects of their work—what happens when the products of their creations are consumed by a reader, viewer or listener.

The Basic Program
Our program in general journalism requires 24 semester hours of coursework in journalism for the major. The student has a great deal of freedom to pursue other fields of interest. We strongly recommend a second major. In addition in another area—sociology, art, economics, psychology, political science—provides excellent background for journalism. It is designed to encourage students to become active questioners. In addition to occupational skills, students are expected to develop an understanding of what their work means to the society in which they live.

The program has no semester-long courses in newswriting, beginning reporting, copy editing, advanced reporting and other subjects standard in most journalism programs. The two-year program—usually taken in the sophomore and junior years—places a great deal of responsibility on the student and offers him or her numerous opportunities to develop the skills of reporting, writing and editing in his or her laboratory work.

Students enroll for four semesters in a general course and a laboratory course, for a total of 24 semester hours. Two semes-
Journalism

Electives
In addition to the 24 semester hours of general journalism courses, there are elective courses including photojournalism, picture editing, radio-television news, public relations, history, law, writing, news-editorial problems and others. However, no more than 36 hours in Journalism may be allocated toward the 124 hours needed for a Bachelor of Arts degree.

Practicum
The Journalism Practicum is open to majors and nonmajors. Any student on a journalism internship or regularly employed as a journalist may enroll for discussion and expert review of his or her work.

Teacher Certification
There is a strong demand for high school teachers who are qualified to teach journalism and are also certified in another subject. Full-time journalism teaching positions are rare in secondary schools in Iowa and many other states. If a student wishes to major in journalism and teach in secondary schools, he or she must take additional journalism elective courses and the required education courses. Twelve semester hours in journalism is the minimum requirement for certification, with an additional six to 10 semester hours recommended.

Honors
The Department grants a degree with Honors in Journalism. An Honors seminar and readings for Honors are offered. Both may be repeated. In the reading class, a major paper is required in the terminal semester.

For Nonmajors
Courses designed to develop informed critics and consumers of journalism attract many nonmajors. They include Communication of Social Issues, Special Topics in Communication, History of Books and Print, Comparative Foreign Communications Systems and Communication: Concepts and Perspectives, and others.

Transferring
Journalism courses taken at other colleges and universities will transfer as electives; but, in most cases, transfer students should expect to spend two years at Iowa to complete the general journalism major.

Graduate Programs
Master of Arts in Journalism
The School of Journalism offers a Master of Arts program which combines professional practice in the media with consideration of their effects, responsibilities and significance. It prepares students for a wide variety of positions in communications, including further study at the doctoral level.

The degree is awarded with or without a thesis. Students who write a thesis must earn a minimum of 30 semester hours of graduate credit, of which a maximum of five semester hours may

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Journalism courses taken at other colleges and universities will transfer as electives; but, in most cases, transfer students should expect to spend two years at Iowa to complete the general journalism major.

The degree is awarded with or without a thesis. Students who write a thesis must earn a minimum of 30 semester hours of graduate credit, of which a maximum of five semester hours may
be credit for the thesis. Those who do not write a thesis must earn a minimum of 18 semester hours of graduate credit, of which two or more hours must be in 19-180 Special Projects in Mass Communication. In both cases, at least nine semester hours of graduate credit must be taken outside the School of Journalism.

All candidates are required to take 19-205: Master's Seminar during their first semester in residence. This course seeks to incorporate fundamentals of theory, history, mass communication, popular culture, society, international communication and other topics involving subjects and issues encountered through guest speakers, lectures, assigned readings and written assignments. Each candidate must take at least three hours in Master's Practicum (19-205) in the area of his or her choice (newspaper journalism, magazines, public relations, radio, television, advertising, educational television, photography, etc.). The student satisfies the balance of the requirements with elective courses chosen in consultation with his or her adviser and the two other faculty members who serve as his or her committee. The program concludes with a comprehensive examination, the nature of which is specified by the candidate's committee.

Doctorate in Mass Communication

The doctorate in mass communication is an interdisciplinary degree. The central objective of the program is to develop scholars who will make significant contributions to teaching and research in communication.

The program emphasizes the development of an understanding of problems in communication. A student develops skills applicable to fields such as university teaching, news communication, organizational and public relations, policy analysis, international communication and a variety of functions which require the ability to develop effective communication strategies. The program is designed around a small core of graduate work in communication, but encourages the student to work with his or her sponsor and committee to create a program appropriate to the student's needs.

Every student in the doctoral program must take the Ph.D. Seminar (19-309) from the start of the program until after presentation and acceptance of the dissertation proposal. Beginning no later than the student's second enrollment and continuing until he or she begins work on the dissertation, he or she works in a Research Practicum (19-301) with one or more members of the graduate faculty. All Ph.D. students and all active graduate faculty members attend the weekly Ph.D. Seminar, and thus have an opportunity to present, discuss and evaluate material.

A Ph.D. student, in order to continue in the program, must find before his or her third enrollment a graduate faculty member who will serve as sponsor or mentor. The sponsor need not be the dissertation supervisor.

A minimum of 72 semester hours (including the dissertation) beyond the B.A. or B.S. is required for a doctorate. Upon completion of the coursework, a comprehensive examination is administered by a committee of at least five faculty members. The nature and scope of this examination are specified by the committee. The thesis work is supervised by a committee of at least five faculty members. A formal dissertation proposal is considered by this committee. For the final defense of the dissertation, the committee must include at least one member from outside the School's faculty. Also, one member of the dissertation committee will be appointed by the School's director of graduate studies to serve as the outside member.

Candidates in both the M.A. and Ph.D. programs must fulfill the requirements of the Graduate College.

Special Facilities

The School has specialized laboratories for photography, typograph- try, audio taping, video taping, typing, copy preparation and print production. The network of the University radio station, WUI, serves as a laboratory for broadcast journalism courses. Many pre-law students use the newsroom of the University student newspaper, The Daily Iowan, as a professional laboratory. The School maintains a journalism reading room. The technology center houses most of the equipment students may use, such as tape recorders, still cameras, motion picture cameras, projection and editing equipment, material and slide-copying equipment, and other audiovisual equipment. The School also has a small desktop computer.

Special Faculty Strengths

Most of the School's staff have had practical training and work experience in communication enterprises such as newspapers, broadcasting, public relations and advertising. A number are gifted, recognized, highly productive scholars.

Center for the Advanced Study of Communication

Affiliated with the College of Liberal Arts and Sciences in the School of Journalism, the Center for the Advanced Study of Communication offers students a variety of intellectual and practical opportunities through its publishing, research and program activities. The Center engages in the publication of books, an international scholarly journal and an occasional papers series; it contracts for research or consults with government and private agencies on communication-related problems; and it develops seminars, colloquia and symposia at a wide range of communication-related issues both here and abroad.

Staff: Gallup professor Thyzet; professors Duncan (on leave), MacLeod, Modra; associate professors Fox, Hatfield, Kottman, Talbot; assistant professors Aschroft, Costello, Hunt, Ziama; instructors Anzert, Rafter, Butler, Cox, Johnson, Martin, Murphy, Tripp.

Special Courses

19-151: Imprint Seminar 1, 2 a.h.
19-152: Imprint reading, preparation of papers, discussion of mass communication problems, master's students only; may be repeated to a maximum of 6 semester hours; second semester.
19-167: Reading for Honours 1 to 3 a.h.
19-168: Reading and discussion focusing upon a problem or issue in mass communication, major paper required in terminal semester; honors quartets only; may be repeated; both semesters.
19-169: Senior Seminar 1, 2 a.h.
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19-169: Senior Seminar 1, 2 a.h.
19-169: Retain discussion concerning major philosophical and social problems in mass communication with which prospective mass communicators must deal.
Courses for Doctoral Students

19.500 P.H. Seminar 2
19.501 P. Research Practicum 2
19.502 P. Seminar 2
19.503 Dissertation 6

Latin

Sec "Classics"

Letters

Director of School: John G. Gerber

Department: A.A.

The major in letters takes literature as its subject. By its international orientation, it provides an alternative to courses of study in a single national language and literature. As an interdepartmental program, it offers students the opportunity to study literature in its broader aspects, as something of interest for itself as well as for the light it sheds upon culture, society and history. A variety of students choose to study in letters. The program is not necessarily preprofessional. Students looking forward to teaching modern European literature, are particularly encouraged to consider the M.L. degree. It is an ideal preparation for those who wish to devote their literary studies to the study of literature.
national literature, or to ignore other forms that are at least close to literature—like film—may now seem arbitrary. Authors and readers alike give their attention to literary works of many kinds in their native languages, in foreign languages and in translation. Letters, speaking, gesticulating, reading—our different means of communication still have much in common. The undergraduate program is the School of Letters offers a way to discover the variety of literary work in one's own private life and in the lives of people from other languages and times.

Course of Study

An undergraduate in letters may take courses from any of the departments of literature. A typical student might study classical and modern theater, oral literature and fiction from several countries. Or he or she might include work in film and practice in printing on a hand-press. He or she may do all this or her readings in translation or may read in one or more foreign languages. There are no requirements for admission to the major; interested students should see the chairman or one of the advisors to the major.

Staff: Negel, chairman (English and Comparative Literature), Dalggaard (English and Comparative Literature), Frank (Spanish and Portuguese), Gillebone (Speech and Dramatic Art), Grenz (French and Italian), Helmsmark (Classics), Parken (German), Weber (Russian), Woerner (English).

Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>108:101 Masterpieces of Western Literature in Translation</td>
<td>2.00</td>
</tr>
<tr>
<td>108:102 Masterpieces of Western Literature in Translation</td>
<td>2.00</td>
</tr>
<tr>
<td>Continuation of 108:101, but may be taken as an independent study</td>
<td></td>
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<tr>
<td>108:103 Great Drama in Translation</td>
<td>3.00</td>
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<tr>
<td>Same as Classics 14:08 and Speech 207:120</td>
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<tr>
<td>108:104 Roman Drama in Translation</td>
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<tr>
<td>Same as German 13:10 and German 13:18</td>
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<tr>
<td>108:105 European Novel, 1850 to Present</td>
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<tr>
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<tr>
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<tr>
<td>108:108 European Poetry in Translation</td>
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<td>108:114 Chinese Literature</td>
<td>3.00</td>
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<tr>
<td>Same as For Eastern Studies 20:14</td>
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<td>108:115 Contemporary Chinese Literature</td>
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<td>108:116 Japanese Literature</td>
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<tr>
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<td>108:117 Russian Literature in Translation</td>
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<tr>
<td>109:119 18th Century French Novels</td>
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<tr>
<td>Same as French 11:14</td>
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<td>Same as Russian 41:32</td>
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</tbody>
</table>

Library Science

Dean of School: Frederick W. Ewen

Degree offered: B.A.

Undergraduate Program

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). If later accepted in the graduate program, students will be allowed to substitute advanced literature courses for those already taken.

Graduate Programs

The Library School's Master of Arts degree program provides the accepted professional preparation for careers in all types of libraries and is accredited by the American Library Association. The School also offers a nondegree graduate program for certification in school librarianship.

Its graduate hold positions, in approximately equal numbers, in public, school and academic libraries, serving 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 on which a grade-point average of at least 2.5 must be earned. In addition, the student must pass a written comprehensive examination. M.A. candidates choose their coursework in the following way:

Required courses (18 semester hours):

21:151 Reference I
21:152 Cataloging and Classification
21:153 Selection of Library Materials
21:154 Introduction to Librarianship

One of the following type of courses:

21:251 The Public Library
21:252 The College and University Library
21:253 School Media Center Administration

One of the following bibliography courses:

21:261 Bibliography of the Humanities
21:262 Bibliography of the Social Sciences
21:263 Bibliography of the Sciences

Elective courses (15 semester hours):

Most students are expected to take the remainder of their elective hours in library science courses. However, when career objectives indicate and with the consent of the advisor, 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.
Students with a strong background in library science may elect to write a thesis, with approval of the director. Six semester hours of credit may be earned in this way. Most students, however, are advised to undertake the internship program.

The program normally requires two semesters and one summer of residence study; or, in the case of students attending summer school only, a minimum of four summer sessions.

Admission Requirements and Procedures
Scholastic requirements for admission to the M.A. program include:
- A degree from an accredited college or university, with a minimum 2.5 grade-point average on a 4-point scale, and at least 85 semester hours of study in the liberal arts and sciences;
- At least one year of college credit (six to 10 semester hours) in a modern foreign language with a grade of C or better;
- Satisfactory score 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 or a member of the faculty.

Because of the large number of applications, the School cannot accept every applicant who meets the scholastic admission requirements. The applicant's general suitability for librarianship is an important consideration. Priority is given to recent college graduates with a strong liberal arts background who desire to enroll as full-time students.

Applicants are requested to write to the School of Library Science for a Preliminary Information Form. If the preliminary information indicates satisfaction of the basic admission requirements, the School will schedule a personal interview. Prospective students are urged to apply four to six months before the date they wish to be admitted.

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 special study certification program described below.

The certification program, a 30-semester-hour sequence, accepts both undergraduate and graduate coursework, does not require a foreign language for admission and carries a more liberal policy toward transfer and correspondence credits than does the M.A. program.

Ten semester hours of transfer, correspondence and extension credits completed at either the undergraduate or graduate level may be applied toward the requirements for certification, provided such credits have relevance to the program. In addition, 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 (18 semester hours):
- 21:151 Reference I
- 21:152 Cataloging and Classification
- 21:153 Selection of Library Materials
- 21:154 Introduction to Librarianship
- 21:155 School Librarianship

Three hours of audiovisual coursework

Elective courses (12 semester hours):

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; 21:125 Practicum in Librarianship; 21:193 Literature for Adolescents; 21:202 Literature and Storytelling for Younger Children; 21:322 Multimedia Concepts in Librarianship; 21:324 Library Services to Children and Young Adults. With consent of his or her advisor, the student may select other library science courses.

For librarians serving up to half time in a school library, 15 semester hours of library science are required for certification as a teacher-librarian.

Facilities and Resources

New quarters for the School of Library Science in the south wing of the University's Main Library provide well-planned facilities for the varied instructional and research activities of the School. Included are laboratories for bibliography, cataloging and multimedia study, as well as a separate Departmental library science library.

All of the resources of the University of Iowa libraries are available to students and faculty of the School. The system contains more than 1.5 million volumes in the Main Library and its departmental branches and currently employs 60 professional staff members.

In addition to the University Libraries, students have access to a variety of public libraries in large and small communities for clinical and laboratory purposes. The State Historical Society Library in Iowa City, the Iowa City and Cedar Rapids public and school libraries; the 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-time graduate and research 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.

Staff: professors Osborn, Wesman; associate professors Newman, assistants professors Hillard, Ogden; instructors Asp, Lange

Administrative Assistant: Ethel Bloem

Librarian: Karen S. Hiltbrand

Affiliated Staff: Dale M. Berz, G. Robert Carlisle, Leslie W. Dulan

Library Science
sition of his or her native language, explaining how languages change in the process of their transmission from one generation to the next, or characterizing regional and social variation in language—are extensions of this main one.

Since language is uniquely human, and since the use of lan-
guage is central to almost everything we do, the teaching of linguis-
tics bear upon other fields of study which deal with human behavior: anthropology, sociology, psychology, literature, the teaching of languages, the diagnosis and treatment of speech disorders Moreover, the formal properties of grammar (that is, of models of "linguistic competence") are of interest to math-
ematicians and computer scientists.

Students majoring in other disciplines concerned with lan-
guage or with symbolic systems (i.e., for example, modern or classical languages and literatures, speech science, anthropology, psychology, philosophy or mathematics) are encouraged to com-
plement the study of basic major subjects— either as the graduate or the undergraduate level—with relevant courses in linguistics.

Undergraduate Program

The undergraduate program is designed to provide a foundation in linguistic theory, training in the scientific analysis of languages and proficiency in a language other than the one native to the student. Specifically, the program includes work in general lin-
guistics, phonetics, grammatical and phonological analysis, study of the history or structure of a particular language (courses in this area are currently available for several languages, includ-
ing English, the Romance languages, Russian, German and Chi-
nese) and other courses in linguistics to be selected in consulta-
tion with the student's adviser. In addition to his or her work in linguistics proper, the undergraduate student's program in-
cludes elementary courses in psychology, anthropology, lan-
guage and culture. The total program includes elective in one of the field above basic course in linguistics. The number of language study included in the student's program depends upon his or her pre-
satutory language training. During the senior year the stu-
dent undertakes an independent research project under the di-
rection of a member of the Linguistics faculty.

M.A. Program

The Master of Arts program in linguistics provides graduate training in general linguistics for students from a variety of academic backgrounds who have an interest in languages and the theory of language. The program is adaptable to the needs of students who plan to pursue further graduate study in linguistics or related fields, of students who wish to complement their undergraduate training in related fields (e.g., language teaching or anthropology) with specialized training in linguistics. Gradu-
ate courses are also open to qualified students who are taking degrees in other fields.

The M.A. program of study includes a graduate introduction to linguistics, two courses in syntactic theory, two courses in the general area of historical and comparative linguistics, and other courses in linguistics and related fields, to a total of 37 semester hours of coursework. A thesis is also required.

Ph.D. in Cultural Anthropology and Linguistics

The Ph.D. in cultural anthropology and linguistics prepares the student for professional teaching and research in the linguistic and the 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 content of the anthropology-linguistics doctoral program may be adjusted to accommodate an emphasis either in an-
thropology or in linguistics, or a balance of the two. The only explicit requirements are the acquisition of two appropriate re-
search tools from a list which includes a foreign language, statisti-
tics, symbolic logic and computer programming, a satisfactory completion of a basic series of courses in linguistics and in an-
thropology (in linguistics, courses in general linguistic theory, phonetics, grammatical analysis, phonological analysis and historical-comparative linguistics; in anthropology, courses in anthropological history, theory or methods, social anthropology, social institutions and an area-geographic area) and satisfactory completion of a series of interdisciplinary courses in language and culture, ethnolinguistic field methods and ethnolinguistic theory.

Beyond this basic training, the candidate for the Ph.D. in

cultural anthropology and linguistics may concentrate in one of
the two areas with further work or may achieve a balance be-
tween the two. At the completion of the core program, each
student's achievement is evaluated by a joint com-
mitee of the two departments, and appropriate recommenda-
tions are made.

It is not necessary that the student entering the program have taken an undergraduate major in either anthropology or linguistics. However, the student must have had the equivalent of the introductory courses in linguistics and anthropology (103:200 and 113:103); these must be made up as deficiencies.

The student may take the Master's degree in either anthropology or linguistics before proceeding to the joint Ph.D. Previous work in one of the two areas at the M.A. level may be applied toward fulfilling the requirements in that division of the joint doctoral program.

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 consists of a thorough founda-
tion 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. Normally the holder of such a degree would be a teacher and researcher as a linguist in a universi-
ty English department, but his or her training under this pro-
gram might well lead to other related fields.

The major part of the training in this program is in general

linguistic theory and English linguistics. Subordinate areas are

literature and the older Indo-European languages. The student is

also expected to take appropriate courses in a related area or

related areas—for example, history, philosophy, etc.

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. The English linguistics area
includes 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 seminar devoted to literature—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. Courses in the traditional period, the student of English linguistics does not have to be a medieval — students in this program have concentrated in literary studies ranging from the Old English period to the twentieth century.

In the area of the older Indo-European languages, there are regular offerings in Germanic (Old High German, Middle High German, Old Saxon, Old Norse, Gothic), Romance (Old French, Old Spanish), Greek and Latin. Upon demand, courses have been offered in Old Provencal and Old Irish. The student of English linguistics is encouraged to take at least one course in an older Germanic language and at least one additional course in Germanic or one of the other older Indo-European languages.

The program of the doctoral student in English linguistics is rounded out by work in such areas as medieval history, the philosophy of language, language and culture, and psychology.

The comprehensive examination for the degree consists of written and oral parts. In the written portion of the examination, the student is examined on general linguistics, the structure of Modern English (including American dialects), the history of the English language and the literary period elected. The oral examination may range over all these areas.

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 audiometric chamber. There is also a remote typewriter terminal connected with the IBM 360/65 computer at the University Computing Center.

The Faculty

Although the Department of Linguistics is new (established in September, 1970), it has a growing reputation not only in the West but nationally. Members of its faculty have achieved notable recognition in the areas of stylistics, American Indian language and the history of the English language. The status of linguistics at the University of Iowa is well observed, since linguistics was being taught in the Department of English at The University of Iowa before the "father" of American structural linguistics, Leonard Bloomfield, published his famous book, Language, in 1933.

The Department of Linguistics is small (currently nine faculty members and approximately 35 students enrolled as undergraduates and graduate majors) and enjoys all the benefits of smallness: 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 in 571 English-Philosophy Building—the general "workroom" and departmental library—through daily "tap sessions" between students and faculty members. The blackboard in that room is always filled with phonological rules, syntactic "trees" and other evidence of the activity of linguistics.

All graduate students and senior undergraduates meet once a week for an hour and a half with members of the faculty to keep abreast of current research in the "Survey of Current Research in Linguistics," at which a student presents a critical review of some recently published piece of linguistic research. Staff: Professors: Holway, McCafferty, McLaughlin, Pfaff, associates: professors Wacht, Soga, assistant professors Koskowska, McLaughlin, instructor Martin; departmental assistant; Missors (Speech); Cossuffi (Classics). (Speech Pathology and Audiology). Dussart (German), Fleck (Computer Science), Garenski (Russian), Heiderlein (Computer Science), Moll (Speech Pathology and Audiology), Olverman (French and Italian), Konig (German), Starelli (Spanish and Portuguese).

Courses for Undergraduates and Graduates

301:10 English for Foreign Students 3 ski.

301:11 Introduction to Linguistics 3 ski.

301:12 Introduction to Language and Communication 3 ski.

301:14 Information and Language Processing 3 ski.

301:171 Analytical and Acoustical Phonetics 3 ski.

301:181 Acoustical and Phonetic Phonetic Theory and Practice in Phonetic Transcription 3 ski.

301:191 Linguistics Analysis 3 ski.

301:201 Phonological theory; procedures for analyzing and describing phonological structures of languages; previous: 201:12 or equivalent 3 ski.

301:202 Linguistic Analysis II 3 ski.

301:203 Principles and methods for analyzing and describing grammatical structures of languages; previous: 201:10 or equivalent 3 ski.

301:214, 119 Introduction to Language Processing 3 ski.

301:222 Introduction to Language Processing 3 ski.

301:223 Principles of phonetics; the phonetic and acoustic classification of sounds, the psychological and physiological nature of speech; previous: 201:12 or equivalent 3 ski.

301:232 Introduction to Language Processing 3 ski.

301:242 Historical and Comparative Linguistics 3 ski.

301:243 Principles of phonetics; the phonetic and acoustic classification of sounds, the psychological and physiological nature of speech; previous: 201:12 or equivalent 3 ski.

301:252 Romance Linguistics 3 ski.

301:262 Comparative linguistics; previous: 201:12 or equivalent 3 ski.

301:271 History of the English Language 3 ski.

301:281 Development of phonological and grammatical structures of English from Old to Modern English; different classifications of English; previous: 201:12 or equivalent 3 ski.

301:282 Building English Grammar 3 ski.

301:283 Phonetics; the phonetic and acoustic classification of sounds, the psychological and physiological nature of speech; previous: 201:12 or equivalent 3 ski.

301:284 The Structure of Language 3 ski.

301:285 Applications of contemporary linguistic theory to analysis and description of structures of modern English; previous: 201:12 or equivalent 3 ski.

301:286 Introduction to English Grammar 3 ski.

301:287 View of present language in relation to contemporary structural and transformational approaches to grammar of modern English; previous: 201:12 or equivalent 3 ski.
Division of Mathematical Sciences

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

Undergraduate Program

The Division has a comprehensive undergraduate program in which undergraduate 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 two majors.

One is a general major 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 second major is intended for students with a strong interest in computer science. This program requires both substantial work in computer science and 12 semester hours of work in an area outside of computer science. The work outside computer science is expected either to prepare the student for further work in computer science or to familiarize the student with an area in which he or she might do computer programming, designing or other computer work (for example, engineering, physics, business administration or economics).

The specific requirements of each of these programs are listed below. In addition to the requirements listed here, each student majoring in the Division of Mathematical Sciences must satisfy the general requirements of the College of Liberal Arts. Credit may be transferred from other institutions, but transfer students must take a minimum of nine semester hours beyond the first year of calculus or beyond the first course in computer science (222C7 Introduction to Computing with Fortran).

Requirements for a Major in Mathematical Sciences

To satisfy this program a student must take at least one year of calculus (either 222M.25 and 222M.26, or 222M.35 and 222M.36) and at least seven courses, each carrying at least three hours of credit offered by the Division, but not including:

222C1 Survey of Computing
222C9 Programming with Business-Oriented Language
222C10 Introduction to Computing with Fortran
222C17 Computing with PL/I
222M1 Basic Mathematical Techniques
222M3-3 Mathematical Techniques I-II
222M4 Matrix Algebra
222M7 Quantitative Methods I
222M10-11 Fundamentals of College Mathematics I-II
222M13-16 Introductory Mathematics for the Biological Sciences I-II
222M20 Elementary Functions
222M25-26 Calculus I-II
222M29 Computational Techniques of Calculus and Linear Algebra
222M33-36 Engineering Mathematics I-II
222M40 Quantitative Methods II
222S5 Elementary Probability and Statistics
222S43 Introduction to Statistical Methods
222S80 Insurance Mathematics

Except for students seeking a secondary teaching certificate, the seven courses must include two chosen among:

222C12 Advanced Computer Organization
222C23 Programming Languages
222C35 Introduction to Computation Theory
222C45 Artificial Intelligence
222M100 Differential Equations
222M118 Complex Variables
222M170 Numerical Methods
222M171 Numerical Solutions of Differential Equations
222M103-104 Foundations of Mathematics I-II
222M110-111 Elementary Topology
222M115-116 Introduction to Analysis I-II
222M120-121 Abstract Algebra I-II
222M130-131 Elementary Theoretical Mechanics I
222M139-132 Elementary Theoretical Mechanics II
222M153-154 Introduction to Mathematical Statistics I-II
222M164-165 Introduction to Probability I-II
222M177 Numerical Analysis for Actuaries
222M178 Graduation

Students who complete the requirements for a secondary teaching certificate may satisfy this requirement by taking any two 100-level courses. Students should not change from one of the calculus sequences (222M.25-28 and 222M.35-38) to the other, since the material is organized differently in the two sequences.

Suggested Programs

Some typical programs in various areas are listed below. They need not be followed exactly; in fact, 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 allow for changes in a 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 222C7 Introduction to Computing with Fortran, preferably along with calculus during the freshman year. The program should also include a course such as 222M.30 Elements of Group Theory, 222M.55 Fundamental Properties of Spaces and Functions or 222M.103 Foundations of Mathematics, and it should include at least a semester's work in statistics and probability.

Additional work, in particular the 100-level course requirement, should be taken in whatever area of mathematical sciences is of most interest to the student. Students contemplating employment in government or industry upon completion of the B.A. degree should consider 222C17 Computing with PL/I and courses in numerical analysis, applied statistics and operations research.
Actuarial Science

The student who wishes to enter the actuarial profession should be guided in his or her selection of courses by the program of education and examinations carried on by the principal actuarial organizations. This means that following a sequence in calculus and linear algebra (MATH 22, 23, 24 Calculus I–IV) or MATH 26, 35, 38 Engineering Mathematics I–IV), the student should embark on MATH 135–154 Introduction to Mathematical Statistics I and II, and MATH 177 Numerical Analysis for Actuaries and 225, 218 Graduate Actuarial Examinations. Additional courses of direct professional interest to actuaries include 225, 178, 179, MATH 201 Advanced Mathematics of Finance, 225, 180 Mathematics of Life Insurance, 225, 181–182 Actuarial Theory and Practice, 225, 183 Construction of Demographic Tables and 225, 184 Risk Theory.

Normally a student would not complete all of these courses during the undergraduate years. Instead he or she would be advised to take a more general program and consider completing the actuarial courses as part of a graduate program. Students of actuarial science are also advised to take at least one course in computer science and to consider a substantial program of courses from among those offered by the College of Business Administration.

Applied Mathematics

All students interested in applied mathematics should take the sequence MATH 22, 25–28 Calculus I–III and Linear Algebra or the sequence MATH 22, 25–38 Engineering Mathematics I–IV.

The course MATH 22, 09 Differential Equations, MATH 218 Complex Variables, MATH 217 Numerical Analysis and MATH 217 Numerical Solutions of Differential Equations are recommended. Additional courses directly concerned with applications of mathematics are MATH 221 Statistical Theory I and II, MATH 217 Fourier Series and Boundary Value Problems and MATH 217 Transform Calculus. Other general courses which may be of interest are MATH 201 Elements of Group Theory, MATH 219 Numerical Analysis for Applications, MATH 216 Introduction to Analysis II, MATH 216 Elementary Theory of Numbers and MATH 216 Linear Algebra.

Students in applied mathematics should be familiar with computer programming (MATH 217 Introduction to Computing with FORTRAN can be taken early along with calculus) and with the basic ideas of probability and statistics (the courses MATH 215–156 Introduction to Mathematical Statistics I–II or MATH 220 Probability and Statistics are appropriate). Students who plan to do graduate work in applied mathematics should take MATH 215 Introduction to Analysis I.

Mathematics Education

For the requirements for teacher certification, see "College of Education." The following program is suggested for students having an interest in mathematics education:

- The sequence MATH 22, 25–28 Calculus I, II, III and Linear Algebra
- MATH 220 Elements of Group Theory (before 78, 125 Education) and MATH 220 Euclidean Plane Geometry;
- In the 100-level courses, the student should strive for exposure to the following areas (broadly preferred over depth): MATH 101, 102 Abstract Algebra; MATH 101, 102, 103, 104 Foundations of Mathematics; MATH 116–116 Introduction to Analysis and MATH 215–111 Elementary Topology.

In addition, all students must take at least two semesters of coursework outside the Mathematics Department but within the Division of Mathematical Sciences, e.g., MATH 217 Introduction to Computing with FORTRAN, MATH 117 Com- puting with PL/I, 225, 135–136 Introduction to Mathematical Statistics and 225, 146 Introduction to Probability.

Pure Mathematics

Students interested in this area of mathematics should take two of the sequences MATH 22, 120–121 Abstract Algebra, MATH 115–116 Introduction to Analysis, MATH 103, 104 Foundations of Mathematics and MATH 110–111 Elementary Topology. The student should also take at least two semesters of coursework outside this area, for example MATH 217 Introduction to Computing with FORTRAN, MATH 117 Computing with PL/I, MATH 210 Differential Equations, MATH 218 Complex Variables, MATH 215–116 Introduction to Mathematical Statistics or MATH 215–146 Introduction to Probability.

Probability and Statistics

The basis for this program is the calculus sequence MATH 22, 25–28 Calculus I–III, Linear Algebra and MATH 22, 35–38 Engineering Mathematics I–IV, together with one of the three sequences: MATH 215, 216 Introduction to Mathematical Statistics, MATH 116–116 Introduction to Probability, or MATH 115, 116 Probability and Statistics for Engineering and Physical Sciences and MATH 115, 116 Engineering Statistics. Students should also select one or two courses in computer science from MATH 217 Introduction to Computing with FORTRAN, MATH 217 Computing with PL/I, MATH 217 Introduction to Programming and one or two courses in mathematical analysis from MATH 55 Fundamental Concepts of Analysis, MATH 110–111 Introduction to Analysis and MATH 115, 116 Introduction to Probability. Students interested in the field of statistical physics or the biologi- cal, social, physical or engineering sciences are also highly recommended.

Further courses in probability and statistics may be selected from MATH 115, 116 Mathematical Models and courses in the Department of Statistics numbered 100 and above. Additional courses may be selected from MATH 22, 20 Elements of Group Theory, MATH 110 Elementary Topology, MATH 216 Introduction to Analysis II, MATH 218 Complex Variables, MATH 218 Linear Algebra, MATH 217 Numerical Methods, MATH 61, 125 Introduction to Operations Research and MATH 51, 145 Digital Systems Simulation I.

Courses offered on a pass/fail basis allow a student to audit some of these courses without taking the required courses. Students who audit any of these courses may not audit any of the required courses.
Requirements for a Major Specializing in Computer Science

Undergraduates specializing 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 the mathematical sciences concentrating in computer science:

- 22M:35 Calculus I 4 hrs.
- 22M:36 Calculus II 4 hrs.
- 22M:37 Introduction to Linear Algebra 4 hrs.
- 22C:7 Intro. to Computing with Fortran 3 hrs.
- 22C:17 Computing with PL/I 3 hrs.
- 22C:18 Assemble Language Programming 3 hrs.
- 22C:23 Programming Concepts 3 hrs.
- 22C:31 Computer Organization and Programming 3 hrs.
- 22C:50 Discrete Structures 3 hrs.
- 22M:50 Elements of Group Theory 3 hrs.
- 22M:167 Graph Theory 3 hrs.
- 22C:135* Computation Theory 3 hrs.
- 35:172 Switching Theory 3 hrs.

Each undergraduate student must also complete 12 semester hours of courses in a field related to computer science with at least one course at the 100-level. Suggested fields are engineering, physics, mathematics, statistics, business administration and economics. If mathematics is selected the course must be in addition to those listed as fulfillment of the basic core requirements.

Other courses strongly recommended by the computer science faculty are:
- 55:10 Logic and Digital Systems
- 56:141 Operations Research
- 56:141 Digital Systems Simulation I
- 52:160 Analog Computer
- 22M:120 Probability and Statistics
- 22M:170 Numerical Methods

Applied Mathematical Science

Committee Chairman: William F. Ames
Degree offered: Ph.D.

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 all-aspect mathematics, at least one branch of 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.

Creative activities of an applied mathematical scientist include the formulation of scientific concepts and problems in mathematical terms, the solution of 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; and the development of mathematical theories in areas which have not hitherto been exploited or systematic mathematical treatment. These efforts may, in turn, lead to the generation of new mathematical ideas and theories, at a result of applications.

Students applying for admission are expected to have an excellent background in science and mathematics, together with a desire to apply mathematics to the solution of relevant scientific questions. Each student will have a committee of three or more faculty members to guide and carefully supervise his or her program. The individual plan of study will be specifically developed by incorporating the desired balance in the appropriate areas of 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 prediction, and develops improvements if necessary.

Since this is a Ph.D. program, students may enter with either a bachelor's or a master's degree. All applicants must satisfy the general requirements of the Graduate College.

Fellowships, graduate tuition scholarships and some research and teaching assistantships are available to qualified applicants. Teaching and research assistantships carry stipends appropriate to the work done, and pay up to $3,500 for the ninth-month academic year. Tuition is not included, but some tuition scholarships are given to graduate assistants and, in most instances, the much lower in-state tuition rate is charged. Students are eligible for federal fellowships and traineeships. Doctoral candidates are also eligible for four-year Teaching Research Fellowships. Under this plan, one or two years will be spent in teaching and one or two in research assignments. During the final year the student will receive a fellowship for uninterrupted study, private research and writing. The stipend is $3,600 for 12 months, plus tuition.

Applications for these appointments must be received before March 1, in any year. For application forms and further information about the academic program, write to the Chairman of the Program in Applied Mathematical Science, Graduate College, The University of Iowa, Iowa City, Iowa 52240.

Computer Science

Department Chairman: Fred P. Veug
Degree offered: B.A., M.S., Ph.D.

Computer science is a mathematically-based discipline concerned with algorithms and information. Since only the existence of the digital computer makes the existence of algorithms and the manipulation of information practical, computer science is concerned with the digital computer in a central way. Thus the computer scientist will be informed about engineering aspects of computer science and mathematical and other applications
of computers. More directly, the computer scientist must be competent in programming and at the same time have an understanding of the capabilities and limitations of digital computers relative to information and algorithms.

To provide the broadest possible background for its students and to offer advantage of courses offered naturally in other fields, the normal curriculum in computer science includes work in several related fields. With limits, an advanced degree program in computer science can be constructed to serve a particular need of a student. However, a certain core of courses should generally be taken by every candidate for an advanced degree in this field. It should be emphasized that 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 taking his or her degree in that other area with a heavy concentration of courses in computer science. The Department offers the degree B.A. in Mathematical Science jointly with the Division of Mathematical Sciences, the M.S. and Ph.D. in computer science.

Undergraduate Program
See "Division of Mathematical Sciences"

Graduate Service Course Sequence
In many departments a prerequisite to advanced study and research is comprehension of the use of a digital computer. The faculty of the Department endorses the study of computer science by graduate students so as to gain the necessary proficiency in the use of a computer. However, the Department will not certify such competence in the area of computer science. Instead, the department which urges a graduate student to gain proficiency in this field is expected to verify that such proficiency has been gained.

The following sequence of courses is recommended for graduate students in other disciplines wishing to gain proficiency in the use of the computer.

22C:100 Introduction to Computing with Fortran 2 s.h.
22C:117 Computing with PL/1 2 s.h.

These two courses provide the student with a basic understanding of the capabilities of computers and experience in writing programs in two of the most widely-used programming languages, Fortran and PL/1.

There will be more graduate students for whom the above sequence will not be sufficient because of their particular research needs. Depending upon those needs, such courses as 22C:18 Advanced Language Programming or 22C:21 Last Processors and Data Structures may be useful.

Graduate Program
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 specific requirements for the M.S. and Ph.D. degrees follow.

The M.S. graduate 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
Admission
The student seeking admission is subject to the general rules of the Graduate College (see "Graduate College"). Although the student's undergraduate major is not specified, it is strongly recommended that the candidate for the degree have a B.A. or B.S. in mathematics, engineering or physical science. If the student's undergraduate program does not include equivalents of the courses listed in the undergraduate program in Computer Science of the Division of Mathematical Sciences, he or she may be expected to complete these courses prior to admission to graduate courses for which these are prerequisites.

Requirements
Upon admission, the chairmen will appoint an advisor for the student. The advisor and student will draw up a plan of study which will assure that the candidate achieves proficiency equivalent to that which can be gained as follows:

22C:122 Advanced Computer Organization 3 s.h.
22C:123 Programming Languages 3 s.h.
22C:133 Introduction to Computation Theory 3 s.h.
22C:193 Problems in Computer Science 1 s.h.
Other 22C courses 6 s.h.
Mathematics and statistics courses 6 s.h.
Additional courses selected by the student with the approval of his or her advisor 7 s.h.


The M.S. candidate may elect to write a thesis, provided the advisor consents. The student 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.

M.S. Comprehensive Examination
The candidate for the M.S. degree must successfully complete a set of written comprehensive examinations as described below. The examinations may require an oral review of the comprehensive examination. All M.S. candidates must take both parts of the exam.
Part I: Fundamental Concepts
The student must take parts A, B and C:
A. Programming (two hrs.)
B. Computer Systems and Hardware (two hrs.)
C. Computation Theory (two hrs.)
The material covered on these exams is that typically taught in 22C:122 Advanced Computer Organization, 22C:123 Programming Languages and 22C:133 Introduction to Computation Theory.
Part II: Specialty Area
The student must take one of the parts listed below. Each exam lasts two hours, except part F which lasts for three hours.
A. Advanced Programming
B. Advanced Computer Systems and Hardware
C. Advanced Computation and Automata Theory
D. Artificial Intelligence
E. Matrix Theory and Numerical Analysis
F. Any one of the standard master's examinations offered by the Mathematics or Statistics Departments.
A student should consult the detailed topical outline of the master's examination which is available in the Mathematical Sciences Division office and library.
Thesis
The M.S. thesis, if the student elects to write one, must be an original contribution to computer science of at least moderate importance. It may be in any area deemed acceptable by the thesis committee. An oral defense of the thesis will be required in addition to the comprehensive examination.
Doctor of Philosophy
Admission
Admission to candidacy for the Ph.D. degree is granted only upon the recommendation of a faculty sponsor and the approval of a Departmental committee. The Department cooperates with the Program in Applied Mathematical Sciences in developing interdisciplinary doctoral programs.
Requirements
The student's advisor and chairman will select the guidance committee, which will help the student draw up a plan of study for his or her Ph.D. work.
The student will be expected to complete about 90 semester hours beyond the bachelors degree, including a thesis. The student must have a satisfactory grade in each course. However, it is the usual case that the Ph.D. student first acquire a masters degree in computer science or in some other mathematical or physical science. Every Ph.D. student in computer science is expected to be knowledgeable in all areas recognized as belonging to the field of computer science and to be expert in at least one field. At present, the computer science student should be knowledgeable in the following four categories:
- Programming concepts, including programming, programing languages, systems theory, applied mathematics, programming, simulation, artificial intelligence and numerical analysis
- Theory of computation, including automata theory, computability and formal linguistics
- Mathematical foundations, including set theory, algebra, analysis, logic and graph theory
- Computer systems, 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 his or her special needs, every student is expected to complete approximately half of his or her coursework in the first two categories. Moreover, he or she is expected to complete at least half of the coursework in courses numbered 200 or above. Finally each student must complete two semester hours of 22C:193.
To ensure breadth of preparation in certain areas, the student must complete three courses, at least one of which is at the 200 level, with grades of A or B in each of three areas:
Two selected from:
- Algebra
- Analysis
- Logic and set theory
- Statistics and probability
- Numerical analysis
The third may be selected from:
- Electrical engineering
- Operations research
- Business administration
- Linguistics
- Other related areas as approved by Department
Ph.D. Comprehensive Examination
A student is admitted to candidacy for the Ph.D. degree in computer science only after he or she has completed the comprehensive examination described below, provided he or she has been recommended by a member of the computer science faculty. The comprehensive examination will normally be taken only when the student has completed coursework as required by the plan of study. The written examinations, which may be followed by an oral review, are as follows:
Part I: Programming and System Concepts
A three-hour examination on all aspects of programming and systems
Part II: Theory of Computation
A three-hour examination on the theoretical aspects of computer science
Part III: Candidate's Specialty Area
An examination to be prescribed for the student
Descriptions of all the examinations are available at the computer science offices.
Thesis
Each student must write a thesis which is a significant original contribution to the field of computer science and successfully defend it in an oral examination conducted by the doctoral committee.
Staff: professors Weng, Easley, associate professors Dohle, Fleck, Makkaphayawat, assistant professors Baron, Toaster, McClain, Alton, instructors Spjeldna, Workman
Courses Primary for Undergraduates

2SC103 Introduction to Computing with Fortress 2 a.h.

2SC104 Operating System Principles 2 a.h.

2SC105 Computer Programming with PL/1 2 a.h.

2SC106 Systems Programming 2 a.h.

2SC107 Advanced Computer Organization 2 a.h.


2SC109 Numerical Analysis 2 a.h.

2SC110 Computer Architecture 2 a.h.

2SC111 Computer Languages 2 a.h.

2SC112 Computer Programming I 2 a.h.

2SC113 Computer Programming II 2 a.h.

2SC114 Computer Programming III 2 a.h.

2SC115 Computer Programming IV 2 a.h.

2SC116 Computer Programming V 2 a.h.

2SC117 Computer Programming VI 2 a.h.

2SC118 Computer Programming VII 2 a.h.

2SC119 Computer Programming VIII 2 a.h.

2SC120 Computer Programming IX 2 a.h.

2SC121 Computer Programming X 2 a.h.

2SC122 Computer Programming XI 2 a.h.

2SC123 Computer Programming XII 2 a.h.

2SC124 Computer Programming XIII 2 a.h.

2SC125 Computer Programming XIV 2 a.h.

2SC126 Computer Programming XV 2 a.h.

2SC127 Computer Programming XVI 2 a.h.

2SC128 Computer Programming XVII 2 a.h.

2SC129 Computer Programming XVIII 2 a.h.

2SC130 Computer Programming XIX 2 a.h.

2SC131 Computer Programming XX 2 a.h.

2SC132 Computer Programming XXI 2 a.h.

2SC133 Computer Programming XXII 2 a.h.

2SC134 Computer Programming XXIII 2 a.h.

2SC135 Computer Programming XXIV 2 a.h.

2SC136 Computer Programming XXV 2 a.h.

2SC137 Computer Programming XXVI 2 a.h.

2SC138 Computer Programming XXVII 2 a.h.

2SC139 Computer Programming XXVIII 2 a.h.

2SC140 Computer Programming XXIX 2 a.h.

2SC141 Computer Programming XXX 2 a.h.

2SC142 Computer Programming XXXI 2 a.h.

2SC143 Computer Programming XXXII 2 a.h.

2SC144 Computer Programming XXXIII 2 a.h.

2SC145 Computer Programming XXXIV 2 a.h.

2SC146 Computer Programming XXXV 2 a.h.

2SC147 Computer Programming XXXVI 2 a.h.

2SC148 Computer Programming XXXVII 2 a.h.

2SC149 Computer Programming XXXVIII 2 a.h.

2SC150 Computer Programming XXXIX 2 a.h.

2SC151 Computer Programming XL 2 a.h.

2SC152 Computer Programming XLI 2 a.h.

2SC153 Computer Programming XLII 2 a.h.

2SC154 Computer Programming XLIII 2 a.h.

2SC155 Computer Programming XLIV 2 a.h.

2SC156 Computer Programming XLV 2 a.h.

2SC157 Computer Programming XLVI 2 a.h.

2SC158 Computer Programming XLVII 2 a.h.

2SC159 Computer Programming XLVIII 2 a.h.

2SC160 Computer Programming XLIX 2 a.h.

2SC161 Computer Programming L 2 a.h.

2SC162 Computer Programming LI 2 a.h.

2SC163 Computer Programming LII 2 a.h.

2SC164 Computer Programming LIII 2 a.h.

2SC165 Computer Programming LIV 2 a.h.

2SC166 Computer Programming LV 2 a.h.

2SC167 Computer Programming LX 2 a.h.

2SC168 Computer Programming LXI 2 a.h.

2SC169 Computer Programming LXII 2 a.h.

2SC170 Computer Programming LXIII 2 a.h.

2SC171 Computer Programming LXIV 2 a.h.

2SC172 Computer Programming LXV 2 a.h.

2SC173 Computer Programming LXVI 2 a.h.

2SC174 Computer Programming LXVII 2 a.h.

2SC175 Computer Programming LXVIII 2 a.h.

2SC176 Computer Programming LXIX 2 a.h.

2SC177 Computer Programming LXX 2 a.h.

2SC178 Computer Programming LXXI 2 a.h.

2SC179 Computer Programming LXXII 2 a.h.

2SC180 Computer Programming LXXIII 2 a.h.

2SC181 Computer Programming LXXIV 2 a.h.

2SC182 Computer Programming LXXV 2 a.h.

2SC183 Computer Programming LXXVI 2 a.h.

2SC184 Computer Programming LXXVII 2 a.h.

2SC185 Computer Programming LXXVIII 2 a.h.

2SC186 Computer Programming LXXIX 2 a.h.
Mathematics

Department Chairman: Richard R. Goldberg
Degrees offered: B.S., M.S., Ph.D.

Undergraduate Program
See "Division of Mathematical Sciences"

Graduate Program
Master's Programs
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 a second-year major in mathematics. A student whose preparation does not meet this requirement, in the opinion of his or her initial advisor, may be required to take certain additional courses to cover the deficiency.

Recent graduates of the Mathematics master's programs have found positions both in education (largely secondary school) and industry.

The Department offers the M.S. degree without thesis and the M.S.T. (Master of Arts in Teaching). 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 sequences and, in the case of the prospective secondary school teachers, material in required education courses. The remainder of the student's program may be chosen from any one or more of the departments in the Division and, if desired, from outside the Division as well.

Thus, the programs seek to provide master's candidates with a common core of knowledge and, outside of this core, to allow maximum desirability.

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.

Program I (designed for secondary school teachers)

Required Courses
Two from 22M:15-16 Introduction to Analysis and 22M:210-211 Analysis, but including either 22M:116 or 22M:211
Two from 22M:120-121 Abstract Algebra and 22M:205-206 Introduction to Algebra, but including either 22M:121 or 22M:206

Two courses in mathematics education

Course Distribution
A minimum of 24 semester hours in the Division of Mathematical Sciences from these courses:
Any course in the Department of Mathematics numbered 100 or above, except 22M:105 Analysis for Applications; Either 22C:122 Advanced Computer Organization, 22C:132 Programming Languages, 22C:135 Introduction to Computation Theory, 22C:145 Artificial Intelligence, 22C:199 Automata Theory I or any 200-level course in computer science, and either 22B:153-154 Introduction to Mathematical Science, 22S:164-165 Introduction to Probability, or any statistics course having any of these as a prerequisite

Comprehensive Examination
A six-hour examination over the required courses will test the candidate's knowledge of mathematics and his knowledge of the relevance of specific concepts to the teaching of secondary school mathematics.

Program II

Required Courses
Two from 22M:115-116 Introduction to Analysis I-II and 22M:210-211 Analysis I-II, including either 22M:116 or 22M:211
Two from 22M:120-121 Abstract Algebra I-II and 22M:205-206 Introduction to Algebra I-II, including either 22M:121 or 22M:206

Course Distribution
A minimum of 24 semester hours in the Division of Mathematical Sciences, and a minimum of 18 semester hours in the Department of Mathematics from the courses listed below. Any course in the Department of Mathematics numbered 100 and above except 22M:105
Any of the following courses in the Department of Computer Science:
22C:122 Advanced Computer Organization
22C:133 Programming Languages
22C:135 Introduction to Computation Theory
22C:145 Artificial Intelligence
22C:199 Automata Theory I 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:164-165 Introduction to Probability I-II or a course which has any of these as a prerequisite

Comprehensive Examination
This examination (for candidates in Program II) consists of two three-hour examinations over the required courses. With the permission of the graduate committee, a candidate may substitute an approved part of the Ph.D. comprehensive examination for part of the master's examination.
Admission Requirements

Regular admission to a Master of Arts program requires at least a 2.5 cumulative grade-point on a 4.0 scale. Regular admission to the M.A.T. program requires a 2.7 grade-point average.

Doctoral Programs

Most of the recent graduates of the Ph.D. program have found positions teaching in universities or colleges. Within the Ph.D. program there is ample opportunity 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, although the Department faculty itself is considerably stronger in the "pure" area.

The Department of Mathematics also cooperates in interdisciplinary doctoral programs with the program in Applied Mathematical 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, the passing of a comprehensive qualifying examination as described below. Also, required in the field of research chosen by the candidate are a complete, refereed examination in depth, 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 areas of analysis, algebra, analysis and topology, and logic. Each student decides in which three of the areas he or she wishes to be examined. The examinations are regularly given twice in each academic year, early October and early April. Further information on these examinations is available in the Mathematics office.

Beginning graduate students who plan ultimately to work for the Ph.D. should follow the guidelines given above for the various M.S. programs, and should seek their advisers’ help in planning a course of study that will prepare them for the comprehensive qualifying examination. Students who enter after having taken some graduate work elsewhere should likewise consult an adviser for an evaluation of the previous work and the planning of further study.


Undergraduate Courses: Lower Division

These courses are not open to graduate students except by special arrangement with chairman of the Department.

230/1 Basic Mathematical Techniques

In this course, ratio and proportion, algebraic expressions and equations, simple products, linear and quadratic equations, simultaneous equations, expor- tions and logarithms are taught. One mathematics requirement prerequisite: one year high school algebra, one year high school geometry.

231 Mathematical Techniques I

5 a.h.

Logarithms, permutation combinations, roots of polynomial equations, inequalities, proportions, complex numbers, primarily intended for students who need
Course Description Course 1

Introduction to Topology 1

Introduction to basic concepts of general topology and algebraic topology, separa-
tion axioms, connectedness, compactness, homotopy, products and function spaces, and the Čech homology and cohomology groups; prerequisite: 2306:10 or 2306:11 or courses of instructor.

Introduction to Topology 2


Introduction to Algebra

Abstract algebra, algebraic structures, including groups, rings, integral domains, polynomials, vector spaces, and linear transformations, partially ordered sets; Lebesgue measure and Lebesgue integration; Riemann-Stieltjes integral; differentiation; Fourier transforms; prerequisite 2306:20 or equivalent.

Introduction to Algebra


Introduction to Topology

Abstract algebra, algebraic structures, including groups, rings, integral domains, polynomials, vector spaces, and linear transformations, partially ordered sets; Lebesgue measure and Lebesgue integration; Riemann-Stieltjes integral; differentiation; Fourier transforms; prerequisite 2306:20 or equivalent.

Introduction to Topology


Introduction to Algebra

Abstract algebra, algebraic structures, including groups, rings, integral domains, polynomials, vector spaces, and linear transformations, partially ordered sets; Lebesgue measure and Lebesgue integration; Riemann-Stieltjes integral; differentiation; Fourier transforms; prerequisite 2306:20 or equivalent.

Introduction to Topology

### Statistics

**Measure and Integration (5 a.h.)**
- Lebesgue measure and integration.
- Hausdorff measure.
- Absolutely continuous functions.

**Functional Analysis (5 a.h.)**
- Banach and Hilbert spaces.
- Baire category theorem.
- Spectral theory of compact operators.

**Abstract Harmonic Analysis (5 a.h.)**
- Theory of locally compact groups.
- Haar measure.
- Group representations.

**Mathematical Statistics (5 a.h.)**
- Probability theory.
- Statistical inference.
- Estimation theory.

**Statistical Inference (5 a.h.)**
- Hypothesis testing.
- Confidence intervals.
- Nonparametric methods.

**Statistical Methods (5 a.h.)**
- Regression analysis.
- Analysis of variance.
- Multivariate analysis.

**Statistical Decision Theory (5 a.h.)**
- Bayesian decision theory.
- Games and decision theory.

**Advanced Topics in Statistics (5 a.h.)**
- Time series analysis.
- Categorical data analysis.
- Survival analysis.
and analyze scientific experiments so that every usable bit of information is squeezed from the data.

Undergraduate Program
(See "Division of Mathematical Science")

Graduate Program
The graduate program is designed to reflect the dual role of
Statistics as an independent discipline within the mathematical
sciences and as a research tool. The Department offers programs
leading to the M.S. degree under both the thesis and nonthesis
plans in the fields of theoretical statistics and probability, applied
statistics, actuarial science and operations research. Programs
leading to the Ph.D. degree are offered in theoretical statistics,
probability and applied statistics. The Department of Statistics
also cooperates in developing interdisciplinary doctoral pro-
grams under the Program in Applied Mathematical Science.

To be admitted to the graduate program, the applicant should
have an undergraduate major in one of the mathematical
sciences. With the approval of the Department, selected candi-
dates may be granted admission on the basis of mathematical
training through one year of calculus.

Master’s Degree Programs
Each of the three nonthesis M.S. degree programs offered by the
Department requires the successful completion of at least 30
semester hours of graduate work. The required minimum grade-
point average for the M.S. degree is 2.5.

The specific course requirements for the three nonthesis 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 adviser, will be substituted in the degree program.

Theoretical Statistics and Probability
22M.113 Introduction to Analysis I
22S:164–165 Introduction to Probability I–II
and at least six semester hours from among:
22M.116 Introduction to Analysis II
22M.210–211 Analysis I–II
22S:160 Applied Statistical Decision Theory
22S:167–168 Introduction to Stochastic Processes I–II
22S:170 Introduction to Nonparametric Statistics
22S:172 Topics in Statistical Methods
22S:253 Theory of Statistics
22S:255 Regression Analysis
22S:256 Multivariate Analysis
22S:271–272 Statistical Inference I–II

Applied Statistics

The following courses are recommended and constitute the core
of the program:

22S:103 Introduction to the Design of Surveys

22S:158 Design and Analysis of Experiments
22S:162 Regression Analysis
22S:173 Statistical Computation and Computation
22S:100 Applied Statistical Decision Theory
22S:133 Quality Control and Reliability
22S:148 Advanced Statistical Methods
22S:160 Applied Statistical Decision Theory
22S:161 Application of Multivariate Statistical The-
22S:164 Introduction to Probability I
22S:170 Introduction to Nonparametric Statistics
22S:170 Numerical Methods
22S:143 Digital Systems Simulation I
22S:241 Operations Research

Other courses relevant to applied statistics, but not appearing
on this list, may be selected for inclusion in M.S. program in
consultation with advisor.

Actuarial Science
22S:177 Numerical Analysis for Actuaries
22S:178 Graduation
22S:179 Advanced Mathematics of Finance
22S:180 Mathematics of Life Insurance
22S:181–182 Actuarial Theory and Practice I–II
22S:183 Construction of Demographic Tables
22S:184 Risk Theory
22S:297 Seminar: Actuarial Theory

and at least one course from outside Division of Mathematical
Sciences, most students elect courses from College of Business
Administration

Operations Research
22S:140 Applied Statistical Design Theory
22S:241 Operations Research
22S:242 Mathematical Programming I
22S:243 Mathematical Programming II

The M.S. degree may be earned under a thesis program in each
of the areas in which a nonthesis M.S. degree may be earned.
The course content of each program must be almost the same
as in a nonthesis program except that up to eight semester hours
may be earned by writing a thesis. Each candidate for the M.S.
degree will have a committee of three members appointed by
the chairman of the Department, and one member will be designated
chairman of the committee. This committee will have the
responsibility of recommending action on the candidate’s ap-
pllication for an M.S. degree. This recommendation is usually
based on the results of two-hour examinations on the topics
covered in the specified courses within each program.
Ph.D. Program

The Ph.D. program in statistics has certain auxiliary objectives, and the Department encourages doctoral students to relate their area of specialization to other fields of knowledge, to seek the ability to use electronic computing equipment or to learn the language skills needed to read foreign scientific journals and to be able to respond in professional contracts with foreign countries. In order to achieve these objectives, during the first year or two of the program, a doctoral student may wish to take a few courses or seminars to advance his or her understanding of the relationship between statistics and other disciplines, to learn computer programming or to increase facility with one or more foreign languages. Each doctoral student is required to include in the program a component which involves experience in either teaching or statistics consulting.

When a graduate student has accumulated approximately 40 to 50 semester hours of credit, of which at least 18 semester hours are in 200-level courses in the mathematical sciences, that student should request permission to take a preliminary examination for the Ph.D. degree. This examination assesses whether the student has mastered the basic concepts of probability and statistics; it consists of two parts, one of which is mandatory for all prospective candidates. The first part is a basic examination on probability and statistics. Essentially the topics covered are those studied in:

228:153–154 Introduction to Mathematical Statistics
1–11
228:164–165 Introduction to Probability I–II
228:170 Introduction to Nonparametric Statistics

This examination is usually divided into two three-hour sessions. For the second part of the examination the student may choose, according to his or her interests, either II (a) applied statistics (three hours) which basically covers the material in 228:128 Design and Analysis; 228:235 Analysis of Variance, 228:256 Multivariate Analysis, or II (b) mathematical statistics (three hours) which covers the material in 228:210–211 Analysis I–II.

The student interested in the area of probability or mathematical statistics should take part I (b). This examination is offered once in the fall semester and once in the spring semester. An examination committee will be assigned to the student and the Department that the student be passed, passed with reservation or failed. In case of failure, this examination may be repeated once. This examination may be used in lieu of the master's written examination.

After the student has passed the preliminary examination and obtained a thesis adviser, he or she and the adviser should prepare a plan of study. The student then seeks permission of the Department chairman to take the Ph.D. oral comprehensive examination. This should be held approximately one semester after the preliminary examination and, in no case, more than a year later. The chairman of the Department will appoint a five-member committee to conduct the examination, at least four of whom must be from the Department of Statistics. The purpose of this examination is to determine whether the student has a sufficient grasp of the necessary mathematical, statistical and probabilistic concepts to work on original problems. Clearly, the student must have the requisite tools which include the major ideas from the preliminary examination, but more than that is expected. For example, a student in applied statistics would be responsible for the mathematical concepts and techniques which are prerequisite for the advanced courses he or she has taken in statistics. Following the examination, the student's Ph.D. committee will make the usual report to the Graduate College on the Ph.D. comprehensive examination. It is traditional that the doctoral program ends with an oral examination over the student's dissertation.

Special Features

The development of high-speed electronic computers has had a big impact on statistics. Practicing statisticians and actuaries find the computer an indispensable tool in their daily work. Remote computer terminals are available in MacLaurin Hall and are employed in Quantitative Methods and several other courses to give students experience using the computer. Because statisticians are often served by other scientists in research projects, it is important that students gain experience in group efforts. In several courses the Department tries to provide this experience. For example, a team of students, with faculty supervision, recently performed an extensive analysis of the factors relating to highway deaths in Iowa.

Iowa's Proud Tradition

Professor H. L. Rietz, who served The University of Iowa from 1918 until 1942, was a pioneer in mathematical statistics and actuarial science. Rietz was the first president of the Institute of Mathematical Statistics and served as a special actuarial advisor during the drafting of the original Social Security Act. He and his students have made significant contributions in each of these fields. Today the Department of Statistics carries on a much more varied program than was possible in those early days; however, the commitment to excellence is the same.


Courses Primarily for Undergraduates

Note: No student who has received credit for a course offered by the Department of Statistics above 228:153 may receive credit for subsequently taking a lower numbered course.

228:4 Quantitative Methods 3 s.h.

Studies approach to problem-solving using probability; using regression analysis; basic non-parametric test statistics; descriptive statistics; large sample theory; introduction to estimation and tests of significance; prerequisite: college algebra or equivalent; students with calculus should take 228:130, 228:131 or 228:132.

228:39 Probability and Statistics for Engineering and Physical Sciences 3 s.h.

Finite probability models, general probability model, random variables, functions of random variables, examination, joint distributions, discrete distributions, continuous distributions, estimation, hypothesis testing, regression; same as Industrial and Management Engineering 228:133 and Engineering Core 21:59; prerequisite: Mathematics 228:04 or equivalent.

228:145 Introduction to Statistical Methods 3 s.h.

Same as Sociology 22:14, primarily for students who are not statistics majors; students should not take both 228:13 and 228:145.
Courses for Undergraduates and Graduates

225:101 Bioinformatics

Elementary course on statistical methods primarily for research in medical subjects and related fields, same as Preventive Medicine and Environmental Health 63:101. 3 s.h.

225:102 Introduction to the Design of Surveys

Same as Preventive Medicine and Environmental Health 63:140. 3 s.h.

225:153-225:44

225:130 Probability and Statistics

Finite and general probability models, random variables, functions of random variables, expectations, moments and common probability distributions, estimation and hypothesis testing. 3 s.h.

225:137 Statistical Methods in Educational Research I

Same as Education 5140. 3 s.h.

225:138 Statistical Methods in Educational Research II

Same as Education 5142. 3 s.h.

225:145 Engineering Statistics

Same as Industrial and Management Engineering 56:132; prerequisite: 225:29 or equivalent. 3 s.h.

225:190 Quality Control and Reliability

Same as Industrial and Management Engineering 56:133; prerequisite: 225:13 or 225:180. 3 s.h.

225:149 Advanced Statistical Methods

Same as Education 7254; prerequisite: 225:14 or equivalent. 3 s.h.

225:160 Introduction to Mathematical Statistics I

Basic probability models, distribution of random variables, order statistics, limiting distributions, sufficient statistics; prerequisite: Mathematics 225:24 or 225:28. 3 s.h.

225:161 Introduction to Mathematical Statistics II

Continuation of 225:15; point estimation, statistical hypothesis, analysis of vari- ance, further normal theory. 3 s.h.

225:187 Correlation Methods

Elementary theory and applications of correlation and regression, multiple regression, analysis of covariance, multiple classification and factor analysis, analysis of variance and covariance, analysis of residuals, application to medical research. 3 s.h.

225:191 Analysis of Experimental Data

Statistical methods and computer techniques used in research, same as Industrial and Management Engineering 56:151; prerequisite: 225:13 or 225:180. 3 s.h.

225:195 Design of Experiments

e or s.h.

225:201 Applied Statistical Decision Theory

Same as Industrial and Management Engineering 56:233; prerequisite: 225:150 or 225:180. 3 s.h.

225:215 Regression Analysis

Same as Education 7256. 3 s.h.

225:235 Generalized Linear Models

Same as Industrial and Management Engineering 56:332; prerequisite: 225:225. 3 s.h.

225:240 Distribution Free Statistical Methods

Same as Education 7253. 3 s.h.

225:243-225:44

225:244 Introduction to Probability

Contours of 225:14; generating functions, convergence of random variables, work and central limit theorem. 3 s.h.

225:247 Non-Parametric Methods

225:260 Time Series Analysis

Same as Industrial and Management Engineering 56:320; prerequisite: 225:15 or 225:180. 3 s.h.

225:261 Analysis of Variance

Same as Industrial and Management Engineering 56:316. 3 s.h.

225:262 Multivariate Analysis

Modeling and exploratory methods for analyzing multidimensional data, same as Industrial and Management Engineering 56:321; prerequisite: 225:15 or 225:180. 3 s.h.

225:263 Theory of Probability I

Same as Industrial and Management Engineering 56:322; prerequisite: 225:15 or 225:180. 3 s.h.

225:264 THEORY OF PROBABILITY II

Same as Industrial and Management Engineering 56:323; prerequisite: 225:15 or 225:180. 3 s.h.
Medical Technology

Directors: John A. Kepple (VA Hospital), Michael L. O'Connor (University Hospital)

Degree offered: B.S., B.S. (plus certification)

Medical technology is one of the newest and fastest-growing professions in medicine. Medical technologists perform laboratory tests upon which physicians rely for accurate diagnosis and proper treatment of disease. These skilled health team workers are in great demand in hospitals, private and government laboratories, clinics, physicians' offices, industrial medical laboratories, pharmaceutical and biological laboratories, and in medical research.

Medical technologists utilize a battery of complicated precision instruments in their work. Modern-day laboratory tests reveal the presence of abnormalities in blood composition and other body fluids as well as body tissues. Laboratory personnel performing these procedures must have the highly specialized skills acquired in the completion of a formal academic and clinical program.

The medical technology profession requires intelligence, accuracy, and reliability in a high degree. As a general rule, students showing an aptitude for scientific subjects in high school will have a success in medical technology.

Advancement opportunities in medical technology depend to a large extent on the quality of education and the ability of the individual. There is a growing demand for medical technologists with advanced degrees to fill positions in supervision, education, and administration.

The University of Iowa offers a program approved by the Council on Medical Education and Hospitals of the American Medical Association and by the Board of Registry of Medical Technologists of the American Society of Clinical Pathologists. The program consists of three years of preclinical studies followed by a one-year clinical program which may be taken at the

University of Iowa Hospitals, the Iowa City Veterans Administration Hospital or, by special arrangement, at another approved hospital school of medical technology.

After successful completion of the four-year program, the student is awarded a Bachelor of Science in Arts degree with a major in general science and medical technology. Also, a Certificate in Medical Technology is granted by the hospital in which the clinical training was conducted. The student is then eligible to take the examination of the Registry of Medical Technologists and thereby become a registered medical technologist, which entitles him or her to the designation M.T. (A.S.C.P.) — Medical Technologist (American Society of Clinical Pathologists).

Preclinical Studies

In the preclinical program, the medical technology student must satisfy the College of Liberal Arts proficiency requirements in rhetoric, physical education, mathematics and foreign language; must satisfy the College of Liberal Arts core requirements in literature, social science and the historical-cultural area; and must earn at least 16 semester hours of credit in science.

The credits in science must include 16 semester hours of credit in chemistry, including general chemistry (eight semester hours must be completed during the freshman year), quantitative analysis and organic chemistry; and 16 semester hours in the biological sciences, including zoology, microbiology and parasitology. A course in general physics is strongly recommended but not yet required.

To enter a clinical hospital program, the student must have earned at least 94 semester hours of credit in preclinical studies, with a minimum 2.0 cumulative grade-point average.

Clinical Program

In the fourth year, students enroll in the 12-month clinical program at the University of Iowa Hospitals or at Iowa City Veterans Administration Hospital. After finishing one of these clinical programs, the University awards 30 semester-hour credits, thus completing the requirements for the Bachelor of Science in Arts degree in general science.

The clinical program covers in depth the following disciplines: clinical hematology, clinical biochemistry, urinalysis, blood banking, clinical microbiology, virology and parasitology. Daily lectures, student laboratory work and rotation through all sections of the clinical pathology laboratories are included.

The Veterans Administration Hospital is approved for 15 students and the program begins in June of each year. University Hospitals is approved for 24 students and accepts a class of 12 students each year and another class of 12 students in the fall of each year.

Because the clinical-year programs of The University of Iowa are limited to a total of 39 students, students may enroll in certain other approved hospital medical technology programs. In such cases, however, prior written approval of the University must be obtained if academic credit towards a bachelor's degree is to be granted upon completion of the clinical program.

Staff: UNIVERSITY HOSPITALS: professor Routh, associate professor Rose; assistant professor Barrett; Nicholson, M. L.
O'Connor, Simmons; instructors: Giehlg, E. O'Connor, Platt, Schuh, Winkel; VETERANS ADMINISTRATION 13 Rs/1 A: Professor Keppler, assistant professor Albi, Shacklett; instructors: Berglund, Oliver

Courses
See "General Science" for description

Microbiology

Department Head: J. R. Porter
Degree offered: B.S., M.S., Ph.D.

Microbiology is a science concerned with the identification, structure and activities of bacteria, yeasts and molds, protozoa, viruses and other organisms of microscopic and submicroscopic size, representing the borderline of life.

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, geobiology—have expanded rapidly in recent years and offer rewarding career opportunities to qualified persons.

Microbiology is an excellent major for undergraduate students who want a good general education with emphasis on an important and interesting science. For the graduate of a bachelor's degree program in microbiology, positions are available in government, hospitals, public health and industrial control, research and teaching laboratories.

Students who continue beyond the bachelor's degree have career opportunities in those same areas, plus college and university teaching, with greater responsibilities and commensurate higher salaries.

The Bachelor of Science Degree

An undergraduate student majoring in microbiology at Iowa must meet general College of Liberal Arts requirements in rhetoric, mathematics and physical sciences, in the literature, historical-cultural and social sciences cores, and in a foreign language.

Required courses for the microbiology major include:

2-1 Introduction to Bacteriology 5 s.h.

or

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

4-1 and 4-4 Principles of Chemistry I-II 6 s.h.

4-5 Principles of Chemistry 3 s.h.

4-6 Elementary Chemistry Laboratory 4 s.h.

4-11 Quantitative Analysis 4 s.h.

4-121-122 Organic Chemistry I-II 6 s.h.

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

99-120 Chemistry of Biological Materials 3 s.h.

99-121 General Chemistry 3 s.h.

29-1-2 College Physics 8 s.h.

61-197 General Microbiology 4 s.h.

61-198-199 Microbiology 10 s.h.

22M-20 Elementary Functions 3 s.h.

72M-25-26 Calculus I-II 8 s.h.

(* Optional but recommended, especially for students planning to go on to graduate study)

The Honors Program

Open to seniors with grade-point averages of at least 3.0 overall and 3.2 in microbiology courses, the Honors Program in microbiology comprises an introduction to original research, directed readings, 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."

For graduate programs, facilities, staff roster and course descriptions, see "College of Medicine."

Museum Training

Department Head: George D. Schrumpf

The Department offers courses which give the student a comprehensive background in the conceptual, design and production phases of exhibit preparation and the general operational procedures of small science museums. Courses are offered during the 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 minor on a master's degree or Ph.D. A major in general science or science education is recommended for students preparing for professional museum careers.

Techniques presented in the Museum Laboratory are of value not only to those intending to pursue museum careers, but also to premedical, geology, zoology and anthropology students. Instruction is designed to meet the individual needs of each of these students. Advanced art students are afforded the opportunity to gain practical working experience by participating directly in the Museum of Natural History exhibit program. 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.

Staff: curator and instructor Schrumpf

Courses

All registrations by consent of instructors

24-1/2 Museum Techniques 1 or 2 s.h.

Collecting, preparing and exhibiting biological materials for museum, classroom teaching or repository use
Music

School Director: Makingmusic


A primary element in the 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 250 undergraduates and 175 graduate students majoring in music is at once large enough to sustain strong programs in all areas of specialization and small enough to ensure the individual attention essential to each student's development.

Approximately 90 percent of the School's undergraduate students earn certification to teach. Most of those who earn certification do enter teaching.

More than 70 graduates of the School have become heads of music at other colleges and universities.

In teaching, graduates of the School generally can find opportunities to continue previous interests in performing, composing and other related activities.

There is also a growing demand for qualified personnel in sales and service for music education programs and other areas of the music industry, and in church music, music librarianship, and recording and broadcasting.

Alumni of the School play in major orchestras in Boston, Dallas, Cincinnati, Minneapolis and New Orleans, and in numerous other professional organizations.

The University of Iowa School of Music is a charter member of the National Association of the Schools of Music. At the undergraduate level, School of Music curricula offer all qualified high school graduates an opportunity for further study of music, either professional or avocational. At the graduate level, curricula provide advanced study, designed primarily for persons preparing for teaching careers in secondary schools or colleges and universities.

All music enrollments require School of Music approval.

Undergraduate Degrees

New undergraduate students planning to major in music are encouraged to audition either in person or by tape recording in advance of registration; write to the director of the School of Music for details. In addition, all transfer students must take the Advisory Examination in music theory (see "Graduate Degree").

Curricula for the two undergraduate degrees are identical, except that candidates for the B.A. may not count more than 30 semester hours in music toward the 126 semester hours required for graduation in the College of Liberal Arts, while candidates for the B.M. may count more than 50 semester hours in music toward graduation in the College of Liberal Arts and, in addition, need only eight semester hours of credit in foreign language. Students who want a teaching certificate may select either degree, but the B.M. is preferred since the B.M. program allows the student to take more coursework in music.

Candidates for either degree must complete these music requirements:

25:1-2 Literature and Theory I, II
25:3-4 Ear Training and Sight Singing
25:4-5 Literature and Theory III, IV
25:7-8 Advanced Ear Training and Sight Singing

Four years of applied music (both solo and ensemble)

Participation in band, orchestra or chorus required of all undergraduates; specific assignments at discretion of advisor and director of School of Music; as a minimum, wind and percussion majors must participate in band program during first two years in residence at the University, female students in concert band and male students in both marching and concert bands; requests for adjustment of rules pertaining to performance in band may be submitted to reviewing committee.

Advanced electives in applied music, theory, composition, music education, music history and literature, or orchestration and conducting

Undergraduate Music Education Programs

For general requirements for teacher certification, see "College of Education".

In addition to B.A. or B.M. requirements in music, liberal arts and education, certification to teach music in Iowa schools requires satisfactory completion of:

25:104 Instrumental Techniques (Cornet, Clarinet and Percussion) 1 or 2 s.h.
25:105 Instrumental Techniques 1, 2 or 3 s.h.
25:106 Instrumental Techniques 1, 2 or 3 s.h.
25:107 Instrumental Conducting 2 s.h.
All brass, woodwind and percussion majors in music education must participate in concert band for eight semesters; men must also participate in marching band for four fall semesters.

String Majors

25:101 Class Viola 0 to 2 s.h.
25:104 Instrumental Techniques (Cornet, Clarinet and Percussion) 0 to 2 s.h.
Minimum of one year on secondary string instrument (required); violin and viola majors elect one year of cello instruction; cello
and bass majors elect one year of violin; in addition, all violin majors are expected to elect one semester of Class Viola.

25:107 Instrumental Conducting 2 s.h.
25:112 String Techniques and Methods 3 s.h.

Vocal and Piano Majors
Vocal majors must evidence satisfactory competency in piano; piano majors must evidence satisfactory competency in voice; either vocal or piano majors lacking such proficiency to continue applied music in appropriate area

25:109 Choral Methods and Conducting 3 s.h.
25:110 Choral Literature and Conducting 3 s.h.

Music Teaching Minor for Elementary Education Majors
Minimum of 24 semester hours required in this program

Required Courses
78:119 Methods: Basic Skills and Techniques in Music Education 3 s.h.
78:120 Methods and Materials: Music for the Classroom Teacher (section for music minors) 3 s.h.
78:192 Laboratory Practice in Elementary School 2 s.h.
Applied Music 2 s.h.
Participation in Music Ensembles 2 s.h.

Electives
Minimum of 12 semester hours to be selected from other music and advanced music education courses (78:198 course designations) with approval of advisor

25:115 Diction for Singers I 2 s.h.
25:116 Diction for Singers II 2 s.h.

Piano Majors-Novice Area
Piano majors who elect to teach in novice area must complete requirements in either brass, woodwind, and percussion or string area

Methods and Materials: Student Teaching
78:145 Methods and Materials: Elementary School Music 3 s.h.
75:142 Methods and Materials: Secondary School General Music 3 s.h.

Instrumental Majors
78:145 Methods and Materials: Elementary School Music 2 s.h.
78:146 Methods and Materials: Secondary School Instrumental Music 4 s.h.

All Majors
78:191 Observation and Laboratory Practice in High School 6 s.h.
78:192 Laboratory Practice in Elementary School 6 s.h. (See "College of Education" for education course requirements)

Graduate Degrees
Each applicant must meet the general requirements for admission to the Graduate College (see "Graduate College"), take the Graduate Record Examination Aptitude Test and take the Advisory Examinations in music history and literature and in music theory ( Harmony, ear training, fugue, and counterpoint), which are given the last session of the two days (Sunday excluded) before registration. A bulletin describing the general requirements for these examinations is available from the registrar's office. School of Music. Students expecting to major in performance must audition in person by submitting a tape recording representative of their current performance.

Master of Arts

The Graduate College requires a minimum of 30 semester hours of graduate credit, including at least 24 semester hours completed in residence. As soon as possible in the first semester of residence, the candidate should select a field of special interest and consult with the area head in that field who will act as his or her advisor. A plan of study approved by the advisor and the Departmental Executive must be filed with the Graduate College during the semester in which the degree is to be granted. After in or the semester in which he or she expects to complete them, the candidate must present himself or herself for a final master's examination. This examination normally covers the areas of music theory, music history and the major area of concentration. Regulations of the Graduate College provide that, upon recommendation of the School of Music, students who are going on to the doctorate may substitute the comprehensive Ph.D. examination for the final master's examination. In such cases it is expected that the student's coursework be of high quality and sufficiently advanced to merit this recommendation.

Areas of concentration for M.A. degrees are composition, music history and ethnomusicology, music education, music literature, music theory and performance (including conducting). The requirements for the thesis and nonthesis programs are identical, except that the thesis may be written in eight to twelve semester hours may be earned for the thesis. These are normally required in all areas except music education and the usual length of the major area of concentration may be in the fields of performance, composition or instrumentation. For the thesis in performance (four semester hours minimum degree credit allowed), one full-length recital is required, degree credit will be given for a recital graded lower than B. It is expected that original compositions shall be sufficiently tested by audition before being submitted as theses.

All curricula for the Master of Arts degree include:

25:521 Introduction to Graduate Study in Music
Any two of the following, to be taken only after any serious deficiencies revealed in advisory examinations in music theory and ear training are remedied through 25:111 Review Theory:
25:145 Counterpoint Forms or satisfactory score on Advisory Examination
25:147 Tonal Forms or satisfactory score on Advisory Examination
One elective from analytical studies sequence (25:148-152) or equivalent
If elected from either 25:145 or 25:147 as a result of the Advisory Examination, student must take one from which
Music

be or the was not excused, and an elective from analytical studies series; if excused from both 25:145 and 25:147, only elective from analytical studies need be taken.

25:301–302 Advanced History and Literature of Music I-ll or equivalent or satisfactory score on Advisory Examination. If excused from either or both 301–302 as result of Advisory Examination, another course should be elected from music history sequences, 25:303 to 25:319, courses 25:323 and 25:320 to 25:333; others occasionally offered by musicology staff may be elected in special cases with permission of musicology adviser.


Keyboard majors may substitute accompaniment in place of participation in large ensemble at discretion of their adviser.

Suitable courses in candidate's area of concentration:

Graduate programs for the M.A. in music education include all minimum requirements of the School of Music (see above), as well as 78:240 Supervision and Administration of Music, 78:441 Psychology of Teaching Music, 78:245 General Music in the Elementary School or 78:241 General Music in Secondary Schools, and two courses selected from the following:

25:108 Advanced Instrumental Conducting
25:172 String Literature
25:207 Advanced Choral Conducting I
25:208 Advanced Choral Conducting II
25:209 Advanced Instrumental Methods and Literature I
25:210 Advanced Instrumental Methods and Literature II
25:341 Advanced Choral Literature I
25:342 Advanced Choral Literature II
25:343 Advanced Choral Literature III

Master of Fine Arts

The M.F.A. is a degree normally requiring two years for students of superior ability in the areas of composition or performance (including conducting). It requires a minimum of 48 postbaccalaureate semester hours. In addition to the curricular requirements for the Master of Arts degree (see above), the student must also present at least two full-length recitals or programs. 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, including two final examinations, with a minimum combined total of 60 semester hours of graduate credit (see "Graduate College").

Doctoral Degrees

The Graduate College requires a minimum of 72 semester hours of graduate credit for the doctorate; two semesters of at least nine semester hours each must be spent in full-time residence on campus at the University beyond the first 24 semester hours of graduate work. As soon as possible in the first semester of his or her residence, the candidate should consult with the head of the area of his or her field of interest for preliminary planning. A formal plan of study must be drawn up no later than the semester in which the comprehensive examination is to be taken, and a copy of the plan must be sent along with the Departmental request to the Graduate College for permission to take that examination. The comprehensive examination is intended to evaluate the candidate's knowledge of music theory, music history and his or her major area at or near the end of the formal preparation and prior to the completion of the dissertation. The student must be registered in the University at the time of the comprehensive examination, which must be passed not later than the session before the session of graduation. The examination may not be taken until the foreign language or other tool requirements (see below) set by the student's supervisor have been satisfied. The final examinations, an oral defense of the dissertation, may not be held until the next session after passing the comprehensive examination (see "Graduate College" for further details).

All doctoral study in music includes:

- Minimum course requirements listed under the M.A. degree.
- One or more additional electives from the analytical studies sequences 25:148–152 or equivalent.
- One or more additional courses in the music history-musicology sequences (see "Master's Degree").
- 25:179 Acoustics or equivalent.
- Reading proficiency in one foreign language (usually German) except for music education students, who may elect two courses in statistics; most areas require one or more additional languages for these further language requirements and levels of achievement expected, students should consult appropriate adviser; it is recommended that entering students register for a language continuously, unless or until they pass required proficiency examination.


Doctor of Philosophy

Areas of concentration for this degree include composition, music history and musicology, music education, music theory, and organ literature. The Ph.D. in music literature (this designation is used for degrees program with a 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, etc.) is expected that original composition shall be retained by the candidate before being submitted as thesis.

Admission to the Ph.D. program in music theory includes the following requirements: satisfactory achievement on the advisory examination in music theory; demonstration of minimal piano proficiency; submission of a qualifying research paper; and satisfactory achievement on a qualifying examination. Details of these requirements may be obtained from the director of the School of Music.

Basic requirements for Ph.D. programs in music education
include, in addition to the requirements for the M.A, in this field, two semester hours credit in both 76-444 and 78-445, and a minimum of eight semester hours in education. Additional course requirements in music and music education will be determined on the basis of the individual professional needs of each student. Admission to the Ph.D. program in music education, is based upon a satisfactory score on the Graduate Record Examination, demonstration of adequate musicianship, holding or qualified for a valid teaching certificate and evidence of successful teaching experience.

Doctor of Musical Arts
For the D.M.A. degree in performance and pedagogy, the candidate must meet all the general requirements for the Ph.D. in music with respect to residence, language requirements, total maximum hours, and written and oral comprehensive examinations. Instrumentalists and vocalists must offer satisfactory evidence of ability in their field of performance by means of an audition, preferably before their first registration or at the latest during the first semester in residence. Conductors shall provide evidence of previous successful professional experience and be auditioned before or during their first semester in residence before being admitted to the D.M.A. program.

The D.M.A. dissertation is the presentation of three full-length recitals or two recitals plus the performance of a concert with orchestra or other appropriate ensemble. Vocalists may substitute the execution of one or more major roles in a large-scale work, e.g., opera or oratorio, for one of their recitals. Conductors will present three programs. D.M.A. candidate must give evidence of their ability to make a scholarly investigation of limited scope by means of a written essay. For further particulars concerning the Ph.D. and D.M.A. degrees in specific fields, the student should consult the director of the School of Music.

Graduate Awards
Qualified graduate students are invited to apply for fellowships and assistantships. Inquiries should be directed to the School of Music.

Music for Nonmajors
Students for whom music is an avocation rather than a vocation will find courses 25-159 Late 18th and 19th Century Composers, 25-160 Early 18th and 20th Century Composers or core courses 11:39-40 of interest in acquiring them with music as listeners; and they should consult music advisors regarding such courses in applied music (solo and ensemble) as may appeal to them as amateurs. Such performances with full or simplified scores, those with an elementary background in music may register for 25-1-2 Fundamentals and Harmony I-I, 25-91-92 History of Music I-I and 25-161 Survey of Opera. Full elective credit for all music courses is available in the College of Liberal Arts for the general student as well as the prospective professional.

Private Lessons
The only special fees in music at Iowa are for private lessons. Semester rates for majors are currently $30.00 for weekly one-hour lessons in the student's major area and $25.00 for weekly half-hour lessons in the secondary area; and for nonmajors, $25.00 for a weekly half-hour lesson.

Opportunities for Performance
The School of Music faculty comprises highly-trained artist-teachers in each area of specialization. Private lessons are offered in all band and orchestra instruments, voice, piano and organ. Frequent recital appearances, including the required senior solo recital, help the student develop technical competence and poise. Participation in a variety of ensembles provides additional valuable training and experience.

All undergraduate students in music must participate in band, orchestra or chorus; wind and percussion majors must participate in band during their first two years at the University. The University Symphony presents five concerts each year and performs with the University Chorus in Christmas and spring concerts. The Chamber Orchestra performs the classical repertoire and the contemporary scores of student composers, accompanies student-performed concerts and some operatic productions and serves the practical needs of aspiring conductors.

Collegium Musicum (Instrumental) performs old and unusual music on old and unusual instruments.

The Symphony Band presents concerts on campus and on tour.

The Hawkeye Marching Band appears at all home football games and at one out-of-town game each fall.

The Hawkeye Concert Band presents concerts on campus and forms the nucleus of the basketball pep and ROTC parade bands.

Jazz Workshop/Stage Bands provide opportunities to study and perform various jazz styles, phrasings and concepts.

The Percussion Ensemble gives percussionists the opportunity to gain extensive experience in all facets of percussion performance.

The University Choir, comprising 65 voices, performs a repertoire including sacred and secular conventions from all periods, folk songs, spirituals and cantatas. In addition to campus appearances, it makes an annual tour.

Opera Workshop gives students ample opportunity to gain practical experience in the production and performance of operas. The year's activities range from single scenes to full-scale productions.

Oratorio Chorus specializes in the performance of choral-orchestral masterworks of the eighteenth, nineteenth and twentieth centuries. Major performances are the annual Christmas and spring concerts with the University Symphony Orchestra.

Collegium Musicum (Vocal) is a small group which performs difficult and interesting choral music of all areas.

The Center for New Music was established with a Rockefeller Foundation grant to provide 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, first facility of its kind to be funded by the Rockefeller Foundation, is an interdisciplinary unit linking the University's schools of Music and Art and its film, dance, theatre and creative writing areas. The Cen-
ter's basic purpose is to encourage talented young artists to develop their creative skills through multimedia and intermedia classes, projects, and performances.

Facilities
With completion of the new Music Building (1970) and an adjacent Halcher 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 53 teaching studios, 73 practice rooms, a large library, an electronic music laboratory, completely soundproofed car training and listening facilities, three chorus and orchestra rehearsal halls, ample solo and ensemble practice facilities, seven practice and recital organs and a 702-seat recital hall. Halcher Auditorium seats 2,600 persons for concerts, 2,400 for opera and orchestral performances.

Library resources include more than 50,000 volumes of music and books—increase at the rate of approximately 2,000 a year—and more than 1,200 reels of microfilm, a microcard file of approximately 300 titles nearly 3,000 LP records and 150 periodicals in several languages. Its acquisition program gives particular attention to a strong, reference collection emphasizing the "broad and masterful." resources of musical research and performance. The library's quarters in the new Music Building provide 24 studio cars, a recital room, a seminar and two books rooms, a large reading area with 50 listening posts and a separate area for the Goldstein Band Library, one of the world's most famous collections of band music.


Courses Primary for Undergraduates

Theory and Composition

2561 Literature and Theory I 3 s.h.

Heating, writing, and liberal study, students of music and fundamentals of theory; must be accompanied by registration in 256, first semester.

2562 Literature and Theory II 3 s.h.

Continuation of 2561; must be accompanied by registration in 256-2; second semester.

2563 Literature and Theory III 3 s.h.

Continuation of 2561-2; second semester.

2684 Literature and Theory IV 3 s.h.

Continuation of 2561-2-3. Open to enrollment for second semester.

2567 Advanced Ear Training and Sight Singing 1 s.h.

Two laboratory periods per week; both semesters.

2568 Advanced Ear Training and Sight Singing 1 s.h.

Continuation of 2567; both semesters.

2511 Review Theory cr. arr.

May be repeated, both semesters.

2515 Undergraduate Composition cr. arr.

Prerequisite: permission of instructor; both semesters.

History and Research

2561 History of Music 3 s.h.

Prerequisite: music majors 255 or equivalent; nonmusic, consent of instructor; first semester.

2562 History of Music II 3 s.h.

Continuation of 2561, but may be taken as independent study; prerequisite same as 2561; may be repeated, first semester.

2575 Papers in Music 1 to 4 s.h.

May be repeated for credit.

Courses for Undergraduates and Graduates

Music Education

Where dual numbers are listed, students preparing for a Music Teacher Certificate should register under Education number.

26100 Class Voice 1 s.h.

Open to music majors for secondary music major; to others by permission.

26101 Class Piano 1 s.h.

Open only to music majors for secondary piano major.

26102 Class Piano II 1 s.h.

Open only to music majors for secondary piano major.

26103 Class Voice 0 to 3 s.h.

Open only to music majors for secondary voice major.

25614 Instrumental Techniques (Cornet, Clarinet, Percussion) 1 or 2 s.h.

Second semester.

25156 Instrumental Techniques 1 to 3 s.h.

Same as Education 15143, for prospective teachers in public schools; fundamentals instead of instrument skills; first semester.

25158 Instrumental Techniques 1 to 3 s.h.

Same as Education 15146, for prospective teachers in public schools; fundamentals instead of instrument skills; second semester.

25159 Instrumental Conduction 2 s.h.

Offered both semesters.

25160 Advanced Instrumental Conduction 2 or 3 s.h.

Prerequisite: elementary conducting skills.

25190 Choral Methods and Conducting 3 s.h.

Same as Education 29141, first semester.

25191 Choral Literature and Conducting 3 s.h.

Same as Education 29141, second semester.

25193 Choral Conducting 5 s.h.

Same as Education 29145; with permission of instructor; may be repeated, second semester.

25194 Choral Literature and Conducting 3 s.h.

Same as Education 29141, second semester.

25195 Methods of Teaching Piano 3 s.h.

Same as Education 29142, second semester.

25196 Studies in Piano Laboratory 3 s.h.

Same as Education 29142, second semester.

25197 Problems in Arranging and Orchestration 3 s.h.

Same as Education 29142, second semester.

25198 Arranging for Marching Band 3 s.h.

25199 Seminar: Percussion Methods, Materials, Percussion Performance Practices 1 or 2 s.h.

Prerequisite: consent of instructor; contemporary percussion literature and current style, notation, techniques or performance and composition.

Theory and Composition

25146 Counterpointal Forms 3 s.h.

Writing counterpoint, superius; nonmusic majors, 255 or 251 or equivalent.

25147 16th-Century Harmony and Counterpoint 3 s.h.

Lectures and laboratory, superius and; 255 or 251 or equivalent; first semester.

25147 Tonal Forms 2 s.h.

Prerequisite: 252 or 251 or equivalent; both semesters.

25148 Analysis of Music Literature, 1600 to 1790 3 s.h.

Prerequisite: 251 or 255 or equivalent; may be repeated, first semester.

25149 Analysis of Music Literature, 1790 to 1855 3 s.h.

Prerequisite: 251 or 255 or equivalent; may be repeated, first semester.
32:100 Analysis of Music Literature, 1825 to 1900 3 s.h.
Prerequisite: 32:91 or equivalent or 13:5-11 or equivalent; may be repeated; second semester.
32:151 Analysis of Music Literature, 1900 to Present 3 s.h.
Prerequisite: 32:100 or equivalent or 13:5-11 or equivalent; may be repeated; second semester.
32:153 Analysis of Music Literature, Special Topics 3 s.h.
Coreq. and consent of instructor by semester
32:154 Intermediate 3 s.h.
Same as Art 19:202, Speech 31:120
32:186 Studies in Jazz 3 s.h.
Coreq.
Prerequisite: thorough knowledge of traditional harmony and counterpoint and at least junior standing
32:186 Composition Seminar 2 s.h.
Prerequisite: advanced standing and permission of instructor
32:187 Orchestration 2 s.h.
Prerequisite: thorough knowledge of traditional harmony and counterpoint and at least junior standing
32:177 Thorough Base Realization I 2 s.h.
Prerequisite: writing keyboard accompaniments in seventeenth and eighteenth-century music
32:178 Thorough Base Realization II 2 s.h.
Prerequisite: improving accompaniments in light of figured bass; open to qualified students with sufficient keyboard proficiency

History, Literature and Research
32:138 Colloquium 0 or 1 s.h.
A seminar approach to special problems; lecture and discussion
32:149 Early and 18th-Century Composers 2 or 3 s.h.
32:150 Early-19th- and 20th-Century Composers 2 or 3 s.h.
32:251 Introduction to Opera Literature 4 s.h.
32:183 Interpretation of German Art Song 3 s.h.
32:183 Interpretation of Russian Art Song 3 s.h.
32:184 History of Organ Building and Design 3 s.h.
32:185 Developments in Art History; history of music and use of music in Renaissance literature; open to graduate students and in others by consent of instructor; may be repeated for credit; offered alternate years; offered 1990-91
32:196 Church Service I 3 s.h.
32:197 Church Service II 3 s.h.
Prerequisite: 32:196; may be repeated for credit; offered alternate years
32:198 Organ Literature I 3 s.h.
Prerequisite: 32:188; may be repeated for credit
32:199 Organ Literature II 3 s.h.
Prerequisite: 32:188; may be repeated for credit
32:199 Orchestral Literature 3 s.h.
32:199 Piano Literature 3 s.h.
32:199 String Instrument Literature 3 s.h.
32:199 Woodwind Instrument Literature 3 s.h.
32:175 Special Studies 3 s.h.
Coreq.
32:176 Music History 3 s.h.
Coreq.

Music Education
32:226 Seminar: Contemporary Issues in Music Education 2 s.h.
Seminar 25:200
32:228 Seminar: Media Problems 2 s.h.
Coreq.
32:231 Methods of Teaching Voice 2 s.h.
Prereq. and alternate seniors

Musicology, Literature and Research
32:201 Advanced History and Literature of Music I 3 s.h.
History in Western music; first semester
32:202 Advanced History and Literature of Music II 3 s.h.
History in Western music; second semester
32:203 Medieval Music 3 s.h.
32:204 Renaissance Music 3 s.h.
32:205 17th-Century Music 3 s.h.
32:206 The Age of Bach and Handel 3 s.h.
32:207 The Classical Period 3 s.h.
32:208 Romantic Music 3 s.h.
32:209 20th-Century Music 3 s.h.
32:210 Music in America in U.S. and Canada 3 s.h.
32:211 Music of the Americas in Latin America 3 s.h.
32:212 Pedagogy and Literature for Major Composers 3 s.h.
32:214 Seminar: Genre of Music 3 s.h.
32:230 Seminar: History of Music in 25:200 and in 314 are units in 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 or three years.
32:225 Seminar: History of Musical Instruments 3 s.h.
32:292 Seminar: Western Instruments, their social role and geographic distribution 3 s.h.
32:293 Principles of Construction and Maintenance of Historical Instruments 2 s.h.

Music Education
32:225 Seminar: Contemporary Issues in Music Education 2 s.h.
Seminar 25:200
32:228 Seminar: Media Problems 2 s.h.
Coreq.
32:231 Methods of Teaching Voice 2 s.h.
Prereq. and alternate seniors

Theory and Composition
32:280 Paper 3 s.h.
Prerequisite: mastery of materials of counterpoint and harmony; writing and analysis, both semesters.
32:283 Varied Formata 3 s.h.
Prerequisite: 25:232; writing and analysis, second semester
32:284 Practice Teaching in Theory 3 s.h.
32:285 Methods of Teaching Theory 3 s.h.
Coreq.
32:286 Methods and Techniques of Teaching Music 3 s.h.
Prerequisite: advanced theory skills; interval, rhythm, melodic, harmonic dictions and selected keyboard skills.
32:277 Seminar: Music Theory Research 3 s.h.
32:241 History of Music Theory I 3 s.h.
32:242 History of Music Theory II 3 s.h.
32:249 Electronic Studio I 3 s.h.
32:250 Electronic Studio II 3 s.h.
Coreq.

Orchestration
32:186 Orchestration 3 s.h.
Coreq.
32:187 Special Studies 3 s.h.
Coreq.
32:176 Music History 3 s.h.
Coreq.

Physics of sound and music; second semester
32:292 Organ Pedagogy 3 s.h.
Study of principles of organ teaching through examination of methods and literature, and practical experience, intermediate and advanced levels; offered alternate years in spring semester

Graduate Courses in Music Education
32:226 Seminar: Contemporary Issues in Music Education 2 s.h.
Seminar 25:200
32:228 Seminar: Media Problems 2 s.h.
Coreq.
32:231 Methods of Teaching Voice 2 s.h.
Prereq. and alternate seniors

Graduate Courses in Musicology, Literature and Research
32:201 Advanced History and Literature of Music I 3 s.h.
History in Western music; first semester
32:202 Advanced History and Literature of Music II 3 s.h.
History in Western music; second semester
32:203 Medieval Music 3 s.h.
32:204 Renaissance Music 3 s.h.
32:205 17th-Century Music 3 s.h.
32:206 The Age of Bach and Handel 3 s.h.
32:207 The Classical Period 3 s.h.
32:208 Romantic Music 3 s.h.
32:209 20th-Century Music 3 s.h.
32:210 Music in America in U.S. and Canada 3 s.h.
32:211 Music of the Americas in Latin America 3 s.h.
32:212 Pedagogy and Literature for Major Composers 3 s.h.
32:214 Seminar: Genre of Music 3 s.h.
32:230 Seminar: History of Music in 25:200 and in 314 are units in 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 or three years.
32:225 Seminar: History of Musical Instruments 3 s.h.
32:292 Seminar: Western Instruments, their social role and geographic distribution 3 s.h.
32:293 Principles of Construction and Maintenance of Historical Instruments 2 s.h.

Graduate Courses in Music Education
32:225 Seminar: Contemporary Issues in Music Education 2 s.h.
Seminar 25:200
32:228 Seminar: Media Problems 2 s.h.
Coreq.
32:231 Methods of Teaching Voice 2 s.h.
Prereq. and alternate seniors

Graduate Courses in Musicology, Literature and Research
32:201 Advanced History and Literature of Music I 3 s.h.
History in Western music; first semester
32:202 Advanced History and Literature of Music II 3 s.h.
History in Western music; second semester
32:203 Medieval Music 3 s.h.
32:204 Renaissance Music 3 s.h.
32:205 17th-Century Music 3 s.h.
32:206 The Age of Bach and Handel 3 s.h.
32:207 The Classical Period 3 s.h.
32:208 Romantic Music 3 s.h.
32:209 20th-Century Music 3 s.h.
32:210 Music in America in U.S. and Canada 3 s.h.
32:211 Music of the Americas in Latin America 3 s.h.
32:212 Pedagogy and Literature for Major Composers 3 s.h.
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32:225 Seminar: History of Musical Instruments 3 s.h.
32:292 Seminar: Western Instruments, their social role and geographic distribution 3 s.h.
32:293 Principles of Construction and Maintenance of Historical Instruments 2 s.h.
Music

25:351 Introduction to Graduate Study in Music 2 s.h.

Use of the music library; overview of music theory; research problems and methods; with guest lectures from various music department areas; required of all graduate students. Prereq: consent of instructor; second semester and summer semester.

25:352 Advanced Bibliography and Reference Materials 3 s.h.

Intensive bibliography, including historical and critical sources. Prereq: 25:351 or consent of instructor; second semester and summer semester.

25:353 Research Note 1 or 2 s.h.

Introduction to research and study of early music and instruments; individual research; may be repeated for credit.

25:354 Senior Internship 2 or 3 s.h.

Specialized research in music, music history, and related fields, under study of a group or by individual investigation: may be repeated for credit; permit; consent of instructor.

25:351 Performance Practice I: Medieval and Renaissance

Problems of interpretation in early music 3 s.h.

25:352 Performance Practice II: 17th- and 18th-Century Music 3 s.h.

Interpretation aspects of music of Baroque and Classical periods.


25:357 Music Research and the Computer 3 s.h.

Current applications of high-speed digital computer to music theory, history, and composition.

25:359 Seminar: Opera Literature or arr.

A study of the most important operas from the standpoint of performers.


25:351 Advanced Choral Literature I 2 or 3 s.h.

25:352 Advanced Choral Literature II 2 or 3 s.h.

25:353 Cantus, motet and madrigal literature from Renaissance through nineteenth century; alternate semesters

25:354 Advanced Choral Literature III 2 or 3 s.h.

25:355 Twentieth-century choral music; alternate semesters

25:356 Seminar; Choral Music or arr.

25:357 Survey of Song Literature I 2 s.h.

25:358 Survey of Song Literature II 2 s.h.

25:359 U.S. art song from Schubert to present; alternate semesters

25:360 Survey of Song Literature III 2 s.h.

25:361 Musical aspects of song literature; primarily for D.M.A. students. May be repeated for credit.

25:360 Readings in Music Theory or arr.

25:361 Readings in Music History or arr.

25:380 Thesis (M.A.) or arr.

25:381 Thesis (Ph.D.) or arr.

25:380 Composition (Ph.D. Thesis) or arr.


25:383 D.M.A. Recital or arr.

Music Education

See "College of Education" for course descriptions

75:110 Methods: Basic Skills and Techniques in Music Education 3 s.h.

75:120 Methods and Materials: Music for the Classroom 3 s.h.

75:145 Methods and Materials: Elementary School Music 3 s.h.

75:152 Music Workshop for Classroom Teachers and 3 s.h.

Elementary Music Teachers 3 s.h.

75:141 Laboratory Practice in Elementary Music 3 s.h.

75:144 General Music in the Elementary School 2 s.h.

75:149 Methods and Materials: Secondary School Instrumental Music 4 s.h.

75:142 Methods and Materials: Secondary School General Music 3 s.h.

75:151 Observation and Laboratory Practice in High School General Music 3 s.h.

75:160 Supervision and Administration of Music 3 s.h.

75:211 Music Education Workshop: Instrumental Methods 4 s.h.

75:221 General Music in Secondary Schools 3 s.h.

75:223 Music Education, Advanced Observation and Laboratory Practice 2 s.h.

75:343 Measurement and Evaluation in Music 3 s.h.

75:445 Research in Music Education 2 s.h.

Permutation courses of instructor

75:445 Social and Psychological Factors in Music Education 2 s.h.

Applied Music

For $200 per semester charged for each course in applied music in student's major field of performance; course count includes that of individual and class lessons (minimum of one hour weekly) at option of instructor; students desiring two $150 courses in same semester must pay $200; all music majors are expected to attend several of applied music courses for which the work is listed. Number of applied music exceptions available in first and second semesters (but not in summer session) is limited to students who require it for performance, or to students.

25:33 Voice I or arr.

25:34 Voice II or arr.

25:35 Voice I or arr.

25:36 Voice II or arr.

25:37 Voice I or arr.

25:38 Voice II or arr.

25:39 Cello I or arr.

25:40 String Bass I or arr.

25:41 Viola I or arr.

25:42 Viola II or arr.

25:43 Percussion I or arr.

25:44 Flute I or arr.

25:45 Piano I or arr.

25:46 Piano II or arr.

25:47 Horn I or arr.

25:48 Horn II or arr.

25:49 Viola I or arr.

25:50 Cello I or arr.

25:51 String Bass I or arr.

25:52 Viola II or arr.

25:53 Bassoon I or arr.

25:54 Bassoon II or arr.

25:55 Percussion II or arr.

25:56 Violin I or arr.

25:57 Piano III or arr.

25:58 Piano IV or arr.

25:59 Organ I or arr.

25:60 Organ II or arr.

25:61 Harp I or arr.

25:62 Harp II or arr.

25:63 Trombone I or arr.

25:64 Trombone II or arr.

25:65 Trombone III or arr.

25:66 Trombone IV or arr.

25:67 Trumpet I or arr.

25:68 Trumpet II or arr.

25:69 French Horn I or arr.

25:70 French Horn II or arr.

25:71 Bass Trombone I or arr.

25:72 Bass Trombone II or arr.

25:73 Bass Trombone III or arr.

25:74 Bass Trombone IV or arr.

25:75 Bassoon I or arr.

25:76 Bassoon II or arr.

25:77 Bassoon III or arr.

25:78 Bassoon IV or arr.

25:79 Baritone I or arr.

25:80 Baritone II or arr.

25:81 Baritone III or arr.

25:82 Baritone IV or arr.

25:83 Contrabass I or arr.

25:84 Contrabass II or arr.

25:85 Contrabass III or arr.

25:86 Contrabass IV or arr.

25:87 Bariophone I or arr.

25:88 Bariophone II or arr.

25:89 Bariophone III or arr.

25:90 Bariophone IV or arr.

25:91 Bassoon I or arr.

25:92 Bassoon II or arr.

25:93 Bassoon III or arr.

25:94 Bassoon IV or arr.

25:95 Bassoon V or arr.

25:96 Bassoon VI or arr.

25:97 Bassoon VII or arr.

25:98 Bassoon VIII or arr.
Instructor in student’s area of skill of performance or for economic majors offered for fee of $23.00 per semester, course consists of one one-half hour lesson or two hours of class (coursework weekly at 8:00 of instructor)

50:17 Violin 0 to 1 a.h.
50:18 Piano 0 to 2 a.h.
50:19 Organ 0 to 1 a.h.
50:20 Harp 0 to 1 a.h.
50:21 Viola 0 to 1 a.h.
50:22 Cello 0 to 1 a.h.
50:24 String Bass 0 to 1 a.h.
50:25 Woodwind 0 to 1 a.h.
50:26 Brass 0 to 1 a.h.
50:27 Percussion 0 to 1 a.h.
50:116 Winds 1 a.h.
50:130 Orchestra 1 a.h.
50:137 Dance 1 a.h.
50:123 Jazz 1 a.h.
50:123 Violin 1 a.h.
50:123 Viola 1 a.h.
50:123 Cello 1 a.h.
50:123 String Bass 1 a.h.
50:123 Woodwind 1 a.h.
50:123 Percussion 1 a.h.

Ensemble

No concert charge for ensemble courses may be requested for credit: offered each semester: prerequisite for each course of instruction

50:176 The Coraline Singers 1 a.h.
50:176 Soloists 0 to 2 a.h.
50:176 Opera Workshop 0 to 2 a.h.
50:176 Chorale 0 to 2 a.h.
50:184 College Museum 1 a.h.

Audition before registration is desirable

50:185 University Choir 1 a.h.
50:186 Piano Accompaniment 0 to 2 a.h.
50:187 Piano Chamber Music 0 to 2 a.h.
50:188 String Chamber Music 0 to 2 a.h.
50:189 Woodwind Chamber Music 0 to 2 a.h.
50:190 Vocal Chamber Music 0 to 2 a.h.
50:191 Oratorio Chorale 0 to 2 a.h.
50:192 Concert Band 1 a.h.
50:193 Marching Band 1 a.h.
50:195 Marching Band, Wind Ensemble, Concert Band 0 to 2 a.h.
50:195 Percussion Ensemble 0 to 2 a.h.
50:197 Jazz Workshop 0 or 1 a.h.

prerequisite course of instructor

Summer Instruction

Children may enroll for applied music courses during eight-week summer sessions for total fees of $23.00 for one half-hour lesson weekly or $50.00 for two lessons.

Courses

See "General Science" for description

Neurobiology

See "College of Medicine"

Nuclear Medical Technology

Program Coordinator: R. E. Peterson
Degree offered: B.S.

Nuclear Medical Technology is that portion of the allied health professions field which encompasses the techniques of using ra-

dio-nuclides in medicine. Due to the burgeoning of new tech-
niques for studying body processes and imaging organs and dis-
sease sites, new medical specialty of nuclear medicine has de-
veloped. Simultaneously, a wider variety of sophisticated equipment unique to the field has come into use, along with an increasing variety of bio-medical and radiopharmaceuticals. The breadth of these specialized procedures, in addition to volume demands, led to the development of this new allied health occupation and new training program. The role and sig-
nificance of the nuclear medical technologist have become well established and are increasing as allied medical specialties come to rely upon nuclear medicine and its trained personnel.

The Program at Iowa

Development of the curriculum and enrollment in the program began in 1967. It has been facilitated by a five-year U.S. Public Health Service development grant for new health manpower personnel. It was the second baccalaureate program established in the U.S., and has educated more nuclear medical technologists than any other program in the country.

The original reasons for the program's establishment remain valid and have encouraged its expansion: in the job market, nuclear medical technologists are commonly paid as well as school teachers; why not have them equally well prepared? A good baccalaureate program facilitates the effort to develop the most competent technologists and multiply the amount of good patient care which the responsible physician can provide. Such a program increases the capability to attract high-quality tech-
nologists candidates. And the baccalaureate program with a gen-
eral science major offers the nuclear medical technologist something to build on, in terms of an educational ladder and vocational mobility: science teacher, graduate school, medical school, etc.

The program in nuclear medical technology at Iowa is accred-
ated by the Council on Medical Education of the American Medical Association. Fulfillment of the requirements established by the American Board, involves three years of preclinical work in the College of Liberal Arts and a minimum of 12 months of professional clinical experience, available in Iowa City at the University Hospitals and Veterans Administration Hospital.

The preclinical education of a nuclear medical technologist necessitates a well-rounded general science major curriculum with special adaptations to the field. During the freshman year, it is the same as for medical technology. During the sophomore year and thereafter, the availability and number of recom-
mended prerequisites produces some deviation from the medical technology program. Upon satisfactory completion of the 12-
month clinical program (the entire four-year program), students are eligible to receive the Bachelor of Science degree with a major in general science and nuclear medical technology, and also be eligible for national certification as a nuclear medical technologist.

All students in the College of Liberal Arts who designate nuclear medical technology as a major are assigned to nuclear medical technology advisors for guidance in the completion of the preclinical courses of study.
Practical Program
The required course of study emphasize the physical and biological sciences, which provide a basic background and which are prerequisites for the subjects and activities of the clinical year. In addition to these science courses, the prospective student must complete the core course requirements for graduation from the College of Liberal Arts and the requirements for a general science major.

The following is a summary of the prerequisites for acceptance into the nuclear medical technology program:
- Proficiency in rhetoric, physical education and foreign language
- Satisfaction of core requirements in the literature, social science and historical-cultural areas
- Completion of the minimum 36 semester hour requirements with either a combination of 12-16 eight semester hours in physics, chemistry or zoology, respectively, or a combination of 20-18 semester hours in physics, chemistry or zoology, respectively; and
- A minimum of four semester hours in mathematics. A minimum of 16 semester hours must be completed prior to entrance into the 12-month clinical year with a 20 minimum cumulative grade-point average for all preclinical courses of study.

Clinical Program
The clinical year of study is centered in the Veterans Administration and University medical facilities. In terms of time allocations, equal emphasis is given to both didactic and clinical experiences. The didactic portion covers in depth the clinical or technical specialties of physics of nuclear medicine, basic instrumentation, scanning instrumentation, radiology, pharmacology, basic pedagogical techniques, electrophoresis, chromatography, liquid scintillation, health physics, principles of nursing-care techniques, photographic chemistry and darkroom techniques, principles of clinical administration, doctrine conference and case critique, fundamentals of microbiology, clinical chemistry, kinetic studies and medical ethics.

Rotations were established in the following areas within the departments of nuclear medicine at both medical facilities: in vivo radioisotope procedures, clinical radiopharmaceutical laboratory, tracer techniques and research application, thyroid function studies, rectilinear and camera scanning, and in vivo kinetic studies.

 Orientations on interrelationships with related hospital functions and facilities are provided by brief rotations in radiation therapy, radiologic technology, radiation protection and several clinical laboratory facilities.

Admission
Prospective students in nuclear medical technology are encouraged to apply for study and to provide a transcript of previous work as early as possible in the precritical program. Since the class size is at present limited to six students, and prerequisites are increasing in importance. Successful applicants for the clinical training program are notified of their selection at least three months before the beginning of the next clinical class. At present, the 12-month clinical training program starts in September of each year.

Staff: Professor Peterson, associate professor Cheng, assistant professor Clawhute, instructor and student advisor: Instructor; clinical director, Nuclear Science and Technology.

Nuclear Science and Technology
Committee Chair: James O. Oehmen
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 Physics in the College of Liberal Arts; and the Radiation Research Laboratory of the College of Medicine.

The program provides a background in the sciences on which nuclear technology is based. It is for students who are interested in applying nuclear processes to scientific and engineering problems, such as the production of electrical power, the application of radioisotopes and the use of irradiation devices.

The program is administered by an interdepartmental committee. The chairman of this committee is the director of students who enter the program. He or she should be consulted for advice concerning the program and for help in choosing a director for the student's M.S. program.

The following courses are prerequisites for the nuclear science and technology program, and must be taken before entering the program or during the program without credit toward the M.S. degree:
- 20M:28 Advanced Calculus III
- 29:2 College Physics
- 4:4 Principles of Chemistry I
- 52:10 or 58:52 Thermodynamics

Program Requirements
For a Master of Science degree in nuclear science and technology, 36 semester hours are required with a thesis, 38 semester hours without a thesis. The degree program is intended to be flexible, while conforming as nearly as possible to the following list:
- Nuclear physics (recommended: 29:191-192) 6 s.h.
- Nuclear reactor analysis and design (recommended: 52:253) 2 s.h.
- Nuclear technology (recommended: 52:180, 56:134, 52:222) 6 s.h.
- Chemistry (recommended: 4:172 or 4:201) 3 s.h.
- Radiation biology (recommended: 77:055, lectures only; or 77:105) 4 s.h.
- Elective: 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 is
Philosophy

The Master of Arts degree requires a minimum of 30 semester hours and may be taken with or without a thesis. In addition, the student must pass a comprehensive examination ordinarily taken after three semesters of graduate work. The examination will cover the history of philosophy, logic and philosophy of science, metaphysics and ethics. There is no foreign language requirement for the Master of Arts degree.

The Doctor of Philosophy degree is granted primarily on the basis of achievement rather than on the accumulation of semester hours, but typically will take four years of graduate study to obtain. Candidacy for the doctoral program is determined in part by the master’s comprehensive examination. In addition, the student must pass a doctoral comprehensive examination to be taken at or near the end of the third year of graduate study and after satisfaction of the foreign language requirement. The examination will cover the history of ancient and medieval philosophy, history of modern philosophy, logic and philosophy of science, metaphysics and epistemology, and ethics. For the doctoral degree mastery of French, German, Latin or Greek is required. For French and German the E.T.S. examinations are used. For Latin and Greek the Department arranges special examinations. The fourth year of graduate study is ordinarily spent in writing the doctoral dissertation.

Staff: professor Bergmann, Batchvarov; associate professor Addis, Cummins, Duerlinger, Gram; assistant professor Ozcetin, Scann

Courses for Freshmen and Sophomores Only

261 Introduction to Ethics 3 h.
262 Elementary Logic 3 h.
263 Elementary Political Philosophy 3 h.
264 Elementary philosophical study of law, government and the state 3 h.
265 Problems of Mind and Matter 3 h.
266 Study of metaphysics and epistemology 3 h.

Courses for Undergraduates Only

2693 Philosophies of Man 4 h.
Some major philosophical figures of man and society from Plato to present; none in Core 123.

2694 Philosophies of Art 4 h.
Philosophical consideration of impact of key developments in scientific thought on man’s conception of himself; none in Core 124.

Courses for Undergraduates and Graduates (Not open to Freshmen)

2691 Introduction to Philosophy 3 h.
2692 Analytical and historical introduction to fundamental issues and arguments 3 h.
2693 Introduction to Ethics 3 h.
2694 Analytical and historical introduction to ethical theory 3 h.
2695 Introduction to Logic 3 h.
2696 Major ideas and basic techniques of modern logic 3 h.
2697 Major ideas and techniques of modern logic 3 h.
2698 Meaning and functions of scientific explanation, nature of scientific concepts, laws and theories, emergence of science 3 h.
2699 Analytical Philosophy 3 h.
2699 Morality and major figures such as Plato and Aristotle 3 h.
2699 Morality and major figures such as Augustine and Aquinas 3 h.
2699 Early Modern Philosophy 3 h.
2699 Modern ethical figures from Descartes to Kant 3 h.
Physical Education for Men

Department: Head: Louis E. Alley
Degrees offered: B.A., B.S., M.A., Ph.D.

(Students becoming certified as teachers but majoring in subject areas other than physical education may complete programs for endorsement as athletic trainers and as coaches)

Because one of the responsibilities of the Department is to prepare physical education teachers and coaches for the public schools, programs designed to prepare such personnel conform to the aims, regulations and standards of the College of Education and to the accreditation standards set by the American Association of Colleges for Teacher Education (AECTE) and implemented through NCATE evaluation teams.

Undergraduate Programs

Preparation for Teaching and Coaching

The program in teaching and coaching is designed specifically to prepare students for service in public schools. All students who complete this program must qualify for teaching certificates by completing appropriate courses in physical education and the required certification courses (see "College of Education"). The program leads to the B.S. degree in physical education. Graduation from the program requires at least a 2.2 grade-point average. Because physical education majors frequently have part-time jobs or participate in intercollegiate athletics, both of which take considerable time and effort, the Department offers this program in eight-, nine- and 10-semester sequences.

Pre-Degree Program

The pre-degree program, which is open only to superior students, 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

Courses for Undergraduates

20:030W Psychological Problems of the Social Sciences 3 s.h.

20:031 Physical Education 3 s.h.

20:106L Laboratory in Physical Education 3 s.h.

20:107L Laboratory in Physical Education 3 s.h.

20:110L Laboratory in Physical Education 3 s.h.

20:111L Laboratory in Physical Education 3 s.h.

20:112L Laboratory in Physical Education 3 s.h.

20:113L Laboratory in Physical Education 3 s.h.

20:114L Laboratory in Physical Education 3 s.h.

20:115L Laboratory in Physical Education 3 s.h.

20:116L Laboratory in Physical Education 3 s.h.

20:117L Laboratory in Physical Education 3 s.h.

20:118L Laboratory in Physical Education 3 s.h.

20:119L Laboratory in Physical Education 3 s.h.

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20:131L Laboratory in Physical Education 3 s.h.

20:132L Laboratory in Physical Education 3 s.h.

20:133L Laboratory in Physical Education 3 s.h.

20:134L Laboratory in Physical Education 3 s.h.

20:135L Laboratory in Physical Education 3 s.h.

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20:164L Laboratory in Physical Education 3 s.h.

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20:166L Laboratory in Physical Education 3 s.h.

20:167L Laboratory in Physical Education 3 s.h.

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20:169L Laboratory in Physical Education 3 s.h.

20:170L Laboratory in Physical Education 3 s.h.

20:171L Laboratory in Physical Education 3 s.h.

20:172L Laboratory in Physical Education 3 s.h.

20:173L Laboratory in Physical Education 3 s.h.

20:174L Laboratory in Physical Education 3 s.h.

20:175L Laboratory in Physical Education 3 s.h.

20:176L Laboratory in Physical Education 3 s.h.

20:177L Laboratory in Physical Education 3 s.h.

20:178L Laboratory in Physical Education 3 s.h.

20:179L Laboratory in Physical Education 3 s.h.

20:180L Laboratory in Physical Education 3 s.h.

20:181L Laboratory in Physical Education 3 s.h.

20:182L Laboratory in Physical Education 3 s.h.
Physical Education for Men

M.A. with Thesis

The study program leading to the M.A. with thesis is designed primarily at the first step in a program of graduate study leading to the Ph.D. degree. There is particular emphasis upon tech-
niques of research as applied to problems related to physical education and athletics. A secondary objective of this program is to provide advanced preparatory for the area of choice teaching—or who 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 the M.A. with-
thesis candidates with the nature and extent of research in all
areas of physical education.

Ph.D. Program

The program for the Ph.D. in physical education is based on the
concept that the successful candidate should have a broad
knowledge of all areas in physical education; a working knowl-
dge 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 accepted areas of specialization in physical education are
Adapted Physical Education; Anatomy; Biomechanics; Cur-
riculum; Supervision and Administrative Theory in Physical
Education and Athletics; Exercise Physiology; History of Physi-
oclcal Education and Sports; Measurement and Evaluation in
Physical Education; Motor Performance and Learning; Soci-
obility of Sports; and Therapeutics.

A broad background in all areas of physical education,
together with a working knowledge of appropriate research tech-
niques, 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
statistics, all of these courses are taught by members of the
physical education faculty.

To ensure that each candidate become truly expert in one
area of specialization, he is required to complete a minimum of
30 hours of graduate work in that area of specialization and
to write an acceptable Ph.D. thesis on a problem in the area.

Most of the courses in the area of specialization are offered by
departments other than the Department of Physical Education
for Men. Professors from these departments participate in writ-
ing 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 thesis. In the case of exercise physiology,
the candidate, in addition to writing a comprehensive examina-
tion in physical education, writes a comprehensive examination
in physiology which is prepared and evaluated by faculty mem-
bers of the Department of Specialized Physiology in the
College of Medicine. Such candidates graduate with minors in
physiology.

Financial Aid

Student financial aid is available through tuition scholarships,
teaching assistantships, research assistantships, NDEA fellow-
ships in exact physiology, teaching research fellowships and
EPDA fellowships for the Education Specialist degree.
Admission Requirements

M.A. with and without Thesis
Admission to the program of study leading to the M.A. degree
with or without thesis is granted on the basis of the student's
gradepoint average on all undergraduate work attempted
and his score on the Graduate Record Examination (Apptitude Test).
The student must have earned at least 2.5 in all undergradute work
attempted a grade-point average of 2.5 (A = 4) or higher to be
admitted to regular senior. Additional admission to the M.A.-
without-thesis program may be granted to students with grade-
point averages no lower than 2.5; however, such students must
qualify for regular status within 120 semester hours of registration
in the Graduate College, by attaining a grade-point average of at
least 2.5.

Ph.D. Program
The student is admitted to the study program leading to the
Ph.D. degree on the basis of his grade-point average on the work
completed for the M.A. or M.S. degree and his score on the
Graduate Record Examination (Apptitude Test). To be consid-
ered for admission, the student must have earned a grade-point
average of 2.0 or higher on all graduate work undertaken.

Facilities
With the construction of a mammoth new Recreation Building,
along with the recent refurbishing of the Field House, excellent
facilities exist for use in the physical education programs,
in the undergraduate and graduate instructional programs and
for student participation in intramural sports, recreational ac-
ivities and athletics.

Research laboratories for physiology of exercise, temperature-
humidity control, motor performance and bio-chemistry are
located in the Field House and provide excellent facilities for
instruction and research in both the undergraduate and graduate
levels.

Because of its cooperative efforts with other departments to
facilitate special programs, the Department provides an oppor-
tunity for students to use additional special facilities in other
departments on the campus.

The Faculty
Members of the faculty in Physical Education for Men are fre-
quently sought as participants in programs at state, district and
national professional meetings, and are elected to offices at all
levels. Some have been invited to present papers as international
symposia and congresses. They are also asked to serve in com-
munity and state in capacities. Several have received spec-
ial recognition through honors and awards from numerous profes-
sional organizations.

One reason for the high quality of the faculty is the wealth
of experience its members have had teaching at all levels in a
variety of situations.

Members of the faculty are also productive researchers and
public writers. Some have received funds for their research from
governmental and private agencies, and all have made significant
contributions to professional journals.

The Department has been ranked among the top few in the
country. Although such rankings are based on several criteria—
curriculum, publications, availability of research and library re-
sources, scholarships and fellowships—the quality of the faculty
is apparent as a major factor.

Staff: professor Allen, Asprey, Canady, Smith; associate profes-
sors Hamann, Ronelle, Fitzhugh; associate professors Emeriti
Armstrong, McCausland, assistant professors Allen, *Gissel,
Hay, Leslie, Maynard; assistant professors Emeriti Beene, Raff-
songerg,* Brown* *; instructors Eric, Stiles, Spall,* instructors (coach-
ng) Banks Jr.,* Crompton,* Harbaugh,* Kudelnica,* Lau-
eron,* Roberts,* Schluich,* Schultz,* Szabo* *.

*Department of Athletics.

Courses Primarily for Undergraduates

276 Elective Physical Education for Men cr. 4.0
Elective for students who have satisfied requirements for physical education skills
or "Basic Skills"; both semesters
257 Electrical Physical Education for Men cr. 3.0
Continuation of 276; both semesters
257 Elective Physical Education for Men cr. 4.0
Continuation of 276; both semesters
278 Elective Physical Education for Men cr. 4.0
Continuation of 276; both semesters
277 Introduction to Physical Education 1.0
Minor lectures on historical and educational aspects of physical education;
first semester
274* Intercollegiate Sports of Dance 1.0 or 2.0
Same as 25.40
2751 Teaching of Recreational Sports I 2.0
Techniques and methods of coaching and organizing groups for participation; first
semester
2752 Teaching of Recreational Sports II 2.0
Continuation of 2751; second semester
2751 Teaching of Gymnastics 2.0
Teaching techniques of conditioning exercise, exercises apparatus and wrestling
exercises; both semesters
2753 Coaching and Gymnastics 2.0
Prerequisite: high school varsity experience or equivalent
2752 Coaching of Football 2.0
First semester; prerequisite high school varsity experience or equivalent
2754 Coaching of Track and Field Athletics 2.0
Second semester; prerequisite high school varsity experience or equivalent
2756 Coaching of Track and Field Athletics 2.0
First semester; prerequisite high school varsity experience or equivalent
2758 Coaching of Soccer 2.0
First semester; prerequisite high school varsity experience or equivalent
2717 Coaching of Swimming 2.0
2758 Coaching of Competitive Swimming 2.0
Second semester; prerequisite high school varsity experience or equivalent
2743 Coaching of Wrestling 2.0
Second semester; prerequisite high school varsity experience or equivalent
2741 Coaching of Tennis 2.0
Prerequisite: high school varsity experience or equivalent
2742 Officiating of softball, softball, and baseball 2.0
2743 Administration of Intramural Activities 2.0
Both semesters
2745 Human Anatomy 2.0
Both semesters
2755 Laboratory Practice in Special Physical Education 3.0
Prerequisite: Pedagogy 271.3 and 271.5; laboratory experience in adapted physi-
cal education, recreation, and corrective therapy; both semesters
2755 Laboratory Practice in Special Physical Education 3.0
Continuation of 275.5; both semesters
2757 Leadedness Training I 1.0
Counseling toward better living
2758 Leadedness Training II 1.0
Counseling toward better living
2759 Leadedness Training III 1.0
Counseling toward better living
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>27:103</td>
<td>Administration of Physical Education and Athletics</td>
<td>2 or 3 a.h.</td>
</tr>
<tr>
<td>27:105</td>
<td>Accept Physical Education</td>
<td>2 a.h.</td>
</tr>
<tr>
<td>27:106</td>
<td>Preparatory, 27:105, second semester</td>
<td></td>
</tr>
<tr>
<td>27:128</td>
<td>Advanced Theory of Wrestling</td>
<td>1 or 2 a.h.</td>
</tr>
<tr>
<td>27:130</td>
<td>Workshop on Advanced Theory of Wrestling</td>
<td>1 or 2 a.h.</td>
</tr>
<tr>
<td></td>
<td>Summer session only</td>
<td></td>
</tr>
<tr>
<td>27:133</td>
<td>Advanced Theory and Techniques of Swimming</td>
<td></td>
</tr>
<tr>
<td>27:134</td>
<td>Diving</td>
<td>2 a.h.</td>
</tr>
<tr>
<td>27:135</td>
<td>Advanced Theory of Teaching Gymnastics</td>
<td>1 a.h.</td>
</tr>
<tr>
<td>27:136</td>
<td>Physical Education for High Schools</td>
<td>3 a.h.</td>
</tr>
<tr>
<td></td>
<td>Summer session only</td>
<td></td>
</tr>
<tr>
<td>27:146</td>
<td>Intramural Programs in Schools and Colleges</td>
<td>2 a.h.</td>
</tr>
<tr>
<td></td>
<td>Summer session only</td>
<td></td>
</tr>
<tr>
<td>27:149</td>
<td>Elementary School Physical Education</td>
<td>2 or 3 a.h.</td>
</tr>
<tr>
<td>27:153</td>
<td>Advanced Anatomy and Kinesiology</td>
<td>3 a.h.</td>
</tr>
<tr>
<td></td>
<td>Emphasis on principles for teaching anatomy and kinesiology at undergraduate level, first semester</td>
<td></td>
</tr>
<tr>
<td>27:161</td>
<td>Instructional Study in Physical Education</td>
<td>2 or 3 a.h.</td>
</tr>
<tr>
<td>27:162</td>
<td>Nature of Physical Education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Basic course in physical education</td>
<td></td>
</tr>
<tr>
<td>27:163</td>
<td>Laboratory of Athletic Performances</td>
<td>1 or 3 a.h.</td>
</tr>
<tr>
<td></td>
<td>Students who have completed 27:181 or equivalent for one semester hour only, first semester</td>
<td></td>
</tr>
<tr>
<td>27:165</td>
<td>Laboratory: Mechanical Analysis of Athletic Performances</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>27:198</td>
<td>Physical Education 'or Elementary Schools</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>27:199</td>
<td>Same as Education 75:241</td>
<td></td>
</tr>
<tr>
<td>27:197</td>
<td>Measurement and Evaluation in Physical Education</td>
<td>3 a.h.</td>
</tr>
<tr>
<td></td>
<td>First semester</td>
<td></td>
</tr>
<tr>
<td>27:180</td>
<td>Scientific Foundations of Physical Education</td>
<td>4 a.h.</td>
</tr>
<tr>
<td>27:181</td>
<td>Scientific Foundations of Physical Education</td>
<td>4 a.h.</td>
</tr>
<tr>
<td></td>
<td>Mechanics and kinesiology, prevention and care of injuries, first aid, prepreregistration</td>
<td></td>
</tr>
<tr>
<td>27:182</td>
<td>Laboratory in Athletic Training</td>
<td>2 a.h.</td>
</tr>
<tr>
<td></td>
<td>First semester</td>
<td></td>
</tr>
<tr>
<td>27:183</td>
<td>Laboratory in Athletic Training II</td>
<td>2 a.h.</td>
</tr>
<tr>
<td></td>
<td>Continuation of 27:182 second semester</td>
<td></td>
</tr>
<tr>
<td>27:199</td>
<td>Supervision of Physical Education for Boys</td>
<td>3 a.h.</td>
</tr>
<tr>
<td></td>
<td>Same as Education 75:246</td>
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</tr>
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Courses Primarily for Graduates:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>27:201</td>
<td>Research</td>
<td>cr. arr.</td>
</tr>
<tr>
<td></td>
<td>Colloquium Department head before registering, both semesters</td>
<td></td>
</tr>
<tr>
<td>27:202</td>
<td>Preparatory, Research of Graduate Topics and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research</td>
<td>4 a.h.</td>
</tr>
<tr>
<td>27:210</td>
<td>Advanced Administration of Physical Education</td>
<td>2 a.h.</td>
</tr>
<tr>
<td></td>
<td>First semester</td>
<td></td>
</tr>
<tr>
<td>27:211</td>
<td>History of Physical Education</td>
<td>2 a.h.</td>
</tr>
<tr>
<td></td>
<td>First semester</td>
<td></td>
</tr>
<tr>
<td>27:220</td>
<td>Advanced Theory of Athletics</td>
<td>3 a.h.</td>
</tr>
<tr>
<td></td>
<td>Advanced theory of coaching, football, baseball, basketball, track and field athletics for graduate students and coached in coaching methods, summer session only</td>
<td></td>
</tr>
<tr>
<td>27:227</td>
<td>Advanced Administration of Physical Education</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>27:232</td>
<td>Public School Curriculum and Physical Education</td>
<td>3 a.h.</td>
</tr>
<tr>
<td></td>
<td>Same as Education 75:245</td>
<td></td>
</tr>
<tr>
<td>27:240</td>
<td>Professional Evaluation in Physical Education</td>
<td>3 a.h.</td>
</tr>
<tr>
<td></td>
<td>Colloidal analysis of current undergraduate and graduate programs in physical education</td>
<td></td>
</tr>
<tr>
<td>27:241</td>
<td>Scientific Principles of Physical Conditions</td>
<td>1 or 3 a.h.</td>
</tr>
<tr>
<td></td>
<td>Students who have completed 27:180 or equivalent for one semester hour only</td>
<td></td>
</tr>
<tr>
<td>27:327</td>
<td>Seminar: Mechanical Analysis of Human Movement</td>
<td>or. arr.</td>
</tr>
<tr>
<td>27:367</td>
<td>Advanced Measurement and Evaluation in Physical Education</td>
<td>3 a.h.</td>
</tr>
</tbody>
</table>

Second semester:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>27:290</td>
<td>Prereq: Seminars in Physical Education: No requirement for M.A. without thesis</td>
<td>3 a.h.</td>
</tr>
<tr>
<td>27:298</td>
<td>Seminar</td>
<td>1 or 3 a.h.</td>
</tr>
<tr>
<td></td>
<td>Students who have completed 27:180 or equivalent for one semester hour only, only in the first semester, and practical implications for teaching</td>
<td></td>
</tr>
</tbody>
</table>

Special regulations:

- 27:911: Continuation of Graduate Study
- 27:194: Special topics in Physical Education

Required of candidates for M.A.: A thesis with thesis, should be completed during first eight semester hours of graduate study. Guidance in selection of topics for research and in research procedure; both seminars

- 27:403: Seminar: Thesis II (Ph.D.)

Promotion:

- 27:402: credit for 27:403; and 27:403 not to exceed five semester hours, both semesters
- 27:404: Seminar: Thesis IV (Ph.D.)
- Promotions 27:402, credit for 27:403: and 27:404 not to exceed 12 semester hours, both semesters

Physical Education for Women

Department Head: M. G. Scott
Degree offered: B.A., B.S., M.A., Ph.D.

Physical education is recognized as profession for women, a profession which is becoming more and more varied in today's society. Elementary schools frequently hire the physical education specialist to work in one or more schools in a city system. The physical education technician is being recognized so that both pre-school and elementary school age children are receiving aid from trained physical education personnel in their play activities and in planned developmental programs in motor skills.

At the secondary level the physical education teacher deals with a variety of activities, many of a recreational value with potential for lifelong use. There are expanding opportunities for coaching the high school girl in competitive sports or in some of the art forms of movement such as synchronized swimming, rhythmic gymnastics, equestrian and dance. At the college level programs usually permit students to follow their own preferences and to experience the joy of movement and self-identification in motor accomplishment. The teacher of physical education is a counselor and guide in such learning.

When the physical education-trained woman assumes the role of mother and community leader, she has the benefit of knowledge about children, their development, interests and activity needs.

Undergraduate Curriculum

The Department of Physical Education for Women provides professional education in three curricula: teaching physical edu-
cation, dance and pre-physical therapy. The dance curriculum may be oriented to dance teaching or to the arts, depending upon objectives. Graduates of the Department enter teaching positions in physical education or dance in public schools or at the college level, or positions in recreation; or they undertake advanced work in dance leading to a career in the theatre or advanced work in physical therapy, depending upon the curriculum elected.

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 also permit advanced work in many activities, so that the student is also prepared to teach at advanced skill levels in that area or to go into coaching in a particular sport. If she chooses she may have coursework and practical experience in coaching a particu-
lar sport.

Theoretical background is provided through anatomical, kinesiological, physiological and health courses, with implica-
tions for the performance and teaching of activities. The emph-
as 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 re-
quirements (see "College of Education"). The teaching cur-
riculum leads to either the B.A. degree or the B.S. degree; the pre-physical therapy to a B.S. degree. The non-professional and dance curriculums lead to the B.A. degree.

Each student must make application not later than the sophomores year for Departmental recommendation to the Col-
lege of Education and professional education courses, as well as continuation in the physical education curriculum she has elected. Any student failing to maintain a grade-point av-
erage of 2.2, or having displayed marked inadequacies for teach-
ing or a leadership role, may be dropped from the program.

Transfer students coming into one of these programs are sub-
ject to all the requirements for students starting in the pro-
gram.

The Department also administers a non-professional major in health and physical education, known as General Studies in Health, Physical Education and Recreation. The purpose of this program is to give a background in health, physical education and recreation, not as a preparation for a career but as a broad acquaintance with material relevant to personal and family recreation and healthful living. Each student's program is individually planned with an advisor following broad guide-
lines and oriented to the student's interests in selecting this major.

Honors Program

The Honors Program is designed to serve the interests of the superior student. To be eligible for Honors, the students must have at least a B average at the beginning of the junior or senior year when Honors courses are taken. She must complete at least the B average throughout the remainder of her college work. This is an opportunity to get some experience in research and gain a perspective on certain aspects of graduate work.

Graduate Programs

Graduate work is offered in physical education, dance and rec-
reation. Curricula lead to the M.A. in physical education, dance or recreation education and to the Ph.D. degree in physical education.

The curricula assume previous education in the respective fields. A program is then planned with the individual in light of her previous education and anticipated future career. Comple-
tion of the graduate degree usually leads to teaching, administra-
tion or supervision in the schools or in a university. Research preparation is provided for anyone who wishes to orient her career in that direction. All M.A. students do some type of research, though the options are highly variable.

The Department was one of the pioneers in graduate physical education programs for women. In the nearly half century of graduate work there has been a growing philosophy of education for women and many of the graduates of these programs have and are still playing leadership roles in the profession, in their institutions and their communities.

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 are helpful in obtaining full opportunities for diversity of instruc-
tion.

The graduate student works primarily in the Department of Physical Education for Women, but the resources of the entire University are available, as needed, for the individual student. Work outside the Department provides a broader view and en-
richment for the selected specialization of the doctoral candi-
date. The most common areas of specialization have been administration, measurement, motor learning, anatomy and bio-
mechanics, physical education for preschool and elementary school age children, statistics and research, and adaptive-individualized programs. Others are possible. Occasionally an internship is possible for the student. The student group is cosmopolitan and international in make-up.

A research laboratory is available in the Women's Gym-
nasium. It is equipped primarily for kinesiological and biome-
chanics research and motor learning, including equipment for electromyography research. Others are available on a coop-
erative basis. Complete computer service is available as needed for research.

Faculty

The faculty represents diversified background and specialization. Abilities and interest are complementary. Most faculty members hold advanced degrees. Several bring educational backgrounds from abroad. All are experienced teachers. Graduate faculty members all are experienced in research and writing and are available for the guidance of graduate students in their area of specialization.

Staff: professor Fox, Scott; professor emeritus Halley; associate professor Scanlon; assistant professor Burke, Charles; graduate assistants Miller, Stolton; assistant professor emeritus Taylor; instructors Brock, Cole, Evans, Foose, Gibbs, Grogg, Grant, Matzen, Og-
don, Robinson, Thayer.
Courses for Undergraduates

2651 Kinesiology 3 s.h.
Physical anthropology majors only
Prerequisite: 280, mechanics of human movement and analysis of motor skills
2801 Independent Study 0-3 s.h.
or, arr.
2802 Honors Readings 0-3 s.h.
or, arr.
2805 Honors Seminar 1-3 s.h.
or, arr.
2806 Readings in Kinesiology 1-3 s.h.
or, arr.

Courses for Undergraduates and Graduates

2651 Physical Education for the Individual 3 s.h.
Fitness needs of youth and adults; physiological process of conditioning
2814 Health Education Workshop 2 s.h.
Same as Preventive Medicine 6304
2816 Physiological Implications for Teaching Physical Education 3 s.h.
Physiological effects of exercise and lack of exercise, methods of conditioning for various exercise programs
2817 Creativities 3 s.h.
Mechanics of preserving common abnormalities of spine and back; remedial work for functional conditions and athletic injuries. Prerequisites: 280, 281 or equivalents
2818 Children's Dance 2 s.h.
Dance for children of preschool to high school age
2819 Rhythmics Analysis of Dance 2 s.h.
28111 Rockstepper's Rhythm: composition of percussive sounds for dance, style and techniques of Rockstep, Rumba, and modern music for the choreographer
28112 Measurement 2 s.h.
Selection and administration of physical measurements and motor tests, use of data
28114 History and Appreciation of Dance 2 s.h.
Origins and development of dance, emphasis on changing forms and trends in dance in human culture; development of dance as theatrical art
28115 History and Appreciation of Dance 3 s.h.
28116 Continuation of 28114
28117 Dance in Education 2 s.h.
Adaptation of dance forms to fit different levels of elementary and secondary schools.
28118 Workshop in Relaxation: Theory and Practice 3 s.h.
Phylogenetic and neorelativist theories of dance, emphasis on progressive and differential relaxation. Implications for extension, staff and efficacy of motor performance
28119 Teaching of Synnergistic Swimming 2 s.h.
28120 Honors Projects 3 s.h.
28121 History of Physical Education 2 s.h.
28122 Beginning Chorography 2 s.h.
28123 Beginning Animation 2 s.h.
28124 Dance Production 3 s.h.
28125 Dance Production 2 s.h.
28126 Introduction to Digital Dance 1 s.h.
28127 Emerging dance using research of dance science and choreography, group and solo work
28128 Production 2 s.h.
Continuation of 28127, emphasizing in concept work
28129 Music and rhythmic movements required for dance accompaniment, including use of percussion instruments and improvisation of percussion sounds for dance
28130 Extracurricular Programs in Physical Education in High School 2 s.h.
28131 Internships in Health and Physical Education 2 s.h.
28132 Internships in Physical Education in Elementary Schools 2 s.h.
28133 Internships in Elementary Schools Physical Education 2 s.h.
28134 Student Teaching in Elementary Schools Physical Education 2 s.h.
28135 Directed Teaching in Elementary Schools Physical Education 2 s.h.
28136 Independent Study 0-3 s.h.
or, arr.
28137 Dance Theatre 4 s.h.
Experience in performing group
# Physical Therapy

Satisfactory completion of the professional curriculum qualifies candidates for the Professional Examination Service (P.E.S.) test for licensure in Iowa and most other states.

The classroom and laboratory instruction in physical therapy is presented in a manner intended to develop a sound basic knowledge of human anatomy, physiology, neurology, orthopedics, surgery, medicine, and of the psychological aspects of human illness, as each knowledge may be applied to the treatment of disabilities through physical therapy procedures.

Orientation to all health professions and the responsibilities of each to provide optimum patient care is stressed throughout the program. The clinical education experiences provide the student with opportunities to develop skills in the evaluation of disabilities and in the preparation and execution of treatment programs.

## Admission Requirements

The deadline date for January 1. Each new class begins in August.

The Graduate Record Examination must be taken during the senior year in order to register in the Graduate College for the second year of the professional program.

Students may enter the program upon completion of the junior year of college work, or the equivalent. The student who has not already done so must receive the bachelor's degree in his undergraduate major upon completion of his first year in physical therapy. It is essential that each student satisfy the requirements of a major department as well as the requirements of the College of Liberal Arts for a baccalaureate degree.

Minimum science prerequisites are two semesters (eight semester hours) of physics, chemistry, biology or zoology, and six semester hours of psychology. Chemistry, physics, biology or zoology courses must include laboratory work. As the quality of work in the general sciences is basic to success in physical therapy, the admissions committee gives special attention to grades in science courses.

The student must have and maintain at least a 2.5 grade-point average on a 4-point system.

Application must be made to the Director of Admissions, The University of Iowa. Personal interviews may be required. Applicants will be contacted for the appointment for required interviews.

### Preprofessional Program

#### Freshman Year

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:1</td>
<td>Rhetoric</td>
<td>8 s.h.</td>
</tr>
<tr>
<td>75:0</td>
<td>Physical Education Skills</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>10:1</td>
<td>Historical-cultural core course(s)</td>
<td>8 s.h.</td>
</tr>
<tr>
<td>4:1</td>
<td>and 4 Principles of Chemistry I-II</td>
<td>6 s.h.</td>
</tr>
<tr>
<td>4:6</td>
<td>Elementary Chemistry Lab</td>
<td>2 s.h.</td>
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#### Sophomore Year

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

### Junior Year

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>21M:4</td>
<td>Trigonometry</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>29:1-2</td>
<td>College Physics</td>
<td>8 s.h.</td>
</tr>
<tr>
<td>37:101</td>
<td>Principles of Human Genetics</td>
<td>3 s.h.</td>
</tr>
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</table>

### Professional Program

#### First Year

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>60:109</td>
<td>Human Anatomy</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>72:151</td>
<td>Intermediate Physiology</td>
<td>5 s.h.</td>
</tr>
<tr>
<td>101:115</td>
<td>Kinesiology</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>101:131</td>
<td>Physical Agents</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>101:141</td>
<td>Professional Orientation and Ethics</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>225:101</td>
<td>Biostatistics</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>60:110</td>
<td>Anatomy and Neuroanatomy</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>69:104</td>
<td>Pathology</td>
<td>1 s.t.</td>
</tr>
<tr>
<td>101:101</td>
<td>Principles of Medicine</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>101:110</td>
<td>Therapeutic Exercise I</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>101:122</td>
<td>Emotional Problems of the Disabled</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>

#### Second Year

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>64:112</td>
<td>Neurology</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>75:150</td>
<td>Surgery</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>76:101</td>
<td>Orthopedies</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>101:102</td>
<td>Principles of Medicine II</td>
<td>cr. arr.</td>
</tr>
<tr>
<td>101:106</td>
<td>Clinical Sciences</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>101:111</td>
<td>Therapeutic Exercise II</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>101:118</td>
<td>Clinical Education I</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>101:112</td>
<td>Therapeutic Exercise III</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>101:113</td>
<td>Physical Therapy and Community Health Problems</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>101:119</td>
<td>Clinical Education II</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>101:121</td>
<td>Administration</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>101:190</td>
<td>Electrotherapy</td>
<td>3 s.h.</td>
</tr>
<tr>
<td>101:120</td>
<td>Clinical Education III</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

### Advanced Degree Programs

Included in the definition of physical therapy is the treatment and evaluation of disease by non-medical means. Elements involved in this treatment and evaluation include such things as pain, coordination, motor development, ability to move limbs, strength and posture. Most of these elements can be included under the umbrella of biomechanics, which is the study of motion and forces as they relate to the human body. The remaining elements tend to fall in the neurobiological area (e.g. perceptual, cognitive). Therefore a knowledge of biomechanics and neurobiology must be applied to the human for evaluation and treatment of the diseases which can potentially be helped by non-medical means.

At this point in time there is a need to scrutinize old techniques and develop new techniques so that patients may receive the best possible treatment for such diseases as central pain, stroke, arthritis, multiple sclerosis, and maladies like fractures, amputations and joint pain. The master's degree program in physical therapy is dedicated to this end.
Because the program is designed to increase the student's knowledge and problem-solving ability in the areas of evaluation and treatment, the program includes research as well as teaching. The four major components of the program are the acquisition of tools to solve a problem; learning advanced techniques in evaluation of neurological disorders, electromyography, and biomechanics; learning communication skills in teaching and administration; and learning through participation in several problem-solving endeavors. The program is sufficiently flexible to accommodate elective pursuits commensurate with the student's ability and interest.

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 requirements of the Graduate College, successfully complete the professional examination tests for physical therapists and take a Graduate Record Examination Aptitude Test.

Traineeships

A traineeship grant from the National Institutes of Health is awarded to each student in the program.

Program Requirements

A total of 30 semester hours of graduate work must be completed beyond the basic professional training, and a thesis is required.

Recently a Ph.D. program especially for physical therapists has been approved by The University of Iowa. This program is intended to produce professionals with advanced training to fulfill positions of leadership in the physical therapy profession and to assume positions in graduate and basic professional education.

The master's degree program is based in Children's Hospital at the Medical Center on its main University campus. It is in the same general area of Children's Hospital as the Physical Therapy Clinic. The professional program is approximately five miles away. Persons associated with the master's degree program in physical therapy are at liberty to use the space and equipment in the orthopaedic-biomechanics laboratories, and another biomechanics laboratory is available in the College of Engineering. These laboratories are equipped with instrumentation—electrogoniometers, force plate, high-speed cameras, motion analyzer, accelerometers and force tables—needed to solve problems of force and motion associated with the human in the normal and abnormal state.

The graduate program is an integral part of a collaborative study of medical problems with orthopedics and engineering. The master's degree program and the Physical Therapy Clinic are interrelated in terms of rehabilitation, staff conferences and consultation for patient care. Interaction with the basic professional program consists primarily of teaching practicum by advanced degree candidates to students in the basic professional program.

Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>63:161</td>
<td>Statistical Methods in the Biomedical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>101:275</td>
<td>Analysis of Selected Neurological Disorders</td>
<td>3</td>
</tr>
<tr>
<td>101:213</td>
<td>Seminar: Physical Therapy</td>
<td>4</td>
</tr>
<tr>
<td>101:324</td>
<td>Anatomy</td>
<td>3</td>
</tr>
<tr>
<td>72:102</td>
<td>Physiology of Exercise</td>
<td>4</td>
</tr>
<tr>
<td>27:241</td>
<td>Scientific Principles of Physical Conditioning</td>
<td>4</td>
</tr>
</tbody>
</table>

Recommended Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>101:290</td>
<td>Advanced Electrotherapy and Electrodiagnostics</td>
<td>3</td>
</tr>
<tr>
<td>101:280</td>
<td>Practicum: Teaching Methods and Design</td>
<td>3</td>
</tr>
<tr>
<td>68:255</td>
<td>Principles of Organization and Management</td>
<td>3</td>
</tr>
<tr>
<td>101:324</td>
<td>Independent Study</td>
<td>3</td>
</tr>
<tr>
<td>3:120</td>
<td>Fundamentals of Laboratory Instrumentation</td>
<td>3</td>
</tr>
<tr>
<td>7H:162</td>
<td>Designing Learning Programs for Health Careers Education</td>
<td>3</td>
</tr>
<tr>
<td>7P:342</td>
<td>Data Processing</td>
<td>3</td>
</tr>
<tr>
<td>7V:101</td>
<td>Operation of Audiovisual Equipment</td>
<td>3</td>
</tr>
<tr>
<td>7H:110</td>
<td>Selection and Utilization of Educational Media</td>
<td>3</td>
</tr>
<tr>
<td>27:312</td>
<td>Seminar: Motor Learning II</td>
<td>3</td>
</tr>
<tr>
<td>31:123</td>
<td>Psychology of Learning</td>
<td>3</td>
</tr>
</tbody>
</table>

Elective Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>76:212</td>
<td>Indications Conference</td>
<td>3</td>
</tr>
<tr>
<td>70:139</td>
<td>Orientation to the Rehabilitation of the Hand-injured Child</td>
<td>3</td>
</tr>
<tr>
<td>59:223</td>
<td>Mechanics of Solids</td>
<td>4</td>
</tr>
<tr>
<td>59:21</td>
<td>Computational Methods</td>
<td>4</td>
</tr>
<tr>
<td>5:100</td>
<td>Child Development</td>
<td>3</td>
</tr>
<tr>
<td>7H:211</td>
<td>Problems in College Teaching</td>
<td>3</td>
</tr>
<tr>
<td>6A:114</td>
<td>Accounting</td>
<td>3</td>
</tr>
<tr>
<td>6A:130</td>
<td>Budgeting</td>
<td>3</td>
</tr>
</tbody>
</table>

Staff: professor emeritus W. Paul; assistant professor emeritus Fehr; assistant professor Jones; Morrissey, Rambo, Sivert; clinical assistant professor D. Paul; instructors Duvette, Skovby, Leuner, Super

Medical adviser for professional program: Merlin P. Scovell

Medical advisor for master's degree program: Richard C. Johnston

Consultants: professors Platt, Fossett; assistant professors Steaffer, Sjensall (Orthopedics); professor Miller, associate professor Holloway (Education); professor Rim, associate professors Andrews, Chak (Engineering); professor Mescall (Anatomy); associate professor Tyron (Physiology); professor Van Allen

Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>101:190</td>
<td>Principles of Medicine (or. art. introduction to medicine; lectures and discussions concerning medicine today and in future; particular emphasis in relationship between various health providers)</td>
<td>3</td>
</tr>
<tr>
<td>101:322</td>
<td>Principles of Medicine II (or. art. lectures, demonstrations, case-presentations of medical disorders from standpoint of pathology; clinical signs and symptoms, treatment and prognosis, prerequisites 101:190)</td>
<td>3</td>
</tr>
</tbody>
</table>

(No elective courses are offered this year.)
Physics and Astronomy

Principles of Chemistry
and Elementary Chemistry Laboratory
5 s.h.

or

General Chemistry I II

and

Chemistry Laboratory 5 s.h.

Undergraduate majors who plan to pursue graduate study in physics are advised to:

* Take 29:171, 172 Methods of Theoretical Physics.
* Acquire reading facility in either Russian or German, and
* Go beyond the minimum requirements listed above to the greatest feasible extent.

Undergraduate Major in Astronomy

Astronomy includes the subdisciplines of astrophysics, classical astronomy, radio astronomy and space astrophysics. 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 with a major in astronomy:

29:123-38
Engineering Mathematics I, II, III, IV 16 s.h.
29:17, 18, 19
Introductory Physics I, II, III 12 s.h.
29:61, 62
General Astronomy 8 s.h.
29:119, 120
Introduction to Stellar Astrophysics I, II 6 s.h.
29:125, 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.
29:130, 131
Elementary Theoretical Mechanics I, II 6 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;
* Take 29:117 Optics
29:118 Kinetic Theory and Thermodynamics
29:171, 172 Methods of Theoretical Physics; and
* Acquire reading facility in one or more of the following languages: Russian, German and French

Honors

Selected junior and senior majors take six to eight semester hours of 29:99 Honors Thesis and prepare an undergraduate thesis as part of their program for the degree Bachelor of Arts with Honors in Physics or Astronomy.

For the general requirements of the College of Liberal Arts, see "College of Liberal Arts."

Graduate Program

Two advanced degrees are offered in physics, the Master of Science (with or without thesis) and the Doctor of Philosophy; and one in astronomy, the Master of Science (with or without thesis). A student who wishes to pursue a program in astronomy beyond the Master's level usually qualifies for admission based on an original degree in physics with specialization in astrophysics or astrophysics.

The Department of Physics and Astronomy cooperates in interdisciplinary doctoral programs with the Program in Applied Mathematical Sciences ("Graduate College"). An interdisciplinary program leading to the M.S. and Ph.D. degrees in chemical physics is also available.

Each entering graduate student is assigned to a faculty adviser who will assist him or her 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 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. Ordinarily, a candidate for any advanced degree should begin research in a chosen specialty during the second year of residency. The thesis or essay adviser then becomes the candidate's general adviser and the chairman of his or her 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 examinations in either case is an oral one conducted by a committee of three members of the graduate faculty appointed by the dean of the Graduate College.

The program for the M.S. degree with thesis requires 30 semester hours of graduate work and a thesis based on an original experimental or theoretical investigation by the candidate. No more than six of the minimal 30 semester hours may be for research (29:281).

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 (29:290). 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:

29:117 Optics 3 s.h.
29:118 Kinetic Theory and Thermodynamics 3 s.h.
29:130 Elementary Theoretical Mechanics 6 s.h.
29:125, 130 Electricity and Magnetism 6 s.h.
29:131 Advanced Laboratory 4 s.h.
29:130, 131 Methods of Theoretical Physics 6 s.h.
29:191 Atomic Physics 3 s.h.
29:92 Nuclear Physics 3 s.h.
29:193 Introductory Solid State Physics 3 s.h.
The student’s plan of study should provide for as much advanced work as aptitude and previous preparation permit.

Master of Science Degree in Astronomy

The M.S. degree is offered with thesis or without thesis. The requirements for the two degrees are the same as for the corresponding degrees in physics (see above), with these changes:

Degree:
- 29:133 Advanced Laboratory 4 s.h.
- 29:192 Nuclear Physics 3 s.h.
- 29:193 Introductory Solid State Physics 3 s.h.

Add:
- 29:119, 120 Introduction to Stellar Astrophysics I, II 6 s.h.
- 29:121 Solar System Astrophysics 3 s.h.
- 29:133 Advanced Laboratory 2 s.h.
- 29:137 Astronomical Laboratory 2 s.h.

If the student intends to continue for a Ph.D. in physics with an astrophysics specialization he or she should take the following courses as soon as possible:

- 29:131 Radio Astronomy 3 s.h.
- 29:232, 233 Theoretical Astrophysics I, II 6 s.h.
- 29:234 Stellar Structure and Evolution 4 s.h.
- 29:235 Special Topics in Planetary and Space Science 2 s.h.
- 29:263 Stellar Astrophysics cr. arr.

Doctor of Philosophy Degree in Physics

The program of study for the Ph.D. degree with major in physics includes:

- Thorough coursework in both classical and modern theoretical physics for all candidates, whether their specialized research is to be in an experimental or a theoretical area;
- Comprehensive examinations;
- Participation in advanced seminars;
- Original research in experimental physics, theoretical physics or astrophysics; and the preparation of a written dissertation based on this work; and
- Successful defense of the dissertation in a final oral examination conducted by a committee of five members of the Graduate Faculty appointed by the dean of the Graduate College.

Emphasis is on the capabilities developed and knowledge gained rather than on the particular courses taken, credits acquired or other aspects of the means to the end. Although no specific courses are required, the following are recommended as preparation for the comprehensive examinations:

- 29:191, 192, 113 Atomic Physics, Nuclear Physics and Introductory Solid State Physics
- 29:205 Classical Mechanics
- 29:212 Statistical Mechanics I
- 29:213, 214 Classical Electrodynamics
- 29:245, 246 Quantum Mechanics I, II

Advanced mathematics, such as the theory of functions of a complex variable and vector and tensor analysis, is used freely in these courses. An introduction to these fields is given in 29:171, 172 Methods of Theoretical 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.

Before a Ph.D. candidate is admitted to the comprehensive examinations, he or she must demonstrate a reading competence in French, German or Russian by receiving a grade of 500 or better in the Educational Testing Service foreign language examination or by passing the reading examination administered by the appropriate language department; or by having satisfactorily completed 12 or more semester hours of collegiate coursework (or the equivalent) in any one of the above three foreign languages. Students whose native language is not English will be considered as special cases.

A candidate for the Ph.D. degree will not be recommended for the degree until he or she has written the dissertation in proper form for formal publication and has submitted it, with the approval of the research adviser, for publication to a standard scientific journal of wide distribution.

Research

The Department has an excellent library and a number of well-equipped laboratories and observatories. An IBM 360/65 digital computer and the associated facilities of the University Computer Center are available for research by students and staff of the Department. Several other smaller computers are available within the Department. The central machine shop is fully equipped and staffed with skilled instrument makers and machine shops, 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, inorganic and organic spectroscopy, solid and solar planety physics, chemical physics and solid state physics.

Theoretical research is directed to atomic and nuclear theory, quantum field theory, arbitrary mechanics, plasma physics, theory of solids, theory of elementary particles, solid state theoretical physics and astrophysics.

Exceptional opportunities are available for experimental research in space physics.

Persons qualified for graduate study are invited to apply for fellowships and assistantships. Inquiries should be directed to the head of the Department.

Staff: professor: Carlson, Frank, Montgomery, Nelson, Norbeck, Van Allen; professor emeriti: Tyndall, Wijler; associate professors: Carpenter, Garnett, Henschel, Klink, Knorr, McClintom, Neff, Savage, assistant professors: Flux, Joyce, Payne, Schloessinger, Schweizer, Shawam; visiting associate professor: Daniel W. Swift; research assistant professor: Erenmark

Courses

Physics

Prerequisites and corequisites specified as such may not be waived by instructor; students may not repeat for either credit or quality points any course or combination of courses they have already completed. Higher level courses for which elementary courses, or their equivalents, are prerequisites; core courses: 29:1, 2 College Physics, eight semes-
29:124 Quantum Mechanics 1 3 s.h.  
Nuclear/elementary quantum mechanics. Schrodinger wave mechanics, Hilbert space methods; probability interpretation; scattering and photonic interactions; identical particles, relativistic applications; introduction to relativistic theory; prerequisite: prerequisite: 29:111, 112, 113.

29:125 Quantum Mechanics II 3 s.h.  
Continuation of 29:124.

29:249 Advanced Nuclear Physics 3 s.h.  
Phenomenology of nuclear physics and hot-motion interpretation; atomic properties of nuclei, nucleons, nuclei, electric fields, collective models, y transitions, J theory, nuclear reaction mechanisms and other topics; prerequisite: 29:111, 112 and 246; may be repeated.

29:259 Advanced Nuclear Physics 3 s.h.  
Continuation of 29:249.

29:361 Seminar: Plasma Physics 3 s.h.  
Discussion of current research.

29:363 Seminar: Solid State Physics 3 s.h.  
Discussion of current research.

29:368 Seminar: Teaching of Physics and Astronomy 1 s.h.  
Discussion of methods, techniques and organization.

29:369 Seminar: Theoretical Physics 1 s.h.  
Discussion of current research.

29:369 Seminar: Space Physics 3 s.h.  
Discussion of current research.

29:367 Seminar: Nuclear Physics 1 s.h.  
Discussion of current research.

29:389 Special Topics in Nuclear Physics 1-3 s.h.  
Advanced lecture course on one or more of following topics: nuclear models; theory of nuclear reactions; weak interactions and heavy ion scope; prerequisite: 29:216, 226, may be repeated.

29:271 Theoretical Solid State Physics 3 s.h.  
Central principles of quantum theory of solids, lattice dynamics, electronic phenomena, magnetic phenomena, superconductivity, magnetization, and other topics; emphasis on non-metallic systems; prerequisite: 29:191, 245, 246.

29:272 Advanced Solid State Physics 3 s.h.  
Continuation of 29:271; may be repeated.

29:273 Relativity 3 s.h.  
Radar: relativistic formulation of mechanics, atom, special theory, electric, magnetic, and gravitational phenomena, Einstein's theory of relativity; prerequisite: 29:272.

29:274 Statistical Mechanics II 3 s.h.  
Advanced study of statistical mechanics; content may vary from year to year; prerequisite: continuation of 29:274; may be repeated.

29:276 Special Topics in Quantum Mechanics 3 s.h.  
Continuation of course; topics may vary from year to year; prerequisite: 29:191; may be repeated.

29:278 Solar-Terrestrial Physics 3 s.h.  
Phenomena of solar atmosphere; coronal and electromagnetic radiation in relation to solar phenomena; magnetic fields, solar magnetic field and interplanetary magnetic field; magnetic storms, auroras and geographically trapped radiation, may be repeated.

29:279 Research in Physics 1-12 s.h.  
Prerequisite: consent of head of Department.

29:290 Physics and Chemistry of the Upper Atmosphere 2 s.h.  
Physics of sound and light waves, absorption of solar radiation in relation to atmospheric gases; heat and chemical processes in atmosphere, aerosol currents, general circulation, atmosphere, stratosphere, ionosphere, mesosphere, and magnetosphere; may be repeated.

29:384 Advanced Plasma Physics I 3 s.h.  
Statistical mechanics of plasma, plasma equation, BIRCH equation, LANDAU equation; plasma equations; BIRCH equation and Maxwell equations, shock, collision plasma density and instability; turbulence and relative motion; magnetohydrodynamics, many plasma problems; prerequisite: 29:246 or consent of instructor; may be repeated.

29:383 Advanced Plasma Physics II 3 s.h.  
Continuation of 29:384, may be repeated.

Astronomy  
See examples notes under Physics series.

For Undergraduates and Graduates  
29:194 Reading in Astronomy 3 s.h.  
Course read Department prior to registering.

29:195 General Astronomy 4 s.h.  
Advanced course offered only in summer semester and on Saturdays following summer; prerequisite same as for 29:116, primarily for secondary and high school teachers of science.

29:119 Introduction to Stellar Astrophysics I 3 s.h.  
Fundamentals of astronomy and stellar spectroscopy; properties of stars, spectroscopic surveys for stars, stellar atmospheres, stellar binaria, and security standards; emphasis on application to investigation of structure of galactic and extragalactic systems; prerequisite: 29:116 and Mathematics 226:26 or 226:46 expected; elementary years, offered 1972-73.

29:130 Introduction to Stellar Astrophysics II 3 s.h.  
Continuation of 29:119; prerequisite: 29:116 and Mathematics 226:26 or 226:46 or equivalent; elementary years, offered 1972-73.

29:121 Solar System Astrophysics 3 s.h.  
Planetary surfaces, atmosphere and atmosphere; moons, meteorites and asteroids; interplanetary phenomena; stars, origin and evolution of solar system; prerequisite: 29:116 and Mathematics 226:26 or 226:46 or equivalent; elementary years, offered 1972-73.

29:187 Astronomy Laboratory 3 s.h.  
Astronomy laboratory work and observation with 16-inch telescope; techniques of astronomical photography, photometry and spectroscopy; laboratory work in data reduction, analysis of light curves and astrophysical computation; prerequisite: 29:252 and consent of instructor; may be repeated.

29:252 Advanced Mathematical Methods 3 s.h.  
See Physical.

29:282 Theoretical Astrophysics I 3 s.h.  
Theory of stellar photometry, astrophysical spectra of stars, formation of absorption lines in stellar spectra; prerequisite: consent of instructor; elementary years, offered 1972-73.

29:283 Theoretical Astrophysics II 3 s.h.  
Interstellar matter, radiation, nuclear and galactic radiation; continuation of 29:282, which is prerequisite for 29:283.

29:284 Stellar Structure and Evolution 3 s.h.  
Structure of solar interiors; nucleogenesis and chemical evolution in stars and evolution of stars; prerequisite: consent of instructor; elementary years, offered 1972-73.

29:285 Special Topics in Planetary and Space Science 2 s.h.  
More or following topics: solar interior, photometry, seismology and planetary interiors; planetary interiors; terrestrial interiors, surface, atmosphere and electromagnetic properties of earth, moon, and comets; may be repeated.

29:363 Seminar: Astrophysics 3 s.h.  
Current problems of current research.

29:362 Research in Astronomy 3 s.h.  
Prerequisite: consent of head of Department.
Political Science

Department Chairmen: Russell M. Rose
Degrees offered: B.A., M.A., Ph.D.

The program in political science deals with general principles of human behavior and organization which enable us to understand and explain political situations, events and processes in the world around us. Both the undergraduate and graduate programs in political science emphasize broad and comprehensive study, rather than narrow specialization on restricted aspects of the subject. The facilities of the Department's Laboratory for Political Research and the Regional Social Science Data Archive afford a unique opportunity for both undergraduates and graduate students to come to grips with real problems through the analysis of real data, and, particularly at the graduate level, the methodological segments of the Department's program provide opportunities for acquiring expertise and experience which are matched by very few other institutions.

At the undergraduate level the program is general and not vocational. Undergraduate political science majors often enter careers in law, public service or teaching, but many also enter careers in business, journalism, medicine and other fields. At the graduate level the Department emphasizes the general Ph.D. program, which is particularly appropriate for students planning a scholarly career. It is also suitable for entry into the executive ranks of the civil service of federal, state and city governments. There is a special M.A. program in municipal administration, designed to prepare students for careers as city managers. The general M.A. program frequently leads to careers in civil service and in municipal or other governmental research bureaus, as well as to careers in teaching.

Undergraduate Programs

The Department offers a standard major (Plan A) and a special teaching major (Plan B). The special major is for those who seek a public school teaching certificate.

Plan A: Standard Major

Undergraduates seeking a standard major must meet the following requirements:

A. At least 34 semester hours of work in political science, including:

30.1 American Politics
Two of these introductory courses:
30.10 Introduction to Political Behavior
30.11 Introduction to Political Theory
30.12 Introduction to Comparative Politics
30.13 Introduction to World Politics

Twelve or more semester hours of work in political science offerings numbered above 100.

B. Complete at least 12 semester hours of work (not including core courses) in any of the following departments: Economics, Geography, History, Philosophy, Psychology, Sociology, Anthropology, European Literature and Thought. If the student earns all 12 semester hours within one of these departments, the selection of courses need not have the prior approval of his or her adviser. But if the student wishes to combine work from two departments, prior approval must be obtained. Completion of the above requirements fulfills the College of Liberal Arts social science core requirement.

C. A grade-point average of at least 2.0 in all political science courses, and in all courses in related Departmental areas of concentration of 12 semester hours or more, selected as referred to in B above. Majors must take all courses in political science and related field on a grade basis.

Plan B: Teaching Major

Undergraduates seeking a teaching major must meet these requirements in a program as preparation for high school teaching in the social sciences with an emphasis on political science:

A. At least 20 semester hours of work in political science, including requirements A. 1-2 in Plan A, and eight or more hours of work in political science offerings numbered above 100.

B. At least 16 semester hours, not including core courses or courses taken in lieu of them. The 16 semester hours may include eight semester hours in survey courses in American history, and eight semester hours in twelve courses offered by the Economics, Geography, Sociology and Anthropology departments.

C. Completion of the sequence of professional education courses leading to certification.

Honors in Political Science

Honors sections of some courses are scheduled for limited groups of outstanding students. Those interested should consult the appropriate instructor at the time of registration or before.

In addition, the Department has a program for majors in political science 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. A student shall be considered for admission if he or she has completed 12 semester hours of work in political science, he or she must have a grade-point average in political science of at least 3.3 in addition to a general grade-point average of at least 3.0. For graduation with honors the student must maintain the grade-point average just indicated; complete at least two semesters of work in the advanced Honors Seminar (30187, 188) with a grade of B or better each semester; and satisfactorily pass a comprehensive examination over the field of political science, at the end of the senior year.

Students interested in seeking a B.A. degree with Honors should see the Departmental Honors adviser prior to the beginning of the junior year.

Graduate Programs

Graduate students in political science must meet the general requirements of the Graduate College. In addition they are expected to be thoroughly familiar with, and are held responsible for, the specific Departmental requirements set forth in the Guide to Graduate Study in Political Science, available in the office of the Department chairman.

Admission requirements are fixed by the Graduate College. The normal Departmental requirements include an acceptable Graduate Record Examination score and a 3.0 minimum under-
graduate cumulative grade point. To be eligible for candidacy for a graduate degree, students must be in good standing. The student seeking the award of an M.A. degree must maintain a grade-point average of at least 3.0; the student seeking a Ph.D. degree must show promise of scholarly distinction and achievement beyond that indicated by a grade-point minimum of approximately 3.4.

Graduate study consists of work in courses, seminars, reading and research. Graduate students in political science may take for credit only those Departmental courses offered specifically for graduate students, i.e., those courses numbered 30-200 and above.

M.A. Programs
To obtain a master's degree with thesis, the student must complete at least 30 semester hours with a grade-point average of at least 3.0. The master's degree without thesis requires 36 semester hours of graduate credit. The Department also offers an M.A. degree in political science under a joint program with the College of Law (see Graduate College requirements for the maximum hours of work allowed). In addition, the student must meet the following specific Departmental requirements:

Normal Load
At the master's level, a normal load is 12 semester hours of credit each semester. The student may register for six to eight semester hours in the summer session and complete the 30 semester hours of work for the M.A. degree in a 12-month period.

Courses Outside the Department
A master's student may take only one course or seminar outside of the Department for each semester or summer session, except where special Departmental programs (e.g., municipal administration) specify otherwise. The student may, of course, register only for Departmental courses or seminars.

Master's Thesis
The student beginning graduate work in the fall will begin planning the thesis during the spring semester, in consultation with an adviser and will ordinarily register for six semester hours of credit during the ensuing summer or fall session to complete the thesis, provided that he or she is admitted to candidacy. If the student has begun in the summer, he or she will ordinarily register for one course (four semester hours) and six semester hours of 30:582 Master's Thesis during the spring semester.

Final Examination
Satisfactory performance in a final oral examination, covering both thesis and coursework, completes the requirements for the M.A. degree. The thesis examining committee must, if the student desires to continue to do Ph.D. work, make a recommenda-
tion as to whether or not the student may proceed. Under no circumstances will there be more than eight semester hours of credit for thesis preparation be counted in satisfying the 30 semester-hour minimum requirement.

M.A. in Municipal Administration
Master's degree of students who complete the program in this field carry the special designation M.A. "in municipal adminis-
tration." The program, which does not require a thesis, gives both an academic and professional training. While strongly ori-
ented toward cities with the council-manager form of govern-
ment, it is not exclusively concerned with it. It is designed to prepare students for the municipal administrator's role of coor-
dinating the physical, fiscal and social aspects of community development. The program normally requires two years to com-
plete and includes an internship of from nine to 12 months. The B.A. or B.S. degree is required for admission. Undergraduate concentration in social sciences, engineering or accounting is helpful but not required. The normal curriculum for the M.A. in municipal administration includes the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>30:101</td>
<td>Municipal Government and Politics</td>
<td>3</td>
</tr>
<tr>
<td>30:120</td>
<td>Introduction to Public Administration</td>
<td>3</td>
</tr>
<tr>
<td>30:121</td>
<td>Municipal Administration</td>
<td>3</td>
</tr>
<tr>
<td>30:221</td>
<td>Financial Administration</td>
<td>4</td>
</tr>
<tr>
<td>30:323</td>
<td>Problems in Public Administration</td>
<td>4</td>
</tr>
<tr>
<td>30:421</td>
<td>Urbanization</td>
<td>4</td>
</tr>
<tr>
<td>35:155</td>
<td>Environmental Health</td>
<td>3</td>
</tr>
<tr>
<td>102:101</td>
<td>Introduction to Planning</td>
<td>3</td>
</tr>
<tr>
<td>31:104</td>
<td>Personal Psychology</td>
<td>3</td>
</tr>
<tr>
<td>30:583</td>
<td>Internship</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>38</strong></td>
</tr>
</tbody>
</table>

Ph.D. Program
A student seeking a Ph.D. degree is expected to complete at least three academic years in residence in a graduate college, including the work for an M.A. degree, which is normally prerequisite to work toward a Ph.D. Students who transfer from other colleges and universities will not be considered Ph.D. candidates unless they have completed M.A. degrees elsewhere. The student may apply to the adviser for a waiver of the requirement for an M.A. degree; the adviser will present the application to the student's examining committee, which will examine the student as it sees fit and make recommendations to the departmental chairman.

Qualifications
The student seeking aPh.D. degree must demonstrate command of one foreign language or other tool of research, selected with the approval of the doctoral committee. If a foreign language is selected, the student must pass an oral test, a written test, a paper or a combination of these. The foreign language must be passed by the end of the second year. The student must demonstrate command of this tool to the satisfaction of the departmental committee.

Comprehensive Examinations
The student must pass comprehensive examinations in four fields of study, at least three of them in political science. Within the first month after the appointment of the Ph.D. examining com-
mmittee, the student must also consult with the other members
of the committee concerning his or her work in their fields. There are seven fields of study in political science, divided into three groups.

Group A: American Government and Politics; Public Administration

Group B: Political Theory; Comparative Government; International Relations

Group C: Philosophy of Political Research; Methods of Political Research

A student must offer at least one field in both Groups A and B.

Teaching and Research Training

Each Ph.D. candidate in political science must acquire at least one semester of special supervised training in teaching and one in research. This instruction is normally given in association with the student's service as a teaching or research assistant.

A student seeking a Ph.D. degree should apply for admission to candidacy by filing a plan of study with the Graduate College before taking its comprehensive examinations. Students are expected to take comprehensive examinations after the completion of the second full year of graduate work.

Doctoral Dissertation

The student must write a doctoral dissertation. Not more than 30 semester hours of credit are granted for the preparation of dissertations, and students may not register for credit for reading or research solely for the purpose of direct work on their dissertations.

Special Facilities

The Laboratory for Political Research was begun in 1963 with the primary function of facilitating training in research methods in political science. The Laboratory assists faculty members in utilizing empirical data and the computer in their undergraduate instruction. This assistance is provided primarily to the faculty of the Department of Political Science and to a broad range of social scientists at the 10 institutions that make up the Regional Computer Center. The Laboratory is an integral part of graduate education in the Department and is involved at every level of graduate training. Publications produced in the Laboratory for Political Research include a newsletter for social scientists at the schools making up the Regional Computer Center and a report series comprising substantive or methodological papers. The facilities of the Laboratory include three keyboard machines, a counter/cutter, two communications terminals and a card reader/line printer.

Special Faculty Strengths

The American Council on Education's most recent ranking of political science departments offering Ph.D. studies placed the University of Iowa Department of Political Science eighteenth among the several hundred departments in the nation. For the last 30 years the Department has ranked high in every study made. For example, Iowa ranked behind only Harvard, Chicago and Columbia (1936-1942) in the number of political science doctorates produced during that time period. The Department definitely feels there is a proper role for the members as individuals to play in the political process. Family members have served in Congress, as members of congressional committees, as executive assistants to a governor and as mayor of a municipality; as members of city councils, regional planning commissions and community school boards; and in other public offices.

Unlike many political science departments, this department has organized and staffed itself to integrate teaching, research and service in an overall program through the Laboratory for Political Research.

Staff: professors Boyston, Davis, Johnson, Kessel, Leah. Weisenberg, Murray, Patterson, Roed, Schmidaus, Snow, Van Dyke, Wallicke, professor emeritus Porter; associate professors Kim, McCrow; Welsh, assistant professor Cary, Green, Irwin, McClysk, Patterson, instructor Madsen

Introductory Undergraduate Courses

301 Introduction to American Politics

4 s.h.

Politics, focusing on American political system; emphasis on national politics in institutional setting; both Iowa state teacher certification required; open to freshmen and sophomores only

305 Introduction to Political Behavior

4 s.h.

Patterns and bases of political attitudes and behavior in public, organizational and institutional settings; laboratory lecture in elements of political behavior research

11 Introduction to Political Theory

4 s.h.

Discussions problems, theories and analysis techniques common to the study

313 Introduction to Comparative Politics

4 s.h.

Comparison of several European or Asian or Latin American systems of government (depending on semester); emphasis on similarities and differences among political parties, interest groups, legislative and executive institutions, policy-making processes and patterns of voting behavior and citizen participation

321 Introduction to World Politics

4 s.h.

Major world regions and contemporary problems of international relations

Advanced Undergraduate Courses

320/330 The Presidency

2, 3 or 4 s.h.

Political behavior of American individuals and groups and institutional structure of political elites; cabin in power (certificates required); open to juniors, seniors, non-political science graduate students; no one has had 301 may enroll

301/401 Federal Government and Politics

3 s.h.

Behavior of American individuals and groups with respect to federal government; emphasis on leadership; role of political parties; federalism; structure of the federal government; behavior of federal officials; role of Congress; the role of pressure groups; Iowa's political parties; political authority as a basis for citizenship in an American democracy

303 Iowa Government and Politics

2 or 3 s.h.

Iowa's political parties, political authorities, constitution, elections, Iowa's political parties; political authority as a basis for citizenship in an American democracy

305 Comparative Government

2 s.h.

Approaches to social analysis of political behavior in American and foreign state governments, with emphasis on collection, analysis, action, processes, issues

307 Public Policies

2 or 3 s.h.

Stress, structure and functions of political parties in the United States, development of motivations, norms, ideologies, organizations, policies and the inter- group relations of parties throughout American system

308 The Presidency

2 s.h.

Power, politics, functions of American presidency; recruitment and role of Chief Executive party, cabinet members, vice-presidents, judicial appointments

308 American Public Policies

2 s.h.

Politics and publics of national government; emphasis on domestic policy-making, impact of public policy

307 American Constitutional Law and Politics

2 s.h.

Role of Supreme Court in American political system; particular emphasis on analysis of Supreme Court cases

309 Introduction to Public Administration

2 s.h.

Administrative and organizational theory and behavior; techniques of management; relations between administration and other branches in federal, state governments, administrative politics
50:121 Municipal Administration 3 or 4 a.h. Problems and principles of municipal administration, including tax policy, personnel matters, budgeting, planning and functioning of city administration. Emphasis on Police, fire, public health, recreation, social welfare services and education.

50:122 Regional Administration 3 or 4 a.h. Organization, regionalization, structure, functions and administrative processes of state governments. Emphasis on administrative arts in education, social welfare, labor, business, agriculture and public works, staff functions, such as personnel, planning, purchasing, budgeting and tax administration analyzed.

50:123 Financial Administration 3 or 4 a.h. Survey of budgetary and accounting aspects of governmental financial operations at national, state and local levels; formulation, examination and execution of governmental budget. Sources of revenue, data administration, intergovernmental fiscal relations, prospective: junior standing.

50:131 Foundations of Political Theory 3 a.h. Major writers and intellectual trends in political thought from pre-Socrates to the Renaissance. 30:11 or junior standing required.

50:132 Modern Political Theory 3 a.h. Major writers and intellectual trends in political thought from Renaissance to the twentieth century.Prospective: 30:11 or junior standing required.

50:133 Contemporary Political Theory 3 a.h. Contemporary thought concerning democracy and related problems.

50:143 Government and Politics of Western Europe 3 a.h. Political institutions and processes of selected Western European countries, including Great Britain, France, Germany, Switzerland, for specific countries or countries under consideration, current Schedule of Courses may be consulted with consent of instructor.

50:144 Introduction to the Government and Politics of the Soviet Union 3 a.h. Current system of government, politics, economics and social order from Revolution of 1917 to present.

50:145 Government and Politics of the Soviet Union and Eastern Europe 3 a.h. Soviet political system, emphasizing changes in pre-stalin period, with comparison to Eastern European systems.

50:153 Government and Politics of the Far East 3 a.h. Functioning and institutions of government in countries of the Far East, with special attention given to social, economic, and historical environments which condition them; see 39:137.

50:164 Introduction to Latin American Government 3 a.h. Governmental institutions and major interests in Latin America; general focus upon economic and political behavior.

50:154 Major States of Latin America 3 a.h. Competencies of political systems of selected major states in Latin America. Out of background, with emphasis on contemporary political systems, may be repeated with consent of instructor.

50:174 Voting Behavior and Elections 3 a.h. Determinants of voting behavior, carried political participation and political anxiety. political socialization processes and norm and function of elections.

50:185 The Legislative Process 3 a.h. Comparative legislative processes and behavior, focusing explicitly upon legislative process analysis, legislative institutionalism, legislatures and their environments, organizational consequences on legislative behavior, reception of legislation, web of legislative lobbying, legislative voting behavior.

50:188 Intergovernmental Relations 3 a.h. Role of courts, lawyers, judges, interest groups in American and selected foreign political systems.

50:190 Problems of Comparative Politics 3 a.h. Problems of comparative politics, including development of governmental systems, structure and behavior of different political systems, for specific countries or regions, may be repeated with consent of instructor.

50:191 International Politics 3 a.h. Contemporary problems in the conduct of international politics, forms and desenvolopes of interaction of states.

50:181 The Political Process 2 or 3 a.h. Development, structure and functions of United Nations; emphasis on decision-making processes of U.N. and issues on international scene.

50:163 American Foreign Policy 3 a.h. Basic principles, programs and events measured by United States in relation to other states and with international organizations; prospective: 30:13 or consent of instructor.

50:183 Inter-American Relations 3 a.h. Development and application of Monroe Doctrine, especially with regard to selected Latin American nations; examination of organization and functioning of Organization of American States and current United States policy toward Latin America.

50:150 Problems of International Politics 3 a.h. Selected problems in analysis of international politics, for specific countries or regions, may be repeated with consent of instructor.

50:168 Human Rights 3 a.h. Basic human rights: their legal and ethical basis, their promotion and protection through governments and international organizations, comparative and international analysis of equality and conduct/materialism.

50:160 Independent Study or, arr. Intensive examination of major ideas and problems of particular area of political science; open to honors candidates in political science and others with consent of instructor.

50:172 Special Seminar or, arr. Continuation of 50:160.

50:200 Introduction to Political Analysis 3 a.h. Conceptual problems of political analysis, types of explanation in contemporary political science.

50:201 Problems in Political Analysis 3 a.h. Introduction to both methods of research and content literature; use of qualitative and quantitative data; prospective: 50:200.

50:250 Administrative Theory and Behavior 3 a.h. Literature and research on organizational and administrative behavior, theories, policies, politics.

50:255 Public Administration 3 a.h. Literature of prescriptive political theory, emphasis on relevance to understanding and evaluation of contemporary politics.

50:240 Comparative Politics 3 a.h. Introduction to current approaches to comparative analysis of political systems, special attention to conceptual and other methodological issues.

50:300 American Political Systems and Behavior 3 a.h. Review and analysis of major American political processes, focusing upon comparative and behavioral electorate.

50:300 International Political Behavior 3 a.h. Review and analysis of major American political processes, focusing upon comparative and behavioral electorate.

50:300 Graduate Courses 3 a.h. Preparation and analysis of major American political processes, focusing upon comparative and behavioral electorate.

50:300 Philosophy of Political Inquiry 4 a.h. Purpose and methods in study of politics.

50:301 Advanced Research Methods 3 a.h. Design, measurement, including data collection and analysis, validity and reliability of data; procedures for preparing data for analysis and writing research papers.

50:322 Administrative Management 3 a.h. Early administrative management, legislative behavior.

50:323 Administrative Management 3 a.h. Comparative administrative management, legislative behavior.

50:324 Research and Policy Planning 3 a.h. Comparative administrative management, legislative behavior.

50:322 Problems in Public Administration 3 a.h. Selected issues in public administration; may be repeated with consent of instructor; see 70:322.

50:320 Problems in Political Theory 3 a.h. Selection of topics prescriptive or explanatory theoretical; may be repeated with consent of instructor.
Psychology 146

31:136 Operant Analysis of Behavioral Deviants
31:160 Research in Personality
31:161 Current Theories of Schizophrenia
31:163 Abnormal Psychology
31:164 Introduction to Clinical Psychology
31:166 Introduction to Behavior Disorders in Children
31:168 Applications of Psychological Tests

Group B (social)
31:15 Introduction to Social Psychology
31:104 Experimental Social Psychology
31:106 Attitude Change
31:107 Contemporary Social Problems

Group C (general experimental and physiological)
31:119 Human Memory, Learning and Conceptual Processes
31:123 Psychology of Learning
31:124 Mathematical Approaches in Psychology
31:125 Brain Functions and Learning
31:126 Physiological Psychology
31:127 Drugs and Behavior
31:172 Motivation
31:135 Perception
31:135 Operant Behavior Analysis
31:137 Sensory Processes
31:141 Differential Psychology

The Bachelor of Arts Degree
In addition to satisfying the general graduation requirements of the College of Liberal Arts, including at least two years of a foreign language, the B.A. student must take 25 semester hours of credit in psychology. At least the last nine hours must be earned in the Department of Psychology at Iowa, and must include either 31:201 Elementary Psychology or 31:303 General Psychology, and either 31:43 Psychological Measurement or 31:120 Experimental Psychology I and 31:143 Introduction to Statistical Methods, and they must include one course each from Groups A, B and C.

The Bachelor of Science Degree
In addition to meeting the general College of Liberal Arts graduation requirements, the B.S. student must take at least 25 semester hours of coursework in the Department of Psychology, including 31:11, 31:12, 31:22, 31:32, 31:120 and 31:127 Experimental Psychology II, and at least one 100-level course from Groups A, B and C.

In addition, the B.S. student must take one course in experimental chemistry, one course in physics, one course each in chemistry and zoology, and at least one semester in calculus or equivalent and at least eight semester hours of a foreign language, or at least one year of college algebra and analytic geometry or equivalent and at least two years of a foreign language.

Honors in Psychology
The Department of Psychology has an Honors Program open to all students with at least a 3.3 grade-point average in psychology courses and 3.0 over all. The Honors Program includes research seminars and individual research collaboration with faculty members. Interested students should consult the Department's Honors adviser before the beginning of the junior year.

Graduate Programs
Graduate study in psychology is designed to provide training which will enable the student to make original contributions as a scholar, investigator and teacher, and to apply psychological knowledge to the solution of important practical problems. The clinical program emphasizes laboratory research both on clinical problems and service activities.

Master of Arts Programs
The Master of Arts degree with thesis is required for all students who want to earn the Ph.D. degree at Iowa. A few students will complete their professional training at the M.A. level.

This program prepares the student for service and administrative positions in various industrial, clinical, medical, governmental or educational-psychological facilities, under the general supervision of a senior psychologist or personnel director.

The student is expected to achieve competence in the professional skills required for an intermediate level of responsibility. The minimum of 38 semester hours of credit comprises 17 hours of basic required courses and at least 21 hours of electives. The required courses are selected from the core program. Electives are chosen in light of the student's vocational objectives and in consultation with the adviser.

Action on the student's application for the M.A. degree without thesis will be taken after completion of the specified coursework with a minimum grade-point average of 2.7 and satisfactory performance on a written and/or oral examination over the area of specialization.

Ph.D. Programs
The Department provides specialized training leading to the Ph.D. degree in general experimental psychology, physiological psychology, social psychology and clinical psychology and personality. The over-all student is expected to offer the student comprehensive training flexibly arranged to encompass a wide spectrum of individual interests and abilities.

Opportunities exist for a variety of sub-specialty programs within and between the major areas of specialization.

All students desiring to receive the Ph.D. degree at Iowa generally obtain an M.A. degree with thesis after four semesters. Four years (or five years in the case of clinical students electing a pre-doctoral internship) is generally required to complete the Ph.D.

Courses are designed to provide an up-to-date summary of fundamental knowledge regarding behavioral processes, research methods, psychological theories, statistical tools and quantitative techniques. The knowledge gained from these courses is then enriched in the more informal atmosphere of seminars concerned with selected topics relevant to the student's area of specialization. These seminars provide opportunities for extensive discussion and expression of individual views regarding theoretical issues, the formulation of research problems and current developments in the research literature. Seminars also give the student valuable practice in the review, theoretical articulation and presentation of research literature. In addition to
courses and seminars, the Department invites nationally and internationally eminent psychologists to appear as guest speakers throughout the year. Usually there are opportunities for students to meet informally with these speakers.

Training in the laboratory is an integral part of the student's work. The acquisition of the appropriate skills for the analytic investigation of behavioral phenomena is regarded as as important as and an indispensable component of graduate training at Iowa. The student begins laboratory training soon after arrival in the Department. Initially, research experience is gained through participation in an on-going project in a collaborative research laboratory with a faculty member. Later, as the student's interests become clearly defined and research skills develop, he or she is encouraged to initiate and pursue independent research. Many of our students publish papers in recognized psychological journals by the time they earn the Ph.D.

Admission Requirements

It is recommended that students who plan to take graduate work in the Department have solid undergraduate training in psychology, including experimental psychology and statistics, and extensive work in the natural sciences, mathematics and the social sciences.

A foreign language is not required. Admission decisions are based upon a composite consideration of the applicant's undergraduate academic achievement, letters of reference and performance on the verbal and quantitative portions of the Graduate Record Examinations.

Special Facilities

The Department has excellent laboratory and library facilities for graduate work in psychology. Special equipment and laboratories are available for research in the fields of animal and human learning, motor skills, emotion, motivation, sensation and perception, physiological processes, clinical, and personality and social psychology.

The Kenneth W. Spence Laboratories of Psychology are designed and used exclusively for teaching and research in psychology.

The laboratories are among the most outstanding in the field. They contain a number of systems for automated control of experiments, as well as a rapid and precise gathering of data. Facilities include small laboratory computers; several observation booths equipped with closed-circuit TV and audio recording equipment for use in clinical and social psychological experimentation; and three animal colonies, soundproof rooms, two surgeries, a laboratory of histology, a darkroom, electrophysiological recording rooms, conditioning laboratories, service shops and a number of additional specialized and general laboratories. Students have easy access to computer facilities within the Department and in the University-Computer Center.

Also of major importance for specialized training programs is the availability of such related facilities as the Psychology Clinic; University's General, Psychopathic and Children's Hospitals; Iowa City Veterans Administration Hospital; University Speech and Hearing Clinic; and University Counseling Center.

Special Faculty Strengths

For more than 70 years, the Department has ranked at or near the top nationally in the number of professional psychologists it has trained at the doctoral level. Since the first national evaluation of graduate programs, its faculty has ranked among the finest in the nation.

Other Unique Aspects of the Iowa Program

Each of the past several years, about a dozen junior and senior students showing exceptional promise have been selected to participate in a 10-week summer program of full-time research of their own design, for which they have been paid by National Science Foundation funds. Continuation of this specific program depends on the availability of non-university funds. However, opportunities for similar research experience without financial support are available through special arrangements with the Honors adviser.

Program participants receive two semesters of research preparation in an Honors seminar, usually conducting a pilot study and acquiring the skills they will need for their summer work. Completion of the program is roughly equivalent to one year of graduate study. Often the work of these participants has been of such scope and quality that it has been published in leading professional journals.


Affiliated Staff: research professor Knott; clinical professor Cantor; clinical associate professor Clowers; clinical assistant professors Boudewyns, Irby; research associate Beter.

Librarian-in-Charge, Psychology Library: Anne O. Evans

Courses for Undergraduates Only

E101 [or 306] is prerequisite to the major course in psychology, except 31:17 and 31:44. Credit can only be earned for one of the courses: 31:15, 31:17, or 31:44. One must have, in addition to 31:15, 31:17 or 31:44, have taken psychology 31:45. A major in psychology may be declared only if the student has successfully completed the major courses.

31:15 Elementary Psychology 4 s.h.

Recommended for B.A. major in psychology and students taking B.A. or B.S. degrees with majors other than psychology; for psychology majors, a first course in elementary principles of behavior.

31:17 General Psychology 4 s.h.

Recommended for A.A. and A.A.S. majors, or B.S. major in psychology; also open to all Honors students and students who have permission of instructor; some room in 31:15, but with additional discussion sections and greater emphasis on research to which experimental method is applied in analysis of behavioral events.

31:17 Psychology of Adjustment 3 s.h.

Basic principles of psychology; in relation to development, adjustment and modification of personality adjustment.

31:18 Introduction to Social Psychology 3 s.h.

Research with behavior of individual human organisms in social situations, assessment of social influence on perception and conceptual processes, social interaction and social interaction and social roles.

31:19 Introduction to Psychobiology 3 s.h.

Focus on central and peripheral factors that determine group formation, functioning and maintenance; through research on neyropsychological research literature, neural and computational models of behavior.

31:17 Educational Psychology and Measurement 3 s.h.

Basic in Education 77:19

31:19 Psychology in Business and Industry 3 s.h.

Principles of behavior in the workplace; principles of personal selection and training, industrial fatigue, worker efficiency.
Quantitative Methods in Psychology
3 a.h.
Mathematical methods necessary for understanding and use of mathematical models in psychology; applications considered, short review of calculus.

11440 Pathological Analysis
3 a.h.
Powerful for psychology majors; continuation of 31,242 in (bio)pharmacology and related applied research, emphasis on data analysis, use of computer in research.

11467 Applications of Multivariate Analysis
3 a.h.
Application of theory of mathematical analysis to behavioral sciences, including matrix algebra and general concepts in investigating psychological problems, prerequisite: 11,344 or equivalent and consent of instructor.

11480 Mathematical Models in Psychology
3 a.h.
Stresses sampling theory and linear regression theory; emphasis on applications to problems in learning, motivation and related areas, including concept identification, estimation, inference, prediction

11490 Psychophysiology and Method
3 a.h.
Reviews and analysis of natural psychological models in psychophysiology, both contemporary and classical, emphasizing current special emphasis on signal detection theory.

11510 Computer Simulation of Psychological Processes
3 a.h.
Introduction to simulation, techniques, evolution of computer simulation as applied to behavioral problems; simulation studies and exercises emphasized, prerequisite: Computer Science 12,203 and 12,202 or equivalent.

11580 Seminar: Mathematical Psychology
3 a.h.
Current problems in applications of mathematics to mental and human behavior.

11590 Seminar: Mathematical Models in Perception and Psychophysics
3 a.h.
Various mathematical models in perception and psychophysics; detailed study of literature and models in signal detection theory.

11640 Seminar: Statistical Analysis
3 a.h.
Preliminary course of instructor.

Experimental Methods

11900 Experimental Psychology I
3 a.h.
Logic and application of experimental methods to analysis of behavioral phenomena; includes overview of major problem areas of experimental psychology.

11910 Experimental Psychology II
3 a.h.
Direct, major problems in experimental psychology; various techniques under this course number that deal with different problem areas, such as learning and memory, problem solving, sensory processes, attitude changes, may be repeated for credit when topics vary. pre requisite: 11,320.

11920 Information in Health and Research Reports
2 a.h.
Methodological aspects of psychological research, use of quasi-experimental methods, writing and critical evaluation of research reports.

Learning, Motivation and Sensory Functions

11932 Memory, Learning and Cognitive Processes
3 a.h.
An introduction to contemporary psychological theory and research.

11940 Psychology of Perception
3 a.h.
Theoretical and experimental basis of learning in animals and human behavior; processes and procedures.

11952 Motivation
3 a.h.
Recent contributions to animal research with critical examination of methodology and implications of contemporary theory.

11953 Personality
3 a.h.
Recent developments in experimental approaches to perception.

11954 Antecedents of Behavior Analysis
3 a.h.
Introduction to basic concepts and results of operant behavior in experimental studies of behavior in laboratory and clinical settings, prerequisites: 11,320 and 12,202.

11967 Sensory Processes
3 a.h.
Application of concepts and methods to sensory processes by which information is obtained by an organism about its environment.

11971 Developmental Psychology
3 a.h.
Consideration of interpretation of age, sex, socioeconomic and race differences in behavior phenomenon of genetic and environmental classes of variables; prerequisite: 11,420 or 31,140.
Recreation Education

Program Chairman: John Heithc
Degrees offered: B.B., M.A.

Study programs in recreation education are sponsored jointly by the departments of Physical Education for Men and Physical Education for Women.

As our society becomes increasingly leisure oriented and government becomes increasingly responsive to needs for leisure activity, career opportunities for professional recreation leaders become more numerous and diverse.

There are opportunities for directors, supervisors and specialists in public recreation at all levels, local to national; in the therapy programs of hospitals, nursing homes and other health care institutions; in industrial recreation; in youth-serving agencies as the Boy and Girl Scouts, Boys' and Girls' Clubs, and YMCA and YWCA; in civilian programs for the armed forces; in college and university student activities; and in correctional institutions, church organizations, athletic clubs and other institutions and agencies where recreation programming is an important function.

The Bachelor of Science Degree

A student seeking the Bachelor of Science degree must satisfy the College of Liberal Arts general graduation requirements. There is also an integrated mathematics skills core, studies in literature, social science, natural science and the historical-cultural area; and at least eight semester hours, or equivalent proficiency, in a foreign language. Course requirements for the major are:

Courses in Recreation

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>28:20</td>
<td>Social Forms of Dance</td>
<td></td>
</tr>
<tr>
<td>27:31-22</td>
<td>Teaching Recreational Sports</td>
<td></td>
</tr>
<tr>
<td>27:37</td>
<td>Techniques of Swimming Instruction (or equivalent)</td>
<td></td>
</tr>
<tr>
<td>104:60</td>
<td>Foundations in Recreation</td>
<td></td>
</tr>
<tr>
<td>104:61</td>
<td>Recreation Leadership</td>
<td></td>
</tr>
<tr>
<td>104:62</td>
<td>Social Recreation</td>
<td></td>
</tr>
<tr>
<td>104:63</td>
<td>Recreational Crafts</td>
<td></td>
</tr>
<tr>
<td>104:110-111</td>
<td>Field Work in Recreation</td>
<td></td>
</tr>
<tr>
<td>104:129</td>
<td>Administration of Recreation</td>
<td></td>
</tr>
<tr>
<td>104:134</td>
<td>Recreation Program</td>
<td></td>
</tr>
<tr>
<td>104:140</td>
<td>Principles of Outdoor Recreation</td>
<td></td>
</tr>
</tbody>
</table>

Courses in Related Areas

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>27:37</td>
<td>Fine Aid (or equivalent)</td>
<td></td>
</tr>
<tr>
<td>36:33</td>
<td>Public Speaking</td>
<td></td>
</tr>
</tbody>
</table>

Principles of Social Psychology

Written Communications in Business

Foundations in Recreation reviews the history and philosophy of recreation and provides career orientation. 104:61 Recreation Leadership is designed to develop leadership abilities in games, dramatics and music.

In Recreation Program the student is given a real problem and develops a program to solve it. 104:140 Principles of Outdoor Recreation examines the roles of various levels of government and the needs and demands of the public in outdoor recreation. Administration of Recreation covers budgeting, management, personnel relations and other administrative aspects of recreation. 104:110-111 Field Work gives the senior student professional work experience in an agency setting appropriate to his or her best career interest.

With the general College and program requirements, the student must also develop an area of concentration and an area of skills emphasis. The student may choose from these areas of concentration:

Recreational Supervision and Administration

Designates for students preparing for positions with responsibility for organizing and administering recreation programs, facilities and departments, including positions in municipal recreation, youth-serving agencies, settlement houses and programs for armed forces.

Therapeutic Recreation

Focuses on organizing, planning and leading recreation programs in treatment and nontreatment settings for ill, deprived, handicapped or disabled persons.

Outdoor Recreation/Education

Focuses on organizing, planning, directing and administering programs in outdoor recreation and education on city, county and state levels; emphasis placed on developing cooperative, interpretive programs with schools, youth agencies and conservation agencies.

The student may choose from these areas of emphasis:

Arts: Music, Drama

Sports: Outdoor Recreation, Dance

Recreation Minor

Recreation Education is an excellent minor for students majoring in elementary or special education.

Honors

For admission to the Honors Program in recreational education, the student must make formal application; must have completed 30 semester hours of coursework at The University of Iowa; must have earned an 11 of the 32 semester hours of credit required for the recreation education major; and must have 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 have successfully completed six semester hours of Honors work at The University of Iowa and must successfully take an Honors examination at the completion of his or her Honors work. The Department offers two Honors courses—106:1905 Problems in Honors, 106:1925 Seminar: Recreation Education Research. With the permission of the chairmen of his or her Honors committee, the student may take three semester hours of Honors work in another department.

Programs Leading to M.A. Degree
Programs are provided leading to the Master of Arts degree with or without thesis. Admission to these programs is granted on the basis of the student's grade-point average on all undergraduate work attempted and score on the Graduate Record Examination Aptitude Test. To be considered for admission, the student must have earned a grade point average of 2.3 or higher on all undergraduate work attempted.

M.A. with Thesis
The program leading to the Master of Arts degree with thesis is primarily designed as the first step in a graduate program of study leading to an advanced degree. particular emphasis is placed on techniques of research.

Undergraduate Prerequisites
The undergraduate courses listed below (or equivalents), together with elective courses in recreation and related areas sufficient to total 30 semester hours, are required. Prerequisite credit may be given for experience and competence in techniques when such competence is demonstrated by examination.

Undergraduate Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundations of Recreation</td>
<td>3</td>
</tr>
<tr>
<td>Administration of Recreation</td>
<td>3</td>
</tr>
<tr>
<td>Recreation Program</td>
<td>3</td>
</tr>
<tr>
<td>Recreation Leadership (or equivalent)</td>
<td>3</td>
</tr>
<tr>
<td>Skills Areas (three of the following)</td>
<td></td>
</tr>
<tr>
<td>Outdoor Recreation-Education</td>
<td>2</td>
</tr>
<tr>
<td>Social Recreation (or equivalent)</td>
<td>2</td>
</tr>
<tr>
<td>Arts and Crafts (or equivalent)</td>
<td>2</td>
</tr>
<tr>
<td>Recreational Sports and Games</td>
<td>2</td>
</tr>
<tr>
<td>(or equivalent)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
</table>

Any or all of the courses listed above may be taken after the student has been admitted for graduate study in recreation. They should, however, be taken at the earliest opportunity.

Requirements
The specific courses listed below, together with elective courses sufficient to total 30 semester hours in recreation and related areas, are required for the Master of Arts degree with thesis.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>28:205 Techniques of Research</td>
<td>4</td>
</tr>
<tr>
<td>36:111 Elementary Social Statistics</td>
<td>3</td>
</tr>
<tr>
<td>77:145 Introduction to Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>104:230 Seminar: Recreation Administration</td>
<td>3</td>
</tr>
<tr>
<td>104:231 Philosophy and Trends in Recreation</td>
<td>3</td>
</tr>
<tr>
<td>104:401 Seminar: Thesis II</td>
<td>1–3</td>
</tr>
<tr>
<td>104:402 Seminar: Thesis I</td>
<td>2–4</td>
</tr>
</tbody>
</table>

M.A. Without Thesis
The study program leading to the Master of Arts degree without thesis is designed primarily as a terminal unit of advanced study in preparation for the administration of recreation programs.

Undergraduate Prerequisites
These are the same as for Master of Arts degree with thesis in recreation.

Requirements
The specific courses listed below, together with elective courses sufficient to total 38 semester hours in recreation and related areas, are required for the Master of Arts degree without thesis.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>104:230 Seminar: Recreation Administration</td>
<td>3</td>
</tr>
<tr>
<td>104:231 Philosophy and Trends in Recreation</td>
<td>3</td>
</tr>
<tr>
<td>104:301 Research in Recreation</td>
<td>3</td>
</tr>
<tr>
<td>54:110 Methods of Social Research</td>
<td>3</td>
</tr>
<tr>
<td>28:205 Techniques of Research</td>
<td>4</td>
</tr>
<tr>
<td>Staff: associate professor Nebbia; assistant professors Gwiazda, Lindsey, Instrutor Hoges, Instrutor Laugh</td>
<td></td>
</tr>
</tbody>
</table>

Courses Primarily for Undergraduates

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>104:110 Foundations of Recreation</td>
<td>3</td>
</tr>
<tr>
<td>Basic philosophieal, biological, scientific foundations and development in leisure and recreation, function and settings of organized recreation and survey of organizations and agencies concerned with recreation</td>
<td></td>
</tr>
<tr>
<td>54:61:1 Recreation Leadership</td>
<td>3</td>
</tr>
<tr>
<td>Leadership principles and techniques: program activities</td>
<td></td>
</tr>
<tr>
<td>104:82 Social Recreation</td>
<td>2</td>
</tr>
<tr>
<td>Practical application of techniques in planning, demonstrating, conducting activities and programs designed for broad variety of social arenas</td>
<td></td>
</tr>
<tr>
<td>104:83 Recreation Leadership</td>
<td>2</td>
</tr>
<tr>
<td>Crafts in general, ceramics, clay, fletch, personal leisure interests, emphasis in skills and knowledge in woodcarving, reedmaking, leathercraft, and/or marine materials, laboratory practice</td>
<td></td>
</tr>
<tr>
<td>104:84 Adjuanced Recreational Crafts</td>
<td>2</td>
</tr>
<tr>
<td>Conservation of 104:83, but may be taken as independent unit</td>
<td></td>
</tr>
<tr>
<td>104:94:55 Camp Leadership</td>
<td>3</td>
</tr>
<tr>
<td>crapamipmation of techniques for camp direction, ACA certification program possible Orientation to Rehabilitation Settings</td>
<td></td>
</tr>
<tr>
<td>104:110 Institutional and community rehabilitation program emphasizing following: psychiatric, retarded, physically handicapped, convalescent, aging and aged</td>
<td></td>
</tr>
</tbody>
</table>

Courses for Undergraduates and Graduates

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>104:110 Readings in Leisure</td>
<td>2 cr.</td>
</tr>
<tr>
<td>Conccedared readings, conference and written reports related to specific area of interest in which student has been interned</td>
<td></td>
</tr>
<tr>
<td>104:110 Field Work in Recreation</td>
<td>2 cr.</td>
</tr>
<tr>
<td>Field experience arranged to include direct leadership, program planning and administrative procedures: prerequisite: 104:110 and permission of instructor</td>
<td></td>
</tr>
</tbody>
</table>
Religion

104:111 Field Work in Recreation cr. arr.
104:110 Co-Requisite

104:110 Colloquium

104:110 Current issues in field service and graduate students majoring in recreation, once a month each academic year.

104:110 Senior Seminar in Therapeutic Recreation 4 s.h.

Senior seminar gives an overview of roles in rehabilitative, organizational, and development programs, in understanding behavior of patients and adaptive activities in basic disability areas.

104:121 Role of Therapeutic Recreation in Rehabilitation 3 s.h.

Role of therapeutic recreation in total institutional and community rehabilitation effort, specific attention given to comparative role of therapeutic recreation in relation to other therapy programs.

104:129 Administration of Recreation I 3 s.h.

Program planning, personnel, finance and budget, facilities and services, other administrative aspects of recreation; prepranae: 104:134

104:130 Administration of Recreation II 3 s.h.

Coordination of 104:129 for undergraduate in municipal recreation administration.

104:131 Community and City Recreation 3 s.h.

Role of schools in educating for leisure and survey of community involvement in recreation through: school, church, voluntary agency, commercial, private, institutional, institutional, and municipal programs.

104:134 The Recreation Program 3 s.h.

Planning and evaluation of recreation program: organization, promotion, utilization of resources, use of tests and leadership techniques. Prerequisite: 104:131

104:135 Administration of Recreation 3 s.h.

Administration of natural resources and public land on national, state, local and private lands; responsibility of recreation agencies to various phases of natural resource recreation and multiple use of public, wild lands.

104:141 Camp Administration 3 s.h.

Public relations, planning, finance and budgets, 7-mus and facilities, ACA standards. administrative structure, legal aspects, and other administrative aspects of organized and resident camping.

104:143 Principles of Outdoor Education 3 s.h.

Development of scope of outdoor education: educational significance, philosophies, organization, administration, methodology and content; particular attention to interpretive programs in ecology for recreation and education majors.

104:143 Pracitcum in Environmental Education or cr. arr.

Organization, administration, leadership and programming for school camp; integration this school curriculum; seniors 104:134, 104:135.

104:150 The Role of the College Union 3 s.h.

Relationship of college union to higher education; role in informal, educational, and social aspects of campus life; relationship to other student organizations.

104:165 Workshop: Camp Programs 1 s.h.

104:165 Senior Seminar: Recreation Education or cr. arr.

Investigation of problem related to specific area of interest.

104:165 Senior Seminar: Recreation Education 3 s.h.

Open to majors and non-majors; may be repeated.

104:165 Principles of Leisure Theories 2 to 4 s.h.

Principles, terminologies, standards of design, planning, construction, administration, and maintenance of areas and facilities for recreation and physical education.

Courses Primarily for Graduates

104:220 Problems or cr. arr.

Same as 20:20.

104:220 Seminar: Administration of Recreation 3 s.h.

Problems of administration, supervision, and programming in recreation programs through projects in various types of recreation areas; (e.g., psychiatric, physically handicapped, mentally retarded, convalescent, etc.) administration, institutional and personnel in activity therapy programs.

104:223 Seminar: Counseling cr. arr.

Specialization in support area for various types of group counseling: development of individual and group therapies and techniques, supervised counseling and counseling techniques in group counseling.

104:224 Design and Maintenance of Recreation Facilities 3 s.h.

Principles, terminologies, standards of design, planning, construction, administration, and maintenance of areas and facilities for recreation and physical education.

104:235 Seminar: College Union Management 2 s.h.

Management of college unions: food services, recreation facilities, guest speakers, bookstores, maintenance, etc., emphasis on administrative problems.

104:236 Seminar: Thesis I (BA) or cr. arr.

104:237 Seminar: Thesis II (BA) or cr. arr.

Religion

Director: Jack J. Spellman

Degree: Bachelor of Arts, M.A., Ph.D.

A central goal of the School of Religion is to provide a forum for graduate and professional study in the field of religion, but it is oriented toward understanding more than it is oriented toward vocation. The School of Religion is not a theological seminary, and it does not prepare students for ordination, although a number of our undergraduate majors later attend theological seminaries well prepared for study in those schools leading toward professional careers in churches and synagogues. Other majors continue their academic study of religion toward the M.A. and Ph.D. degrees to become specialists in the study and teaching of religion as a basic dimension of human culture.

B.A. Program

For a major in religion, undergraduate students elect 24 semester hours of coursework in religion according to their own interest, provided they take some courses which give them a general acquaintance with the basic religious traditions one would encounter in the contemporary world. Students majoring in religion will also elect 12 hours in related courses in departments such as Anthropology, Art, Classics, History, Philosophy, Psychology, and Sociology. These courses should be selected with the approval of the major advisor. The advisor must also approve the foreign language submitted by the student to meet the two years' requirement for the B.A. degree.

Honors Program

Religion majors eligible for the Liberal Arts Honors Program may obtain a degree with Honors through satisfactory completion of an Honors essay during the senior year.

Graduate Program

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. Graduate study is offered in five areas, including 13 fields, as follows:
Religion

Area A: Jewish and Christian Scriptures
1. Old Testament
2. New Testament
3. Post-Biblical Judaism

Area B: History of Christianity
1. Early Church (to 500)
2. Middle Ages (500-1500)
3. Modern (since 1500)
4. America

Area C: Theology and Ethics
1. Jewish
2. Roman Catholic
3. Protestant

Area D: World Religions
1. History of Religions
2. Intensive Study of Religion in India, China, or Japan
3. Religion and Personality Development
4. Religion and Health

Master of Arts Degree
A student must have a reading knowledge of either French or German. The student may substitute another foreign language if it is related to his or her field of study and is approved by an advisor.

The formal course requirement is four courses or seminars at the 100-level or above, in each of three areas. For a total of not less than 10 hours in each area and 30 hours altogether. Four hours of thesis research may be counted toward the total of hours and courses required in a manner determined by the advisory committee for each student. In each of the three areas, the student will be responsible to only one faculty member who will advise him or her on courses in that area; the three faculty members together will constitute the student's advisory committee. By the second semester in this program, a student should have decided on areas of concentration. By this time, the committee should have been formed.

This committee conducts the master's examination, written toward the end of a student's fourth semester of study, and intended as an examination on the 12 courses or seminars taken.

A thesis is also required. It must be approved by the advisory committee but will normally be written under the supervision of only one of the three members. It will not be formally defended except in cases where the advisory committee considers it desirable.

If his or her work shows sufficient competence, a student who has completed the master's degree may continue in the Ph.D. program by petitioning for a change in degree objective. In such a case the student will be expected to take and pass the qualifying examinations and to meet the other requirements for the degree.

Doctor of Philosophy Degree
The particular program of each student will be designed with an advisor in areas of the student's interest in order to represent both a broad and a specialized knowledge within the field of religion and to enable the student to satisfy the following requirements.

In qualifying examinations, the student will be examined in three of the five areas listed above. For this purpose there will be three major written examinations.

After passing all three qualifying examinations (not counting the summer session), the student and advisor will set up a three-member committee for comprehensive examinations.

The committee will determine two subjects for the comprehensive examinations. The student will be expected to write a dissertation in one of the three subject fields in which he or she takes the comprehensive examinations.

The student's plan of study for comprehensive examinations will include 10 hours of coursework at the 100-level or above outside the School of Religion with grades of A or B; 10 hours of coursework in one of the fields of religion other than his or her major field of interest with grades of A or B; and not more than three papers which indicate the student possesses the necessary skills required for Ph.D.-level work in his or her special subject.

A reading knowledge of French and German is required in all areas. Since these languages are tools for basic research, students are advised to acquire them as early as possible in their courses of study. Before taking the qualifying examinations, students must have passed the Graduate School Foreign Language Tests in both of these languages. If the nature of a student's specific program of study warrants it, and the faculty permits it, another language may be utilized for French or German. In addition to French and German, several areas have special language requirements. Students in New Testament, for example, must satisfy Departmental requirements in Greek. All students should consult with their advisors as early as possible concerning the special requirements entailed in their field of study.

A dissertation is also required, and not more than 12 semester hours of credit are allowed for it. An oral examination on the dissertation and related materials will be conducted by a committee of five or more members.

A student whose grade point average is graduate study at Iowa falls below 3.0 will be placed on probation. If the student falls to bring that average up to 3.0 within one semester, ordinarily he or she will be disqualified from further graduate study in the School of Religion.

Faculty and Facilities
The School of Religion remains unique in the quality of its undergraduate and graduate studies in religion within the context of a state university. Its faculty members have received national and international recognition. Beyond the immediate faculty of the School itself, students in religion have access to related faculty in other departments of the College of Liberal Arts and in other colleges of the University. Some of these faculty are so closely related that they are listed below as affiliated staff. Besides comprehensive library collections in the areas studied in the School of Religion, there are several special collections in aspects of Judaism and Reformation studies. The library and its staff give excellent cooperation in helping religion students to obtain materials essential to their research.

Staff professors: Belgum, Pocelli, Mood, Scharlemann, Sondling; associate professors Baird, Korte, McCue, Nickelburg, Pachos; assistant professors Booth, H. T. Goldenstein, Holstein, Paterson,
Reserve Officers Training Corps (ROTC)

There are two ROTC departments at The University of Iowa—Army (Military Science) and Air Force (Aerospace Military Studies). They are academic departments, and credits earned in them may carry toward any degree the University offers. Neither department offers a degree, but both offer second lieutenant commissions. The commission is comparable to a degree in that it makes the holder an officer in the active or reserve military and, therefore, is a requisite for entry into the military profession as an officer and is an important indicator of potential to employers.

Undergraduate Program

The purpose of the ROTC department is to educate cadets to be officers in the United States Army or Air Force. The subjects which do provide service background, professional skills, ethics, standards and duties, and stress military leadership and management. Cadets who are commissioned serve one tour on active duty at a current starting salary of at least $4,640 per year. They serve in any of 15 Army branches or 4 Air Force functional areas. That commissioned military service is invaluable leadership-experience in other fields is borne out by the fact that a remarkable large number of men in key leadership positions of government and industry have ROTC backgrounds.

The curriculum consists of a series of variable-length, inter-related courses which must be taken in a controlled sequence. Most of the curriculum is open to the general college student, but some courses are limited to cadets. A student who wants to complete ROTC must follow cadet regulations, be physically fit, not have a conscientious objector and not have any court convictions.

The Two-Year Program

The ROTC curriculum normally spans four years; it can be completed in three or three and a half by corps-using two years' coursework into one year, or two semesters' coursework into one semester, with approval of the Department head.

The program also can be completed in two years, if the student attends a six-weeks' summer training camp at a military installation before beginning the last two years of the regular ROTC curriculum. No University credit is given for summer camp attendance. Priority for summer camp assignment is given by the A-way to community college students, and by the Air Force to pilot or navigator candidates.

Students interested in the two-year program should consult the appropriate department at least two and a half years before their University graduation.

Service Commitment

ROTC is completely voluntary. There is no commitment to enter the military services until enrollment in the first semester of the third year. University rules apply for adhering, adding and dropping ROTC courses. The first two years of ROTC at Iowa or the basic summer camp are a "free" look at the Army or the Air Force. Entry into the last two years of ROTC's competitive and entails a commitment to serve two years as an Army officer or four years as an Air Force officer. Cadets taking Army or Air Force flight training incur an additional one-year commitment.

All recipients of ROTC scholarships accept a four-year commitment.

Advanced Placement

Service veterans and men with other ROTC experience can get full credit towards commissioning (not graduation) for some ROTC courses by providing proof of this background to the appropriate Department head.

Financial Assistance

ROTC scholarships provide tuition, books, laboratory fees and a $100 per-month tax-free subsistence allowance are available to high school seniors, ROTC cadets and qualified two-year program applicants. (See "Scholarships and Loans.")

All cadets in the last two years of ROTC receive $100 monthly as a tax-free subsistence allowance. Students attending the summer camps are paid while there and receive travel expenses.

Uniforms and books for classes taught by military faculty are furnished, and a $100 uniform allowance is provided for commissions.

Cadets using National Defense Education Act loans have 12.5 percent of the loan canceled for each of the first five years of commissioning active duty service.

Commissioning

Cadets are commissioned as second lieutenants when they successfully complete ROTC and receive their baccalaureate degree. Normally, they report to active duty shortly after commissioning. Officers who wish to obtain a graduate degree may delay reporting to active duty for that purpose. Cadets or officers who are accepted in the colleges of Medicine or Dentistry can comm-
ples their education and go on active duty as doctors or dentists. Cadets who pass a state bar examination can apply for a commis-
sion in the Judge Advocate General Corps. Doctors, dentists and JAG officers enter active duty as captains.

Graduate Programs

ROTC does not have a graduate program; however, graduate students can enter the two-year program and receive all financial
benefits except scholarships.

Special Activities

The military departments sponsor several special activities which contribute to cadre and university life. The Pershing Ri-
fl.es, Black Berets and Arnold Air Society are military fraternal
organizations engaging in military inter-collegiate competitions and service activities. The Co-Officers and Angel Flight are wom-
ens' organizations auxiliary to Pershing Rifles and Arnold So-
ciety and participate with them in many activities. The depart-
ments also sponsor a small-bore rifle club. 

ROTC cadets compete for individual national and local awards presented for outstanding achievement in leadership,
academics, citizenship, athletics and military proficiency. These
awards are formally presented at appropriate ceremonies. (See
"Awards, Honors and Prizes").

The departments sponsor ceremonial and social activities throughout the year. The primary ones are the Military Ball,
Joint Awards Ceremony and Governor's Day.

Aerospace Military Studies

Department Head: LtCol. Raymond B. Means

The normal sequence of courses required for successful comple-
tion of the Air Force ROTC program includes courses from other
departments in communication skills, history and political
science. Variations in the program outlined below may be ap-
proved by the Department head.

First Year

23:11 Aerospace Military Studies

23:96-97 AFROTC Training

10.1, 2 or 3 Rhetoric Skills

Second Year

30:13 Introduction to World Politics

23:96-97 AFROTC Training

23:11 Aerospace Military Studies

Cadets who pass qualification tests and are selected on a com-
petitive basis attend summer field training session between third
and fourth years. Those successfully completing field training
may continue into last two years of Air Force ROTC

Third Year

23:81 Growth and Development of Aerospace

3

23:96-97 AFROTC Training

0

Third-year cadets required to take one of select group of 100-
level history or political science courses during second semester

Fourth Year

23:53-84 Air Force Leadership and Management

6

23:97 AFROTC Training

0

23:50 Flight Instruction

1

Flight ground school course required for fourth-year cadets in
flight instruction program

Special Facilities and Equipment

Throughout the academic year, classroom instruction is supple-
mented with one- or two-day visits to air force bases. Most cadets
have the opportunity to make at least one visit each semester.
Travel is generally to Air Force aircraft flown by AFROTC
instructors. Briefings and tours by base personnel with further
explanation by the AFROTC instructor who accompanies each
group give added dimension to these trips.

Faculty

All Air Force ROTC instructors are professional Air Force
officers who are assigned for a three-year tour of duty with the
required approval of the dean of the College of Liberal Arts. It is
Air Force policy to nominate only outstanding officers with
advanced degrees to AFROTC instructor duty. Normally at
least one officer is pilot or navigator rated. All AFROTC Instruc-
tors must complete the comprehensive Air Force Academic In-
structor Course.

Unique Program Aspects

Before a cadet begins his junior year of Air Force ROTC, he
attends a four- or six-week summer camp session offered at Air
Force bases across the country. This field training includes
courses in cadre orientation, survival training, junior officer
training, aircraft and aircrew indoctrination, physical training,
organization and function of an air force base, career orienta-
tion, small arms familiarization and first aid.

Staff: AS-100 and AS-200 and Flight program instructor Major
Cosser; commander of cadre and AS-400 instructor Captain
Brown; AS-300 instructor Captain Wodarchik

Military Science

Department Head: Colonel Robert S. Kubly

Variations in the following normal military science curriculum
may be permitted by the Department head. Only cadets may
take courses above 23:90

First Year

24:10-20 Fundamentals of Leadership and Management

3

23:96-99 Leadership Laboratory

0

Second Year

23:34-44 Applied Leadership and Management

4

23:98-99 Leadership Laboratory

0
Aerospace Military Studies Courses

General Military Education Program

Freshman Year

231A The United States Air Force
1 a.h.
First semester: designed to acquaint beginning students with the roles of Air Force life and some general principles and techniques of growth of Air Force, as well as modern use of offensive and defensive forces and employment of special purpose forces throughout world.

Sophomore Year

235-45 U.S. Defense Policy
1 a.h.
Second semester: includes study of U.S. defense policies, review of defense posture, emphasis on principles of foreign relations. Focuses on current international situation, military organizations and policies; includes number of guest presentations and senior discussions, presentations 235A-235E, or equivalent, as determined by Staff, and second semester freshmen constituent skills course approved by Department.

235A Corps Training
3 a.h.
First semester: provides with practical command and staff leadership experience by performing various tasks within framework of organized combat corps. Emphasizes basic drill and Decker procedures and proper use of Air Force discipline, as well as knowledge of training tasks of Air Force officers; environment oriented to cadets and must be taken every semester as requirement for continuation.

235D Corps Training
2 a.h.
Second semester: same as 235A-234.

Professional Officer Course Program

Junior Year

23A-22A Aerospace Warfare
3 a.h.
First semester: consists of survey of development of air power. In United States, contemporary aerospace power. Emphasizes, space operations. Emphasis devoted to developing comprehensive skills needed by junior officers; prerequisites: 23A-21A or equivalent, as determined by Staff or registration; plus successful completion of Aerospace Force ROTC summer field training program or consent of instructor.

23A-23A The Professional Officer
3 a.h.
First semester: includes junior-level experience, including theoretical, professional, legal aspects; exposure to communications skills needed by junior officers; prerequisites: 23A-21B, plus successful junior history or political science course; plus successful completion of Aerospace Warfare.

23A-23B The Professional Officer
3 a.h.
Second semester: military management, function, strategy, tactics; preparation for active duty; prerequisites: same as 23A-21B.

23A-24A Aerospace Military Studies Flight Instruction
1 a.h.
Ground school phase includes FAA Regulations, flight operations, navigation and aerodynamics; flight phase encompasses 45 to 60 hours of flight instruction by Iowa City Flying Service. Course completion may qualify cadet for private pilot license, required for qualified pilot category AFROTC cadets; ground school phase open to other students with consent of instructor.

23A-25A Terrain Analysis
3 a.h.
Use of maps and areal photo information as aids for military operations, taught jointly with Geography Department, through taking 23A-45A course for 23A-25A.

Military Science Courses

23B-10 Military Science
1 a.h.
Introduction to the role, mission, role, organization and development of U.S. military forces; introduction to role of an officer, including responsibilities and professional ethos; role of airmen and their military responsibilities. Introduces cadets to military life on weekend, off-peak and special periods of 23B-20 arranged to permit cadets starting ROTC without semester to get in line and to compete for three-week summer training program.

23B-20 Military Science
1 a.h.
Completion of 23B-10.

23B-4 Terrain Analysis
3 a.h.
Use of maps and aerial photos in analysis of terrain for military operations, taught jointly with Geography Department, through taking 23B-45A course for 23B-4.
Bachelor of Arts Program

Students who major in Russian must meet the general requirements for a degree in Liberal Arts and earn at least 34 semester hours of credit in advanced Russian courses:

- 41:105-106 Second Year Russian
- 41:111-112 Third Year Russian
- 41:113 Advanced Composition and Conversation

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.

The requirements for a minor in Russian can be fulfilled by eight semester hours of second- and third-year Russian.

Department Chairman: Norman Lusenburg
Degrees offered: B.A., M.A.

Students who major in Russian in their work in Russian studies, journalism, library science and the social sciences. Others take Russian because they are curious about another culture, some intend to use the language while traveling. Some students major in Russian before going into law or another profession—some as preparation for graduate work in comparative literature, English or social sciences.

Russian majors with the B.A. and the required education courses may teach, but the number of teaching jobs in secondary schools is small; in Iowa, 11 high schools offer Russian.

Jobs for Russian majors in government are available, but not plentiful. Translation work is available for outstanding students, but jobs for translators are not easy to find.
There are special reading courses designed to give students from other fields an opportunity to acquire a reading proficiency of Russian in either the social or natural sciences. A second-year 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 a class on Tolstoy.

Special Activities
Each year the Department presents several guest lecturers and sponsored films. Students sometimes put on Russian plays and belong to Russian Circle, an organization of graduates and undergraduates for social activities. The Department also provides a coffee room where students have the chance to practice speaking and improving 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.

Study Abroad
Students who wish to broaden their education through study abroad are encouraged to do so. The Department assists qualified students in selecting foreign study programs and institutions best suited to their educational objectives. Frequently, students from Iowa have studied at a summer language institute in Munich, Germany, where an Iowa faculty member is on the staff.

The Honor 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 Honor Program in Russian. An extensive reading program with discussions, regular reports and a semester paper comprise 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.

Staff: professor Scribner, Luxembourg; assistant professor Weber; instructors Parrott, Ogelrud

Courses for Undergraduates and Graduates
41101 Elementary Russian 4 s.h.
41102 Elementary Russian 4 s.h.
Prerequisite: 41101 or equivalent
41103 Second-Year Scientific Russian 4 s.h.
Emphasis on reading scientific and technical Russian material; for students especially those requiring in science, who seek primarily to develop reading ability for professional purposes or research.
41104 Second-Year Scientific Russian 4 s.h.
Prerequisite: 41103 or equivalent
41105 Second-Year Russian 4 s.h.
Standard second-year course recommended for students satisfying their foreign language requirement for B.A. degree and desiring further training in active use of the language; prerequisite: 41102 or equivalent
41108 Second-Year Russian 4 s.h.
Prerequisites: 41105 or equivalent
41107 Supplemental Russian Reading 2 s.h.
Prerequisite: 41105 or equivalent and consent of instructor
41109 Special Readings 2 or 3 s.h.
Prerequisite: Instructor or consent of language instructor
41111 Intermediate Composition and Conversation 4 s.h.
41113 Advanced Composition and Conversation 4 s.h.
Prerequisites: 41111 or equivalent
41114 Advanced Composition and Conversation 3 s.h.
Prerequisite: 41113 or equivalent
41115 Teaching Methods, Russian 3 s.h.
Sem 27, 4124
41125 Russian Pronunciation 1 s.h.
41126 Russian Pronunciation 1 s.h.
41131 Russian Literature in Translation (1800-1880) 3 s.h.
Conducted in English; none as 41111
41132 Russian Literature in Translation (1880-1917) 3 s.h.
Conducted in English; same as 41112
41138 Tolstoy 3 s.h.
Conducted in English
41141 Dostoevsky 3 s.h.
Conducted in English
41171 Readings in Russian Literature 3 s.h.
Conducted in Russian; prerequisite 41132 or equivalent
41172 Readings in Russian Literature 3 s.h.
Conducted in Russian; prerequisite 41132 or equivalent; continuing of 41171, if not full
41191 Readings in Soviet Literature 3 s.h.
Conducted in English
41191 Russian Civilization 3 s.h.
Conducted in English
41196 Honors Program Russian or arr.
May be repeated to maximum of eight semester hours; prerequisite consent of Department

Courses Primarily for Graduates
41201 19th-Century Russian Literature 3 s.h.
41202 Old Russian Literature 3 s.h.
41211 19th-Century Russian Literature 3 s.h.
41212 19th-Century Russian Literature 3 s.h.
Consent only 41211 but may be taken as independent unit
41220 Russian Drama 3 s.h.
41221 Soviet Literature 3 s.h.
41224 Lyric Form 3 s.h.
41240 Present-Day Research Methods 2 s.h.
41252 Seminar: Stepanov, Larionov 2 or 3 s.h.
41252 Seminar: Tolstoy 2 or 3 s.h.
41252 Seminar: Pushkin 2 or 3 s.h.
41254 Seminar: 20th-Century Literature 2 or 3 s.h.
41255 Seminar: Turgenev, Goncharov 2 or 3 s.h.
41259 Seminar: Emile Litvak 2 or 3 s.h.
41270 Seminar: Dostoevsky 2 or 3 s.h.
41281 History of the Russian Language 3 s.h.
41283 Old Church Slavonic 3 s.h.
41290 Special Work 2 s.h.
41310 Reader's Thesis 2 s.h.

Science Education
Coordinator: Robert E. Vega

The fundamental purpose of the various plans of study in science education is to improve science teaching by strengthening the content backgrounds and professional competence of the students enrolled. There is concern for science instruction at all
Comprehensive written examinations are required in all three master's programs. The written examination consists of examinations in the fields in which the candidate has distributed his work. These are intended to be comprehensive examinations and are submitted by staff members from the fields in which the candidate is concentrating his work. An oral examination may be required by the examining committee. For those persons in the thesis program, an oral defense of the thesis must be scheduled and approved by three members of the graduate faculty.

Specialist Degree
The EdS is an intermediate degree between the master's and the Ph.D. programs. It is recommended for supervisors (state, regional, or local) as well as for instructors in community colleges and/or small four-year liberal arts colleges. The degree consists of 60 semester hours of work beyond the bachelor's degree, of which 28 semester hours are in supportive sciences, 10 semester hours in related fields and 22 semester hours in science education, including research and internship credits. The comprehensive consists of a three-hour examination in a science area, a three-hour examination in a supporting field and a three-hour examination in science education. The graduate committee must be composed of the science education adviser, a professor from a science area, a professor from a related area and a professor from a second science area or from science education. An oral defense of the research project must be scheduled with and approved by three professors from the graduate faculty.

The Doctor of Philosophy Degree
The candidate for the Ph.D. in science education is expected to have demonstrated ability in scientific or educational research by the completion of a master's thesis. Previous teaching experience is assumed for all students and additional teaching experience are generally incorporated into the degree program. The student should have a general knowledge of the fundamentals of at least one science area, as evidenced by the completion of a graduate concentration in one of these areas. Each candidate will have at least the equivalent of a master's degree in education as well as in one area of science. Both educational and scientific research competencies are to be demonstrated by a study which could result in a publication. The Ph.D. dissertation will be a scholarly work which will be the culmination of the candidate's principal research effort. Minimal requirements beyond the master's degree include:

- Twenty-eight semester hours in one of the following areas: biological sciences, physical sciences or earth sciences;
- Sixteen semester hours in another field of science: botany, chemistry, geology, mathematics, physics, astronomy, zoology, archaeology, history and philosophy of science, radiation research, physiology, microbiology;
- Two semester hours of special research in science;
- Twenty-eight semester hours of education, including science education and educational research.
Social Studies Education

There are no specific tool requirements such as foreign languages; however, the student and adviser plan a program to provide competency in educational statistics and computer programming.

The comprehensive examinations consist of a four-hour examination in science education, a three-hour examination in a major area of science and a three-hour examination in a minor area of science.

Financial Aid

Provision is made for advanced graduate students in science education to serve as laboratory instructors in some University science courses and as instructors in the College of Education. Several research and teaching assistantships are offered in the field of science education. These are in addition to financial aid available to University students generally (see "Scholarships and Loans." and "Graduate College").

Staff:
Professor Yager; associate professors Cowan, Phillips; assistant professors Townsend, Sharp.

Advisory Committee: Hubray (Botany), Duke (Chemistry), Glenister (Geology), Van Allen (Physics and Astronomy), Jones (College of Education), Stahl (College of Liberal Arts), Yager (General Science Program)

Courses

Specializations in science education are described in the College of Education, 74 and 75 catalogues. The following general science courses may also be included in the program:

B100 Laboratory and Field Study in Earth Science or. or. or.
Primarily for teachers with minimum training in earth science, brief systematic review of principles of geology emphasizing laboratory and field work dealing with rocks, earth, fauna, flora, maps, and geologic history.

B105 Laboratory Study in Biological Science or. or. or.
Special study designed for teachers who wish to sharpen their understanding of biological science. Matter consists of a set of readings from current biological science literature.

B106 Laboratory Techniques in Biology or. or. or.
Special study for teachers who wish to sharpen their understanding of laboratory procedures, including solutions, cultures, and organisms.

B115 Commentary on Contemporary Physics or. or. or.
Provide background for understanding of modern physics especially important in secondary school science. Emphasis should be in terms of "national programs" in physics and educational requirements.

B120 Modern Concepts in Chemistry or. or. or.
Updates and strengthens current backgrounds of students; attention given to new research; emphasis on chemical sciences.

B125 Modern Concepts in Earth Science or. or. or.
Review of research in field special reference to applicability in teaching.

B130 Nutrition or. or. or.
Provision for independent study.

B130 Meeting of Science 2 or 3 s.h.
Explore elementary philosophy and logic which characterize science. Emphasis on how such concepts are teaching.

B130 History of Science 2 or 3 s.h.
Major stage of development of modern science and the American science effort of early 19th Century. Focus, modern European science upon current events of scientific importance.

B140 Problems in Teaching the Teaching of Environmental Science 3 s.h.
Consider approaches toward understanding environmental problems through elementary school and textbook systems within which they exist; involve development of "error history" of significant environmental time having local importance; prerequisite: consent of instructor.

B150 Problems of Science Education or. or. or.
Instruction in chemistry research design in science education; identification of research problems, assistance with pilot projects, required of all M.S. candidates and Ph.D. candidates. If not part of M.S. program note as 75.300

87.261 Construction of Teaching Materials for Science 3 s.h.
Preparation of special laboratory materials for instruction is elementary, junior high and high school courses; some attention to other learning materials, such as audio-visual materials, used at all levels; experience in this work will be found in current secondary and college teaching, required of all graduate students; note as 75.300.

87.262 Science Curriculum 3 s.h.
A study of the literature, policies, and techniques of constructing science courses, college level. An extensive study of current policy and practice in course design and development.

87.263 Supervision of Science 3 s.h.
Practices, principles, responsibilities, and objectives of teaching science, and supervision of teaching science. Attention given to problems of changed emphasis: supervision of courses, regional, state and national boards; examination of "evaluation" and development of new procedures used primarily for supervising new and advanced teachers.

87.300 Seminar Science Education or. or. or.
Reports of research projects selected in science program; emphasis on reports of research on M.S. and Ph.D. levels; paper intensive, group discussion and analysis of individual presentations; required of all Ph.D. candidates each semester; one registration required of all master's candidates; same as 75.300.

87.351 Special Problems in Science Education or. or. or.
Preparation of formal presentations for Ph.D. candidates; required of all Ph.D. candidates and preceded by committee approval (usually in the spring). Same as 75.351.

87.390 M.A. Thesis or. or. or.
Preparatory course of instructor.

87.493 Ph.D. Dissertation or. or. or.

Social Studies Education

Chairman: John H. Neher
Degrees offered: B.A., M.A., Ph.D.

Undergraduate Program

The major in social studies introduces the student to social science on our campus. Standing by itself, it is a broad, interdisciplinary, non-professional major providing an excellent foundation for careers in law, social work, religion, urban planning and development, and government service at all levels. Graduates of the program have gone on to teach, to conduct research, and to write books in secondary education. Together with the professional requirements for certification, this major meets the requirements established by the North Central Association of Colleges and Secondary Schools.

There is good deal of flexibility in the program and, in consultation with an adviser, it can be tailored to the needs and interests of the individual student. All of the coursework is taken within the seven cooperating departments: Anthropology, Economics, Geography, History, Political Science, Psychology and Sociology.

The B.A. in Social Studies consists of a total of 52 semester hours distributed as follows: 12 semester hours in history, including a minimum of eight semester hours in the history of the United States; eight semester hours each in the Departments of Economics, Political Science, Sociology, and Geography; and eight semester hours of elective work which may be done in anthropology or psychology or may be distributed among one or more of the seven departments.
Students pursuing a social studies major will be engaged in survey courses introducing them to the various social sciences. But many of the departments offer independent study and readings as alternatives to formal classes. There is no separate Honors Program in social studies. Students who qualify are encouraged to do their Honors work in the social science department in which they wish to concentrate their work.

Admission Requirements
Students wishing to major in social studies must have the permission of an adviser. Transfer students must have earned a minimum grade-point average of 2.5 in all work done in the subjects of the seven cooperating departments in order to be admitted to the program. Approval of advisability for the bachelor's degree will be granted only by students who have a 2.5 grade-point average in all college work undertaken in the cooperating departments.

Graduate Program
Master of Arts
The inter-disciplinary nature of the Master of Arts in Social Studies Education degree is of special interest to classroom teachers in secondary education, to instructors in junior and community colleges, and to educators wishing to concentrate in social studies curriculum and instruction.

Graduates of this program are at work as classroom teachers and chairmen of social studies departments in junior and senior high schools. Some are serving as curriculum consultants for school districts, while others are staff members in community colleges. A few have found the degree excellent preparation for their professional work in various correctional and penal institutions.

For a small number the master's program has provided access to civil service positions at various levels of government. In the master's program the candidate may elect to take the degree with or without thesis. A minimum of 38 semester hours is required under either plan. These 36 semester hours may be distributed in one of two ways.

In Plan A the candidate does or his or her work in three of the seven cooperating departments: Anthropology, Economics, Geography, History, Political Science, Psychology and Sociology. A minimum of 10 semester hours is required in each of the three fields chosen. The remaining eight semester hours may be taken in one of the three fields or distributed among them.

In Plan B the candidate work in two of the cooperating social science departments and in courses offered by the College of Education. Under this plan the student takes a minimum of 10 semester hours in each of the two social sciences he or she has chosen, and a maximum of 10 semester hours in education. The remaining eight semester hours may be taken in one of the social science fields or distributed between them.

Under either plan, a minimum of nine semester hours must be taken in graduate courses bearing a number of 200 or over. It is intended that at least one such course be taken in each of the three fields included in the program.

Comprehensive written and oral examinations are required of the candidate. The written portion consists of a six-hour examination over the fields in which the candidate has distributed his or her work. These are intended to be comprehensive, not course examinations, and are submitted by staff members from the fields in which the candidate is concentrating. The oral portion is conducted by the candidate's committee in the field.

Candidates in this program may have a wide variety of educational experiences, depending on the fields of study chosen. Small group instruction, seminar work, independent study and reading, experience with computers, internships and laboratory work are among the possibilities.

Admission Requirements
A student wishing to major in social studies for a master's degree must present a minimum of 20 semester hours of credit in the area of social studies earned as an undergraduate in an accredited institution. The transcript of the applicant must show a minimum grade-point average of 2.5 or all work undertaken in the social studies up to the time of application. After having declared a social studies major, a student must maintain a 2.5 grade-point average in all work undertaken.

Doctor of Philosophy
Graduates with a doctorate in social studies education can be found in a variety of professional positions. Some have gone into administration in institutions of higher education and are serving as presidents, provosts or deans of faculty or graduate schools. Some are department chairmen in colleges of education or curriculum directors in large school districts. Many are engaged in teacher education programs in colleges and universities. Quite a few are college instructors in their areas of academic concentration.

As is true of the bachelor's and master's degrees, the doctorate is an interdisciplinary program administered through the College of Education. The emphasis is on broad but thorough grounding in two of the academic areas chosen from history and the social sciences, and specialization in some aspect of professional education. The student must take a minimum of 90 semester hours of coursework and dissertation credit beyond the bachelor's degree and exclusive of requirements established by the College of Education. These credits are to be distributed among two of the cooperating disciplines—anthropology, economics, geography, history, political science, psychology and sociology—and the field of professional education. Depending upon the background and needs of the candidate, work in the two disciplines chosen will constitute between 60 and 75 percent of the 90 semester hours; work in education, between 25 and 40 percent of the total.

Depending upon the areas of study chosen by the candidate, there will be opportunity for regular class work, small group instruction, internship, independent study, field work, and laboratory and computer experience. Seminar and advanced work in courses numbered 400 or above is required in each of the three areas chosen for study.

After most of the coursework has been completed, a qualifying examination of approximately nine hours—three hours in each of the fields chosen for study—is required. When the dissertation has been completed, an oral examination is conducted by the candidate's committee in the field.

The research problem may be in either of the two academic
Likewise, the suspence of practice are quite varied. All levels of government, from local to international, employ social workers, as do a range of nongovernmental agencies. Social work practice is found in settings where the function is predominantly social work service and also in settings where the central function is mainly other than social work (e.g., medicine or education). There is also some private practice.

The School is affiliated with the graduate and undergraduate sections of the Council on Social Work Education, and is approved by the Council’s Commission on Accreditation.

Undergraduate Program

The undergraduate program in social work is primarily intended to provide a broad general education along with basic preparation for those desiring to enter social work practice directly. Several groups of student goals are encompassed—employment in the social welfare field (where the B.A. degree is sufficient for entrance into such fields as public welfare, family and children services, corrections, certain group-serving organizations); providing a base for graduate study especially in social work; providing knowledge for employment in allied helping professions; and broad preparation for informed citizenship activities. The program is a four-year course of study. With the exception of the social service courses taught by the social work faculty, it consists of regular courses in other departments of the University.

Advisory Service

The student may declare the major in social work when enrolling as a freshman or at any later time when completion of the major remains feasible. This declaration should be made to the Liberal Arts Advisory Office, whereupon the student will be assigned to an undergraduate adviser on the faculty of the School of Social Work.

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.

Requirements

Undergraduate students majoring in social work must satisfy the general College of Liberal Arts basic skills, core and foreign language requirements, excluding the social science core. The following courses are required for the major:

30:001 Introduction to American Politics or 30:100 American Political System 4.0 h.
31:1 Elementary Psychology 4.0 h.
31:3 General Psychology 4.0 h.
34:1 Introduction to Sociology: Principles 4.0 h.
6E:1 Principles of Economics or 6E:2 or 6E:106 4.0 h.
42:168 The Field of Social Work (serves as Sociology 141A) 4.0 h.
42:171 Social Welfare Policy I 4.0 h.
42:176 Introduction to Social Work Methods 4.0 h.
42:193 Field Experience 3.0 h.
A minimum of 15 semester hours of coursework is required in one department from the 12 listed below. Most students select either sociology or psychology for this purpose. One of the above specifically required social science courses can be applied toward this requirement if the choice for the 15 hours is in a department of the social sciences. At least six hours are required from one or more departments in the other group.

A. Social Science
   Economics
   Geography
   Political Science
   Psychology
   Sociology

B. Humanities
   American Civilization
   English
   European Literature and History
   Philosophy
   Religion

For most students majoring in social work, there is considerable room for electives in social work as well as in other departments. In making these selections, students can contact the School of Social Work for a list of recommended courses.

The following electives are offered in social work:

- 42:062 Elementary Statistical Concepts 3 s.h.
- 42:131 Human Behavior in the Social Environment 4 s.h.
- 42:132 Human Behavior in the Social Environment II 3 s.h.
- 42:191 Individual Study 1-3 s.h.
- 42:192 Honors in Social Work 2-3 s.h.

Graduate Program

The primary objective of the School is to have each student achieve a foundation for entering and growing in professional service. Students are expected to master basic knowledge and skill underlying the profession and become self-sufficient practitioners able to assume responsibility for their continued education throughout a lifetime. This implies a sensitivity and responsiveness to changes occurring in our work, and particularly to the conditions arising from these changes in both their personal and social aspects. The School emphasizes the diversity of role performance of the social worker and the common and differential use of knowledge. It recognizes that social work practice requires competency in working with individuals, groups, and communities.

The School has several distinguishing characteristics. It is one of a limited number of schools which has a 16-month program encompassing the summer months. Each student is assigned to a single practicum base which takes place within the context of the community with teaching-learning experiences drawn from a wide range of resources in that community. A student's practicum base may be in one of the community agencies or in a Training Center, located in one of three geographical areas, and administered by the School through its own faculty members. Individualization of students' needs and interests is provided through the choices available in the development of his or her educational program as he or she fulfills the basic requirements of the School and through provision for electives within the School and the University.

The student begins the program late in August and completes it in late December of the second year. All students are on the Iowa City campus during the first semester of the first year, spending full time in classroom courses. Beginning the spring semester of the first year and continuing until late October of the final semester, the student is in the practicum and has concurrent classroom courses. The latter part of that semester is used for completion of the comprehensive requirements and coursework. Educational Centers are maintained in Iowa City and Des Moines. After the fall semester of the first year, classes meet in these Centers and each student attends one semester his or her practicum placement requirement.

The graduate curriculum is organized into four interdependent sequences of courses: Social Work Practice, Social Welfare Policy, Human Behavior in the Social Environment and Practice. All students take courses in each of the sequences, and each student receives four units for special study. A program of study is organized to meet the requirements of the School and to accommodate the educational goals of the individual student. A student may be waived out of required courses by satisfactorily completing the testing procedures administered by the respective course instructors. Required courses are indicated in the course descriptions by an asterisk. The research requirement, in addition to the basic course, is met through a seminar in social work research, participation in ongoing research or completion of an individual or group research project. In addition, during the second year students are required to complete at least one unit of study in social welfare policy, social work practice and human behavior, and one unit in each of the following human systems: individual, family, group, organization and community.

Requirements

- A minimum of 52 semester hours of credit is required in graduate courses approved by the School.
- At least 24 of the semester hours earned in residence at The University of Iowa;
- A minimum cumulative grade-point average of 2.50 on a 4.0 scale;
- Satisfactory completion of all required coursework, including the research requirement;
- No credits by correspondence; and
- A final comprehensive requirement late in the second year of study.

Upon faculty recommendation, a student who has completed a clear equivalent of part or parts of the M.S.W. program during the junior and senior undergraduate years may be permitted to qualify for the degree with less than 51 semester hours of graduate credit, but in no case with less than 40 hours. Any student who may wish to omit a specific course may, upon written request, have opportunity for a precourse examination.

Admission

Applications for admission are accepted after October 1 for entrance the following August, which is the only starting time for the full M.S.W. program. Early application is recommended; admissions may have to be closed shortly after January 1.
Courses Primarily for Undergraduates

42902 Elementary Statistical Concepts 3 a.h.
42903 The Field of Social Work 4 a.h.
42908 Social Welfare in Soviet Institutions; historical development; structure of social work practice; profession of social work; some facts on Sociology 34-508
42916 Introduction to Social Work Methods 4 a.h.
42919 Introduction to Social Work Practice 4 a.h.
42920 Individual Study 4 a.h.
42980 Social Welfare Policy: Selected Aspects I 3 a.h.
42983 Social Welfare Policy: Selected Aspects II 3 a.h.
42990 Social Welfare Policy: Selected Aspects IV 3 a.h.

Courses for Graduates

43131* Social Work in the Soviet Experience I 4 a.h. or 4 a.h.
43137 Social Work in the Soviet Experience II 4 a.h. or 4 a.h.
43139 Social Work in the Soviet Experience III 4 a.h. or 4 a.h.
43155 Social Work in the Soviet Experience IV 4 a.h. or 4 a.h.

* Required in the M.S.W. program

References in other courses not noted here are assumed to be the same as those noted in the Social Work in the Soviet Experience courses. Students are referred to the course descriptions for further information.

Courses Primarily for Graduates

43217 Social Work: Research and Evaluation 3 a.h.
43218 Seminar on the Family 3 a.h.
43221 Legal Problems of Social Welfare 3 a.h.
43222 Sociology of Social Welfare: readings and legal aspects of social work practice 3 a.h.
Sociology

Department Chairmen: James L. Price

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

Undergraduate Programs

The undergraduate program provides sociology courses as a means of promoting a liberal arts education. No attempt is made to prepare undergraduate majors for specific careers.

However, an undergraduate major in sociology provides three types of direct assistance in career preparation. First, some careers which require no graduate education have as a prerequisite social science knowledge which sociology is especially well equipped to provide; an example of such a career is social science teaching in high school. Second, some careers which require graduate education have traditionally found considerable benefit from an undergraduate major in sociology; social work is an example. Third, teaching and research in sociology in colleges and universities is usually preceded by an undergraduate major in sociology.

Undergraduate majors who are primarily interested in career preparation should plan their programs in joint consultation with the sociology advisor and an adviser representing the career into which entrance is sought.

Undergraduates who are not majoring in sociology commonly take sociology courses in their career preparation. Most of these students come from business administration, elementary education, and nursing. Undergraduate students interested in careers in the physical, biological or social sciences are advised to seek the Bachelor of Science degree. A minimum of 26 semester hours is required within the Department for either degree. In addition, the general requirements of the College of Liberal Arts must be fulfilled.

Both the Bachelor of Science and Bachelor of Arts majors require 34.1 Introduction to Sociology: Principles, 34.2 Introduction to Sociology: Problems and 14.12-14 Theory, Research and Statistics. The student should take the two courses in theory, research and statistics as soon as possible to increase his or her capacity to benefit from additional coursework in sociology. Courses for the other 12 hours in sociology may be freely chosen by the student.

Additional requirements for the Bachelor of Science degree include either 22M.2 Mathematical Techniques I and 22M.30 Elementary Functions, or 22C.7 Introduction to Computer with Formulas and 22C.17 Computing with PL/1; and 22B.25 Elementary Probability and Statistics II, 14.23 and 26 and Calculus I-II may be substituted for either of the mathematics options by students who have had the equivalent of 22M.2 Mathematical Techniques I or 22M.30 Elementary Functions in high school.

In addition to the requirements, all undergraduate majors are advised to take six semester hours in anthropology, economics, geography, political science or psychology, and to include in their programs at least one basic course in history or philosophy.

Students who are preparing for high school teaching should note that eight hours are required for certification in an allied field.

In most cases, it is advisable to choose departmental electives for a general major, leaving the more specialized courses for graduate study.

Honors students who wish to graduate with Honors must include 34.190 Development of Modern Social Theory and 34.97 Honors Research in their programs. Each candidate for Honors must have an Honors advisor and take an examination at the end of the senior year.

Graduate Programs

The graduate training program in Sociology is career-oriented. Major attention is directed toward the education of professional sociologists, most of whom will teach and do research in colleges and universities.

The Department also provides professional training in the areas of deviance-control. Students interested in this type of professional training enroll in one of two programs, the Master of Arts with concentration in criminology or the Master of Arts with concentration in law enforcement and corrections.

With few exceptions, admission into the graduate program requires a minimum undergraduate grade-point average of 3.0 and a combined score of 1100 on the Graduate Record Examination. (The score of 1100 refers to the combined scores of the quantitative and verbal sections of the Graduate Record Examination.)

The Master of Arts degree in sociology may be obtained in a 30-hour program with thesis or in a 36-hour program without thesis. With the exception of the thesis, the two programs are essentially the same. The program without thesis is intended for persons who want 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 take 34.201 History of Sociological Theory, 34.202 Sociological Theory, 34.214 Elementary Statistics and Data Analysis, and 34.215 Sampling, Measurement and Statistical Techniques. Those few required courses must be passed with a grade of B or better.

The Doctor of Philosophy degree in sociology is awarded to candidates who have completed approximately 90 hours of work at the graduate level, pass a post-M.A. set of courses in methodology-statistics (34.216 Intermediate Statistics and Data Analysis, 34.117 Theory and Research Design, and 34.218 Advanced Statistics and Data Analysis), complete the comprehensive examinations and prepare a dissertation.

All candidates for the Doctor of Philosophy degree are expected to be competent in the basic tools of the sociologist—theory, history of theory, methodology and statistics. In addition, each candidate is examined over one major and one minor area chosen from among the areas currently represented on the faculty. Examples of current areas are social psychology, criminology, research methods, deviant behavior, family, stratification, political sociology, community, organizations and the basic tools. A student's major and minor areas cannot both be in basic tools. A detailed statement of regulations for graduate study is available upon request. Prospective doctoral candidates should carefully examine this statement.

The M.A. with Concentration in Criminology

The Master of Arts degree with concentration in criminology is a 10-semester-hour program with thesis. An internship for
which research credit may be obtained may be arranged during the semester in a correctional institution or agency. Students who are awarded this degree may be eligible for continued work toward the Ph.D. in sociology.

The M.A. program with concentration in criminology provides the student with the latest information regarding the nature of crime and delinquency, their causes and treatment, and with an opportunity to gain insights into some of the problems which will confront him or her in future work. Arrangements have been made to utilize Iowa's penal institutions, training schools and correctional agencies as laboratories for graduate instruction. Persons applying for admission to this program should have the equivalent of an undergraduate major in sociology, including a first course in criminology or juvenile delinquency.

These additional courses are required:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>34:143 - 144</td>
<td>Crime and Justice</td>
<td>6 c.h.</td>
</tr>
<tr>
<td>34:142</td>
<td>Probation and Parole</td>
<td>2 c.h.</td>
</tr>
<tr>
<td>34:145</td>
<td>American Prison Systems and Their Administration</td>
<td>2 c.h.</td>
</tr>
<tr>
<td>34:146</td>
<td>American Police Systems and Their Administration</td>
<td>2 c.h.</td>
</tr>
<tr>
<td>34:147</td>
<td>Prevention of Crime and Delinquency</td>
<td>2 c.h.</td>
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</table>

The remainder of the student's program will be composed of courses selected to meet particular needs and goals.

M.A. with Concentration in Law Enforcement and Corrections

Successful completion of this program requires a minimum of 45 graduate credits and 20 to an M.A. degree in Law Enforcement and Corrections without thesis. Students who obtain this degree will be qualified for a variety of positions in law enforcement and correction. The program provides the student with a broad education in the social and behavioral sciences; knowledge of criminal law and procedure, and the administration of justice; an understanding of the administration and operation of law enforcement agencies and institutions; familiarity with the field of community organization and welfare services; and training and experience in interviewing, counseling, investigation and case recording. The program is founded on the conviction that the sociology can make important contributions in the field of law enforcement; therefore, corrections and sociological orientations are emphasized.

As for the M.A. program with concentration in criminology, arrangements have been made to utilize Iowa's penal institutions, training schools and correctional agencies as laboratories for graduate instruction.

To be admitted to the program, the student must have a B.S. or B.A. degree and a minimum grade-point average of 2.75, and must have completed these courses or equivalents:

<table>
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<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>34:1</td>
<td>Elementary Psychology</td>
<td>3 c.h.</td>
</tr>
<tr>
<td>34:163</td>
<td>Abnormal Psychology</td>
<td>3 c.h.</td>
</tr>
<tr>
<td>34:1</td>
<td>Introduction to Sociology: Principles</td>
<td>3 c.h.</td>
</tr>
<tr>
<td>34:214</td>
<td>Elementary Statistics and Data Analysis</td>
<td>3 c.h.</td>
</tr>
<tr>
<td>34:215</td>
<td>Sampling, Measurement and Observational Techniques</td>
<td>3 c.h.</td>
</tr>
<tr>
<td>34:120</td>
<td>Principles of Social Psychology</td>
<td>3 c.h.</td>
</tr>
<tr>
<td>34:126</td>
<td>Collective Behavior</td>
<td>3 c.h.</td>
</tr>
<tr>
<td>34:140</td>
<td>Criminology</td>
<td>3 c.h.</td>
</tr>
<tr>
<td>34:141</td>
<td>Juvenile Delinquency</td>
<td>3 c.h.</td>
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</table>

Special Facilities

The Department maintains IBM unit record machines, electronic calculators and computer terminals for research and teaching activities. 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).

CRIB was established in 1968 as a laboratory for research in social psychology. The basic facility is a five-room small-groups laboratory complex with audio, videotape and interactive process recording equipment.

The data archives unit houses the results of numerous survey studies which are made available for teaching and research purposes to faculty and students.

IUCRC was established in 1958 and maintains a research library, data bank and laboratory.

Staff: Professors Caldwell, Moffard, Price, Saunders, Staff, Shannon, Wiltse; associate professors Couch, Payne, Stratton; assistant professors Fox, Kim, Robinson, Winterland; instructors: Kraus, Lawer, Shearing-Phillips; staff, Jacobson, Johnson.

Courses for Undergraduates Only

Note: All sociology majors required to take 34:1, 34:2, 34:14 and 34:11.

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>34:1</td>
<td>Introduction to Sociology: Principles</td>
<td>3 c.h.</td>
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</table>

Successful approach to the study of culture and social behavior. Introduces students to sociological perspectives. Prerequisite: 34:1 may be taken in partial fulfillment of exit science core requirements.

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<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>34:12</td>
<td>Sociological Analysis of Behavior</td>
<td>3 c.h.</td>
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</table>

Concentration of 34:11; analysis of selected variables of political behavior and social behavior. Prerequisites: 34:11 may be taken in partial fulfillment of exit science core requirements.

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>34:18</td>
<td>Theory, Research and Methodology</td>
<td>3 c.h.</td>
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Year-long introduction to sociology. Critical examination of social research, including problems of sampling and measurement, selection of research materials, and interpreting research findings. Matrix of research on the scientific study of social phenomena. Prerequisite: 34:11 and 34:12.

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<tr>
<th>Course Code</th>
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<tr>
<td>34:28</td>
<td>Individual Study</td>
<td>1 c.h.</td>
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Directed reading in special areas of sociology in which student has had previous work.

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<tr>
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<tr>
<td>34:405</td>
<td>Honors Seminar</td>
<td>3 c.h.</td>
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For upper-division students. Open to superior academic records; selected topics of special academic interest. Prerequisite: permission of instructor.

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<tr>
<td>34:406</td>
<td>Honors Research</td>
<td>3 c.h.</td>
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For upper-division students. Open to superior academic records; selected topics of special academic interest. Open to honors committee, selected after consultation with honors adviser.

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>34:410</td>
<td>Special Project</td>
<td>3 c.h.</td>
</tr>
</tbody>
</table>

For upper-division students. Open to superior academic records; selected topics of special academic interest. Open to honors committee, selected after consultation with honors adviser.
Advanced Courses

Social Theory
34:190 The Development of Modern Social Theory
3 s.h.
Consensus on selected writings of major nineteenth-century theorists and several representative contemporary sociologists, recommended for sociology majors and required for Thesis majors; prerequisites: 34:1 and junior standing.
34:201 History of Sociological Theory
3 s.h.
Issues of major twentieth-century social thinkers: Marx, Weber, Durkheim, Stauden, Meade; prerequisite: graduate standing or consent of instruc-
tor.
34:202 Sociological Theory
3 s.h.
Contemporary theoretical ideas and trends in sociology; nature of theory, place of theory in research and strategies of theory construction; prerequisites: graduate standing or consent of instructor.
34:203 Seminar: Sociological Theory
3 s.h.
Selected problems in sociological theory (prerequisites: 34:201 and 34:202 or con-
sent of instructor; may be repeated).
34:204 Sociology of Knowledge
3 s.h.
Role of ideas, belief systems and ideologies in social life; relationship between ideas and social control as macrostructural and/or microstructural levels; pre-
quisite: graduate standing or consent of instructor.
34:205 Seminar: Contemporary Social Theory
34 s.h.
Compass and cranium of making sense: contemporary theoretical approaches and theories of empirical research studies; prerequisite: graduate standing and graduate level status.
34:207 Seminar: General Systems Theory
3 s.h.
Relevance of general systems theory to social sciences; changing conception of ideas like “system,” “process,” “feedback,” cybernetics and idea of control, closure, Carnap’s ontologies and internal evolution, process of structures transform-
ations; other central concepts; general systems model as integrating paradigm for all sciences, as alternative to concepts of social structure and social organization in sociology, and in concepts of interaction and behavior in social psychology; prerequisite: graduate standing or permission of instructor.

Statistics and Methods of Research
34:111 Nonparametric Statistics in Social Research
3 s.h.
Techniques which do not make numerous stringent assumptions about nature of population from which data are drawn, emphasis on application to rank-order and classification data in small samples; prerequisites: 34:214 or equivalent.
34:212 Mathematics for Sociology
3 s.h.
Review of mathematics relevant to analysis of social systems and survey of economic, quantitative, and mathematical models; prerequisite: graduate standing and consent of instructor.
34:213 Research Design and Data Analysis
3 s.h.
Problems of drawing theoretical inference from data in studies using very large samples, study designs and statistical procedures; procedures common to many areas of social association, logic of statistical inference and hypothesis testing; correc-
tion and control of errors; multiple regression techniques of social-cum- 
trol transaction; design; and sample elaboration; electronic data processing; prerequisite: introductory statistics.
34:215 Sampling, Measurement and Observational Techniques
3 s.h.
Procedures of drawing social data from which valid inferences or ob-
servations may be drawn: basic sampling designs, questionnaire construction, interview-
ing techniques, principles of participant observation, coding and preparation of data for computer analysis; computer and collective research, reliability and validity problems, and testing techniques; prerequisite: 34:214.
34:216 Intermediate Statistics and Data Analysis
3 s.h.
Procedures of drawing theoretical inference from data in studies using basic design, measurement techniques and analytical procedures, choice of optimal parametric and nonparametric statistical techniques for basic analysis problems, elementary procedures of measurement error in data analysis, analysis of variance and statistical interactions, and other recent computer applications in data processing; prerequisites: 34:1 and 34:215.
34:217 Theory and Research Design
3 s.h.
Theory building and field problem formulation; operationalization and measurement of theoretical variables; choice of strategy, research site, team, qual-
itative and quantitative research design; developing and testing causal models; prerequisite: 34:215.
34:218 Advanced Statistics and Data Analysis
3 s.h.
Problems of drawing theoretical inference from data in studies using moderately complex measures, study designs and analytical techniques, multivariate methods involving several variables; measurement and seeking error in data analysis; teststa-
tioning: regression and simple transformations; computer applications; prerequisite: 34:1 and 34:216.
34:219 Seminar in Research Methods and Data Analysis
3 s.h.
Selected topics: prerequisite: advanced graduate standing and consent of instruc-
tor; may be repeated.

Social Psychology
34:100 Principles of Social Psychology
3 s.h.
Basic concepts and principles of social psychology: personality, intrapsychic and interpersonal processes; prerequisite: 34:1.
34:105 Research Methods in Social Psychology
3 s.h.
Methodology, results and interpretations of studies of social psychology of mental health and mental illness and of psychiatric hospital social institutions; prerequisite: 34:1.
34:122 Media Communication
3 s.h.
Problems of conceptualization and measurement of opinion processes, influence of mass media, reference groups and subgroups, interpersonal relations, personality factors, mass media; prerequisites: 34:115, 34:120, 34:125, 34:135, 34:141.
34:135 Small Group Analysis
3 s.h.
Study of small groups as functional units in structure of larger social organizations; emphasis on research interest in its own right; prerequisites: 34:120 and Psychology 34:1 or graduate standing and consent of instructor.
34:161 Socialization
3 s.h.
Socialization, creed behavior, social movements treated as forms of social change; prerequisite: 34:120.
34:167 Interaction Processes
3 s.h.
Various aspects of study of interactional processes in both laboratory and field settings, special emphasis given to problems of measurement and interaction; stu-
dents required to observe, coding and analyses of social interaction; prerequisites: 34:1 and 34:120.
34:177 Field Methods in Social Psychology
4 s.h.
Field experiments, quasi-experiments and routine natural observation technique; open to advanced undergraduates and graduate students; enrollment by permission of instructor; prerequisites: 34:1 and 34:120.
34:180 Culture and Personality
3 s.h.
Principles of psychosocial psychology, psychological variables in understanding behav-
ior; intrapsychic differences and rotations in personality and socialization; prerequisite: 34:150 or 151 or 151H or Sociology 34:1.
34:189 Group Organization and Leadership
3 s.h.
Principles of social psychology, interpersonal relations in small group; prono-
unces of group formation and change social functions of leadership; prerequisites: 34:1.
34:230 Contemporary Approaches to Social Psychology
3 s.h.
Review and critical analysis of recent theoretical approaches and theories of social psychology; prerequisites: 34:120 and Demonstrated standing as major or (degrees major) in social psychology; other by consent of instructor.
34:251 Seminar: Selected Topics in Social Psychology
3 s.h.
Selected theoretical and methodological issues, prerequisite: advanced graduate standing and consent of instructor; may be repeated.
34:256 Psychology in Small Groups
3 s.h.
Selected topics: prerequisite: advanced graduate standing and consent of instruc-
tor; may be repeated.
34:268 Seminar in Collective Behavior
3 s.h.
Selected topics: prerequisite: advanced graduate standing and consent of instruc-
tor; may be repeated.
34:270 Models of Deviation
3 s.h.
Models and dynamics of deviances, particular emphasis upon significant
geographical and ethnicological issues; prerequisite: graduate standing and collective social behavior; prerequisite: consent of instructor; may be repeated.
34:275 Developmental Psychology
3 s.h.
Problems of normal growth and development; prerequisite: advanced social psycholog-
ical psychology; prerequisite: consent of instructor; may be repeated.

Criminology and Penology
34:140 Criminology
3 s.h.
Criminology, the crime problem, criminal investigation and pre-trial, pre-trial, pre-trial, pre-trial, pre-trial, pre-trial, pre-trial, pre-trial
36:247 Seminar: Community Surveys 3 a.h.
Examination of community study project, in coordination with activities of Iowa Urban Community Research Center; prerequisite consent of instructor.

36:277 Seminar: Community Theories 3 a.h.
Survey of current and historical theories and writings relevant to understanding of urban communities; includes study of writings of DuCharme, Park, Reinhard, Woman and others; prerequisite: graduate standing or consent of instructor.

36:285 Seminar: Community Development 3 a.h.
Problems growing out of increase in urban population and relative decline in rural population; emphasis on Iowa and the Midwest; prerequisite: graduate standing and consent of instructor.

Social Problems
36:138 Sociology of Aging 3 a.h.
Aging: problems of old-definition, communication breakdowns and changing value systems; reading with respect to areas of ability; prerequisite: 13:1.

36:123 The Social Psychology of Alcohol Use and Community Problems 3 a.h.
Social and cultural factors in delinquency and use of beverage alcohol; social psychological analysis; public definition and responses to alcoholism; prerequisite 13:120. 13:193 Criminology 3 a.h.
Description under "Criminology and Police".

36:141 Juvenile Delinquency 3 a.h.
Description under "Criminology and Police".

36:151 Social Problems of Underdeveloped Areas 3 a.h.
Description under "Social Institutions and Social Change"; same as 11:151.

36:155 Race and Ethnic Relations 3 a.h.
Multidisciplinary study of intergroup relations, special emphasis given to historical, sociological and psychological issues in study of American minority groups; prerequisite: 24:1.

36:179 African Social Structure and Social Change 3 a.h.
Development problems in relation to villages, kinship, power structure and urbanization in tropical Africa; prerequisite 23:1; 24:1; 11:0; 11:150; same as Anthology 111:121.

36:344 Seminar: Deviant Behavior 3 a.h.
Description under "Social Institutions and Social Change".

Individual Reading and Research Projects
36:433 Independent Study 3 a.h.
arr

36:434 Research 3 a.h.
arr

36:435 Thesis 3 a.h.
arr

Spanish and Portuguese
Department Chairman: Oscar Fernandez Degree offered: B.A., M.A., Ph.D.

The Department provides coursework for undergraduate and graduate majors in Spanish or Portuguese, for satisfaction of foreign language requirements for baccalaureate and advanced degrees in other fields and for satisfaction of the second literature requirement for undergraduate majors in English and in Letters.

The Department works closely with the departments of Sociology and Anthropology, which offer certification in Latin American Studies; with the University's several other foreign language departments; and with the School of Letters and departments of Political Science, History and English.

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 transportation, tourism, journalism, international broadcasting and publishing, as well as research, library work and translating.
Undergraduate Programs in Spanish

There are two programs for undergraduate majors in Spanish. First- and second-semester courses interrelate the four performance objectives—understanding, speaking, reading and writing—through a four-skills format and a policy of frequently testing these skills. Students thereby acquire a broader base on which to diagnose their strengths and weaknesses and to calculate and plot their progress in preparation for future work. Third- and fourth-semester courses are conducted on a dual-track basis, allowing students to enroll in sections having either an oral and/or a written emphasis, writing and oratory analysis.

Upper-level courses are scheduled to enable students to arrange their schedules so that they are to complete contact with the language four or more consecutive hours on given days. The undergraduate major in Spanish requires these courses beyond the second-year level:

Language
35:27-28 Third-Year Composition and Conversation
35:105 Fourth-Year Composition and Conversation

Literature
35:101 Renaissance and Golden Age Literature
35:102 Modern Spanish Literature
35:103 Contemporary Spanish-American Literature
35:104 Spanish-American Poetry and Literature

Spanish Teaching Minor
The Spanish teaching minor requires 35:27-28, 35:105 and 35:157 Spanish Pronunciation and Diction. Students preparing for certification to teach at the secondary level should elect additional courses in pronunciation and civilization.

Honors in Spanish
Admission to the Honors Program in Spanish requires a 3.0 minimum grade-point average overall and a 3.2 in Spanish. Graduation with honors in Spanish requires six semester hours earned in 35:123-124 Honors Literature, 35:121-122 Honors Language, 35:123-124 Honors Literature, 35:122-123 Honors Language, and an Honors essay in Spanish and/or an oral discourse in Spanish.

Undergraduate Program in Portuguese
The first-year Portuguese program employs a shared-teaching technique in which sections usually are taught three days a week by one teacher and two by another. This gives students exposure to different teaching techniques, voices and accents in a correlated program which provides a wider base of experience as preparation for future study of the language.

The undergraduate major in Portuguese requires 24 semester hours of credit in courses beyond the second-year level.

Offerings for Nonmajors
Undergraduate students pursuing Bachelor of Arts or Bachelor of Science degrees in other disciplines may meet part of the College of Liberal Arts language requirement with English-translation reading courses the Department offers.

A senior seminar, The Concept of Revolution in Twentieth-Century Spanish-American Writing, and a course on Cervantes are also conducted in English. All other Spanish literature courses are conducted in Spanish.

The Department's Portuguese division offers Brazilian Civilization and Portuguese Civilization to English; the two courses provide a broad overview of the two cultures.

The Department's English-language courses in Hispanic literature are coordinated with those for the newly-established major in letters, and further interdisciplinary development of this kind is anticipated.

Graduate Programs
Master of Arts
Candidates for the M.A. degree must complete 38 semester hours of course work with a thesis, including 35:208-209 Graduate Composition and Conversation, 35:210 Studies in Style and prescriptive literature courses covering the Middle Ages, the Golden Age (Cervantes and one other aspect), the modern era and Spanish America.

Candidates for the M.A. must have completed the equivalent of the undergraduate major. Deficiencies may be remedied with the appropriate coursework.

Doctor of Philosophy
All prospective Ph.D. candidates must apply to the Department in writing. The degree requires at least three years of graduate study—at least one of them at Iowa—and the passing of a comprehensive examination, preparation of a dissertation and oral defense of the dissertation. Candidates must demonstrate early an ability to conduct independent investigation, by completing two research projects.

Two doctoral programs are available.

One provides for intense specialization in Spanish and Spanish-American literature. Before his or her comprehensive examination the candidate must become well acquainted with another Romance language and literature (a Portuguese-Brazilian program is especially recommended), complete the equivalent of a year of college Latin and demonstrate a reading knowledge of another approved foreign language.

The other doctoral program provides for specialization in Spanish language and literature with emphasis on philology. Before his or her comprehensive examination, the candidate must complete a course in general linguistics, complete the equivalent of three semesters of college Latin and demonstrate a reading knowledge of another approved foreign language.

In both programs coursework and individual reading must be designed to give the candidate a thorough knowledge of the history of the Spanish language, its literature and related civilizations, from medieval to modern times; provide adequate experience in a second Romance language; and develop the student's capacity for critical analysis of literary texts.

All candidates with M.A. degrees will demonstrate their general knowledge through a qualifying examination and through seminar papers which are evaluated by Departmental committees. If the committee concludes that the candidate is unable to present the results of his or her scholarly work clearly, logically
Spanish Courses

Primarily for Undergraduates

Foreign residence or otherwise are required to take a placement test at the time of their first registration to any Spanish course. If students with two years of high Spanish place in 35.1, four semester hours will be added to their graduation requirements. (The student may not be advised to fulfill minimum foreign language requirement.

35.1 Beginning Spanish

2-4 s.h.

35.2 Intermediate Spanish

3 s.h.

35.3 Advanced Spanish

3 s.h.

Special Facilities

The Language Laboratory provides facilities for language learning, teaching and research. These include standard and short-wave radios, tape recorders, record players, soundproof recording rooms, two drill rooms with 60 dual-channel tape recorders, a speaking laboratory, a language lab for 16, and 8-16 broom equipment, and a library of tape and disc recordings. The Department offers to its majors a specific course in Language laboratory procedures.

The Department sponsors a regular 20-minute variety program, "El Canto de Español" ("Happenings in Spanish"), over University radio station WSHU.

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 go to various campuses in the state.

Faculty

Of 16 full-time faculty members, three devote their teaching and research interests primarily to literature. Within this field are represented the analysis and interpretation of the literatures of medieval Spain, the Golden Age (sixteenth and seventeenth centuries), the contemporary period, colonial Spanish America, Spanish America of the sixteenth and seventeenth centuries (including ongoing innovations in theater, poetry and fiction), Portugal and Brazil. Seven of our faculty members devote themselves primarily to research in language teaching methods and preparation of pedagogical materials in Spanish and Portuguese for use by undergraduate and graduate students. Their endeavors produce innovations in methodology and new textual and laboratory materials.

Several of our staff members have held or still hold committee chairmanships in the Modern Language Association and the American Association of Teachers of Spanish and Portuguese. Several have been listed in international directories of scholars. Some also serve on consulting and editorial boards for literary serials and other publications.

Appointments

Teaching, research and laboratory assistantships are available to qualified graduate students. As a number of NDEA Title IV fellowships in Spanish, and University scholarships and fellowships, the latter including four-year teaching-research appointments.


Spanish and Portuguese
Departmental Requirements for the M.A.

- A minimum of 30 semester hours including Introduction to Research or its equivalent
- A research thesis or, for the nonthesis degree, a graduate seminar in which significant original research is done
- Successful completion of a six-hour written examination, the scope of which is determined by the candidate's division and his or her graduate committee

Departmental Requirements for the M.F.A. in Dramatic Art

- A minimum of 48 semester hours and six semesters in residence
- Demonstration of outstanding artistic talent and achievement in theatre

Departmental Requirements for the Ed.S. (for Junior College Teaching)

- A minimum of 60 semester hours, including Introduction to Research, a course in the teaching of speech, an approved seminar and at least 19 semester hours completed in the College of Education's graduate program in higher education
- Successful completion of a research report
- A semester's internship in an 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

Departmental Requirements for the Ph.D.

- A minimum of 72 hours of graduate credit, exclusive of research tools and dissertation
- At least one course, or equivalent, in introduction to research, dramatic theory, rhetorical theory and others as determined by the student in consultation with his or her adviser and graduate committee
- Successful completion of a qualifying examination and demonstrated competence in one's research area
- Substantial scholarly dissertation

Staff: professors Becker, Bowes, Bryants, Cordier, Sheiniger, Hitchcock, MacCain, School, Thayer; professors emeriti: Beard, Gillis, Harthberger; associate professors: Brownstone, Catalano, Krauf, Ochs, Wiering; project professors: Adams, Andrew, Brandau, Drexhage, Gillispie, Hall, Kemp, Miller, Seiter, instructor: Elsen; directors: Krbr, Wockenfuss

Interdivisional Courses

3652 The Science of Speeches Voice and Pronunciation 3 s.h.
Phonetics, voice quality, intonation, loudness and noise, with applications to film, broadcasting, public address and dramatic situations

3697 Oral Interpretation of Literature 1 3 s.h.
Introduction to principles and practice of reading literary prose and poetry to audiences, adaptation, interpretation, evaluation, manuscript production, and written literary criticism and English

3679 Analysis and Criticism of Communication Arts 3 s.h.
Study and application of analytical and critical principles in understanding and appreciating dramatic works, speeches, films, and radio and television programs

3680 Honors in Speech and Dramatic Art 3 s.h. or cr. arr.
Open to seniors and graduate students by permission

3681A Oral Interpretation of Literature II 3 s.h.
Critical analysis and oral presentation of more complex works of fiction, mystery, comedy

3684 Special Studies cr. arr.

3685 Introduction to Research 3 or 5 s.h.
Required of all new graduate students in speech and dramatic arts except those enrolled for degree Master of Fine Arts, problems of selecting and developing special problems, study and application of representative methods and techniques of research, lectures, discussions, readings, papers and reports, guidance in research

3686 Master's Thesis cr. arr.

3685 Ph.D. Dissertation cr. arr.

Broadcasting and Film

Professor in Charge: Hugh V. Cordier, J. Dudley Andrew

Degrees offered: B.A.

B.A. with Emphasis in Broadcasting and Film

A minimum of 24 semester hours in the Department of Speech and Dramatic Art is required for a major in broadcasting and film. The program is intended for the student who seeks an understanding of the nature of the broadcast and film media and their relationship to the larger field of communication arts. The program is offered within the context of a liberal education and is not regarded solely as preparation for a professional career. Students may emphasize either broadcasting or film in their selection of elective courses, but minimal requirements will lead all students to exposure to his historical and evaluative courses in both broadcasting and film and to experience in the production of materials for broadcast and film media.

Requirements for the Major:

- 565:50 Introduction to Broadcasting (lecture, two semester hours; laboratory, one semester hour)
- 565:51 Survey of Film (lecture, two semester hours; laboratory, one semester hour)
- At least six additional hours of advanced professional performance courses within the division
- At least six additional hours of advanced historical/critical/theoretical studies in the division
- Courses in other divisions of the Department as required of all majors

M.A. or Ph.D. in Broadcasting and Film

The M.A. candidate is expected to offer a plan of study which balances the artistic and scholarly aspects of the broad professional dramatic art. The major emphasis of the Ph.D. program is broadcasting and film and is the development of research competence.

For basic requirements, see "Graduate College" and section above on graduate degrees in speech and dramatic art.
36:134 Group Communication 3 s.h.
Survey of small-group research and theory
36:201 Qualitative Methods in Speech Research 3 s.h.
Principles and methods of designing and conducting experimental research in speech and dramatic art
36:203 Quantitative Methods in Speech Research 3 s.h.
Research design and analysis of variance
36:221 Review and analysis of experimental research on interpersonal communication 3 s.h.
36:223 Principles in Performance 3 s.h.

Speech and Language 103:100
36:228 Acquisition of Communication Behaviors 3 s.h.
Research and theory on acquisition of functional communicative behaviors, including language behavior; original research may be required
36:331 Seminar: Problems in Group Communication 3 s.h.
Focus on problem area in small group research, problem area changing from term to term; original research required
36:432 Seminar: Communication Research 2 or 3 s.h.
Focus of seminar changes from term to term; among other topics to which seminar devotee semester are language variation and methodologies issues; original research required; seniors only

Dramatic Art Professor in Charge: David Thayer Degrees offered: B.A., M.A., M.F.A., Ph.D.
B.A. with Emphasis in Dramatic Art
The requirements are:
- 11.51-52 Drama in Western Culture (to satisfy the historical-cultural core requirement);
- A minimum of 30 semester hours of credit for courses taken within the Department, or a combination of courses from this department and equivalent courses from other colleges or universities;
- A distribution of courses among the divisions of the Department as indicated in item 5 of the general requirements for the B.A. degree;
- 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 stress on choosing courses which will fulfill graduate department entrance requirements for those expecting to take advanced degrees. Students expecting to apply for a teaching certificate should choose courses to satisfy Departmental and state requirements.

M.A. in Dramatic Art
This is a general program for high school and junior college teachers and for students who want to earn an intermediate degree before proceeding to the doctorate. The program of 30 or more semester hours is selected by the student and his or her adviser within the following guidelines:

Introduction to Research (36:300) 3 s.h.
Courses in theory and criticism 6 s.h.
Courses in theatre history 6 s.h.
Courses in dramatic literature 6 s.h.
Courses in theatrical production 9 s.h.
A thesis or graduate seminar in history, theory or criticism of drama or theatre is required.

M.F.A. in Dramatic Art
Students who demonstrate exceptional ability in playwriting, directing, design, acting 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 reapply for admission each year. Substantial creative work of high quality is expected of all candidates.

Ph.D. in Dramatic Art
The program for the Ph.D. is made to suit individual back-grounds and requirements. The principal purpose of the program of study and research leading to the Ph.D. degree is to give the candidate a mastery of a major field of learning, including a working command of its significant literature and research methods and of the professional skills appropriate to it.

Courses for Undergraduates
36:112 Shakespeare 3 s.h.
See as English 67:2
36:111 Drama in Western Culture 4 s.h.
See as core course 11:15; required of all dramatic art majors
36:122 Drama in Western Culture 4 s.h.
Combination of 36:111; see as 11:15; required of all dramatic art majors
36:191 Modern Drama 3, 4 s.h.
See as English 96:3 and 120:3

Courses for Undergraduates and Graduates
One-hour concurrent registration required for all courses marked with asterisk (*), 120 or 140 of required production activity for each hour of credit; may be taken independently of core courses
36:110 Dramatic Art Laboratory 3 s.h.
CR/NS
36:111 Acting I 3 s.h.*
Readings, improvisations and some study developing actor's psychological technique; covers in basic concentration of emotions, observation, imagination and memory; required of all majors.
36:112 Acting II 3 s.h.*
Readings and study focusing upon synthesis of technique, character creation, and script analysis; required of all majors.
36:113 Stage Movement 2 s.h.
Basic movement training for actors, development of awareness and control of body is structural and improvisational situations
36:114 Acting Workshop 2 s.h.*
Advanced technique and scene work; concurrent registration in 36:110 and 36:113 required; 36:110 and consent of admissions committee
36:115 Voice Laboratory 1 s.h.*
Voice development for stage; open only to students registered in 36:110
36:116 Movement Laboratory 1 s.h.*
Individual instruction in movement technique and experience; open only to students registered in 36:110
36:117 Visual Styles in Movement 2 s.h.
Department, movement, movement, and representation during from Medieval period to present, leading of typical movement and technique
36:118 Introduction to Theatrical Design 3 s.h.*
Analysis of scripts for theatre designers and technicians; mechanical drawing for theatre scene design of scenery, costumes, lighting and makeup; prior or concurrent registration in 36:110 required
Speech and Dramatic Art

37/111 Introduction to Theatrical Design 3 a.e.
Continuation of 37/110; prerequisite: 37/110; prior or concurrent registration in 37/112 required.

37/112 Production Design 2 a.e.
Projects in scenic, costume, lighting and property design; prerequisite: 37/111.

37/113 Design Studio 2 a.e.
Individual assignments to develop ability to visualize a scene of design; skill in methods for rendering and in costume design; prerequisite: 37/112 and consent of instructor.

37/116 Survey of Visual Arts 3 a.n.
Equipment, materials and procedures for preparation of theatrical scenery and lighting.

37/120 Advanced Sceneary Construction 2 a.e.
Advanced problems in construction, rigging and shifting scenery.

37/121 Lighting 2 a.n.
Theoretical and practical concepts for control of light on stage.

37/122 Electrical Control in the Theatre 2 a.n.
Design, maintenance and use of electrical systems for control of light and other effects in the theatre.

37/125 Stage and Production Management 2 a.n.
Dress rehearsals and production personnel.

37/126 Advanced Makeup 2 a.n.
Design and execution of stage makeup, three-dimensional makeup with prosthetics, preparation of suit and wardrobe.

37/127 Scenic Design 3 a.n.
Lectures on scenic painting materials, shop layout and techniques of applying scene.

37/130 Properties and Special Effects 3 a.n.
Design, construction and staining of theatrical properties; development and control of special effects.

37/137 Stage Costume Design 2 a.n.
Selection and use of fabric on stage.

37/138 Stage Costumes, Dressing and Draping 2 a.n.
Pattern-making for stage costumes; with particular reference to period drama.

37/138 Stage Costume Design and Shading 2 a.n.
Consideration of historical background including hats, headdresses, masks and wigs.

37/139 Stage Costume History 2 a.n.
History of dress in relation to stage costume.

37/140 Costume and Makeup 3 a.n.
Design of makeup and costumes.

37/143 Directing I 3 a.n.
Principles and techniques of directing plays and groups in the modern theater; preparation of the director; prerequisite: 37/101.

37/144 Directing II 3 a.n.
Study of the five-act structure with emphasis on director as interpreter; preparation for directing workshops.

37/146 Theatre Techniques in Translation 3 a.n.
Directing acting experience in rehearsal and performance of stage productions; prerequisite: 37/140 or permission of instructor.

37/147 Children's Theatre and Creative Drama 3 a.n.
Theory and practice of creative drama for theatre artist and classroom teacher.

37/148 Playwriting I 3 a.n.
May be repeated to maximum of six semester hours.

37/149 Playwriting II 3 a.n.
Workshop in playwriting, with presentation and discussion of work by playwrights at advance level; prerequisite: 37/155 and consent of instructor; same as English 618.

37/157 Playwrights Workshop 3 a.n.
Presentation and discussion of work by readers; prerequisite: consent of Work- shop staff; same as English 619.

37/158 Greek Drama in Translation 3 a.n.
Same as Classics 1650 and 1690, same as classics 1651 and 1691.

37/159 Roman Drama in Translation 3 a.n.
Same as Latin 1090 and 1091.

37/16 English Drama of the 16th Century 3 a.n.
Same as English 614.

37/165 English Drama of the 17th Century 3 a.n.
Same as English 614.

37/166 Continental Drama, 1500 to 1700 3 a.n.
The drama, written and performed in Italy, Spain and France, 1500 to 1700.

37/167 Continental Drama, 1700 to 1850 3 a.n.
Drama and stage in France and Germany from the 18th to the 19th centuries.

37/177 Modern Drama: Swan to Ibsen 3 a.n.
Same as English 616.

37/178 Drama in Spain: Placido to Alcaraz 3 a.n.
Same as English 617.

37/180 Modern American Drama 3 a.n.
Same as English 618.

37/181 Contemporary Drama 3 a.n.
Working analysis of recent dramatic scripts through reading, discussion and rehearsal.

37/182 Principles of Drama 2 a.n.
Same as English 615.

37/183 Studies in Modern Drama 2 a.n.
Individual examination of modern dramatic technique, strategies and trends; elimination of unsuccessful performances of Playwrights Workshop by consent of instructor; same as English 616.

37/184 American Theatre History 2 a.n.
Principal plays, playwrights and developments in American theatre from the beginning to the present.

37/186 Strategies in the Drama 2 a.n.
Play analysis for theatre artists; emphasis on current trends in drama.

37/197 Periods in The Drama 2 a.n.
Study of plays traditionally designated as comedy, tragedy or melodrama in order to investigate the social and political assumptions that were included under these terms.

37/198 Romance and Amour-precieux 3 a.n.
Study of plays related to classical aspects of Romanticism, Realism, Naturalism, Symbolism, Expressionism, and absurdism, etc.

37/199 M.F.A. Production 1 to 4 a.n.
Agreement with professor; same in all aspects of production of plays.

37/201 M.F.A. Workshop 1 to 4 a.n.
Independent work in novel and poetry.

37/202 Properties in Theatre or, a.n.
Principles and practice of scenic design for the Renaissance.

37/203 English Drama of the Renaissance 4 a.n.
Same as English 612.

37/204 English Comedy of the Renaissance 4 a.n.
Same as English 614.

37/205 Porter's Theatre 2 or 3 a.n.
Major theatrical and critical works on drama from Cinque to present; same as English 615.

37/206 Dramatic Theory 2 or 3 a.n.
Major theatrical and critical works on drama from Cinque to present; same as English 615.

37/208 Dramatic Theory II 2 or 3 a.n.
Consent of 37/205; same as English 614.

37/217 History of Criticism 3 a.n.
Same as English 615.

37/218 History of Off-Stage 3 a.n.
Same as English 650.

37/255 Physical Theatre 3 a.n.
Theatrical scenic conditions, scenery, properties and architecture to 1600.

37/256 Physical Theatre 3 a.n.
Continuation of 37/255.

37/427 Modern Methods of Dramatic Technique 3 a.n.
Theory and practice from Stanislavski to present.

37/430 Bennett: American Theatre History or, a.n.
The Bachelor of Arts Program

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 and extracurricular activities emphasizing informed and guided improvement in oral performance, and courses devoted to theoretical, critical and historical study of the principles and practice of public address, and the interpretation of public address and theatre, film, radio, television and other arts of communication. Further, the student concentrating in public address is expected to pursue substantial study beyond the general graduation requirements of the College of Liberal Arts.

Programs for majors include:

- 36:31 The Basics of Speech: Voice and Pronunciation
- One of the following:
  - 36:32 Public Speaking
  - 36:31 Group Discussion
- 36:32 Interpersonal Communication
- 36:75 Parliamentary Procedure
- 36:57 or 36:151 Oral Interpretation of Literature
- One of the following:
  - 36:125 Theory and Practice of Persuasion
  - 36:129 Theory and Practice of Argumentation
  - 36:130 Interview and Conference Techniques
- One of the following:
  - 36:85 Speeches of the Western World
  - 36:86 Theories of Rhetoric
  - 36:87 Rhetoric of Agitation and Control
  - 36:96 Greek and Roman Public Address
  - 36:131 Contemporary Public Address
- 36:134 Group Communication
  - Selected courses in drama and theatre, and in radio-TV-film
  - At least 15 semester hours beyond the liberal arts graduation requirements in literature, history, psychology, philosophy, foreign language and/or social sciences, including a course in expository or argumentative writing

The Master of Arts Program

The course of study 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 adviser. All programs will include:

- Introduction to Research (36:8; 300)
- 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 provide guided experience in research resulting in a significant dissertation.

Courses

36:201 Principles of Speech Communication 3 a.h.

Instruction and guided practice in fundamentals of oral communication, satisfies University requirement in speech for freshmen and sophomores (10:1 or 12:1, or equivalent); requirement may be satisfied also by pass administered at beginning of each semester by Psychometric Program, and for qualified students by passing Speech 36:20:3 and open for credit to students who have or are taking Rhetoric 10:1 and 2, 222, Speech 36:10:6 or equivalent

36:202 Public Speaking 3 a.h.

Intermediate course in speechmaking—reviewing previous coursework (10:1 and 2, 222, or equivalent) or other experience in basic principles and practice of oral communication; acquainting him with public concerns; study and experience in more complex forms of adjectival and persuasive speaking; frequent speechmaking; analysis and criticism of speaking and speakers; attention to needs and techniques of written speaking and reading; development of speaking and written speaking.

36:203 Group Discussion 3 a.h.

Principles and practical application of group problem-solving techniques; leadership and group participation; projects in social decision and action

36:204 Interpersonal Communication 3 a.h.

Readings, exercises and projects in dyadic and small-group analysis, involving theory and application of personal perception, interpersonal attraction, message variables, feedback and emotional content

36:247 Perforamnce Procedures 4 a.h.

Sale of order for conduct of business in meetings of committees, state and organizations; opportunity for practice in making and debating motions from floor and in guiding open parliamentary sessions

36:248 Speeches of the Western World 3 a.h.

Notable speeches of classical Greece and Rome, modern Europe, from Britain and United States, studied as dynamic events in historical context and as important works of rhetorical art

36:250 Theories of Rhetoric 3 a.h.

Examinations of influential theorists of oral and written prose discourse past and present; a reading, lecture, and essay survey of representative papers toward understanding instrumental communicatives; satisfies English 240

36:262 Rhetoric of Agitation and Control 3 a.h.

Intensive study of the methods and techniques of analyzing agitation involving radical social change and response to this agitation; in small groups students participate in one or more sections of agitation and control and prepare short papers
Speech Education

Professor in Charge: Hugh F. Seibert
Degree Offered: B.A.

Teaching speech, drama and forensics offers rewards which compare favorably with those in other fields. Salaries, working conditions and living standards are usually excellent. The demand for well-prepared and qualified teachers of speech, dramat- ics and forensics in high schools and colleges compels favorably with the demand for teachers of many other subjects in high schools and colleges.

Students may proceed to the B.A. with emphasis in speech education by electing a minimum of 30 semester hours in the Department as recommended in Plan A, B or C below and a minimum of 20 semester hours in education plus two semester hours in American history or American government. Basic to each of the three plans are the distribution requirements for all majors in the Department plus:

3653 The Basis of Speech: Voice and Pronunciation 3 s.h.
3632 Interpersonal Communication 3 s.h.

Plan A. Speech and Dramatic Art Emphasis

3681 Group Discussion 3 s.h.
3682 Interpersonal Communication (required) 3 s.h.
3653 The Basis of Speech: Voice and Pronunciation (required) 3 s.h.
3657 Oral Interpretation I 3 s.h.
3660 Communication Theory in Everyday Life 3 s.h.
3687 Parliamentary Procedure 2 s.h.
3689 Introduction to Broadcasting 3 s.h.
3681 Survey of Film 3 s.h.
367100 Dramatic Arts Laboratory 3 s.h.
367101 Acting I 3 s.h.
368129 Theory and Practice of Argumentation 3 s.h.
367140 Directing I 3 s.h.
315 Introduction to Speech and Hearing Process and Disorders 3 s.h.

Plan B. Speech and English Emphasis

368100 Public Speaking 3 s.h.
36821 Group Discussion 3 s.h.
36821 Interpersonal Communication (required) 3 s.h.
3653 The Basis of Speech: Voice and Pronunciation (required) 3 s.h.
3657 Oral Interpretation of Literature I 3 s.h.
3660 Communication Theory in Everyday Life 3 s.h.
3687 Parliamentary Procedure 2 s.h.
3685 Speeches of the Western World 3 s.h.
358132 Selected American Speakers 3 s.h.
36850 Introduction to Broadcasting 3 s.h.
36851 Survey of Film 3 s.h.
3660 Educational Forensics 3 s.h.
36110 Speech for Educators 3 s.h.
Speech Pathology and Audiology

36R:129 Theory and Practice of Argumentation 3 s.h.
3:15
Introduction to Speech and Hearing Processes and Disorders 3 s.h.

Plan C. Theatre Emphasis
36R:32 Interpersonal Communication (required) 3 s.h.
36:53 The Beas of Speech: Voice and Pronunciation (required) 3 s.h.
36:57 Oral Interpretation of Literature I 3 s.h.
36T:110-111 Introduction to Theatrical Design I-II 6 s.h.
36T:101 Acting I 3 s.h.
36T:140 Directing I 3 s.h.
36T:100 Dramatic Arts Laboratory 4 s.h.
36T:149 Children's Theatre and Creative Dramatics 3 s.h.
36M:50 Introduction to Broadcasting 3 s.h.
or
36M:51 Survey of Film 3 s.h.
36M:57 Educational Formatics 3 s.h.
or
36M:110 Speech for Educators 3 s.h.
3:15 Introduction to Speech and Hearing Processes and Disorders 3 s.h.

Students are advised to complete a minimum of 20 semester hours as a minor in English (with some work in dramatic literature), social studies or other tangential fields to strengthen their major, and to accumulate a record of achievement in University forensic, broadcasting and film, and theatre activities.

Sequencesal Requirements in Education

Statutory: American history or American government 2 s.h.

Junior Year
76:100 Introduction to Secondary Teaching 2 s.h.
75:91 Pre-Education Practicum (PREP) 2 s.h.
75:75 Educational Psychology and Measurement 3 s.h.

Senior Year
76:160 Methods: High School Speech 3 s.h.
76:92 Methods in minor or three-semester-hour course in education in lieu of second methods course 3 s.h.
76-191-192 Observation and Laboratory Practice in 12 s.h.
92 Teaching Speech in High School

For detailed information about teacher certification, see "College of Education."

Courses
36-110 Methods: High School Speech 2 s.h.
Teaching speech, drama, and forensics, consideration of various patterns in teaching; curricular programs, objectives, instructional methods and materials, criteria for selection and grading, units and references, periodicals and sources of publications, practice and value of evaluation and self-evaluation techniques. (36-66 required for majors who plan to apply for professional certificates in speech)
36-110 Educational Formatics 3 s.h.
Planning, organizing and evaluating curriculums and curricular formatics procedures in schools; designed for independent study; class meeting on four Saturdays; data arranged.
36-110 Speech for Educators 3 s.h.
To aid teachers and others interested in teaching relationships between teacher and student; awareness of the student, awareness of self, interaction between teacher and student; emphasis on the educational setting. (36-66 required for majors who plan to apply for professional certificates in speech)

Speech Pathology and Audiology

36:150 The Teaching of Speech 3 s.h.
Principles, practices and problems of teaching speech and hearing problems; speech and hearing problems in second schools; they are considered in terms of planning, teaching, topics and discussion of problems related to teaching speech and hearing problems.
36T:170 Workshop in Teaching Dramatics, Forensics and Speech or, arr.
Methods, materials, and curricular aids, procedures and evaluation in teaching and supervising students in courses and exercises; activities, observation, demonstration and practice in teaching voice and speech development, dramatic art; discussion and debate, radio and television, and individual speech, drama, and forensic events; same as Education 76:60.
36:250 Teaching Freshmen Rhetoric 2 s.h.
Lecture-dissertation course exploring literature and problems involved in teaching composition, public speaking and reading, same as English 85:00.
36:201 Foundations of Speech Education 2 to 4 s.h.
Origins, early events, psychological bases, and theories and practice of teaching speech, inherent causes, teaching and writing by early contributors to speech education from Publius to English educational speech education in works of Aristotle, Quintillian, Attic orators, Br. Augustine, Romans, English teachers and writers.
36:250 Modern Speech Education 2 to 4 s.h.
Modern speech education, beginning with works of Rameau and English authors, and ending with contemporary developments in teaching, research and associated fields. Same as Education 76:200, 85:200.

Speech Pathology and Audiology

Department Chairman: Kenneth L. Wolf Degrees offered: B.A., B.S., M.A., Ph.D.

The courses and degree programs of the Department of Speech Pathology and Audiology are planned to meet the needs of students preparing for a wide variety of opportunities. These include clinical service, college and university teaching, and research concerned with speech, language and hearing processes and disorders. The offerings also include courses for students with vocational and professional goals in other fields, such as psychology, education, speech and dramatic arts, dentistry and medicine, whose preparation may be enriched by the study of speech and hearing processes and their disorders.

Graduates in this field provide clinical services for persons with speech, hearing or language problems in hospitals, clinics, clinics, rehabilitation facilities and elementary and secondary schools; teach in colleges and universities; and/or carry out research in laboratories concerned with communication processes and disorders.

All professional programs of the Department leading to the M.A. degree are accredited by the Education and Training Board of the American Board of Examiners in Speech Pathology and Audiology.

Undergraduate Curricula

Since the major's degree is equivalent to the minimum level of preparation for persons seeking professional careers in this
Speech Pathology and Audiology

field, the undergraduate curricula leading to B.S. or B.A. degrees in speech and hearing science have as a primary purpose the preparation of students for graduate work. Hence, the undergraduate program emphasizes the normal processes of speech, hearing and language. These undergraduate programs may be taken, of course, by persons who want a degree in the College of Liberal Arts but who do not desire a career in this field. Students may qualify for either the B.S. degree or the B.A. degree with a major in speech and hearing science by completing, in addition to the general requirements prescribed by the College of Liberal Arts, the undergraduate Departmental program given below:

Required Departmental Courses
3:15 Introduction to Speech and Hearing Processes and Disorders 3 s.h.
3:20 Phonetics of American English 3 s.h.
3:110 Anatomy of the Speech and Hearing Mechanisms 3 s.h.
3:112 Fundamentals of Speech Science 3 s.h.
3:113 Introduction to Hearing Science 3 s.h.
3:114 Children’s Language Development 3 s.h.
3:117 Introduction to Psycholinguistics or Introduction to Linguistics 3 s.h.

Required Courses in Related Areas
29:113 Physics of Sound and Music 3 s.h.
31:143 Statistical Analysis I 3 s.h.
31:1 Educational Psychology 4 s.h.
31:3 General Psychology

Minimum of nine semester hours completed by one course from Group 1 and one course from Group 2, as listed below, and one additional course selected from fields of psychology, anthropology or sociology

Group 1
5:100 (5:111) Child Development 3 s.h.
5:131 (5:114) Introduction to Child Psychology 4 s.h.

Group 2
31:13 Psychology of Adjustment 3 s.h.
31:205 Personology 3 s.h.
31:163 Abnormal Psychology 3 s.h.

Other Requirements
Students majoring in speech and hearing science must also complete or have had the equivalent of college algebra, trigonometry, college physics dealing with light and sound, and a college course in the biological sciences.

Honor Program
The senior year program leading to the B.S. degree with Honors in speech pathology and audiology is open to students who at the beginning of the senior year have completed at least 10 semester hours of coursework that can be counted toward a major in the Department, and must have earned at least a 3.0 grade-point average on all major courses and over all. For graduation with Honors, the student must complete the requirements for a major in this department; complete two semesters of study in residence after entering the senior year; Honors program; maintain a minimum overall grade-point average of 3.0, a minimum grade-point average of 3.0 for all courses in the major, and a minimum grade-point average of 3.0 in the required six semester hours of Departmental Honors courses for seniors (Honors Seminar and Honors Thesis); and be recommended for graduation with Honors by the Honors thesis adviser and the Departmental Honors advisor.

Students who are eligible and who are not already classified as Honors students should consult with the departmental Honors advisor before the beginning of the senior year. At any time during undergraduate study, students who have earned a minimum grade-point average of 3.0 and have not entered the University as Honors students may apply for Honors classification in the College of Liberal Arts and in this department by recommendation of the Departmental Honors advisor.

Advanced Degrees in Speech Pathology and Audiology
More specific details on the requirements for advanced degrees can be obtained by consulting the Graduate College and/or contacting the office of the Department of Speech Pathology and Audiology.

A graduate student is accepted as a candidate for an advanced degree by recommendation of the Departmental staff based upon a review of the student’s previous academic record and scores on the Aptitude Test of the Graduate Record Examination, if available. In certain cases a student may be admitted for graduate study with acceptance as a degree candidate reserved until the student has demonstrated his ability to perform satisfactorily in graduate courses during one or more semesters of residence at Iowa.

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 science, development of oral communication and psychology of human behavior which is essentially equivalent to an undergraduate major in this field.

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 full academic load for all regular graduate students is 12 semester hours of course registration per semester and six semester hours in summer sessions. In addition, as an integral part of the training program all full-time degree candidates are given
part-time professional training assignments of a research, teach-
ing or clinical nature. The assignment for each student in any
semester is based on his or her particular professional goals and
on the type of activity which contributes most to professional
growth and development. Time required for such activities will
be approximately 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 Department of Speech Pathology and Audiology cooper-
ates in interdisciplinaty doctoral programs with the Program in
Applied Mathematical Sciences (see "Graduate College").

Master of Arts Degree
All entering M.A. degree candidates are required to take prelimi-
nary 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 adviser
with a basis for developing an appropriate plan of study. These
examinations are ordinarily taken during the first semester of
residence. Portions of the examinations may be waived if the
student chooses to take appropriate courses.

Professional Program
The professional M.A. program is designed to prepare clinicians
in speech pathology and audiology who will be fully competent
to function independently in a variety of clinical settings. Per-
sons 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 require-
ments listed under one of the four other sections (B, C, D or E)
and elective enrollments. The student should choose one of these
curricula in relation to career objectives and interests.
A total of 38 semester hours of graduate work is the minimum
required for a master's degree in this department. It has been
found that students usually require at least three semesters and
one summer term to become fully qualified for their career objec-
tives. Candidates for the professional M.A. degree are not re-
quired to present a thesis. However, students demonstrating
research aptitude and interest are encouraged to do so. All candi-
dates for the professional M.A. degree without thesis are re-
quired to take final written comprehensive examinations.

Requirements for the Professional M.A. Degree
A. All Majors
*3116 Neural Processes of Speech and Language 3 s.h.
*3150 Clinical Procedures in Speech Pathology and
Audiology 2 s.h.
*3182 Articulation Disorders 3 s.h.
*2185 Hearing Loss and Audiometry 4 s.h.
3214 Clinical Procedures for Language
Habilitation 3 s.h.
3244 Aural Rehabilitation 3 s.h.
7C:199 Counseling for Related Professions
Two advanced seminars or three 2 or 3 s.h.

* Equivalent undergraduate course will be accepted as meet-

ing 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
clinical experience.

B. Speech Pathology, General Clinical Emphasis
Courses listed under A and
3183 Stuttering 3 s.h.
3212 Voice Disorders 2 s.h.
3225 Neuropathologies of Speech and Language 3 s.h.
3237 Cleft Palate 2 s.h.
Practicum, research and elective courses to bring total to at
least 38 semester hours

C. Speech Pathology Major, Emphasis on Clinical Work in Ele-
mentary and Secondary Schools
Courses listed under A and
3183 Stuttering 3 s.h.
3212 Voice Disorders 2 s.h.
3225 Neuropathologies of Speech and Language 3 s.h.
3237 Cleft Palate 2 s.h.
7E104 Remedial Methods in Speech and Hearing 3 s.h.
7E192 Laboratory Practice in Elementary School 5 s.h.
Practicum, research and elective courses to bring total to at
least 38 semester hours

D. Audiology Major, General Clinical Emphasis
Courses listed under A and
3120 Fundamentals of Laboratory Instrumentation 3 s.h.
3241 Advanced Audiology 4 s.h.
3343 Conservation of Hearing 3 s.h.
3473 Hearing AIDS 3 s.h.
3244 Aural Rehabilitation (in addition to A above) 1 s.h.
3214 Clinical Procedures for Language
Habilitation 3 s.h.
Practicum, research and elective courses to bring total to at
least 38 semester hours

E. Audiology Major, School Hearing Clinician
Courses listed under A and
3241 Advanced Audiology 4 s.h.
3343 Conservation of Hearing 3 s.h.
3243 Hearing AIDS 3 s.h.
3244 Aural Rehabilitation (in addition to A above) 1 s.h.
7E104 Remedial Methods in Speech and Hearing 3 s.h.
7E192 Laboratory Practice in Elementary School 5 s.h.
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 addi-
tion to those previously listed, will meet the requirements of
most states.
American Government or American History 2 or 3 s.h.
Introduction to Elementary Teaching 2 s.h.
Children's Literature 3 s.h.
Educational Psychology and Measurement 3 s.h.
Exceptional Children 2 or 3 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 is planned to provide the student with the opportunity to attain a comprehensive and thorough knowledge of subject matter both in the area of speech pathology and audiology in general and also in the area of his or her own particular specialization. Consideration is given to special interests and goals whenever possible in arranging the details of the student's Ph.D. program.

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. Establishment of prescribed programs for these areas is not intended to circumscribe the graduate curriculum of the Ph.D. candidate who has specialized 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 clearly defined and that he or she presents an adequate plan of study for their accomplishment.

Courses beyond those included in the Departmental listings are allowed with concurrence of the candidate's advisor. Emphasis, statistics, physiology, neurology, anatomy and psychology.

The Ph.D. comprehensive examinations are ordinarily taken after approximately two years of graduate study. The examinations are written and oral and include a general review of the student's qualifications and performance in graduate training. Candidates whose earlier training has not included a master's thesis are not eligible to take the comprehensive examinations until they have demonstrated aptitude for research by completing a suitable research project and presenting a paper summarizing the results. This project is to be of a magnitude appropriate for a master's thesis. The Ph.D. candidate must also successfully complete a dissertation based upon original research in the area of specialization.

Recommended Courses

A. All areas of specialization

Courses, or their equivalents, required for M.A. degree and 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, 591 or 592 Research

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 Psychocoustics
3:255 Psychocoustics Laboratory
3:256 Physiology of Hearing
3:257 The Pathological Auditory System

Seminars in areas of interest

Clinical practicums

D. Speech and language science

Courses listed under A and
3:254 Psychocoustics
3:255 Psychocoustics 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 Psychocoustics
3:255 Psychocoustics Laboratory
3:256 Physiology of Hearing
3:127 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 Facilities

The student of speech pathology and audiology at The University of Iowa is provided with a broad range of opportunities to acquire experience in both clinical and research areas.

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 Speech and Hearing Clinic serves the University and the general public. Included in its services are outpatient evaluations and rehabilitation programs for speech, hearing and language problems. Included in a six-week summer residential program for children. These clinical programs are planned for the training of students through supervised clinical experience with a wide variety of speech, hearing and language disorders. This training is enhanced by the use of the new and
of the human environment with particular reference to the urbanized areas. Preparation for work in this profession involves training in observing, analyzing and interpreting the social, economic, political and technological forces which affect environment. The Department is recognized by the American Institute of Planners as meeting its standards for professional education.

Both the M.A. and the M.S. degree program are professional programs which prepare and qualify students to enter the planning profession. The curriculum is planned for a two-year, four-semester sequence. The total requirement is 48 semester hours. There is today a strong demand for the services of persons with graduate degrees in planning. The profession is unusually rewarding in its opportunities for collaborative participation with professionals in related fields contributing to planning.

Admission Requirements
Candidates for admission are required to have a bachelor’s degree from an accredited college. Applicants from a wide variety of fields of undergraduate concentration are eligible for admission. Those fields considered most relevant are sociology, economics, political science, geography, civil engineering and architecture. Each student is expected to have a basic knowledge of economics, American government and statistics. Engineering students will be given exams in these areas, and extra individual work may be required to reach a minimal competence.

Study Director*
A program of study is prepared for each student on an individual basis, related to previous education and experience. In the second year, each student chooses one of three directions in their planning education:

- Generalist, in which students pursue the broadest knowledge of the field of urban and regional planning without specific specialization.
- Concentrated Generalist, in which students focus on a particular subarea of planning such as housing, health, design, transportation, education or land use.
- Specialist, in which students choose intensive study of a particular subarea at the expense of a more general approach and depend heavily on courses outside the Department.

Curriculum, Options and Requirements
The curriculum in planning is designed to differentiate between urban and regional focus; to allow for concentrations in various methodological disciplines, such as analytical techniques, policy formulation, implementation and evaluation of design, and concentrations in functional sectors of planning, such as land use, transportation, economic development, open space/ recreation, social policy planning, health and environmental quality.

The required professional planning courses comprise approximately one-half of the semester hours necessary for the degree. The remaining hours are chosen to develop the special interests of the student through course offerings in other departments, specialized courses by the planning faculty and individual study programs.

Joint Programs
A joint program with the College of Law is offered, leading to the degree, Juris Doctor and Master of Arts in Urban and Regional Planning, after approximately four years of study. This represents an overlap of credits sufficient to reduce the time required from five to four years. A joint degree program is also offered in urban transportation. The Center for Urban Transportation Studies is located in the Institute of Urban and Regional Research and offers a multidisciplinary training and research program. Other joint-degree programs are also possible; inquiries regarding such are advised well in advance of the start of the academic year.

Thesis Requirement
A thesis for six semester hours credit is included; this may be expanded to warrant additional credit. Variance is encouraged in the form of the thesis, to include design/physical planning projects, multimedia presentations and other approaches. An alternative to the thesis is offered: a shorter paper or project for three or more credit hours plus a comprehensive exam.

Internship Employment
For the summer between the two academic years, each student is advised to secure employment in an operating planning agency, community organization or private firm assigned through counseling with the faculty. Emphasis is made upon finding opportunities in large metropolitan areas or in agencies undertaking experimental programs. If meaningful internship work is unavailable, there are options such as a systematic program of volunteer work or agency observations throughout the second year. A brief paper concerning the nature of internship or optional work is also required.

Options
Within the two-year sequence options have been designed to provide choices as to general direction as described above. During the 1971-1972 Department of Planning and Urban Affairs, these options through a major review of curriculum on an experimental basis. The new program continues for 1972-1973. Should there be any major changes, applicants will be informed. The two-year sequence is as follows:

First Semester
A 13-credit "omnibus" course is required of all students. It is taught by three faculty members and three teaching assistants. Its purpose is to demonstrate the generalist approach and teach some fundamentals of planning.

Second Semester
Each student will take a four-credit course which combines the materials 102-206 Planning Analysis and Techniques and 102-210 Quantitative Methods in Planning which were not covered first semester. Second semester all students will take four credits in a seminar of one of the modules. In this context four short courses of three to five weeks' duration can be selected among approximately 10 offerings. The module will cover subareas of planning such as housing, land-use controls, transportation, regional de-
Urban and Regional Planning

Field Studies Program
From time to time there are opportunities for second-year students to get academic credit for field work in the planning area. In the past students have worked with low-income residents of Des Moines and Waterloo. If extensive, such work can be carried out in residence. Progams is presently attempting to find a regular field studies option in Chicago. If this is successful, field work opportunities will become a regular option in the curriculum.

Joint Program in Urban Planning and Law
The 4-4 program in Urban and Regional Planning and Law is offered to students who are interested in the resolution of major social, economic and political problems. The Program is composed of required work in law and planning, and electives which permit some flexibility of purpose and design. The Program is best suited to persons with broad interests and experience, capable of interdisciplinary study and seeking to prepare themselves for research investigation and advocacy for neglected groups and interests of society.

The College of Law requires the degree Juris Doctor in 90 semester hours. In the joint program, 15 semester hours of work in planning are accepted for credit toward the law degree. The requirements for an M.A. in Urban and Regional Planning is a minimum of 46 semester hours. Two courses (six to seven semester hours) in law may be credited toward the planning degree.

Joint Program in Urban Transportation
The graduate program in urban transportation consists of a multidisciplinary approach to research and training in urban transportation. The training and research program is conducted in a broad urban context with emphasis on the interaction of various academic disciplines to adequately define the scope of urban transportation problems as they relate to social, economic, political and physical elements of the urban environment. This broad multidisciplinary approach to urban transportation education exists at The University of Iowa through the Institute of Urban and Regional Research, which is the parent organization for the graduate program in urban transportation. The urban transportation program can be part of a Departmental master's or doctoral program. The graduate program in urban transportation does not grant degree; degrees are granted by participating departments and programs, such as civil engineering, economics, geography, industrial and management engineering, political science, sociology and urban and regional planning.

In essence the training program will consist of a set of core courses which will be required of all students in the urban transportation program. Students will also have to meet degree requirements within their respective departments. The research program to be pursued in this program covers a broad scope of activities. Specific research efforts to be conducted are transit planning is small metropolitan areas, trip generation and travel behavior in metropolitan areas, urban change detection and the continuing planning of urban transportation planning, network analysis and corridor analysis design team.

Students should submit duplicate copies of application and letters of recommendation, along with a statement indicating...
urban context, with an emphasis on the interaction of several academic disciplines to define adequately the scope of urban transportation problems as they relate to social, economic, political and physical elements of the urban environment. This broader framework exists at The University of Illinois through the Institute of Urban and Regional Research which is the parent organization for the Graduate Program in Urban Transportation.

The urban transportation program is taken in conjunction with a Departmental masters or doctoral program. The Graduate Program in Urban Transportation, which is housed in the Institute of Urban and Regional Research, does not grant degrees nor are the degrees in urban transportation per se. Rather degrees are granted by participating departments and programs, such as Civil Engineering, Economics, Geography, Industrial and Management Engineering, Law, Political Science, Sociology, and Urban and Regional Planning. An appropriate notation will be made on a student's transcript when completing the urban transportation requirements.

The training program consists of a set of core courses which are required of all students in the Urban Transportation Program. Students also have to meet degree requirements within their respective departments. The research to be pursued in this program covers a broad scope of activities. All supported students are expected to participate in research projects. The emphasis is on policy related research projects. Presently, research is being conducted in transit analysis and planning, trip generation, and travel behavior, urban change detection in the continuing phase of urban transportation planning, network analysis, transportation corridor analysis, transportation safety research and transport investment analysis.

Students should submit duplicate copies of application and letters of recommendation, along with a statement indicating their interest in urban transportation and how it relates to their main field.

Curriculum

Students working toward a master's degree or a Ph.D. in any one of the following departments may find the Urban Transportation Program attractive and related to his or her interests:

- Civil Engineering
- Economics
- Geography
- Industrial and Management Engineering
- Law
- Political Science
- Sociology

Urban and Regional Planning

Students participating in the Graduate Program in Urban Transportation must satisfy the requirements of their departments as well as the core courses specified in the Urban Transportation Program. The core courses of the Urban Transportation Program are subdivided into two separate option sets. One option focuses on Transportation Policy Analysis and the other on Transportation Systems Analysis. Each option requires six core courses with two courses common to both options. In addition to the core requirement, students enrolled in the program may elect other courses. Depending on the nature of the student's department or program of origin a combined master's program may be of one, two or three years duration. Generally speaking the Urban Transportation Program will add one or two semesters to a student's program depending on the degree to which core courses apply to the main program.

Core Courses

The following courses are common to both the Transportation Systems Analysis option and the Transportation Policy Analysis option:

- 102.211 Social, Economic and Institutional Impacts of Urban Transportation
- 53.270 Urban Transportation Planning

The following are core courses for the Transportation Policy Analysis Option:

- 68.153 Introduction to Regional and Urban Economics or
- 44.137 City Growth and Development
- 30.101 Municipal Government and Politics or
- 30.353 Community Political Systems or
- 34.150 Political Sociology
- 102.226 Seminar: Urban Transportation
- 102.102 Urban Politics or
- 44.116 Political Ecology

The following are core courses for the Transportation Systems Analysis option:

- 53.213 (Proposed) Transportation Analysis or
- 102.226 Seminar: Urban Transportation Issues
- 44.236 Travel Behavior in Urban Areas or
- 44.137 City Growth and Development
- 102.213 (Proposed) Research Methodology or
- 56.248 Integer Programming and Network Flow
- 56.341 Introduction to Operations Research or
- 56.241 Operations Research

Student Support

Both fellowship support and research assistantships are available for qualified students in the Graduate Program in Urban Transportation. Generally, fellowships will be awarded to first-year students and research assistantships to second-year students.

Women's Studies

Advisory Subcommittee Chair: Patricia Addis

In response to a conscious need of women to examine their social, psychological and political positions, the University has begun the development of a Women's Studies Program. Several departments and programs now offer courses consid-
Zoology

Department Chairman Jerry J. Kothke Degrees offered B.A., M.S., Ph.D.; also M.S. in biology jointly with Botany Department

Undergraduate Program

Major is required to have a modest background in physics, mathematics and chemistry in order to prepare them for understanding biological phenomena at the various levels of organization, from the molecular, cellular and organic to those of the population, species and ecosystem. Graduates of the Department need proficiency in the requirements in the health sciences, or they may continue into graduate programs leading to teaching (high school, community college, college and university), service and research in various professional areas (e.g., parasitical fields, parasitology, environmental sciences, etc.).

The basic courses offered in the Department serve both its own majors and those planning to enter medicine, dentistry or related professions. They also serve students in fields such as psychology, anthropology and sociology. The Department is developing additional courses for the non-major—that is, in the major in the humanities, social sciences, business administration, etc.

The Departmental experience is based upon an introductory course which stresses principles. Each student is further required to take courses in genetics (which give emphasis to traditional basic approaches, and to current materials in molecular genetics, and some acquaintance with other genetic disciplines) and in cell physiology (the cell cycle, cell structure and function, energetics, intermediary metabolism, regulation, membrane phenomena and mechanisms of action of nerve and muscle). Beyond these courses students are given certain choices from a restricted block of courses: entomology, invertebrates, vertebrates, evolution, ecology (at least eight hours) and free choices from nearly all of the other undergraduate level courses (12 hours), or a total of 31 semester hours in zoology. To emphasize the concern of

the Department with breadth of training, and desirability of background in related disciplines, students may substitute four hours of work in botany, microbiology, biochemistry or mathematics (calculus) for four hours of work in zoological courses.

Required courses for the B.A. degree are:

230 Principles of Animal Biology 5 s.h.
270 Fundamental Genetics 4 s.h.
270 Cell Physiology 4 s.h.

Eight hours are to be selected from the following list:

270 Principles of Modern Entomology 4 s.h.
270 Animal Kingdom I (Invertebrates) 4 s.h.
270 Animal Kingdom II (Vertebrates) 4 s.h.
270 Evolution 4 s.h.
270 Ecology 4 s.h.

Twelve hours are to be selected from any other undergraduate courses in zoology numbered 102-199, except that no more than two semester hours may be accumulated from courses 270, 180, 182, 196, 198, 199. One may not elect 270 if 170 has been taken. Four of these 12 hours may be earned in botany (any course), calculus, general biochemistry (59:145) or microbiology (61:157).

Requirements for the B.A. degree are under review and may be modified. Write the Department for current details.

Other courses in physical sciences and mathematics required of undergraduate majors are:

228M20 Elementary Functions 3 s.h.
41 and 44 Principles of Chemistry I and II 6 or 7 s.h.

4 Principles of Chemistry 3 s.h.
46 Elementary Chemistry Laboratory 2 s.h.
4121 Organic Chemistry I 3 s.h.
4122 Organic Chemistry II or Biochemistry 3 s.h.
4141 Intermediate Chemistry Laboratory 2 s.h.
291 and 292 College Physics 8 s.h.

For general degree requirements see "College of Liberal Arts." Supplementary courses in botany, chemistry, geology, microbiology, mathematics and physics are recommended.

Honors

Honors candidates in zoology fulfill the College-wide requirements by completing at least six semester hours of work in 230, 270, 197 and 198; followed by a comprehensive examination. 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, leading to M.S. or Ph.D. degrees, 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. Over 80 percent of the doctors 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 for 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 progress toward meeting the requirements of the advanced degree programs are monitored by the faculty of that Department area.

The faculty area committee can specify courses which must be taken or avoided. It can recommend that particular teaching or research experiences be sought. It has the obligation of offering advice and counsel. It is responsible for preparing the M.S. examination, administering it and providing faculty members for the formal committees which oversee M.S. theses and evaluate the examinations. Once a student has been approved for continuation toward a Ph.D. degree, he or she selects an advisory committee of five (not from outside the Department), and that committee is thereafter responsible for advising and monitoring the student's progress.

Admission

Applications for admission to the graduate programs should have a cumulative undergraduate grade point average of 2.8 or better. Graduate Record Examination scores (verbal and quantitative) should be above 500, 1100 level (the two scores summed). Under special circumstances students with a grade-point average below 2.8 may be considered for conditional admission.

Although the Department prefers applicants with an undergraduate program much like its own, it is open to students with other backgrounds, such as biology, biochemistry, botany, etc. All new students prior to registration in August, submit themselves to 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 are excused from further work in one or all of these fields, or are required to take specific courses to enhance their background in the area. These requirements are made in order to ensure breadth of background prior to engaging upon more 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 zoology may request modification of certain of the area requirements; this matter is the province of the student's degree committee.

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 will be tailored to the student's background and career goals. Credit received in courses at the 100-level or above, with the exception of 37.101, and of courses in zoology required to make up deficiencies revealed by the diagnostic examinations (see above), may be included in the 10-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 must 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 37.101 and 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 a 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 electives. 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 are now considering the offering of a 34-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's charged with establishing those formal course or 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 specialties (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. Usually the student has demonstrated some ability in research through the M.B. 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.

Special Facilities

The Zoology Department is housed in five buildings, a clus ter, the two newest being wings of the original unit. One of these, which doubled available research space, was occupied in 1965, the most recent, which is somewhat larger, was occupied in 1971. The buildings house the Department fully, so far as teaching, office and research facilities are concerned. The buildings also house a Departmental library which provides adequate study space as well as the books and journals for nearly all of the teaching and research needs of the Department.

Many of the laboratory courses in the Department use living animals heavily, 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 facility 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, darkfield, Nomarski optics. Centrifuges of various sorts, including refrigerated, high speed and ultra high speed models, are available.

Other special equipment includes electrophoresis and chromato- technology apparatus; electron scanning and recording equipment; environmental studies; X-150 computer, a Wang calculator, and other desk top computers; gas flow and liquid scintillation counters for radiotracer detection; and analyzers, including a gas-flow chromatograph; a pH-flow counter; constant temperature bath units of various types for marine and terrestrial organisms; incubators; recording UV and visible spectrophotometers; densitometers; Coulter counters; instruments and a field vehicle for field work in physical ecology; water tables, aquaria and "instant ocean" microcosms; tissue culture rooms and hoods, and cold rooms. Laboratories are otherwise equipped for advanced work which calls for specialized biochemical, biophysical, cytological or serological techniques.

Special Faculty Strengths

Virtually every faculty member has received special recognition, through awards of special postdoctoral support (fellowships, research grants, travel grants), or, in the case of senior faculty members, through election to honorary societies, election to offices of learned societies, or election to editorships or positions on editorial boards, or to appointment or election to review groups of societies, of the National Science Foundation, the National Institutes of Health, or the National Institute of Mental Health. A number are members of managing boards of scientific organizations. Most perform ad hoc reviewing of professional manuscripts and research grant applications. All have published.

The Department, as a whole, has been reviewed by granting bodies and has on five different occasions been awarded funds for one building or significant remodeling, both on campus and at the Lake-side Laboratory. The Zoology Department was the largest beneficiary of the NSF "Biological Sciences Development" award, made in 1967, with a supplement in 1971. Fellow zoologists, participating in a survey by the American Council on Education, have rated it superior in the quality of its faculty and its graduate training program, placing it among the "numbered" departments.

Graduate Student Awards and Aids

Qualified graduate students are invited to apply for awards and aids. At present some support is obtained by at least 30 percent of the graduate students in the Department. The largest support are supported by teaching assistantships (all Ph.D. candidates are required to assist in several courses), by partial tuition scholarships in the academic year and full tuition scholarships in the summer session, and by research assistantships, provided either through Graduate College support or from individual research grants administered by faculty members. The Department has several NSF trainers, some NSF predoctoral fellows, several NIH trainers in developmental biology (in a Departmental training program), several NIMH trainers in neurobiology (an interdepartmental program), some NDEA predoctoral trainers, and several postdoctoral fellows or trainers supported by funds from the NSF and the NIH. One NIMH predoctoral fellow is in residence.

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 at marine laboratories on the coast, or at other appropriate summer stations. Most assistantship and other ap pointments 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 appointments should include clear statements of research interest, if any, and interest has been deferred at the time of application.

Iowa Lakeside Laboratory

Courses in field biology and aquatic biology extend the on-campus work in ecology. See "Division of Extension and University Services."

Staff: Professor Boekevits, Broniewski (on leave), Frankel, Kessel, Kolb, Littmann, Mahler, Spangler, Williams; professors emeriti Beckers, Marsh, Noff, Siffert (on leave 1972-73), associate
Zoology

37163 Population Genetics 3 s.h.
Lecture, discussion, readings, reports on distribution of alleles in populations; genetic basis of natural variation and genetic aspects of evolution; prerequisites: 27120 or equivalent

37165 Behavioral Genetics 3 s.h.
Behavioral and genetic techniques employed in study of inheritance of behavior characteristics; human and animal studies; emphasis on quantitative study of animal behavior; prerequisite: consent of instructor

37166 Quantitative Genetics 3 s.h.
Principles of quantitative genetics presented in detail; emphasis placed on parametric estimation and selection; prerequisites: 27161 or 27160 or equivalent and consent of instructor

37169 Quantitative Methods in Biology 3 s.h.
Application of statistical methods to biological data; data description and presentation, simple hypothesis testing, analysis of variance and linear models, using computer applications when possible; prerequisite: consent of instructor

37171 Molecular Genetics 4 or 3 s.h.
Biochemistry of DNA, RNA, and protein in bacteria and viral viruses; emphasis of dependence of these phenomena on genetic code; regulation of these biol-

37173 Topics in Molecular Genetics 4 s.h.
Area of particular current interest chosen for detailed study; e.g., "Regulation of Transcription" (1975); "Animal Tumor Virology" (1975); topics relate to general mechanisms or control of DNA, RNA, or protein synthesis; lectures, discussions, oral reports; prerequisites: 27171 or consent of instructor; may be repeated for credit

37177 Prenatal: Insect Reproduction and Development 2 to 5 s.h.
Lecture reports and discussions on genetics, anatomy, endocrinology, and morphological and behavioral control mechanisms; research problem optional; prerequisite: consent of instructor

37180 Sensory Neurophysiology 1 s.h.
Prerequisite: consent of instructor

37181 Integrative Neurophysiology 3 s.h.
Selected topics of current interest in field of neurophysiology

37194 Immunoreceptor and Cellular Aspects of Development 4 s.h.
Course problems in developmental biology, emphasizing mechanism of informa-
tion flow and their control; structure and function of microorganisms, cells and cell systems; emphasis on information flow as a basis for development and differentiation in multicellular organisms; prerequisites: 37192; biotechnology recommended

37195 Laboratory Research 1 to 3 s.h.
Prerequisite: consent of instructor

37197 Readings in Zoology 1 to 3 s.h.
For honors students

37198 Seminar Honors Seminar 1 or 2 s.h.
Discussions and reports centered on either single major topic or as regular lecture series of 32317; may be repeated

37199 Independent Study 1 to 3 s.h.
For senior majors in zoology; prerequisite: consent of instructor

Courses Primary for Graduates

37204 Molecular and Experimental Entomology Laboratory 1 or 2 s.h.
Prerequisite: 27204 or equivalent; additional work in areas of current interest to students

37205 Molecular Biology Seminar 1 or 3 s.h.
Kondorosi's seminar, research reports, discussions of current literature in main emphasis on laboratory aspects; prerequisites: 27104 and consent of both instructor and student

37206 Neckers Laboratory Seminar 1 s.h.
Lectures and reports on four structure of cells prerequisites: 27212 or equivalent

37207 Library Research 2 s.h.
Enrollment by consent of instructor

37211 Independent Study 1 to 3 s.h.
For graduate students in zoology; for students engaged in research in genetics; may be repeated indefinitely; prerequisite: consent of instructor

37215 Seminar: Genetics 0, 1 or 2 s.h.
Lectures, discussions, seminars on selected topics in genetics; may be repeated for credit, prerequisite: 27110 or consent of instructor; seniors only. 27112 and 27121 or equivalent

37217 Seminar: Zoology 0 or 1 s.h.
Weekly lecture on current research; invited speakers

37226 Seminar: Embryology 2 s.h.
Selected topics of current research interest in basic physiology and biochemistry of nervous system; readings, reports, and discussions; prerequisites: 27212 or 27214 or equivalent or permission in physiology and behavior

37229 Neurobiology 2 s.h.
Lectures, discussions, readings, reports on development of systemic nervous system, and sense organs, development of behavior, nerve growth and regeneration; prerequisites: 27213 or 27113 or equivalent

37230 Neuroendocrinology 2 s.h.
Lectures and discussions on physiological, developmental, biochemical and meta-
tabolic aspects of protein hormones; emphasis on current literature; prerequisite: 27212 or equivalent

37231 Seminar: Theoretical Zoology 1 s.h.
Current concepts in ecotopgraphy; prerequisite: 27231 or consent of instructor

37232 Development of Single-Cell Systems 3 s.h.
Biochemical and structural development in protists and microorganisms; some consideration of other cellular systems, including integration of the cell cycle, cell reproduction, development of nuclear differentiation; given in even-numbered years with 27234; lecture and discussions; prerequisite: consent of instructor

37233 Seminar: Behavioral Ecology 2 s.h.
Prerequisites: consent of instructor

37235 Seminar: Behavioral Ecology 2 s.h.
Lectures, readings, discussions on gas actions in development; prerequisite: 27231

37233 Seminar: Behavioral Genetics 3 s.h.
Lectures, reports, discussion of development and differentiation in female and male gynern cells; prerequisite: consent of instructor

37240 Electron Microscopic Techniques I 1 s.h.
Lectures and laboratory on methods of thin sections, embedding, ultramicro-
scopy, electron microscopy, tissue preparation, and special techniques in light microscopy

37242 Electron Microscopic Techniques II 4 s.h.
Continuation of 27240, for experimental aspects of electron microscopy, cell and tissue biology, including repair, electron microscopy, taxonomy and systematic applications; prerequisite: 27240 and consent of instructor

37244 Seminar: College of Science 2 s.h.
Discussion of theoretical and practical problems, continued to graduate students

37251 Seminar: Zoology 0 or 1 s.h.

37252 Seminar: Zoology 0 or 1 s.h.

37291 Seminar: Zoology 0 or 1 s.h.
37293 Independent Study in Zoology 0 or 1 s.h.
Instruction in business administration and economics began at The University of Iowa before 1900. A School of Commerce was organized in 1914, and was granted college status in 1921. In 1959 its name was changed to College of Business Administration.

The College offers the degrees Bachelor of Business Administration; Master of Business Administration; Master of Arts in Accounting, Business Administration and Economics; and Doctor of Philosophy in Business Administration and Economics.

These undergraduate and graduate programs are fully accredited by the American Association of Collegiate Schools of Business. Each program is administered by an academic program committee with both faculty and student membership. The College comprises four departments—Accounting, Business Administration, Business Education, Economics—and a Center for Labor and Management.

Facilities

The College is located in Phillips Hall, an air-conditioned, high-rise building designed especially for the programs of the College. Completed in 1965, the building contains several seminar and conference rooms, an auditorium, a student lounge, 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.

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 region. Current administrative and industrial relations 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.

General Information: Undergraduate Study

The College offers the Bachelor of Business Administration degree in all four of its departments.

The B.B.A. student completes background studies either in the College of Liberal Arts at Iowa or in another institution and usually enters the College of Business Administration as a junior.

Admission requires at least sophomore standing. Unconditional admission requires at least a 2.25 grade-point average in all college-level courses undertaken, all courses undertaken at Iowa, all business and economics courses, and all business and economics courses undertaken at Iowa.

The applicant must also have satisfied the U of I College of Liberal Arts' rhetoric skills requirement and either its historical-cultural, literature, social science or natural science core requirement.

No more than 60 semester hours, or equivalents, 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 is counted toward the B.B.A. degree only if such courses are normally offered at lower division courses at Iowa.

Fulfillment of the minimum requirements does not assure admission. The College's admission committee reviews all applications and selects the applicants who appear best qualified. Students who have minor deficiencies in meeting grade-point requirements may be granted conditional or probationary admission.

Pass/Fail Grading

Of the total semester hours required for a B.B.A. degree, up to 33 may be taken on a pass/fail basis with the consent of the advisor and instructor. However, a student may not count more than 16 semester hours of pass/fail credit in his or her last 60 semester hours of coursework. Courses used to satisfy the common business requirements which carry a 6A, 6B or 6E prefix may not be taken pass/fail nor may courses in the student's major area or areas of concentration. Registration on a pass/fail basis must be completed during the first three weeks of a semester or the first two weeks of a summer session.

Maximum Schedule

Course schedules of more than 18 semester hours for a semester or nine for a summer session require the advisor's departmental approval.

Graduation Requirements

Iowa's new B.B.A. curriculum reduces from 125 to 120 the number of semester hours required for graduation; and, while requiring at least 48 hours in business courses, it also requires at least 48 hours in nonbusiness courses. Thus the student must develop more breadth in his or her program than he or she would acquire in a traditional business program, and is encouraged to
develop a great deal of breadth. Yet if the student chooses he or she may develop some measure of specialization. Also, in most instances the student will be able to complete the new program a semester or summer session sooner than the old.

At least 24 semester hours of credit in courses offered by the College of Business Administration, and at least eight semester hours of credit in the student's major or area of concentration must be earned at Iowa.

To graduate, the B.B.A. candidate must have at least a 2.0 grade-point average on all coursework attempted, all coursework attempted at Iowa, all business and economics coursework attempted, all business and economics coursework attempted at Iowa, all coursework attempted in the major or area of concentration and all coursework attempted at Iowa in the major or area of concentration.

The last 30, or 45 of the last 60 semester hours of credit must be earned in residence at Iowa following admission to the College of Business Administration.

If the quantitative method, accounting and economics requirements are not satisfied when the student is admitted to the College, they must be undertaken in his or her first enrollment and completed with satisfactory completion. In general, all common requirements should be completed by the end of the student's junior year.

Required Courses
Each candidate for the B.B.A. degree must satisfy the following minimum common requirements:

- Rhetoric-Communications 6 s.h.
- Historical-Cultural 6 s.h.
- Literature 6 s.h.
- Natural Science 3 s.h.
- Sociology or Psychology (two courses in either area) 6 s.h.
- Quantitative Methods 8 s.h.
- Accounting 6 s.h.
- Economics 6 s.h.
- Finance 3 s.h.
- Legal Environment 3 s.h.
- Management 3 s.h.
- Marketing 3 s.h.

In addition to the common requirements listed above, a student must complete a major area of study or two areas of concentration. The requirements for a specific major are established by the departments of the College. The two areas of concentration are selected by the student and must be approved by the academic advisor. Each area must consist of three courses (three semester hours), and two courses in each area must be offered by the College of Business Administration.

General Information: Graduate Study

Admission
An applicant to any advanced degree program must be admitted to the Graduate College (see "Graduate College"). In addition to a baccalaureate degree from an accredited college or university, a satisfactory grade-point average and three letters of recommendation, an applicant to the advanced degree programs in business administration, excepting economics, must achieve satisfactory scores on the Admission Test for Graduate Study in Business (ATGSB). No admission decision will be made until the ATGSB score is on file with the Director of Graduate Studies in Business. An applicant to the economics programs must attain an satisfactory score on the Graduate Record Examination (GRE).

Details concerning the examinations may be obtained directly from Educational Testing Service, Box 966, Princeton, New Jersey 08540, or from University Evaluation and Examination Services, 330 Jefferson Building, Iowa City, Iowa 52240.

Interdepartmental 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 and other nonbusiness areas, as well as for graduates of schools or colleges of business administration. For the student who has taken an undergraduate business administration course, 54 semester hours of coursework are required. For the student holding an undergraduate degree in business administration, certain of the requirements will normally be waived. However, in all cases, a minimum of 30 semester hours of graduate work is required.

Curriculum—The following courses, totaling 24 semester hours, are normally required of the nonbusiness undergraduate major.

Some of these courses are also required of the student who has majored in business but who was not exposed to one or more of these courses. This work is normally taken in the first year.

6A:114 Financial Accounting 3 s.h.
6B:154 Human Resource Management 3 s.h.
6B:181 Quantitative Methods in Economics and Business 3 s.h.
6B:182 Statistics for Business Decisions 3 s.h.
6B:215 Financial Management 3 s.h.
6B:231 Marketing Management 3 s.h.
6B:335 Organization and Management Theory 3 s.h.
6E:106 Price and Employment Theory 3 s.h.

Since the M.B.A. student uses the computer, any student not having computer programming capabilities is expected to enroll in a credit or noncredit programming course at The University of Iowa.

The M.B.A. Core—The student who has previously met the requirements of the courses listed above will enter directly into the M.B.A. core. 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 faculty, selects six hours of work. Examples of areas of concentration which might be taken are:

Accounting  Operations Research
Finance  Organizational Theory
Industrial Relations  Quantitative Methods
International Business  Risk Management and Insurance
Marketing  Systems Management

Following are the core-course requirements totaling 30 semester hours:

6A:214 Managerial Accounting  3 s.h.
6B:203 Managerial Economics  3 s.h.
6B:205 Business and Society  3 s.h.
6B:242 Operations Research in Business  3 s.h.
6B:261 Organizational and Individual Behavior  3 s.h.
6B:278 Simulation Exercise  1 s.h.
6B:279 Administrative Policy  2 s.h.
As an alternative to 6B:279, the student may take 6B:291.
6B:291 M.B.A. Seminar  2 s.h.
6E:202 National Income Analysis  3 s.h.
Area of Concentration  6 s.h.
Elective  3 s.h.

Doctor of Philosophy in Business Administration

The doctoral program is intended for individuals preparing for faculty positions in university or collegiate schools of business administration and for business or government careers as research directors, staff specialists and consultants.

The Ph.D. program includes requirements which are considered essential preparation for all students, yet is sufficiently flexible to accommodate specialization according to the student's interests, background and objectives. In all phases of the program, doctoral students can demonstrate proficiency through qualifying area examination and are encouraged to do so.

Basic Areas—The purpose of the basic areas is to develop competence in research methods and to provide knowledge needed for study in any later and more specialized courses. Ideally, the student should complete all requirements in the basic areas before proceeding to the elected and specialized areas. The requirements in the basic areas may be satisfied by passing a qualifying examination or by successfully completing each course.

The basic areas and required courses are:

**Economic Theory**
6B:214 Income and Employment Theory  3 s.h.
**Statistics and Quantitative Analysis**
6B:243 Decision Making I  3 s.h.
6B:244 Decision Making II  3 s.h.
**Behavioral Sciences**
6B:263 Behavioral Science and Business Organization I  6 s.h.
6B:266 Behavioral Science and Business Organization II  6 s.h.
**Social Environment**
6B:259 Social Environment of Industry  3 s.h.

Elective Areas—Each student elects two areas for intensive study. With the approval of the adviser and the director of graduate studies in business administration, the student chooses two "200-level" graduate courses in each of two areas. The elected area requirements may be satisfied by comprehensive examination, but this is unusual. Any student who, in any elective, does not attain a scholastic level of achievement deemed essential for a Ph.D. student, may be required to take a comprehensive examination, in addition to successfully completing the course.

One of the elected areas must be, and both may be, in business administration. The business administration elected areas may be such areas as accounting, finance, information theory, organizational behavior, marketing, industrial relations and insurance. However, no attempt is made to restrict the elected areas to traditional classifications. The elected areas may be in the behavioral sciences, social environment or an area which combines economic theory, statistics and quantitative analysis.

The requirements of one of the elected areas may be satisfied outside of the College of Business Administration by successful completion of two graduate-level courses. For example, two psychology courses would be acceptable, provided the student's adviser and the director of graduate studies in business determine that the courses are relevant to the student's total academic program.

Specialized Areas—As a preparation for dissertation research, the student selects two areas for specialization and takes two graduate-level courses in each. One or both specialized areas may be a continuation of the coursework taken in the elected areas. They also may be from three of the student's four basic areas; economics (i.e., economic theory, manpower economics, etc.) or statistics and operations research or the behavioral sciences.

Assuming good scholastic attainment, it is possible for a student to move through the basic and elected areas without taking a comprehensive examination, but all students must pass written comprehensive examinations in both of their specialized areas. In neither specialized area is the examination limited to the two courses in that area, but the examination assumes that the student has completed the requirements which give him or her a mastery over the field which is being examined.

Following completion of all areas, and after passing written comprehensive examinations over the specialized areas, the student must sit for an oral comprehensive examination. The successful completion of these requirements permits the student to work full time on the dissertation.

Dissertation Research—The doctoral dissertation is intended to provide written evidence of the candidate's ability to conduct scholarly research in his or her chosen specialized areas. Normally the original investigation, plus the writing and defense of the dissertation, will require full-time effort for at least one year.

Upon submission of the completed dissertation, the candidate is required to take an oral dissertation defense examination. This dissertation defense is held before dissertation committee members and any faculty members of The University of Iowa who may wish to attend. Success in the examination completes the final requirement for the degree of Doctor of Philosophy in Business Administration.
Accounting

Department Chairman: Louis F. Blagomt
Degrees offered: B.B.A., M.A.

Accounting is the systematized recording, classifying and interpretation of the economic facts of a business or other organization, to permit efficient 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 is increasing. A CPA may work for one of many national, regional, or international firms, or he or she may establish an independent practice. Approximately 30 percent of all accounting graduates take the CPA examination.

B.B.A. Requirements

All students in the undergraduate program in accounting must complete a basic core of accounting courses—Income Tax Accounting, Accounting for Management Analysis and Control, Financial Accounting (Assets and Liabilities), Financial Accounting (Special Topics), and Auditing Concepts and Procedures—and must elect either cost analysis and budgeting, advanced tax accounting, or advanced and contemporary accounting.

A special program of financial aids provides annual awards to students in accounting through contributions from several major industrial firms and from public accounting firms.

In addition to courses required of all candidates for the degree, Bachelor of Business Administration, the undergraduate major in accounting requires a basic core of accounting courses totaling 18 semester hours as follows:

6A:113 Income Tax Accounting
6A:130 Accounting for Management Analysis and Control
6A:144 Auditing Concepts and Procedures
6A:145 Senior Seminar in Accounting

In addition, the student may elect one or more of these courses:

6A:141 Advanced Tax Accounting
6A:146 Professional Accounting Problems
6A:170 Special Topics in Accounting

A maximum of 27 semester hours of credit in accounting courses may be counted toward the B.B.A.

M.A. Requirements

The Master of Arts degree is awarded upon successful completion of a minimum of 30 semester hours of graduate study. A minimum of 15 semester hours must be earned in 200-level courses. A total of 12 semester hours must be earned in these accounting courses:

6A:220 Accounting Literature and Research I
6A:221 Accounting Literature and Research II
6A:222 Contemporary Accounting Issues
6A:223 Contemporary Accounting Issues II

The remaining study will be in courses tailored to the student's background, interests, and career objectives. The candidate has the option of writing a thesis for which three semester hours credit may be received, or a nonthesis option may be elected. In your case the candidate will be examined orally in the fields included in the program of study. This examination will be arranged by the adviser near the end of the student's program.

Staff: Professor Barlow, Professor Emeritus Burney, Maynard; associate professors Blagomt, Kline, Smith; assistants professors Bailey, Kennedy, King, Ritts, Lambke

Courses Primarily for Undergraduates

6A:1/1 Introduction to Accounting
Survey and analysis of contemporary accounting information systems emphasizing ethical problems in external reporting by firms and in internal control systems, and their relation to investor decisions. Prerequisite: satisfactory performance on recent ACT mathematics test.

6A:112 Introduction to Accounting II
Survey and analysis of contemporary accounting information systems, emphasis on preparation of information for decision making in organizations; internal reports and their relation to decision making employed by firms; prerequisites 6A:111

Courses for Undergraduates and Graduates

6A:115 Income Tax Accounting
Survey of current practices and thought relating to external reporting by firms to its investors, creditors, and other current external reporting methods and their alternatives primarily for B.B.A. students without undergraduate accounting, but open to undergraduate business majors, prerequisite 6A:111 or equivalent.

6A:116 Accounting for Management Analysis and Control
Introduction to internal tax administration, structure and governmental implications for individual and business decision making. Prerequisite: 6A:115 or 6A:116

6A:120 Accounting for Management Analysis and Control
Survey of current tax planning and control techniques employed by firms; prerequisites 6A:115 or 6A:116

Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:130 Financial Accounting: Assets and Liabilities
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:144 Auditing Concepts and Procedures
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:145 Senior Seminar in Accounting
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:170 Special Topics in Accounting
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:180 Advanced Tax Accounting
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:186 Accounting
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:195 Senior Seminar in Accounting
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:197 Advanced Tax Accounting
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:198 Accounting
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:199 Advanced Tax Accounting
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:200 Professional Accounting Problems
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:201 Special Topics in Accounting
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

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Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:220 Accounting Literature and Research I
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115

6A:221 Accounting Literature and Research II
Survey of current practice in preparing financial statements and the influence of financial information on decision making; prerequisites 6A:111 or 6A:115
Business Administration

Department Chairman: Anthony Y. Sinukuan
Degree offered: B.B.A.

Students graduating with the B.B.A. in business administration have a wide range of career choices. The largest number goes into marketing. Many are employed by financial institutions and in junior management positions. Others enter government service and other subeconomics fields requiring administrative skills. Many continue their studies toward advanced degrees.

There is also considerable latitude within career areas. For example, the avenues open to a business administration graduate with a major in marketing include advertising and promotion, consumer product development and improvement, and product distribution.

The purpose of Iowa's undergraduate program in business administration is to give the student a general overview of business with its position in and relationship to society. It deals with business theory, decision making and management systems generally, rather than specializing in a particular facet of business administration.

Designed to teach students about business rather than how to conduct business, the program's behavioral approach stresses the concept of the human interaction in business and society at large.

The student of business administration can choose between two options in fulfilling the degree requirements:

A. In addition to courses specified in the College's general statement, students can select two three-course sequences (usually nine to twelve 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.

B. In addition to courses outlined in the general statement, students can elect a major in one of the following areas by satisfying the specified requirements.

Requirements for the Major in Financial Management

6B:111 Investments
6B:114 Commercial Banking

Students also must elect either 6B:115 or 6B:116 and select six additional semester hours from the following courses:

6B:112 Security Analysis
6B:126 Real Estate and Urban Land Economics
6B:135 Short-Term Financing
6B:116 Long-Term Financing

At least two semester hour sequences in basic core are also required.

Requirements for the Major in Financial Economics

6E:117 Money and Banking
6E:119 Public Finance
6E:171 Industrial Organization
6B:111 Investments
6B:114 Commercial Banking
6B:103 Managerial Economics or 6E:103 Micro-Economics

Requirements for the Major in Insurance

6B:20 General Insurance
6B:131 Property and Casualty Insurance
6B:122 Life and Health Insurance

In addition, students must select at least one, but no more than two, courses from the following:

6B:120 Mathematics of Insurance
6B:124 Social Insurance
6B:124 Risk Management
6B:129 Independent Study

Six additional hours of courses are specified by the student's advisor.

Requirements for the Major in Industrial Relations

6B:150 Minority Rights in an Industrial Society
6B:153 Labor-Management Relations and Public Policy
6B:154 Human Resources Management
Courses for Undergraduates and Graduates

6B101 Directed Readings in Business Administration: An individualized guided reading in selected topics in business

6B103 Managerial Economics: An economic analysis applied to basic problems encountered in marketing, finance and production; provides foundation for more specialized work in these fields

6B113 Investments: The investment process in modern finance

6B116 Security Analysis: Valuation of corporate securities; financial statement analysis; economic and regulatory environment

6B114 Commercial Banking: Banking structures and functions; money market and liquidity management; lending policies and portfolio management; banking competition and regulation; prerequisites: 6B11

6B115 Financial Management: Case problem approach; methods of analyzing and planning current assets of firm, management of types of debt and equity capital structure planning; understanding of security issuance; issue of capital and capital budgeting; prerequisites: 6B11, 6B16

6B116 Intermediary Financial Management: Case problem approach; methods of analyzing and planning current assets of firm, management of types of debt and equity capital structure planning; understanding of security issuance; issue of capital and capital budgeting; prerequisites: 6B11, 6B16

6B116 Selected Topics in Finance: The in-depth study of selected topics in finance not covered by regular courses, credit hours and course content determined by instructor; prerequisite content of instructor

6B120 Mathematics of Life Insurance: Elements from probability and mathematics of finance developed and applied to problems in determination of insurance premiums, benefits and reserve; same as Statistics 220-80

6B121 Property and Liability Insurance: Business and individual needs for insurance; fire, fire insurance, marine insurance and allied lines; public liability, automobile, other property and casualty coverage; insurance contracts and underwriting; prerequisites: 6B20

6B122 Life and Health Insurance: Life, health and accident coverage from viewpoint of the individual, business, government and insurance companies; policy types, rate making, investments, regulation, group insurance, estate planning; prerequisites: 6B20

6B123 Social Insurance: Governmental activities in creating economic security and alleviating poverty; issues of security and severity; current progress including OASDI, Unemployment Comp., AFDC, etc.; potential programs such as national health insurance

6B124 Risk Management: The use of risk and self-insurance, management for dealing with risk; insurance industry, types of insurance, functions of insurance and government regulation of insurance; social and economic factors; basic features of selected insurance contracts; prerequisites: Economics 6B2

6B125 Introduction to Marketing: General introduction to structures of marketing, marketing environment of organization, and to strategies in conducting marketing decisions, buyer behavior, and management of marketing decisions

6B126 Introduction to Law: General history and structure of law; law's action in guiding changing economic and social systems; prerequisites: Economics 6B1 or junior standing

6B125 Administrative Organization: Overview of technical, economic and human problems encountered by both managerial and nonmanagerial employees of task-oriented organizations; basic disciplines and structures present a comprehensive understanding of organization and environment; fundamentals of technical problem analysis and decision methods intended as an introduction to the organizational environment

6B128 Production Management: Organization and management of manufacturing enterprises; production design and process planning, plant layout and materials handling, work simplification and measurement, productivity and inventory control, quality control, plant location, maintenance of plant equipment, cost and budgetary control; prerequisites: Economics 6B2

6B129 Promotional Concepts/Buyer Behavior: Supermarket buying habits, merchandise planning, advertising and personal selling; classification of influences on buying behavior, including learning, perception, demonstration, imagery, motivation, perceived social, self, role, life style, reference groups, culture, social class and family; strategic use of persuasive communications in marketing; prerequisites: 6B1 and instructor consent

6B130 Advertising Theory and Planning: Advertising as promotional force; emphasis on theory, planning, resulting strategic and tactical decisions that advertising executive makes; same as Journalism 19-120

6B131 Strategic Communications: Theories of communication and human behavior as applied to advertising copy and layout; laboratory situations designed to inculcate creative experience; same as Journalism 19-120; prerequisite: 6B127 or Journalism 19-120

Courses for Undergraduates

6B101 Directed Readings in Business Administration: An individualized guided reading in selected topics in business

6B103 Managerial Economics: An economic analysis applied to basic problems encountered in marketing, finance and production; provides foundation for more specialized work in these fields

6B113 Investments: The investment process in modern finance

6B114 Commercial Banking: Banking structures and functions; money market and liquidity management; lending policies and portfolio management; banking competition and regulation; prerequisites: 6B11

6B115 Financial Management: Case problem approach; methods of analyzing and planning current assets of firm, management of types of debt and equity capital structure planning; understanding of security issuance; issue of capital and capital budgeting; prerequisites: 6B11, 6B16

6B116 Intermediate Financial Management: Case problem approach; methods of analyzing and planning current assets of firm, management of types of debt and equity capital structure planning; understanding of security issuance; issue of capital and capital budgeting; prerequisites: 6B11, 6B16

6B116 Selected Topics in Finance: The in-depth study of selected topics in finance not covered by regular courses, credit hours and course content determined by instructor; prerequisite content of instructor

6B120 Mathematics of Life Insurance: Elements from probability and mathematics of finance developed and applied to problems in determination of insurance premiums, benefits and reserve; same as Statistics 220-80

6B122 Life and Health Insurance: Life, health and accident coverage from viewpoint of the individual, business, government and insurance companies; policy types, rate making, investments, regulation, group insurance, estate planning; prerequisites: 6B20

6B123 Social Insurance: Governmental activities in creating economic security and alleviating poverty; issues of security and severity; current progress including OASDI, Unemployment Comp., AFDC, etc.; potential programs such as national health insurance

6B124 Risk Management: The use of risk and self-insurance, management for dealing with risk; insurance industry, types of insurance, functions of insurance and government regulation of insurance; social and economic factors; basic features of selected insurance contracts; prerequisites: Economics 6B2

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6B128 Production Management: Organization and management of manufacturing enterprises; production design and process planning, plant layout and materials handling, work simplification and measurement, productivity and inventory control, quality control, plant location, maintenance of plant equipment, cost and budgetary control; prerequisites: Economics 6B2

Courses for Undergraduates and Graduates

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6B125 Administrative Organization: Overview of technical, economic and human problems encountered by both managerial and nonmanagerial employees of task-oriented organizations; basic disciplines and structures present a comprehensive understanding of organization and environment; fundamentals of technical problem analysis and decision methods intended as an introduction to the organizational environment

6B128 Production Management: Organization and management of manufacturing enterprises; production design and process planning, plant layout and materials handling, work simplification and measurement, productivity and inventory control, quality control, plant location, maintenance of plant equipment, cost and budgetary control; prerequisites: Economics 6B2
teaching at the secondary, junior college or university levels, and provides a broad educational experience in the field of business administration.

**The Undergraduate Program**

The business education undergraduate program primarily for persons who want to become business teachers at the secondary level.

The program has three areas of concentration—secretarial education, office education and basic business education— from which the undergraduate student selects an area of emphasis. Secretarial education prepares the student to teach typing, shorthand, accounting and other information-processing techniques. Office education gives the student the background necessary to teach typing, accounting and general business courses. Basic business education prepares students to teach in broader economic business, consumer economics, business law, economic geography and accounting.

Students majoring in business education must complete the general requirements for the Bachelor of Business Administration degree in addition to courses required 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. Student teaching, in an accredited high school in cooperation with an experienced business teacher, is the capstone of the undergraduate program.

These courses are required of all business education teaching majors:

- Business Typewriting
- Office Calculating Machines
- Administrative Communication
- Business Data Processing
- Principles of Business Education

* For teacher certification, students must take a terminal course at The University of Iowa.

In addition, the student must choose from one of these three teaching options:

**Secretarial Education Option**

- Transcription (required) 3 s.h.
- Office Services (required) 3 s.h.
- plus six semester hours from:
- Executive Secretarial Procedures 3 s.h.
- Written Communication in Business 3 s.h.
- O.M. Management 3 s.h.
- Practicum: Office Problems 3 s.h.
- Data Processing Systems 3 s.h.
- or other electives as approved

* For teacher certification, students must take a terminal course at The University of Iowa

**Office Education (Nonsecretarial) Option**

- Office Services (required) 3 s.h.
- plus nine semester hours from:
- Written Communication in Business 3 s.h.

**Basic Business Education Option**

- Office Management 3 s.h.
- Practicum: Office Problems 3 s.h.
- or other electives as approved

**M.A. Program**

This nonthesis program in business education is designed for the graduate student who holds a bachelor's degree and has either a major or a minor teaching area in business education.

Sufficient flexibility is provided in the program to meet individual needs for upgrading professional competence in teaching the business subjects. In order to achieve this desired flexibility, coursework from three areas is included in the program, with an approved freedom of choice within each area:

- Business Administration: to provide improvement in specific content areas in business
- Professional Business Education: to emphasize the improvement of teaching and philosophy of business education; and
- Professional General Education: to emphasize general aspects of teaching.

A minimum of 32 semester hours must be included in the program, with an approximate distribution of hours among the three areas of study as follows:

- Business Administration: 12 to 15 semester hours of courses must be selected from courses in general business administration, with the approval of the adviser; available areas: accounting, administrative management, teaching, personnel, economics, financial economics, financial management, industrial relations, public relations, insurance and marketing.
- Business Education: nine to 12 semester hours must be selected from professional business education courses with the approval of the adviser; and
- Educational: six to nine semester hours must be selected from professional education courses with approval of the adviser; available areas: adult education; educational administration; educational media; educational psychology; measurement and statistics; higher education; social foundations and comparative education; and special education.

Three two-hour examinations or two three-hour examinations are required in business administration, business education or secondary education. An area is defined as six semester hours or more in related courses.
M.A.T. Program

The M.A.T. program is a 38-semester-hour nonthesis course of study. It is designed for superior liberal arts 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.

Individuals who have not obtained certification are eligible if they have completed the accredited bachelor’s degree programs with majors in academic areas commonly included in high school curriculums and have obtained a minimum grade-point average of 2.5 (A = 4.0). Most advisors require students to maintain a 3.0 in graduate work once they are accepted into the program. While students may be admitted before taking the Graduate Record Examination, this requirement should be met before the next registration date.

Two summers and an academic year of two semesters are usually necessary to complete the program. The certification sequence consists of 24-27 semester hours of graduate coursework as follows:

- One elective course in education: 3
- Audiovisual Teaching Methods
- Social Development of the School-Age Child
- Principles of Guidance
- Construction and Use of Classroom Tests
- Preprofessional Seminar

Education Psychology 3
Philosophy or History of Education 3
Methods (credit arranged) 3-6
Observation and Laboratory Practice 12

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 session 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.

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

Degree Requirements

- Two tools to be chosen from: foreign language, applied statistics, two areas of advanced mathematics, computer programming, scientific method or other appropriate research tool to be approved by the adviser

Areas of study:

A. Major area—business education
B. Related area in business
C. Minor or collateral area in education (such as adult education, educational administration, educational psychology, guidance and counseling, or higher education)
D. Completion of at least 90 semester hours beyond the bachelor’s degree, including the dissertation

- Comprehensive examinations: three hours in each of the areas of study
- Dissertation proposal: to be submitted to doctoral committee
- Defense of the dissertation

The plan of study will be developed by the student and an advisor in accordance with individual needs. In each area of study, there must be at least nine semester hours of doctoral-level coursework approved by the advisor.

Facilities

Modern office machines and equipment as well as secretarial listening laboratories are housed in the new air-conditioned College of Business Administration building. Phillips Hall.

Faculty

All full-time faculty members of the Business Education Department have doctoral degrees, teaching experience at the high school level and extensive work experience in private industry. In addition, the entire faculty has an enviable record in publishing, from textbooks and monographs to articles written for leading publications in business education. The staff has engaged in both private and governmental research, as well as business and industrial counseling.

Staff: professor Grate, Kallaus, associate professor Nollmeyer; assistant professors Ennis, Zuber

Courses Primarily for Undergraduates

481: Basic Typewriting 3 s.h.
Basic organization and operation of modern-day communication media, integrating techniques and fundamental business letters, tables and forms, open only to students with 60 or above on formal typing test.

482: Business Typewriting 3 s.h.
Subsequent development and integration of skills and knowledge necessary in production of letters, forms, manuscripts, tables and other pertinent business communications, required for business teachers; prerequisite 481 or equivalent.

481B: Beginning Shorthand 3 s.h.
Shorthand theory and development of skill through business dictation; prerequisite 481B and consent of instructor; not open to students with one year of high school shorthand in equivalent.

482B: Advanced Shorthand 3 s.h.
Shorthand theory and review; skill development and transcription; prerequisite 485B or equivalent; second semester only.

482B: Transcription 3 s.h.
Special emphasis on advanced skill in transcription; prerequisite 485B or equivalent; men only.

485C: Executive Secretarial Procedures 3 s.h.
Development and integration of knowledge, skill and related qualities necessary for high-level office personnel and administrative assistants, with teaching implications for business education majors; prerequisite 481B or equivalent, 485B or equivalent, and junior standing; second semester only.
68:20 Office Calculating Machines 2 a.h.
Practical operating knowledge of adding machines, calculators, typewriters, and similar office devices; emphasis on study of the mechanics of office calculating machines, typewriters, and related mechanical devices; comprehension of basic mathematical operations and statistical analysis; emphasis on typing accuracy; test; final exam.

68:22 Office Services 3 a.h.
Process and technique necessary for efficient transmission of written information; production typing emphasis on design of tables, special reports and letters; organization of experience on speed, neatness, style and typewriter equipment; prerequisite: 68:21.

68:23 Administrative Communication 3 a.h.
Interdisciplinary study of communication processes in business including organizational, psychological and language processes (both written and spoken), communication skills, systems and techniques; prerequisite: satisfactory performance on required or equivalent and junior standing.

68:106 Office Management 1 a.h.
Management of office activities including planning, organizing, staffing, directing, controlling, and evaluating functions, as well as human relations factors and communication techniques; emphasis on management information; prerequisite: junior standing.

68:146 Practicum: Office Problems 1 cr. arr.
Research on standards and performance in office systems applied to secondary business education; coordinated classroom and office supervision; test of office supervision and office operations; for seniors and juniors in business education.

68:132 Business Data Processing 3 a.h.
Information needs of management; data processing systems orientation; programming business problems; management and business teacher education; considerations in data processing; prerequisite: junior standing.

68:136 Data Processing Systems 3 a.h.
General system concepts; data processing systems analysis and design; integrating data processing concepts through class project plan; prerequisites: junior standing and 68:132 or equivalent.

68:191 Principles of Business Education 3 a.h.
Principles, practices, and problems of business education; particular emphasis on secondary and community college.

68:192 Methods of Business Subjects 3 cr. arr.
Study of objectives, content and teaching methods for business education materials; three to six semester hours of credit from the following courses is recommended: business education (three semester hours); bookkeeping (one semester hour); business law (three semester hours); psychology (one semester hour); mathematics (one semester hour); computer science (one semester hour); education (one semester hour); test; final exam; prerequisite: completion of major requirements or consent of instructor; senior or junior.

68:196 Organization and Administration of Cooperative Programs 4 a.h.
Objectives, operation and coordination of vocational programs; office and distributive education programs; summer session techniques.

68:197 Business Calculating Techniques 2 a.h.
Problems of correcting classroom instruction with real job training in office and distributive education programs; required for teacher coordinators of office education programs; prerequisite: summer session only.

68:198 Business Education 2 a.h.
Study of vocational education programs with special emphasis on curriculum development and social science and business and industry; required for teacher coordinators of office education programs.

68:199 Business Education Workshop 0 to 1 a.h.
Offers supervised experience.

Courses Primarily for Graduates
68:203 Seminar: Basic Business and Economics 2 to 3 a.h.
Technological and social, political, economic, behavioral objectives; and implications of research for teaching in basic business and economic education.

68:204 Seminar: Career Counseling 2 a.h.
Accounting principles and applied analysis; comparison of approaches, techniques and methods of career development; emphasis on analyzing various aspects of career counseling, technical and personal counseling; primarily for high school and community college counselors of help-seeking, counseling and data processing seminars.

68:206 Seminar: Secretarial Education 2 to 3 a.h.
Research findings and experiential emphasis applied to areas of secretarial education; including office procedures and communication, psychology applicable to all fields of business education.

68:207 Seminar: Teaching Information Processing 2 a.h.
Information processing concepts and devices; practical and theoretical applications to business teacher: development of criteria to maintain, analysis of teaching methods and study of evaluation problems.

68:101 Supervision of Business Education 3 a.h.
Principles, techniques and practices of business education at supervisory level; design for business education administrators and those who wish to prepare for, or improve, supervisory roles in business education; same as Education 76:211.

68:202 Post-Secondary Business Education 3 a.h.
Philosophy; organization and administration; principles and problems; curriculum development and teaching procedures in postsecondary business education programs including two-year colleges.

68:216 Seminar: Administrative Communication 3 a.h.
Communication theory applied to organizing and administrative processes; communication in total business education system; emphasis on selected areas of business; prerequisite: 68:196 or equivalent.

Research methodology and principles of research in business education; same as Education 76:220.

68:225 Administrative Management 3 a.h.
Organizational behavior; basic information concepts; current and planned development in management information; effective administrative techniques; applications to selected areas of business, industry and government; prerequisite: 68:145 or equivalent and graduate standing.

68:242 Directed Readings 1 cr. arr.
Individually guided reading in business education; data processing, communication or business education; prerequisite: standing consent of instructor; may be repeated to maximum of six semester hours.

68:276 Research Seminar: Business Education 2 a.h.
Analysis of research methods and design; formal research within total framework of business education, including business teacher education, office management, secretarial education, and data processing.

68:277 Research: Business Education 3 a.h.
Research findings and experiential emphasis applied to areas of business education; emphasis on analysis and synthesis of business education policy involving current framework of business education.

Economics
Department Chairman: Jared Bernard
Degree offered: B.B.A. in 128 hours.
See also "College of Liberal Arts"
Economics is the study of people determining what they produce, consume, buy and sell. It is also concerned with the coordination of these activities between individuals and groups within and among societies. Economics examines such problems as unemployment, economic growth and development, inflation, the balance of trade and economic welfare.

Undergraduate Requirements
In addition to the common requirements for students in the College of Business Administration, the major in economics for the Bachelor of Business Administration degree requires 16 semester hours in 100-level economics courses, including one in microeconomics and one in macroeconomics. Alternatively, the degree may meet the requirements for the degree by meeting the common require-
Economics

Admission Requirements and Procedures

The general admission requirement is a bachelor's degree from a college or university in good standing. The minimum overall grade-point average for admission is 2.5 (A=4) for the M.A. program and 2.7 for the Ph.D. program. Each applicant also must submit scores from the Graduate Record Examination (GRE), Test and three letters of recommendation. Minimum prerequisites for entry into the Ph.D. program also will normally include two semesters of calculus and one semester of linear algebra. The linear algebra course may be taken during the summer preceding entry into the Ph.D. program. Knowledge of this material will be presupposed throughout the Ph.D. program.

M.A. Program

The M.A. degree is designed as a terminal degree. Incoming students who feel that they wish to earn the Ph.D. but who are initially undecided are advised to enroll in the Ph.D. program so that both degrees remain open to them.

Terminal M.A. Program

Graduate Programs

The program requires a total of 30 semester hours and a thesis, or 36 hours in the nonthesis program. An oral defense of the student's M.A. thesis is required of those choosing the thesis option. Those choosing to do two seminars and papers will be given oral examination over that material.

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. The core areas are microeconomic theory, macroeconomic theory, mathematical economics and econometrics. The core itself is comprised of 10 courses designed to be taken in a specific sequence. The academic loads of nine to 10 semester hours in this sequence presuppose that the student is employed as a research or teaching assistant. Those who are not may carry additional courses. The Graduate College requires 72 semester hours of graduate credit for a Ph.D.

Core Sequence

First semester

6E:203 Microeconomics I
3 s.h.
6E:211 Mathematical Economics I
3 s.h.
Multi-variable Calculus, e.g., 22M:28
22M:28 may be taken for three semester hours graduate credit under the number 22M:199
4 s.h.
6E:200 Topics in Economics
1 s.h.
Second semester

6E:204 Macroeconomics I
3 s.h.
6E:212 Mathematical Economics II
3 s.h.
22S:120 Probability and Statistics
4 s.h.
Third semester

6E:205 Microeconomics II
3 s.h.
6E:221 Econometrics I
3 s.h.
Field course
3 s.h.
Fourth semester

6E:206 Macroeconomics II
3 s.h.
6E:221 Econometrics II
3 s.h.
Field course
3 s.h.

Incoming students who have multivariable calculus may replace this course with a field elective in their first semester. Those with aspirations for a major in econometrics should take 22S:153 Introduction to Mathematical Statistics I and in their second semester replace Statistics 22S:120 with 22S:154 Mathematical Statistics II.

Major Area Courses

Each student must have a major area of study in addition to the core courses. A major area consists of a minimum of 21 semester hours of coursework comprising an intensive study of a field (e.g., money and banking, trade) 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 seven field courses chosen by each student under
Economics

faculty direction must be approved by the faculty (through the graduate
director in consultation with the graduate advisory
committee). The student must maintain a 3.2 grade-point aver-
age 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 erased the second time replace his or her
earlier grade for Departmental purposes.

Examination Sequence and Disqualification Procedure

The qualifying examination is given following the end of the first
spring semester and again one week before fall semester of the
second year and takes six hours to complete.

The written qualifying examination will cover economic theory,
mathematical economics and statistics. The purpose of the
examination is to determine which students may continue for the
Ph.D. degree and which students should complete a terminal
M.A. program. A student who fails will be asked to complete
qualifications for a terminal master's degree. A student with a
grade of "marginal" will be asked to re-examine the exam, the follow-
ing fall, to pass or to fail.

Comprehensive Core Examinations

Comprehensive core examinations are given two weeks after the
end of the spring semester in the second year, and one week
before fall semester of the third year. It is, too, a six-hour exam.

The written comprehensive core examination covers the core
areas of economic theory, mathematical economics and econo-
metrics. A student who fails will be asked to complete qualifica-
tions for a terminal master's degree. A student with a grade of
"marginal" will be asked to sit for the complete set or various
parts of the exams the following year, at which time he or she
may receive a grade of pass or fail.

Comprehensive Examination

A thesis seminar will be held in which students who are working
on their dissertations will participate. This seminar will be the
numbered course but an apéndicea forum convened as required.
The student will complete the oral comprehensive examination
by presenting a thesis proposal before this seminar to the satis-
faction of a committee of five members of the faculty appointed
for the occasion by the graduate director. Successful completion
of this seminar, of the core examinations and of the major area
courses with a acceptable grade average would result in the
student's admission to candidacy for the Ph.D. degree.

Disertation Examination

An oral examination in defense of the dissertation research is
required.

Teaching and Research

Teaching and/or directed research are a required part of the
graduate program. The program is designed to bring all students
to a uniform 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
area.

Staff:

professors Costantini, Krause (Murray Professor), Lloyd,
Morgan, Nordquist, Pack, Wu; professor emeritus Olson; associ-
est professors Albrecht, Balch, Barnard, Jeffers, Pogue, Ruffin,
Sibert, Spitz, Swaminathan, assistant professors Dent, Joseph, Re-
disch, Wasilew, Williamsen

Courses Primarily for Undergraduates

Exempt: ECON 410 and 412 may be taken in either order or they may be taken simul-
aneously, they satisfy social science core requirement for B.S. and B.S. students.

ECON 101 Principles of Economics

Organizations and workings of modern economic system; role of markets, prices
and coordination in promotion of economic welfare; regulation of business and
labor, provision of public goods (health, education, security, poverty and distribu-
tion of wealth, economic factors in total environment; alternative economic sys-
tems; prepatterns satisfaction of University curricular requirements.

ECON 203 Principles of Economics

National income and output; employment and prices: money and credit, govern-
ment finance; monetary and fiscal policy, economic growth and development,
international relations; economic systems; prepatterns satisfaction of University
curricular requirements.

Economic Analysis and Policy

ECON 102 Microeconomics

Serves as ECON 410, with additional prerequisite of one semester of calculus.

ECON 103 Microeconomics

Economic theory of consumer behavior, producer behavior, and role of markets
in coordinating economic decisions; conditions for efficient resource allocation
between market mechanisms; prepatterns ECON 211 and 412 or senior standing.

ECON 104 Microeconomics

Serves as ECON 410, with additional prerequisite of one semester of calculus.

ECON 105 Macroeconomics

Measurement, theory and control of aggregate economic activity; prepatterns:
prepatterns ECON 211 and 412 or senior standing.

ECON 106 Price and Employment Theory

Role of market and price determination under various conditions; national income
analysis, employment, growth and economic policy; alternative economic systems.

ECON 168 Macroeconomics

ECON 110 Economics of International Trade

Structure of America's international trade and balance of payments, role of trade in
economic growth, analysis of economic and political aspects of international trade.

ECON 111 Economics of International Trade

Structure of America's international trade and balance of payments, role of trade in
economic growth, analysis of economic and political aspects of international trade.

ECON 112 Economics of International Trade

Structure of America's international trade and balance of payments, role of trade in
economic growth, analysis of economic and political aspects of international trade.

ECON 113 Economic Growth and Environmental Decay

Consequences and consequences of economic growth in more developed countries; cli-

ECONOMICS

Economics

ECONOMICS III 3 s.h.
Advanced single-equations model literature, autocorrelation, test for cointegration, dummy variables, Bayesian models, nonlinear models, functional form.

ECONOMIC DEVELOPMENT I 3 s.h.
Process of economic development in underdeveloped countries; emphasis on theory of development; prerequisites: consent of instructor.

ECONOMIC DEVELOPMENT II 3 s.h.
Principles of economic development in underdeveloped countries; emphasis on policy alternatives in development; prerequisite: consent of instructor.

ECONOMIC DEVELOPMENT III 3 s.h.
Principles of economic development in underdeveloped countries; emphasis on policy alternatives in development; prerequisite: consent of instructor.

INTERNATIONAL ECONOMICS I 3 s.h.
Theory of foreign trade; trade theory and policy; trade and growth; prerequisite: consent of instructor.

INTERNATIONAL ECONOMICS II 3 s.h.
Theory of foreign exchange; balance of payments adjustment; gold-standard problem; exchange controls; international investment; prerequisite: consent of instructor.

MONETARY THEORY I 3 s.h.
Microeconomics of monetary theory, classical monetary theory controversy, money and employment; prerequisite: consent of instructor.

MONETARY THEORY II 3 s.h.
Historical evolution of monetary theory; non-Keynesian and recent aggregate models of the business cycle (monetary and real sectors, money in economic growth, recent empirical studies of monetary factors; prerequisite: consent of instructor.

LABOR ECONOMICS & RELATIONS 3 s.h.
Economics of labor market relevant topics in wage theory; models of institutional behavior in the labor market; economic impact of collective bargaining on employment conditions; contributions of the alternative models of labor economics; prerequisite: consent of instructor.

LABOR RELATIONS 3 s.h.
Developments from Trumans Fair Deal to health-care system; alternative to recent alternatives; models of physician pricing and distribution decisions, hospital investment, demand and hospital inflationary mechanism; exploration of health production, technology and organizational forms and their implications for national, state and local health planning; prerequisite: consent of instructor.

ECONOMIC DEVELOPMENT OF THE NORTH AMERICAN ECONOMY 3 s.h.
Analysis of long-term growth patterns of American economy with reference to special theories of economic growth; discussion of recent research on demographic transition theory, population, market, consumer demand, capital formation, and costs and results of organization; prerequisite: consent of instructor.

ECONOMIC DEVELOPMENT OF THE UNITED STATES ECONOMIC GROWTH 3 s.h.
Aggregative analysis of exogenous change and income growth in American economy; focus on the impact of monetary and fiscal policies on rates of income growth; impact of two world wars on economic structure; U.S. historical period is setting for testing of historical economic hypotheses of commodity, factor and financial markets; prerequisite: consent of instructor.

EUROPEAN DEVELOPMENT OF WESTERN EUROPE 3 s.h.
European economic growth since Industrial Revolution; emphasis on population trends and economic growth, evolution of capital markets, patterns of capital accumulation and investment: rates of economic growth; analysis of technological growth and growth of agri-economics; prerequisite: consent of instructor.

EUROPEAN DEVELOPMENT OF EASTERN EUROPE 3 s.h.
Evolution of modern theory of business firms and market structures: detailed study of patterns of market areas between U.S. types and areas of the country, of buyers and sellers and ultimate market performance; prerequisite: consent of instructor.

INDUSTRIAL ORGANIZATION II 3 s.h.
Public policy issues in industrial organization; appraisal and critique of antitrust laws; regulations of public utilities and transportation in U.S.; prerequisite: ECON 321 or consent of instructor.

ECONOMICS OF THE GOVERNMENT BUDGET TAXATION 3 s.h.
Role and effects of taxation in modern economy; effects of major taxes upon allocation of resources, distribution of income, and economic growth and mobility; debt issues in taxation; tax incidence; prerequisites: consent of instructor.

ECONOMICS OF THE GOVERNMENT BUDGET EXPENDITURES 3 s.h.
Economic functions and effects of government spending; economic function of government; allocative effects of spending on government functions; demand effects; and distribution effects of government spending; prerequisite: consent of instructor.

ECONOMICS OF MONETARY POLICY LECTURE 3 s.h.
Analysis of modern theory of money and interest rates; study of the factors affecting the money supply; and the theory of the short-run, medium-run, and long-run, with emphasis on monetary aspects of the economy; prerequisite: consent of instructor.

FEDERAL TAX POLICY 3 s.h.
Estimates of federal tax issues on national income, taxes and social welfare distribution and economic ability; evaluation of policies for changes in federal tax system; prerequisite: consent of instructor.

STATE AND LOCAL GOVERNMENT FINANCE 3 s.h.
Economic functions of state and local governments; purposes and problems of multi-level, multi-level government; state-local government finance in practice description, evaluation, and prescription for change; prerequisite: consent of instructor.

REGIONAL ECONOMICS 3 s.h.
Basic principles of economic theory. Analysis, planning, and policy in regional context; study of migration of labor, income and investment; economic impact of urbanization; prerequisite: consent of instructor.

URBAN ECONOMICS 3 s.h.
Analytical aspects of urban economics; emphasis on urban growth in context of economic development, impact of private landowners decisions on patterns of growth, discussion of public economics of urban centers and transportation in metropolitan areas; prerequisite: consent of instructor.

THESIS IN ECONOMICS 3 s.h.
Prerequisite: consent of instructor.

Courses in Advanced Graduate Seminars

ENT 311 Seminar in Economic Theory 3 s.h.
Prerequisite: consent of instructor.

ENT 312 Seminar in Economic Development 3 s.h.
Prerequisite: consent of instructor.

ENT 313 Seminar in International Economics 3 s.h.
Prerequisite: consent of instructor.

ENT 314 Seminar in Monetary Economics 3 s.h.
Prerequisite: consent of instructor.

ENT 315 Seminar in Labor Economics 3 s.h.
Prerequisite: consent of instructor.

ENT 316 Seminar in Health Economics 3 s.h.
Prerequisite: consent of instructor.

ENT 317 Seminar in Economic History 3 s.h.
Prerequisite: consent of instructor.

ENT 318 Seminar in Economics of the Government Sector 3 s.h.
Prerequisite: consent of instructor.

ENT 319 Seminar in Urban and Regional Economics 3 s.h.
Prerequisite: consent of instructor.
College of Dentistry

Administrative Staff
Dean Donald J. Celagian
Dean Emeritus: George S. Easton
Associate Dean and Coordinator of Research: Jess Hayden, Jr.
Director of Clinical: C. Frederick Kfie
Coordinator, Student Affairs: A. Scott Craig
Director, Continuing Education: Ralph C. Appleby
Librarian: Margery F. Jenne

The College of Dentistry is both administratively and physically an integral part of the University. It draws upon and contributes to the University's diverse resources, and its students enjoy all the advantages and privileges enjoyed by the general student body. The College benefits particularly from its cooperative relationship with the colleges of Medicine, Nursing and Pharmacy in the University Health Center, whose teaching, research and service activities have earned international recognition.

Basic Program in Dentistry
The basic educational program leading to the degree, Doctor of Dental Surgery (D.D.S.), comprises three years of preprofessional study and four years of study in the College of Dentistry. The dental curriculum consists of five basic units:

Basic Sciences
Gross, general radiographic and developmental anatomy; gross anatomy; biochemistry; general microbiology; physiology; general pathology; oral pathology; pharmacology; microbiology; clinical pathlogy; oral biology

Restorative Dental Sciences
Gross, microscopic and radiographic dental anatomy; dental materials; endodontics; operative dentistry; fixed partial prosthetics; removable prosthesis

Oral Medicine
Physiology of mastication; introduction to diagnosis and therapy; preventive dentistry; oral diagnosis; dental radiology; atherosclerosis and pain control; oral surgery; periodontology; internal medicine; therapeutics; bioclinical conference

Community Dentistry
Etiology; history of dentistry; biometry and the scientific method; research design and planning; epidemiology; nutrition; preventive dentistry and community health; principles of human behavior; dental economics; dental jurisprudence; practice management

Pediatric Dentistry
Facial growth and development; periodontics and orthodontics

To achieve a close correlation of the basic sciences with clinical disciplines, the student is introduced to actual clinical work during the freshman year.

The sophomore program includes comprehensive training in the effective coordination of auxiliary personnel. Classroom instruction in this area is followed by practical experience offered in conjunction with the dental hygiene program.

Junior dental students rotate through a series of " clerkships" which give them meaningful exposure to each of the eight clinical disciplines.

Senior dental students are involved in the delivery of comprehensive dental care in an environment which closely simulates conditions in private dental practice. Seniors also are exposed to various extramural health programs at state and University Hospitals and the State Department of Health.

The curriculum provides a summer preceptorship in which senior dental and dental hygiene 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.

Special Programs
Enrichment
A dental student may satisfy Departmental requirements by examination in lieu of course participation. The student must maintain satisfactory performance throughout the program. A student who qualifies for the program must maintain a satisfactory level of achievement to remain in the program. An enrichment program may consist of electives taken for credit, advanced clinical training, research or any combination of these activities. It may also provide a means to fulfill some Graduate College requirements, if the student's objective is a combined Dentistry-Graduate College degree.

Teacher Training
In close cooperation with the Graduate College and the colleges of Education and Liberal Arts, the College of Dentistry offers one of the few programs preparing dentists to become professional educators. The program combines graduate-level coursework in dentistry, education and the liberal arts, with supervised teaching experience and research in the College of Dentistry. It leads to a master's degree in education or science. Each student's course of study is tailored to individual abilities and interests. The student may elect to emphasize coursework and supervised practice teaching in any of the restorative dental sciences and
College of Dentistry

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
Additional courses to total at least 56 semester hours; chosen electives should give the applicant a well-rounded educational background; they should be selected from courses in the social sciences, philosophy, psychology, history, foreign languages, higher mathematics or chemistry

The Dentistry 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 three years of college work will be considered for admission if the applicant's performance and potential for dental proficiency are considered outstanding. These candidates will be required to take the Graduate Record Examination Aptitude Test as well as the Dental Admission Test. In these instances, assessment of the candidate's performance on the Graduate Record Examination will be included in the evaluation by the admissions committee of the applicant's credentials for entrance in the College of Dentistry.

The applicant should have a cumulative grade-point average of at least 2.5 (A=4.0). Since the quality of coursework in preclinical science is basic to success in dentistry, the admissions committee gives special consideration to such coursework.

Interview
Personal interviews may be required of applicants for admission to the College of Dentistry.

Required Dental Admission Test
All applicants must complete the Dental Admission Test sponsored by the Council on Dental Education of the American Dental Association.

Tests are given three times annually, and The University of Iowa is a testing center. Applicants for admission to The University of Iowa College of Dentistry are urged to complete the examination in the preceding October to enable the admissions committee to begin its selection in December. Applicants who have completed more than one year of creditable work are urged to take the examination in the preceding April.

All applicants for admission to the College of Dentistry should obtain application forms for the required test from the the Uni-

Facilities
The new Dental Science Building, a major unit in an expanded Health Center, enables the College to double its enrollment and accelerate its research activities, and facilitates the development of interdisciplinary communication in Health Center teaching, research and patient-care activities. The Health Center complex includes a new Basic Sciences Building, a new Health Sciences Library and a new College of Nursing. The Health Sciences Library will house 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 comprises separate but connected four-story wings located on either side of a mall. The south wing will be devoted to clinical teaching, with various Departmental clinic facilities, support laboratories, clinical research space, offices, mechanical rooms and an automated learning center. The north wing will house a variety of teaching, administrative and research facilities, including teaching laboratories, research laboratories, administration area, an audiovisual production center and the program in community dentistry.

Admission
The closing date for applications and credentials is February 15 for the class entering the College of Dentistry the following September. Applicants are urged to file the completed application and the necessary official transcripts as soon as possible after July 1 of the year preceding the year in which they wish to enter.

The prospective dental student is encouraged to complete a program leading to a standard bachelor's degree before entering dental school 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
The college work outlined below meets the basic academic requirements for admission to the College of Dentistry. Each applicant must submit to the Office of Admissions the completed application form and official transcripts from all colleges attended.

College Credit
The college curriculum should include at least three academic years of accredited work comprising at least 56 semester hours and including these required courses:

Rhetoic
Satisfactory accomplishment in English composition and speech communicants with the academic requirements for a bachelor's degree of the college attended.
enry or the American Dental Association. Test applications should be submitted well before the test deadline.

Deposit by Accepted Applicants
An accepted applicant must submit the required $50.00 deposit within 30 days after notification of favorable action on his or her application. This deposit is not refundable but is credit toward the first fee payment. An applicant who fails to make the deposit within the time specified forfeits a place in the entering class.

Physical Examination
Applicants accepted for admission are required to submit a satisfactory physical examination report to the University Student Health Service within two weeks following notification of acceptance.

Advanced Standing
Applications for admission with advanced standing are considered on the basis of their individual merit and availability of space in a given class.

Combined Liberal Arts-Dentistry Course
The program for acceptance by the College of Liberal Arts of 30 semester hours of elective credit earned in any other college of the University makes it possible for the student who enters the College of Dentistry to obtain the bachelor's degree from the College of Liberal Arts upon successful completion of the freshman year in dentistry. To take advantage of this plan, the student must fulfill all specific requirements for the bachelor's degree, including the requirements for a major in some department of area of concentration. The successful completion of the last 30 hours in the College of Liberal Arts preceding enrollment in the College of Dentistry satisfies the College residence requirement.

Additional Admission Considerations
Fulfillment of the specific requirements listed for admission does not guarantee admission to the College of Dentistry. From the applicants meeting minimum requirements, the admissions committee selects those who appear best qualified for the study and practice of dentistry. The committee considers applicants' academic averages, the scores on the required Dental Admission Test and several other factors.

Since the available places in the freshman class of the College of Dentistry are limited, preference will be given to applicants who are residents of Iowa under the University's regulations on 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.

Graduation Requirements
Promotions and Graduation
Student promotions and graduation are determined by the respective class performance committees appointed by the dean. Faculty members involved in course work offered during a given academic year. A minimum cumulative grade-point average of 2.0 is required for promotion and graduation. However, the performance committee may recommend that a student withdraw from the College of Dentistry or repeat an academic year, regardless of his or her grade-point average, when the student is deemed generally unfit to be promoted or to enter the dental profession.

Committee on Appeals
This ad hoc committee is appointed by the dean from the faculty of the College and is chaired by the dean or his designated representative. The committee considers such matters as student scholastic achievement, promotions, absences and general fitness to enter the dental profession. This decision reached by the committee is final.

State Boards of Examination
All states require an examination before a board of dental examiners prior to issuance of a license to practice. Iowa law provides for two examinations yearly by the Iowa State Board of Dental Examiners. These are given on dates coinciding with the time of graduation.

Expenses
Students are given an opportunity to rent most of their dental instruments from the College of Dentistry. The rental fee amount to $300 per year. In addition, charges are assessed for expendable laboratory supplies, averaging approximately $150 per year for the first two years, and a $150 breakage for which is refundable upon graduation or termination of enrollment.

Financial Assistance
Under the Health Professions Scholarship and Loan Programs, eligible dental students may borrow up to $5,500 each year of their undergraduate professional studies. Eligible students may also apply for federal scholarships. 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 concludes 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.

A number of short-term loans are available from the American Dental Association, the Iowa Dental Association, the Kollog 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 Aids. 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 direct an inquiry to the Office of Student Financial Aids.

Student Organizations
All dental students automatically have 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 Omicron, have chapter houses at Iowa, and both have wives' auxiliaries. There is also a Dental Student Wives Club.

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, Preventative Prosthodontics, Operative Dentistry and Endodontics, Oral Diagnosis, Oral Pathology, Oral Surgery, Orthodontics, Pedodontics and Periodontology.

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 are one year or more in length, but 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.

Preclinical Sciences

Courses

Following are required course offerings by departments in college other than dentistry for undergraduate dental students.

17:143 The Science of Nutrition 2 s.h.
Principles of human nutrition; dietary reference to oral cavity; prebiotics; Biochemistry 99:151 (5 s.h.) Principles of Human Nutrition, Physiology and Biochemistry 72:151, sophomore year.
86:101 Stress Anatomy for Dental Students 4 s.h.
An introduction to gross and microscopic anatomy emphasized on head and neck. Graduate students must have consent of Dental Field, sophomore year.
86:202 Musculoskeletal Anatomy for Dental Students 5 s.h.
Cells, tissues, organs, development of face and oral structures, freshman year.
81:102 Dental Morphology (Bariatrician) 5 s.h.
Lecture, laboratory.
82:223 General and Systems Pathology for Dental Students 4 s.h.
Lectures, conferences, dissections, laboratory, x-ray of current surgery and surgical materials, sophomore year.
72:151 Pharmacology for Dental Students 5 s.h.
Lecture, laboratory.
82:181 Embryology 5 s.h.
Lectures and laboratory.
82:181 Histology 5 s.h.
Chemical constituents and reactions of living matter; 16 clock hours, junior year.

Dental Hygiene

See "College of Liberal Arts"

Fixed Prosthodontics

Department Head: Kent E. Thayer

Degree offered: M.S.

The primary purpose of the Master of Science program is fixed prosthodontics is to train and prepare dentists for careers in College of Dentistry/Fixed Prosthodontics/odontal education and/or dental research. It is also acceptable for individuals wishing to further prepare themselves for private practice in fixed prosthodontics. The program satisfies the formal training requirements for eligibility for the American Board of Prosthodontic examination.

The graduate student, in cooperation with the head of the Department and/or the advisor, constructs an individual curricular 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 two graduate students are normally accepted into the program each year.

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 GRE is required.

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 similar courses in other specialties of dentistry. A course in research methodology as well as a course in biostatistics or elementary statistical inference in medicine is required. Some coursework in the general area of education or in one of the basic science areas is also required. Orally and/or written exams are given during the regularly scheduled graduate degree exam period each year.

Any student who is unable to maintain the minimum 2.5 grade-point average during the first year of the program, or those individuals who elect to terminate their program after one year, will be considered for issuing of certificate 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.

Staff

Professor Thayer; professor emeritus Herrick, associate professor emeritus Kerr, assistant professors Pritts, Krakht, Sserve

Courses

81:001 Introduction 3 s.h.
Introduction to concepts of education and instruction.
81:007 Fixed Prosthodontics Techniques 3 s.h.
Lectures covering introduction to crowns and bridge dentistry, including crown, root, and occlusal forms and preparation and assembly of bridge.
81:008 Fixed Prosthodontics Techniques Laboratory 4 s.h.
Technical procedures related to construction of fixed prostheses.
81:011 Dental Materials 1 s.h.
Review of basic physical and clinical properties that apply to materials used in dentistry; relationship of standard microscopic structure to physical and mechanical properties.
81:005 Fixed Prosthodontics Laboratory 5 s.h.
Seminars correlating previously acquired knowledge in biological and basic science and technical courses with clinical prosthodontic treatment. This course is in Dental Hygiene, supplemented by individual supervision and demonstration.
Operative Dentistry and Endodontics

Department Head: Wallace W. Johnson
Degree offered: M.S.

Undergraduate Study

Graduate courses in this department are part of the total dental curriculum and are designed to be taken at specific times during the student's academic training. In endodontology, the student studies pathological conditions of the dental pulp and learns to diagnose and treat these conditions to the patient's benefit. In operative dentistry, the student learns the methods and materials used to recondition and maintain teeth to health, function, and esthetics. After introductory courses in the laboratory, the student begins training in the patient clinics.

M.S. Program in Endodontology

The program in endodontology is designed to provide a level of training which will lead to a career in research, teaching, and/or specialization in the clinical practice of endodontics. Applicants must be graduates of recognized dental schools, and foreign students must demonstrate proficiency in the use of English. Unless the preparatory training of the candidate includes sufficient work in mathematics and chemistry, it will be necessary to complete these studies through differential calculus, statistics, and quantitative analysis before undertaking a research project.

Completion of the program will usually entail two calendar years of full-time effort. The applicant must be financially prepared to pursue studies without interruption. In compliance with basic Graduate College regulations for programs in Dentistry, these degree requirements must be met:

- Satisfactory completion of at least 48 semester hours of all graduate-level courses to be divided as follows:

  A. 30 semester hours in the major field of clinical endodontics and selected courses offered by the departments of the College of Dentistry
  B. 10 semester hours in a minor field of biochemistry, physiology or microbiology
  C. 10 semester hours in the contributing areas of microbiology, mathematics, statistics, and analytical chemistry

- Preparation of an acceptable thesis based on original research; not more than 16 semester hours of research credits and eight semester hours of thesis preparation credit may be counted in satisfying the 48 semester hour minimum for the degree

- Satisfactory performance in a comprehensive written and 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.

M.S. Program in Operative Dentistry

The program in operative dentistry is designed to prepare the student for a career in dentistry and teaching. Since operative dentistry is not a specialty area of dentistry, course arrangement of the graduate program can be quite flexible. The student has considerable freedom to pursue courses in advanced study of particular personal interest. Excellent courses of study have been arranged in the biological sciences, material sciences, and education.

An applicant for this program must be a graduate of a recognized school of dentistry and must comply with the requirements for admission to the Graduate College of the University. An interview with the applicant may be requested.

In addition to Graduate College requirements for advanced degree programs, these Departmental requirements must be met:

- Satisfactory completion of 48 semester hours of graduate-level courses. These may be distributed as follows:

  A. 20 semester hours of graduate-level courses in the College of Dentistry; these may include clinical dentistry and practice teaching
  B. 20 semester hours of graduate-level courses in other areas of the University; these should include courses in statistics and education
  C. Eight semester hours in original research and thesis preparation

- 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 written defense of the thesis and examination of the candidate by the examining committee. The director of the degree program will act as advisor to the student and as chairman of the examining committee.

Staff: professors Bjorndal (director), Endodontics; Johnson (director, Operative Dentistry); professor Emeritus W. E. Stovall, associate professors P. W. Dion, K. S. Liang, assistant professors D. W. Denney, J. S. Fuller; instructors L. L. Smith, R. T. Sherry, R. T. Leck

Teaching associates: associate professors A. W. B. Hillis, assistant professors P. Lewis, J. A. Logan.
to undergraduate students in dentistry, and operates a laboratory fully equipped for basic tissue research.

Staff: professor Soni; associate professor Weber; assistant professors Mackenzie, Searf

Courses
93-101 Oral Biology 3 s.h.
Recent advances in oral biology: dietary concepts of mineralized tissues; prevention of oral diseases; fluorides and pyrophosphates in dentistry
93-102 Oral Biology 3 s.h.
Lec., sem., lab.; anatomy, physiology of oral cavity; speech pathology; clinical evaluation
93-103 Problems or, ar.
Small research projects pertaining to recent developments in oral biology

For Graduates
93-201 Mineral Management and Dental Caries 3 s.h.
Structure of enamel in relation to classification of enamel and structural defects of enamel of normal and abnormal dental diseases
93-202 Pathology and Structure of Bone 3 s.h.
Histology, growth, maintenance, function and adaptation of bone tissue in pathological states such as developmental disturbances, inflammatory diseases, disturbances of metabolism, rare diseases
93-203 Topics in Oral Biology 3 s.h.
Selected recent developments in oral biology
93-204 Research Techniques in Oral Biology 3 s.h.
Methods of research and techniques for light microscopy, electron microscopy, histology, cytology
93-205 Research in Oral Biology or, ar.
93-206 Biology of the Periodontium and Pulp 3 s.h.
Selected aspects of periodontium and pulp; their growth and development
93-207 Practice Teaching or, ar.
Supervised practical experience in operative and laboratory teaching

Oral Diagnosis
Jehangir Divakar J. D. Whiteware
Degree offered: M.B.

The primary objective of the Division of Oral Diagnosis is to provide basic instruction for dental students and other health professionals in methods of completion of oral diagnosis and preparation of an adequate treatment plan for the patient. These objectives are met through a system of lectures, seminars and clinical instruction beginning with the extended summer program of the freshman year and continuing through the junior clinical year of the dental curriculum.

In addition to the didactic and clinical program for freshmen, sophomores and junior students in oral diagnosis, the Division is responsible for the Bioclinical Conference course, whose objective is to enable the student to solve problems arising in the course of clinical practice as part of the dental office situation. This provides training for the student in a situation similar to those encountered if he or she is admitted for staff privileges in any recognized hospital program.

At the present time oral diagnosis is not recognized as a specialty in field of dentistry. However, the master's degree program is structured so that oral diagnosis becomes recognized as a specialty in dentistry at a later date, all candidates who have completed the Master of Science degree program in the Division will meet the requirements which may be anticipated in a specialty program.

In addition to serving the instructional needs in undergraduate and graduate programs, the Division serves as a screening and diagnostic area for all patients entering the College of Dentistry for treatment. This service is vital to the maintenance of an adequate patient load for the other clinical teaching facilities of the College.

Master of Science Degree with Thesis

All candidates for the Master of Science degree in oral diagnosis are required to pursue a course meeting the minimum requirements of the Graduate College. No provision is made for pursuit of a Master of Science degree without a thesis. The candidate is expected to develop substantial ability in research in his or her selected field of endeavor, and this area of research must be applicable to the general field of oral diagnosis. Minimum requirements for the completion of the thesis are 24 months of work in a full-time graduate program enrollment. This will include a minimum of 40 semester hours of acceptable graduate credit in courses outlined by the staff of the Division of Oral Diagnosis. Determination of the qualification of the candidate for the degree of Master of Science will be made by a final comprehensive oral examination in accordance with the rules of the Graduate College.

Admission Requirements

The size of the Division staff and facilities limit the number of applicants who may be accepted for the Master of Science degree program. Therefore it is necessary that each prospective applicant discuss the opportunity for enrollment with the Departmental executive prior to admission of an application for admission to the Graduate College. The minimum requirements for admission to the program are those of the Graduate College. The final decision on acceptance of any applicant meeting minimum requirements for the Master of Science degree program will rest with the Division staff of Oral Diagnosis.

Staff: associate professor Whiteware; assistant professors Erbe, Fanning, Hammond; instructors Horton, Kiel, Perry, Sieg, Spy philosophy

Courses

Admissions
88-107 Ethics and Practice Management I 1 s.h.
Ethical concepts and professional role-play between doctor and patient; 16 clock hours, junior year
88-108 Practice Management II 1 s.h.
Organization and management of dental office with applications of accounting and budgeting; 16 clock hours, senior year
88-109 Clinical Dentistry 16 s.h.
Supervised clinical experience in dental screening and delivering procedures, diagnostic, restorative and operative treatment of patients; 32.5 clock hours, senior year

Dental Radiology
88-102 Dental Radiology for Dental Hygiene Students 1 s.h.
Lecture and instruction in internal techniques, radiation hygiene, film processing and mounting; 16 clock hours, first year
88-103 Clinical Dental Radiology for Dental Hygiene Students 1 s.h.
Supervised clinical experience in taking dental radiographs, film processing and mounting; 16 clock hours, second year
Oral Pathology

Department head: Allen K. Fisher

The main objectives of the Department of Oral Pathology are to provide basic instructions of dental and other health professional students on diseases affecting oral structures, advanced instruction in this subject for graduate-level students from health science and related fields, and preparation of especially qualified students for careers in teaching and research.

A program leading to a Certificate in Oral Pathology is offered to graduates of dental schools desiring clinically-oriented training in preparation for specialization in oral pathology. The M.S. program is a longer and more comprehensive one, and includes research training.

The laboratory diagnostic service which the Department of Oral Pathology provides for the clinics of the College of Dentistry contributes extensively to all phases of the Department's educational effort. The laboratories are well equipped for work in histologic anatomy, hematology and selected in-processes in clinical chemistry. Special facilities for studies in histochemistry and pathologic tissue metabolism are used mainly for graduate student and staff research. Additional training, particularly in pathologic anatomy, is available in the College of Medicine Department of Pathology in which the Department of Oral Pathology faculty members hold joint appointments.

Admission Requirements

The size of the Departmental staff and facilities limits the number of applicants who can be accepted for programs leading to the Certificate in Oral Pathology and the Master of Science degree. Therefore, it is necessary that each prospective applicant for advanced training discuss his or her opportunity for acceptance with the Departmental executive prior to submission of the application for admission to the Graduate College. Minimum requirements for admission to either program are a cumulative grade-point average of 2.70 and satisfactory scores in the Gradate Record Examination Aptitude Test and in the Advanced Test on either biology or chemistry. Final decision on acceptance of any applicant meeting the minimum requirements for admission will rest with the Departmental staff.

Certificate in Oral Pathology

This program combines academic studies with extensive laboratory practice of oral pathology under staff supervision, and requires a minimum of 24 months of full-time work for completion. Qualifications for the certificate include completion of all required courses with a passing grade, demonstration of satisfactory competence in the practice of oral pathology and a satisfactory grade in a final comprehensive oral examination before an examination committee composed of members of the graduate faculty in the departments of Pathology and Oral Pathology.

Although additional courses may be elected if circumstances permit, the required courses in this program are:

- 68.203 General and Systemic Pathology 4 s.h.
- 83.206 Oral Pathology 4 s.h.
- 85.207 Advanced Oral Pathology 4 s.h.
- 85.201 General and Systemic Pathology 4 s.h.

Master of Science Degree with Thesis

Candidates for the Master of Science degree are expected to develop substantial scientific research effort into the mechanisms of profuse disease and should anticipate that considerable effort will be devoted to completion of an original research project and the thesis which will be based upon it.
The nature of the research project, and some of the courses which constitute the tools for research and for the informed practice of oral pathology, dictate prerequisite in mathematics, quantitative analysis and physical chemistry. When students are admitted to this program without these prerequisites they will be required to complete mathematics through calculus and at least one semester of physical chemistry set later than 18 months after beginning the program. Applicants who have not earned doctorates in health sciences are also required to show evidence of equivalent training in the sciences contributory to pathology. Minimum requirements for completion of this program are 36 months of full-time work and 30 semester hours of acceptable graduate credit. The required courses are:

- 4111 Analytical Chemistry 3 s.h.
- 65:203 General and Systematic Pathology 4 s.h.
- 65:320 Oral Pathology 4 s.h.
- 65:371 Cyology 4 s.h.
- 37:165 Fundamental Genetics 4 s.h.
- 62:200 Basic Otolaryngologic Science 4 s.h.
- 225:189 Biostatistics 3 s.h.
- 99:165 General Biochemistry 3 s.h.
- 99:167 Experimental Biochemistry 3 s.h.
- 99:263 Clinical Biochemistry 3 s.h.
- 61:166 Diagnostic Microbiology 5 s.h.
- 35:206 Advanced Oral Pathology 6 s.h.
- 35:207 Advanced Clinical Pathology 8 s.h.
- 35:208 Research in Oral Pathology 10 s.h.

Evaluation of the qualifications of candidates for the Master of Science degree or for that degree and the Certificate in Oral Pathology will be determined by final comprehensive oral examination in accordance with the rules of the Graduate College. The examination committee will be composed of members of the graduate faculty from the departments of Pathology and Oral Pathology and one additional member of the graduate faculty representing the science other than pathology which provided the most important research and contribution to the thesis. The examination will relate to the candidate's knowledge of basic pathologic processes and to the thesis. It will also cover the practice of oral pathology if the candidate is to be considered for the Certificate in Oral Pathology. Staff: professors Fisher, Tate, assistants professors Shales, Hammond.

Courses

*8000 Pathology for Dental Hygienists 3 s.h.*
- Description of abnormal anatomy of oral cavity and oral pathology and tissue and general understanding of basic principles involved in significant diseases of mouth, subject matter include degenerations, infections, inflammation, wound healing, developmental abnormalities, cysts, neoplasms, periapical and dental caries.

*80:103 Clinical Pathology 4 s.h.*
- Conference study and practice of diagnosis of oral disease by laboratory methods and selection principles of pathologic examination, instructions limited to small group of students under varied conditions emphasize emphasis on clinical procedure adaptable to office practice; practical experience provided by in-service assignments in Clinical Laboratory.

*80:304 Oral Pathology 4 s.h.*
- Lecture, conference, demonstration, laboratory course devoted to diagnosis, treatment, and study of oral diseases of normal oral structures, pathogenesis, pathophysiology, histology, and surgery structure oral cavity pathological abnormalities, reparative tissue proliferations, reaction, specific infections, allergic and immunizations.

*85:206 Advanced Oral Pathology 8 s.h.*
- Principles of Pathology for further study of oral diseases involving oral structures; course for any semester assigned to pathology in general course of study, biological research, histological analysis of pathologic processes and diagnostic interpretation emphasized.

*85:207 Advanced Clinical Pathology 8 s.h.*
- Principally for graduate in dentistry requiring intensive training in diagnosis by laboratory methods, guidance provided through clinical rotations and seminars with Departmental staff experience developed by participation in operations of Clinical Laboratory, pathology case studies, histology, and clinical chemistry emphasis.

*Research in Oral Pathology 8 s.h.*
- Regimens in this course provide means of gaining academic credit for oral clinic work; general property of thesis required for candidates for Master of Science degree and may be open to other qualified students whose interests coincide with available Departmental research facilities.

Oral Surgery

Department: Head: Mark L. Hale Degree offered: M.S.

The Department of Oral Surgery is involved in both undergraduate and graduate education of dental students. It combines clinical and didactic training to an individual basis to the interests, abilities and development of the student.

The undergraduate program is based in the College of Dentistry, with some clinical assignments in the Department of Oral Surgery and Dentistry at University Hospitals. Graduate study is based primarily in the Residency Training Program at University Hospitals. The facilities of the University’s Health Center complex provide an appropriate environment for graduate training in oral surgery.

The graduate program takes an individual approach, encouraging and directing the student to pursue fundamental concepts so as to allow not only for specialty training but as preparation for investigation, teaching and consulting service through professional growth.

Staff: professor Hale, associate professors Higa, Thatcher, assistant professor Wolfson, instructor McCray; nurse clinician Goodwin.

Courses

*For graduate course descriptions, see “College of Medicine”*.

*21:102 Anesthesiology 1 s.h.*
- Principles and methods of local anesthesia, induction and contribution under general anesthesia for oral surgery; 12 clock hours, special seminars.

*21:104 Oral Surgery I 1 s.h.*
- Basic principles of oral surgery, infections, and oromucosal infections and their control; evaluation of dental patient’s related medical history, 12 clock hours, special seminars.

*21:105 Oral Surgery II 1 s.h.*
- Techniques of extraction and minor oral surgery procedures; 12 clock hours, clinical experience in small group in oral surgery clinic, 12 clock hours, special seminars.

*21:107 Oral Surgery III 1 s.h.*
- History, examination, diagnosis and treatment of acne and traumatic injuries of the mouth; 12 clock hours, special seminars.

Clinical experience: application of principles of oral surgery in surgery clinic at University of Cincinnati, 12 clock hours, special seminars.
Orthodontics
Department Head: George F. Andreasen
Degree offered: D.D.S. (Certificate of Orthodontics also offered)

Undergraduate Program
The purpose of the undergraduate program in orthodontics is to enable the general practitioners of dentistry to recognize, diagnose and treat with competence simple malocclusions of the teeth.
Lecture courses guide the student in the learning of basic concepts of dental and facial growth, as well as treatment-oriented subject matter. In a laboratory course, diagnostic records are taken and evaluated and treatment appliances are fabricated. A volunteer program of clinical treatment of selected patients is supervised by the Department.
Opportunities exist for research and independent study in the Department.

The Graduate Program
The purpose of the graduate program in orthodontics is to educate specialists capable of diagnosing and treating with skill any malocclusion of the teeth requiring comprehensive care. The specialist should be familiar with and able to critically analyze biologic, biomechanic, diagnostic and treatment concepts in orthodontics. The majority of graduating specialists are self-employed in urban communities; a few are employed by the government and in education.
Satisfactory completion of a 24-month period of intensive study, including lecture courses, seminars, clinical practice and a research paper qualifies a student for the Certificate of Orthodontics. If a student satisfactorily completes a thesis based on an original research project, he or she will qualify for an M.S. degree in addition to the Certificate of Orthodontics.
Opportunities are available for research and independent study in the Department.
Admission requires the D.D.S. degree, or its equivalent, and satisfaction of Graduate College requirements.
Special facilities for research in biomechanics and craniofacial growth are available. Interaction with other departments provides varied learning and research opportunities in surgical orthodontics, cleft lip and palate treatment, speech pathology, animal experimentation and human growth.
Staff: professors: Office:--associate professors: Andreasen, Krensmann; assistant professors: Biabarn, Suley; assistant clinical professor: DeKock, Thorburn, Hanneman.

Courses
89:105 Orthodontic Techniques 1 s.h.
89:106 Orthodontic Techniques 1 s.h.
89:107 Orthodontic Techniques 1 s.h.
89:108 Orthodontic Techniques 1 s.h.
89:109 Orthodontic Techniques 1 s.h.

Pedodontology
Department Head: F. M. Putnam
Degree offered: D.D.S. (Certificate also offered)

The Department of Pedodontology is concerned with the prevention and treatment of dental disease in children. A program of instruction combining didactic, laboratory and clinical experiences is offered to dental and graduate students. Special consideration is given to reviewing the current literature and managing the dental problems of handicapped children. Efficient treatment through the proper utilization of dental auxiliary personnel and record management is also emphasized.
Clinical and laboratory research projects are in progress, with financial support from federal agencies and other sources. Sig-
significant contributions have been made in the areas of fluoride action and child behavior management.

Faculty members hold numerous national and state offices, committee memberships, consultancies and honors. They serve as reviewers for several professional journals and federal granting agencies. They also participate regularly in continuing education programs for dentists and other health science personnel.

Staff: associate professors Parkins, Full, Johnson, Wert, Brown; assistant professor Walker

Courses
90:161 Pediatric Dentistry and Treatment 2 a.h.
90:162 Pediatric Dentistry 1 a.h.
90:198 Clinical Dentistry
90:144 Advanced Clinical Dentistry
90:147 Comprehensive clinical management of pediatric patient
Preparation for Graduates

90:001 Pediatric Literature Review I cr.
90:002 Pediatric Literature Review II cr.
90:003 Pediatric Literature Review III cr.
90:004 Pediatric Literature Review IV cr.
90:005 Research Project/Thesis cr.
90:010 Practice Testing/Assessment cr.
90:037 Thermo Preparation cr.
90:049 Introduction to Advanced Pediatric Dentistry 2 a.h.
90:050 Advance Pediatric Dentistry 3 a.h.
90:051 Pediatric Hospital Rehabilitation 1 cr.
90:052 Pediatric Hospital Rehabilitation 2 cr.
90:053 Pediatric Radiology cr.
90:054 Pediatric endoscopy cr.

Periodontology

Department: (Name) C. M. Freistag
Degree offered: M.S. (clinical training for certification also offered.)

Master of Science Program

The Master of Science program is designed primarily to provide training for research, teaching/hl and/or specialization in the clinical practice of periodontology.

The applicant must be a graduate of a recognized dental school. Unless the candidate's preparatory training includes sufficient work in mathematics and chemistry, it will be necessary to complete these studies through differential calculus, statistics and quantitative analysis before undertaking a research project.

Completion of the course will usually entail 24 calendar months of full-time effort. The applicant must be financially prepared to undertake prospective studies uninterrupted. Qualified persons may apply for postgraduate fellowships from the National Institute of Health or the National Science Foundation. However, these fellowships should be received prior to matriculation.

In compliance with the basic regulations of the Graduate College for programs of higher education in dentistry, these requirements must be met:

- Satisfactory completion of a minimum of 80 semester hours of all graduate level courses, to be divided as follows:
  A. 35 hours in the major field of periodontology and selected courses offered by the departments within the College of Dentistry
  B. 12 semester hours in a minor field of biochemistry, physiology or microbiology
  C. 13 semester hours in the contributing areas of micromor-20

- Preparation of an acceptable thesis based on original research; not more than 15 semester hours of research credit and eight semester hours of thesis preparation credit may be counted in satisfying the 60-semester hour minimum for this degree

- A comprehensive written and oral examination which is of a functional character and does not duplicate credit examination

The head of the Department serves as the student's adviser and examining committee chairman.

Certifying Program

This program is designed to meet all requirements of the American Board of Periodontology for eligibility for certification. The program provides a sound foundation for the clinical practice of periodontics.

Accepted students register in the Graduate College. Upon satisfactory completion of 30 semester hours of coursework in periodontology and related fields, they receive the certificate from the College of Dentistry. Admission requirements are a 2.5 grade-point average (A = 4) or better, two letters of recommendation and a D.D.S. or D.M.D. degree or equivalent.

Admission: professor Freistag; associate professor Laison; assistant professor Bergquist, Rubright, instructor Katiff
Affiliated or part-time staff: clinical assistant professor Bolding; instructors Collins, Cooper

Courses
90:001 Periodontics 2 cr.
90:002 Periodontics 1 cr.
90:003 Periodontics 2 cr.
02:14 Periodontal Methods 3 s.h.
Practical survey of clinical and methods of periodontal practice; 40 clock hours
02:156 Periodontology 3 s.h.
Lectures, demonstrations, clinical practice in diagnosis and treatment of periodontal disease; 153 clock hours; junior, senior
02:159 Periodontology for Dental Hygienists 2 s.h.
Lectures, demonstrations, and clinical practice of periodontal disease and treatment; registration limited to junior dental hygiene students
02:16 Dental Periodontology for Senior Dental Hygiene Students 2 s.h.
Summer, clinical practice in diagnosis and treatment of periodontal disease; registration limited
02:166 Advanced Periodontics for Senior Dental Hygiene Students 5 s.h.
First semester: lectures, demonstrations and clinical practice in managing advanced inflammatory diseases of tooth-supporting structures; prerequisites 02:164
02:117 Advanced Periodontology for Senior Dental Hygiene Students 5 s.h.
Second semester: lectures, demonstrations and clinical practice in managing advanced inflammatory diseases of tooth-supporting structures

Graduate Courses
02:267 Periodontology cr. arr.
02:268 Seminar: Periodontology cr. arr.
02:269 Periodontics cr. arr.
02:264 Research: Periodontology cr. arr.
02:265 Methods of Instruction in Periodontology cr. arr.
02:266 Periodontology Literature Review cr. arr.
02:267 Practice Teaching in Periodontology cr. arr.
02:268 Research Advances in Periodontology cr. arr.
02:269 Periodontology Seminar cr. arr.

Preventive and Community Dentistry

Programs in preventive and community dentistry have been designed to provide dental students with experiences to increase their awareness of current health needs and to encourage students to develop and implement approaches to alleviate these needs. Extramural programs provide students with opportunities to interact with diverse care teams and communities in Iowa and beyond. The community as a classroom should be 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. A recent addition to the Department's resources is a five-unit mobile dental van which will be operated throughout Iowa and provide senior dental students an experience which will closely simulate a community dental practice.

Graduate Program
A proposal for a Master of Science program in Preventive and Community Dentistry has recently been submitted to the Graduate College and to the Board of Regents. This new program utilizes a broad interdisciplinary approach. The program will be individualized to meet the needs of graduate students planning careers teaching preventive and community dentistry in dental colleges, administering dental health programs and researching in the field of preventive and community dentistry.

Staff: professor Phair; assistant professor Falasco, Henderson; instructor Skeele
Affiliated staff: Goodrich, Sconce, Henderson, Beals; preventive

Jerald Valley

Courses
11:1102 Preventive and Community Dentistry 2 s.h.
Lectures and discussions: introduction to public health at the national, state and local levels; include study of dental health care delivery systems, manpower and financial resources, methods of payment for dental care, dental epidemiological methods, findings and community active programs for prevention and control of dental diseases
11:1104 Community Dentistry Field Trips 2 s.h.
(1) One day, 2 s.h., or two or three, one day each, students spend one week as externs to independent practice dentists in the community. (2) One day trip, two to three hour, one day spent in dental clinics and workshops and one to two hours spent with university dental unit providing dental services for snare-inflicted children throughout state
11:1105 Community Dentistry 2 s.h.
Working with members of the community to plan and develop systems of care for children in low-income areas
11:1106 Dental Literature Review 2 s.h.
Lectures and discussions: introduction to research design, formulating hypotheses, analyzing data, conclusions and implications of data, critical analysis of published research
11:1107 Dental Epidemiology 2 s.h.
Lectures and discussions: study of health diseases affecting population and its role in health, including clinical studies of infectious diseases which initiate epidemiologic and pathologic assessment of chronic diseases, clinical oral diseases; special emphasis given in dental diseases, of which dental caries is a specific example, and epidemiologic studies which led to its prevention through fluoridation of public water supply
11:1109 Literature Review in Preventive and Community Dentistry 2 s.h.
Lectures and discussions: critical review of literature and bibliographic references required in order to complete a major subject area
11:1111 Preventive and Community Dentistry 2 s.h.
Lectures and discussions: introduction to research design, formulating hypotheses, analyzing data, conclusions and implications of data, critical analysis of published research
11:1120 Research Seminar in Community Dentistry 2 s.h.
Lectures in which principles of preventive and community dentistry are presented and research projects of students are presented
11:1122 Research Seminar in Community Dentistry 2 s.h.
Lectures in which current research projects of students are presented and research projects of students are presented
11:1128 Preventive and Community Dentistry 2 s.h.
Lectures and discussions: introduction to research design, formulating hypotheses, analyzing data, conclusions and implications of data, critical analysis of published research
11:1129 Preventive and Community Dentistry 2 s.h.
Lectures and discussions: introduction to research design, formulating hypotheses, analyzing data, conclusions and implications of data, critical analysis of published research
11:1130 Preventive and Community Dentistry 2 s.h.
Lectures and discussions: introduction to research design, formulating hypotheses, analyzing data, conclusions and implications of data, critical analysis of published research
11:1140 Individual Study in Preventive and Community Dentistry 2 s.h.
Individual study in area of special interest to student; results of study reported in paper
11:1140 Epidemiology of Dental Diseases 2 s.h.
Lectures in which research papers are presented and critical analysis of published research
11:1150 Preventive and Community Dentistry 2 s.h.
Lectures and discussions: introduction to research design, formulating hypotheses, analyzing data, conclusions and implications of data, critical analysis of published research
11:1150 Field Experience in Community Dentistry 2 s.h.
Lectures and discussions: introduction to research design, formulating hypotheses, analyzing data, conclusions and implications of data, critical analysis of published research
11:1150 Preventive and Community Dentistry 2 s.h.
Lectures and discussions: introduction to research design, formulating hypotheses, analyzing data, conclusions and implications of data, critical analysis of published research
11:1160 Thesis Preventive and Community Dentistry 4 s.h.
Thesis research and writing in area of community or preventive dentistry
Removable Prosthodontics

Acting Department Head: Keith E. Thayer
Degree offered: M.S.

The Master of Science degree in the removable prosthodontics program satisfies the formal training requirements for eligibility for the American Board of Prosthodontics examination. Minimum requirements for admission into 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.

It is intended that the advanced training program in removable prosthodontics be flexible to the extent that the goal of the individual student may be realized. The head of the Department or his designated representative will be the student’s advisor. The Department takes into consideration that one set program is not in the best interest of all students nor of the profession. The requirements are considered flexible to the extent that an endeavor is made to fill the needs of each individual student. This is possible since normally not more than two students will be accepted each year for advanced training in the Department.

The degree candidate will be required to pass an oral and/or written examination. The candidate’s advisor will serve as chairman of the examining committee. The candidate 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.”

Staff: professor Thayer; associate professor Miller; assistant professors DeCouter, Scandret; instructor Stoner
Affiliated staff: LaVelle, Osborn, Thompson, Tong

Courses

84305 Removable Prosthodontic Technique Lecture 2 hrs.
Overview of removable prosthodontics.

84306 Removable Prosthodontic Technique Laboratory 4 hrs.
Laboratory exercises in construction of complete and removable partial dentures.

84310 Removable Prosthodontics 5 hrs.
Seminars and clinical experiences; mouth examination, diagnosis, prognosis and functions in design and construction of complex and removable partial dentures.

Primarily for Graduates

84309* Literature Review: Removable Prosthodontics cr. arr.
Thematic readings and preparation of elements.

84311* Technique Methods: Removable Prosthodontics cr. arr.
Assigned problems, technical procedures in construction of complete and removable partial dentures.

84312* Advanced Clinical Prosthodontics cr. arr.
Clinical work under faculty supervision; complete cases in sequence of difficulty.

84313* Seminar: Removable Prosthodontics cr. arr.
Research studies and collection of data on selected research project.

84324 Seminar: Removable Prosthodontics cr. arr.
Conference and discussion of assigned topics.

84355 Practice Teaching: Removable Prosthodontics cr. arr.
Clinical and laboratory teaching experiences assigned by advisor.

84399* Thesis/Preparation: Removable Prosthodontics cr. arr.
Preparation in accordance with regulations of Graduate College.

* May be taken during any semester with permission of Department Head.
College of Education

Administrative Staff
Dean: Howard R. Arms
Dean Emeritus: David T. Peterson
Associate Dean Emeritus: A. Von Dyna
Associate Dean Emeritus: Henry J. Delpina
Assistant Dean: Stuart C. Boy, Roy A. Wright, Owen L. Springer
Principal, University Hospital School: Paul D. McEachern
Director, Iowa Testing Program: William E. Callahan
Director, Iowa Center for Research in Science Education and Iowa
Educational Information Center:浦田 D. Bower
Assistant Director: Albert B. Hambrook
Assistant Professor: G. B. Henderson
Editorial-Psychology Librarian: Anne G. Evans
Curriculum Laboratory Librarian: Gwenn M. Bongiovi

Division Chairmen
Division of Social Foundations, Adult Education, Higher Education
and Educational Media: Duane Anderson
Division of Educational Administration: W. Lane
Division of Elementary Education: Jerry N. Kuhn
Division of Educational Psychology, Measurement and Statistics: Paul
J. Bloomer
Division of Secondary Education: John F. Mckee
Division of Counselor Education: Albert B. Houck
Division of Special Education: Archie Mclennan

The first permanent college-level department of education in the
United States was established at The University of Iowa in 1872.
The department became the School of Education in 1907; and
the College of Education, structured in the basic pattern which
prevails today, was founded in 1913. The growth of the College
has corresponded to the growth of the University.
The College has seven divisions: Social Foundations, Adult
and Higher Education, and Educational Media; Educational
Administration; Elementary Education; Educational Psy-
chology, Measurement and Statistics; Secondary Education;
Counselor Education; and Special Education.
The University is accredited by the National Council for Ac-
creditation of Teacher Education (NCATE) for the preparation
of elementary and secondary school teachers and other professional
school personnel, with the doctorate the highest degree ap-
proved.

Faculty
Members of the College of Education faculty are productive in
research and writing and are well qualified by preparation and
experience. Ninety-seven percent of the members of the faculty
with academic rank hold earned doctorates in their teaching
fields, and 93 percent have had teaching or administrative experi-
ence in the public schools.
A major strength of the College is its close working relation-
ship with the College of Liberal Arts. With few exceptions, professors on the College of Education faculty also hold acade-
ic rank in the College of Liberal Arts. A majority of the
professors who teach secondary school methods have doctorates
in their teaching disciplines, as well as preparation in education,
and hold academic rank both in their academic departments and
in Education.
The faculty has a strong commitment to teaching and to the
applications of new methods and media in their own classes.
Most members employ modern audiovisual media; and field
practicum experiences are emphasized in such areas as teacher
education, counseling, special education, curriculum and ad-
ministration.
In addition to independent research by individual faculty
members, several studies are being pursued with the support of
foundation and federal grants awarded to divisions and indi-
vidual staff members. Most members of the faculty are active
in professional societies, and several recently have held or now
hold key offices in such organizations at the national level.

Facilities
The University Hospital School
This facility contains two unique sections within the same com-
plex, the Children’s Rehabilitation section and the Pine School
section. In cooperation with the University Hospital School, the
College of Educational studies and develops curricular procedures
and materials for both sections of the Hospital School.
Children’s Rehabilitation
This section has three main functions: the education, care and
treatment of children who can be educated but who are so
severely involved physically that they cannot attend or progress
optimally in the regular schools; specialized training for workers
and volunteers in all areas concerned with handicapped children;
and clinical research pertaining to causes and prevention of
handicapping conditions in children and to management of
handicapped children.
Pine School
This section provides special help on a daytime basis for se-
lected pre-kindergarten and elementary school children in the Iowa City
area who are mentally retarded. Educational research, teacher
education and broad services are the main functions of this
section. Opportunities for student teaching and supervised clini-
cal practice is available.
Basic and clinical research is ongoing in the Children’s Re-
search unit of the University Hospital School. This research
pertains to mental retardation and related conditions. Such
projects are carried on mainly by the Department of Pediatrics
in the College of Medicine.

School Program for Emotionally Disturbed Children
This program is located in the child psychiatry unit of the Uni-
versity’s Psychiatric 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.

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.

Curriculum Laboratory
The Laboratory provides materials for student teachers and students of curriculum problems. It brings into a convenient central location approximately 15,000 elementary and secondary school textbooks, reference books, courses of study, bibliographies, special pamphlets, teaching aids such as tapes and games, other materials needed in curriculum development, and it administers the University Youth Collection of approximately 10,000 volumes.

Educational Media Instructional Area
A variety of instructional equipment and materials are contained in this area. Laboratory facilities provide opportunities for developing skills in the design and production of instructional materials and in the operation of instructional equipment of all types.

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.

Iowa Center for Research in School Administration
In combination with the Iowa Educational Information Center this research activity conducts studies of trends in Iowa schools, publishes special research reports, conducts some local school surveys, develops management information systems services, and provides consultation and services in the field of computer applications in education.

Education-Psychology Library
With approximately 91,000 volumes, the Library is located on the west second floor of East Hall. It offers periodicals, films, ERIC microfiche, books, reference books, a reserve room and seating space for students of education psychology and child behavior.

University Counseling Services
The facilities of the University Counseling Services are available to students in counseling psychology for research and practicum purposes.

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 division also conducts research studies in educational measurement and evaluation, publishes brochures, sponsors lectures and symposia and provides consultative services to school systems.

Certification and Degree Programs

General Information
The College of Education offers teacher-education programs in elementary, secondary and special education. These programs have a number of common characteristics.

General Liberal Arts Requirements
The bachelor's degree requires 124 semester hours of credit, whatever program the student elects to pursue, and this total must include the general College of Liberal Arts requirements in rhetoric and physical skills, mathematics, and the literature, social science, natural science and historical-cultural core areas.

State Requirement
Certification to teach in Iowa requires completion of two semester hours in American history or American government.

The Professional Semester
The final phase of the teacher-education programs in all three areas is the professional semester—a full semester devoted to supervised student teaching and observation in a variety of situations. Periodic seminars provide for discussion and evaluation of student teachers' programs. Student teachers usually live in the communities in which they have their student-teaching assignments.

Certification
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 approved 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.

Admission Requirements
To be admitted to a teacher-education program the student must:

- Be admitted to the University as a degree candidate;
- Complete the American College Test; and
- Be free of any health impairment or physical handicap which precludes success in teaching.
Application Deadline
With some exceptions, applications for admission to a teacher-education program must be submitted by May 15 prior to the academic year in which the applicant wishes to enter the program. Generally the student will enter the program in the junior year.

Elementary Education
Elementary teachers guide children in experiences with music, artwork, stories and plays, and introduce them to science, math, language and social studies. Elementary teachers usually work with one group of children and teach several different subjects. However, teachers in the upper grades may teach only one or two subjects to several different groups.

Among the most important qualifications for elementary school teaching, in addition to an enjoyment and understanding of children, are patience, self-discipline and high standards of personal conduct.

Preparation for elementary teaching involves study of 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.

Currently, the demand for teachers has been sharply reduced. As a result, competition for positions is very great, and young people seeking their first positions may find schools placing great emphasis on their academic work and the quality of their training. However, outstanding graduates are finding jobs, and many of these positions are quite good.

The elementary-education program is designed specifically to prepare students to teach kindergarten through sixth grade. A special sequence is also available for selected students seeking the nursery school-kindergarten endorsement in addition to elementary certification.

Students interested in teaching in such areas as art, music or physical education at the elementary level should consult their advisers regarding special certification requirements.

Students interested in dual certification for elementary and special education should note the requirements for admission to each of these programs. Students interested in this combination must make a separate application to each program and these applications will be considered independently.

Professional Requirements
Elementary-teacher certification at The University of Iowa requires successful completion of a preparatory program approved by the Iowa Department of Public Instruction and the National Council for the Accreditation of Teacher Education. These certification patterns are available—the Bachelor of Arts, Bachelor of Science, and Bachelor of General Studies.

In the B.A. and B.S. programs the professional courses constitute a major in the B.G.S. program they do not. The professional requirements are the same in all three programs; the differences are in the general College of Liberal Arts requirements.

The student must have been admitted to the preteacher-education program to be eligible to enroll in the foundation courses, which should be completed before the junior year.

B. Required Foundation Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>7E:00</td>
<td>Introduction: Elementary Teaching</td>
<td>2</td>
</tr>
<tr>
<td>7E:01</td>
<td>Pre-Education Practice</td>
<td>2</td>
</tr>
<tr>
<td>7E:100</td>
<td>(Must be taken concurrently with 7E:100; students with prior equivalent experience may file application for exemption from 7E:91)</td>
<td></td>
</tr>
<tr>
<td>7P:15</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>7V:101</td>
<td>Operation of Audiomusical</td>
<td>1</td>
</tr>
</tbody>
</table>

The Junior-Senior Sequence

Students must have been admitted to the teacher-education program to be eligible to enroll in this sequence, which must be completed during the two semesters and/or summer session preceding student teaching:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>7E:160</td>
<td>Methods: Elementary-School Language Arts</td>
<td>2</td>
</tr>
<tr>
<td>7E:161</td>
<td>Methods: Elementary-School Social Studies</td>
<td>2</td>
</tr>
<tr>
<td>7E:162</td>
<td>Methods: Elementary-School Science</td>
<td>2</td>
</tr>
<tr>
<td>7E:163</td>
<td>Methods: Elementary-School Mathematics</td>
<td>2</td>
</tr>
<tr>
<td>7E:164</td>
<td>Methods: Elementary-School Reading</td>
<td>2</td>
</tr>
</tbody>
</table>

Student Teaching Experience (Senior Year)

Fifteen semester hours of credit are given for successful completion of the semester of student teaching (7E:191 or 192 Observation and Laboratory Practice).

Areas of Specialization

The student selects an area of specialization from the approved list. It takes approximately 24 semester hours of credit approved by the student's adviser to meet this requirement. Most of this coursework is completed in the College of Liberal Arts.

Areas of specialization for elementary-education majors are: elementary music, elementary physical education, elementary art, elementary reading, early childhood education, elementary language arts, elementary science, elementary social science, elementary mathematics, elementary generalist and special education.

Admission to Postteacher Education

All entering freshmen who indicate on the University application form that they wish to pursue an elementary-education program will be admitted to the postteacher-education program if they meet minimum requirements (see "General Information").

University of Iowa students not admitted to the program as freshmen, and transfer students not admitted to the program at the time of their initial application to the University, must submit formal applications for admission to the program. In addition to minimum requirements for entering freshmen, they must have completed at least 28 semester hours of college coursework, with at least a 2.2 grade-point average (A = 4) for all college coursework attempted.

Admission applications for the postteacher-education program may be submitted by May 15 or December 15 of the semester in which the applicant achieved the 18-hour minimum. Students who are accepted into the postteacher-education program and have attained sophomore standing are eligible to enroll in the foundation level of the elementary education program.
Admission to Teacher Education (Junior-Senior Sequence)

Students who have completed the foundation portion of the elementary-education program, have completed at least the sophomore year and wish to continue into the junior-senior sequence must apply for admission to the sequence. This application, the final step in gaining formal admission to the elementary-teacher education program, must be on file by May 15 preceding the academic year in which the applicant wishes to enroll in the junior-senior sequence.

Minimum requirements for admission are:
- Successful completion of at least 35 semester hours of college coursework;
- Successful completion of all foundation courses;
- At least a 2.2 cumulative grade-point average for all college coursework attempted; and
- Recommendation by a review committee, based on the applicant's total record, a personal interview and the applicant's record in the pre-education program (75:91).

Late transfer students at the junior level or above will be considered for admission if they have satisfied the foundation course requirements and have applied for admission to the junior-senior sequence by December 15 of the junior year.

Graduate students are subject to the same application deadlines, selection procedures and admission and course requirements as undergraduates, except that their grade-point averages must meet the requirements for admission to and continuation in the Graduate College.

A student who does not complete the student teaching portion of his or her program with the class to which he or she is admitted must reapply for admission to a new teacher-education program class.

Number of Admissions

Due to limitations in the number of sections for student teachers in cooperating schools, and to limitations in the number of faculty members, it may be necessary to limit the number of students admitted to the junior-senior sequence in elementary education. In that case, the best-qualified applicants will be admitted.

Secondary Education

Secondary school teaching requires an understanding and appreciation of adolescent children, a sound background in the liberal arts, an open attitude toward contemporary society and its problems, and an enthusiasm for the subject taught.

Junior and senior high-school teachers usually specialize in a particular subject. They teach several classes each day, either in their main subject, in related subjects or in both. The most frequent combinations are English and history or other social sciences; mathematics and general science; and chemistry and biology or general science. Teachers of home economics, agriculture, driver education, music, art, industrial arts and business-oriented subjects less frequently conduct classes in other subjects.

Although classroom instruction is a large portion of their work, secondary teachers additionally plan and develop teaching materials, originate and correct tests, keep records and make out reports, consult with parents, supervise study halls and perform other administrative duties. The growing use of teaching machines, programmed instruction and teacher aide helps eliminate many routine tasks.

Many teachers are also involved in supervision of student activities, including clubs and social functions, and become involved in nonacademic affairs as interested members of the community where they teach. Maintaining good relations with parents and the local community is an important aspect of the teaching profession.

At least one year of professional education beyond the bachelor's degree and several years of successful classroom teaching are required for most supervisory and administrative positions in secondary education.

Some experienced teachers are assigned as part- or full-time guidance counselors, or as teachers of handicapped or other special groups of children. Usually additional preparation and certifications special certificates are required for these assignments.

Program Requirements

The student must complete a sufficient number of courses (30–54 semester hours) to satisfy the requirements for a teaching major in a department of the College of Liberal Arts or the College of Business Administration. In most cases the completion of an academic major will satisfy this requirement.

It is strongly recommended that students earn sufficient credits (18–24) in a field outside the major to qualify to teach in the second field.

The student must complete this foundation program of professional courses during the sophomore and junior years:

- 75:90 Introduction to Secondary-School Teaching 2 s.h.
- 75:91 Pre-Education Practicum 2 s.h.
  (To be taken concurrently with 75:100; students with prior equivalent experience exempted from 75:91 upon recommendation of director of student teaching)
- 75:75 Educational Psychology and Measurement 3 s.h.
  (Graduate students permitted to substitute appropriate graduate courses for 75:75 and 75:100)

Juniors who expect to do their senior year of student teaching in the fall semester of the senior year must take methods courses during either the preceding academic year or the summer session. Majors in art, music and physical education must earn credit in elementary and secondary special methods and in elementary and secondary student teaching.

Professional Semester

Senior students may enroll for the professional semester (75:191 Observation and Laboratory Practice) in either the fall or spring semester. In some major fields, students will be expected to enroll in both 75:191 and 75:192. The basic amount of credit for Observation and Laboratory Practice will be 12 semester hours. To register for Observation and Laboratory Practice, the student must have:
- Been formally admitted to the Program in Secondary-Teacher Education;
- Attained senior standing;
- Satisfactorily completed courses 75:75, 75:91 and 75:100 or their equivalent;
College of Education

- Maintained a cumulative grade-point average of not less than 2.2 if an undergraduate student or 3.5 if a graduate student (2.7 if an M.A.T. candidate), on all college work attempted, all college work attempted at The University of Iowa and all work attempted in the teaching major;
- Filed application for an assignment by May 15 preceding the academic year during which student teaching is desired; and
- Consulted with and been recommended by the appropriate special methods instructor and the Coordinator of Student Teaching.

Students who want or need more than 12 semester hours in the Professional Semester may elect one of these options:
76:190 Individual Field Projects in Laboratory Practice 1-3 s.h.
75:187 Seminar in Student Teaching: Curriculum and Instructional Problems (special sections in English, Social Studies, Mathematics, etc.) 2 s.h.
7V:110 Selection and Use of Educational Media 2 s.h.
Effective education or content courses in a major or minor teaching field, if offered on Saturdays or late afternoons when student teachers can attend 2-3 s.h.

The CUTE Program
Concerned students who feel they may better further their education through student teaching in an inner-city situation, and who are interested in working with disadvantaged people, may apply through the Center for Urban Teacher Education (CUTE) program.

This program is a federal project and one of the many Midwest Comprehensive Educational Laboratories. Iowa is one of 40 institutions which place selected students in the Kansas City inner-city system.

This program is open to any student who meets the general requirements in the College of Education.

Admission
A freshman interested in teaching in secondary education may declare this interest at the time he or she applies for admission to the University, but is not eligible to elect professional courses in education until attaining sophomore standing.

To be admitted to the program in secondary-teacher education, the student must meet the basic requirements (see "General Information") and must have attained sophomore standing (at least 28 semester hours of credit) with at least a 2.2 cumulative grade-point average on all college coursework attempted.

Transfer students are required to complete at least one semester or summer session in residence at Iowa, earning at least eight semester hours of credit.

A graduate student seeking admission to the program in secondary-teacher education must meet requirements for admission to the Graduate College, have at least a 3.5 cumulative grade-point average (2.7 for the M.A.T. student) and have completed at least one semester or summer session at Iowa, in which he or she earned at least eight semester hours of credit.

Tentative admission may be granted to transfer students with advanced standing (56 semester hours) and to graduate students, prior to fulfillment of the residence requirement; but final admission and the student's teaching assignment must await satisfaction of the residence requirement.

Special Education
The Department 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 Iowa program in special education aims to give the student a knowledge of the characteristics of exceptional children, educational programs currently provided for exceptional children, and methods of teaching exceptional children.

Upon completion of the Bachelor of Arts, Bachelor of Science or Bachelor of General Studies programs, the student may be certified to teach either mentally-retarded or physically-handicapped children at the elementary and/or secondary level.

A student majoring in special education has two options to qualify for certification in special education only, and not as an elementary- or secondary-school teacher in other than a special education program, or to qualify for regular certification in elementary or secondary education as well as certification in special education.

The Division of Special Education recommends the dual program because it enhances the student's employment opportunities and provides a more comprehensive training for teaching. However, completion of the dual major may require attending summer sessions if the student wants to graduate in four years.

The special education major requires a minimum concentration of 20 semester hours of coursework in the student's chosen area of teaching—either the mentally retarded or the physically handicapped. The program also requires one semester of student teaching, usually taken during the senior year.

The program is enriched by team teaching, guest lectures, audiovisual aids, field trips, the use of observation techniques and laboratory experiences.

Certification in Elementary Education and Secondary Special Education with Emphasis in Mental Retardation
Coursework required by Special Education:
7U:30-31 Introduction to and Observation of Exceptional Children I-II
7U:32-33 Instructional Methods and Procedures in Special Education I-II
7U:135 Mental Retardation
7U:192 Laboratory Practice in the Education of the Mentally Retarded Child (night course 9:30-12:00 at the elementary level)

Coursework required by Elementary Education:
7E:91 Exploratory Experience in Teaching (or equivalent)
Certification in Elementary Education and Elementary Special Education with Emphasis in the Physically Handicapped

Coursework required by Special Education:
7E:150 Introduction to and Observation of Exceptional Children I-II
7E:152 Instructional Methods and Procedures in Special Education I-II
7U:159 Orientation to Rehabilitation of the Physically-Handicapped Child
7U:191 Laboratory Practice in Education of the Physically-Handicapped Child (eight weeks)

Coursework required by Elementary Education: Same as for emphasis in Mental Retardation

Certification in Elementary Education Only, with Emphasis in Mental Retardation

Coursework required by Special Education:
7U:30-31 Introduction to and Observation of Exceptional Children I-II
7U:32-33 Instructional Methods and Procedures in Special Education I-II
7U:135 Mental Retardation
7U:192 Laboratory Practice in the Education of the Mentally-Retarded Child (one semester)
7E:160 Methods: Elementary-School Language Arts
7E:163 Methods: Elementary-School Mathematics
7E:164 Methods: Elementary-School Reading
7P:109 Socialization of the School-Age Child
7V:110 Operation of Audiovisual Equipment
7V:111 Selection and Utilization of Educational Media

One of these:
31:13 Psychology of Adjustment
31:15 Introduction to Social Psychology
31:163 Abnormal Psychology

Coursework required by Elementary Education: Same as preceding programs

Certification in Secondary Special Education (Mental Retardation) with a Major in Psychology

Coursework required by Special Education:
7U:30-31 Introduction to and Observation of Exceptional Children I-II
7U:32-33 Instructional Methods and Procedures in Special Education I-II
7U:135 Mental Retardation
7U:143 Vocational Resources for Exceptional Children
7U:192 Laboratory Practice in the Education of the Mentally-Retarded Child (one semester at the secondary level)

Coursework required by Psychology: See "Psychology" in "College of Liberal Arts"

Other coursework:
7C:101 Principles of Guidance
7E:140 Methods: Elementary-School Language Arts
7E:164 Methods: Elementary-School Reading
7P:75 Educational Psychology and Measurement
7P:109 Socialization of the School-Age Child
7S:100 Introduction: Secondary-School Teaching
7V:110 Operation of Audiovisual Equipment
7V:110 Selection and Utilization of Educational Media
345:1 Introduction to Sociology: principles
345:142 Juvenile Delinquency

Admission

Because of limited facilities, the Division of Special Education limits enrollment in its undergraduate program. If the number of applicants exceeds its enrollment limit, the best qualified applicants will be admitted.

A student who wants to be admitted to the special-education program must make formal application.

Students applying before or during the first semester of the freshman year must meet the general requirements for admission to a teacher-education program.

Students who apply after completing one semester or more of college-level study must meet the general requirements, and must have at least a 2.2 grade-point average on all coursework attempted and on all coursework attempted at the University.

Students planning to complete additional majors in elementary or secondary education must be admitted to and meet the requirements of these programs.

Advanced Study

General Information

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 graduate programs leading to the Master of Arts (M.A.T.), Master of Arts in Teaching (M.A.T.), Educational Specialist (Ed.S.) and Doctor of Philoso-
Master of Arts

Master of Arts programs are offered on both a thesis and nonthesis basis. Nonthesis M.A. programs provide more specialized professional preparation than the traditional M.A. thesis programs. Nonthesis programs are not necessarily terminal programs, but students who expect to continue on to doctoral work are urged to select an M.A. thesis program, which offers more intensive experience in research procedures. Students who complete a nonthesis M.A. program and are admitted to a Ph.D. program are required to submit evidence of writing and research skills to their advisor and to the College of Education during the early part of their doctoral program.

Master of Arts in Teaching

The M.A.T. program is a 38-semester-hour (minimum) nonthesis course of study designed for superior liberal arts graduates who have few or no professional-education courses on 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, mathematics, music, science and social studies. A grade-point average of 2.7 is required for admission.

Educational Specialist

This degree is granted upon the completion of a prescribed two-year, postbaccalaureate program designed for students preparing themselves professionally in such fields as teaching, administration and supervision and special services.

Doctor of Philosophy

The Ph.D. degree is the highest earned academic degree awarded by the College and is conferred upon students who have demonstrated superior scholarship and mastery of research skills in coursework as well as in the preparation and defense of a dissertation.

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, businesses, 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 interdisciplinary relationships.
public instruction, test publishing organization or research cen-
ter which calls for some special competence in educational mea-
surement and research methodology; also appropriate for the
student seeking to broaden knowledge of measurement and re-
search methodology as much for the sake of personal develop-
ment as for professional improvement; intended primarily for the
student planning to continue advanced work in measurement
theory and statistical methods at the Ph.D. level

Doctoral Program

Purpose: To prepare students for high-level professional posi-
tions in the fields of educational measurement and statistical
methods in colleges, universities, state departments of public
institutions, large school systems, test publishing firms or re-
search centers.

Reading Disability

Master’s Program (without thesis)

Purpose: To prepare resource teachers in the area of reading
disability at elementary, junior-high and secondary levels; em-
phasis on supervised clinical practice in the diagnosis and in-
struction of children with reading disability whose intellectual
functioning is within the normal range.

Elementary Education

Master’s Program (with or without thesis)

Purpose: To prepare students in such areas of specialization as
children’s literature, early childhood education, language arts,
mathematics, reading, science and social studies; completion of
this program pattern, together with four years successful teach-
ing experience, qualifies the student for the permanent profes-
sional certificate with endorsement as an elementary-school
supervisor; most appropriate for those who intend to continue
classroom teaching or who are interested in a supervisory or
curriculum development position.

Master’s Program in Developmental Reading

Purpose: To prepare students for positions as reading specialists
in kindergartens and grades 1–14; also valuable for students who
want to specialize further in the area and eventually to teach in
a college or university; qualifies the student for the reading-
specialist certificate endorsement and, after four years of success-
ful teaching experience, for the permanent professional
certificate and endorsement as an elementary-school supervisor.

Master’s Program in Elementary School Administration

Purpose: To prepare students for positions as elementary-school
principals; planned both as a terminal one and as the first year
in a two-year sequence leading to the educational specialist de-
gree; together with four years successful teaching experience,
qualifies the student for the permanent professional certificate
with elementary-school supervision and elementary-
school administration endorsements.

Educational Specialist Degree

Purpose: To equip potential educational leaders with the knowl-
edge and skill necessary for positions in which the administrator
assumes responsibility for a number of elementary-school at-
tendance units; it is also anticipated that many elementary-
school principals may wish to increase their competence by
completing this program.

Doctoral Program

Purpose: To prepare students for college teaching and adminis-
trative positions, or for research, curriculum, supervisory or
administrative positions in large consolidated and urban school
systems.

School Guidance and Counseling

Master’s Program (with or without thesis)

Purpose: To provide graduate-level instruction necessary for
school counseling positions.

Educational Specialist Program

Purpose: To provide advanced specialization in counseling and
guidance for M.A. graduates who seek to increase professional
competence in supervision and administration at the school and/or
state levels.

Doctoral Program

Purpose: To prepare individuals for leadership and research posi-
tions in counseling and guidance, most often as counselor educa-
tors in colleges or universities, or as directors of guidance
programs in large-city school systems or at the state and national
levels.

Rehabilitation Counseling

Master’s Program (with or without thesis)

Purpose: To develop basic competency for counseling-type in-
teraction with the vocational problems of the physically, men-
tally and culturally handicapped; graduates are equipped to
perform as rehabilitation counselors with public agencies,
rehabilitation centers, hospitals and sheltered workshops; stu-
dents intending doctoral study or wanting to emphasize research
skills should follow the thesis program.

Doctoral Program

Purpose: To prepare individuals for research, counseling and
training positions, as counselor educators in universities and as
directors of vocational services in hospitals, rehabilitation cen-
ters and other settings.

College Student Personnel

Master’s Program (with or without thesis)

Purpose: To prepare candidates for such positions as admissions
officers, activities directors, financial aid advisors, union direc-
tors, residence directors and foreign student advisors; and with
experience, as student deans, college counselors and teachers, and director of admissions or placement

Ed.S. Program
Purpose: To provide specialized professional training in college student-personnel administration beyond the master’s level for persons not planning to enter doctoral study; to prepare students for such positions as dean of men or women, dean of students in a small college or director of admissions or director of students activities at any level

Doctoral Program
Purpose: To provide training in depth through an academic, research-oriented curriculum which draws heavily upon the field of counseling psychology; prepare individuals to serve competently in such positions as dean of men or women, dean of students, college counselor or teacher, director of admissions, placement director or counselor educator; generally planned as a four-year program in which the M.A. is conferred sometime during the second year; students entering with an M.A. take three years, including dissertation

Counseling Psychology
Doctoral Program
Purpose: To prepare doctoral-level counseling psychologists for positions primarily in higher education, usually with academic appointments in counselor education or psychology and service assignments in counseling and vocational psychology, and to conduct their own research and direct that of their students, supervise counselor trainees and consult with other student services personnel

Higher Education
Master’s Program (without thesis)
Purpose: To prepare students for entry-level staff and administrative positions such as assistant dean of instruction, in two- and four-year colleges

Educational Specialist Program
Purpose: To provide the advanced graduate education needed by instructors at the undergraduate level in two- and four-year colleges and by administrators in higher education not planning to continue for the doctorate; the Specialist degree may be awarded upon completion of a joint program in higher education and an academic discipline comprising a minimum of 60 semester hours of graduate work under 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

Secondary School Administration
Master’s Program (with or without thesis)
The master’s degree in secondary school administration is offered in the Division of Educational Administration

College of Education

Doctoral Program
Purpose: To prepare students for positions as secondary school principals, directors of secondary education and college teaching in secondary education

Secondary School Curriculum
Master’s Program (with or without thesis)
Purpose: To prepare teachers and administrators for positions as counselors, directors and coordinators in the field of secondary-school curriculum development

Doctoral Program
Purpose: To prepare students for leadership positions in the field of curriculum for public schools, state departments and college teaching

Art Education
Master’s Program
Purpose: To prepare highly-qualified teachers of art for public schools, junior colleges and small liberal arts colleges; the strong academic emphasis assists teachers who art themselves creative artists to become highly literate in the history and language of art; administered by the School of Art and Art History with the cooperation of the College of Education

Doctoral Program
Purpose: To prepare college teachers and researchers in art education and supervisors of art in state departments of education and school systems; to provide an opportunity for continuing inquiry and creative work in art history and in studio administration by the College of Education with the cooperation of the School of Art and Art History

Business Education
Master’s Program (without thesis)
Purpose: Designed for the graduate student who holds a teacher’s certificate and has either a major or a minor teaching area in business education; coursework from three areas is included in the program with an approved freedom of choice within each area:

- Business administration content, to provide improvement in specific business content areas
- Professional business education, to emphasize improvement of teaching techniques and philosophy of business education
- General professional education, to emphasize general aspects of teaching

Doctoral Program
The Business Education Program leading to the Ph.D. is offered on a joint basis by the colleges of Education and Business Administration; the candidate may place emphasis in both colleges, although primary emphasis normally will be given to the various programs in business, with particular attention to business education.
English Education

Master's Program
Purpose: To prepare teachers and supervisors of English for secondary schools and junior colleges

Doctoral Program
Purpose: To prepare supervisors, teacher-training personnel, college teachers and researchers in English education

Mathematics Education

Master's Program (with or without thesis)
Purpose: To provide students not intending doctoral study with advanced specialization in mathematics as a better foundation for teaching at the secondary level

Doctoral Program
Purpose: To prepare qualified persons for careers in mathematics education at the university level or as supervisors of secondary- and elementary-school mathematics in large educational enterprises

Music Education
The music education programs are administered by the School of Music in cooperation with the College of Education.

Master's Program
Purpose: To provide students with deeper insights into music, the theory and practice of music education and the role of music in the school curriculum

Doctoral Program
Purpose: To prepare students for teaching, research or administrative functions in (a) college positions—teachers of music education classes and activities, band, chorus and orchestra directors, administrators of music departments and schools of music; and in (b) public-school positions—music supervisors, research and curriculum consultants, and directors of city- or district-school music programs

Physical Education for Men
This program is administered by the Department of Physical Education for Men.

Master's Program (with or without thesis)
Purpose: To prepare students for the administration, supervision or teaching of physical education in schools; thesis program designed primarily as the first step in graduate study leading to the Ph.D. degree; particular emphasis is placed upon techniques of research

Educational Specialist
Purpose: To prepare graduate students for teaching physical education in community colleges

Doctoral Program
Purpose: To prepare graduates to teach graduate courses in their area of specialization and to conduct and direct research in that area

Physical Education for Women
This program is administered by the Department of Physical Education for Women.

Master's Program (with thesis)
Purpose: To prepare women for leadership in physical education as teachers, administrators or supervisors

Doctoral Program
Purpose: To prepare women for teaching, administration or research in physical education

Science Education

Master of Arts Program in Science Teaching
See section on M.A.T. Program

Master of Science Program (without thesis)
Purpose: Designed for students who plan to continue in teaching

Master of Science Program (with thesis)
Purpose: Designed for candidates who plan to continue study toward the Specialist or Ph.D. degree

Educational Specialist
Purpose: Recommended for supervisors (state, regional or local), as well as for instructors in community colleges and/or small four-year liberal arts colleges

Doctor of Philosophy
Purpose: Available for qualified candidates who aspire to college and university positions as science education; major supervisory posts in national, state and local systems; instructors of general-education science courses and areas of major colleges; or positions as research directors in science education

Social Studies Education

Master's Programs
Purpose: To provide an opportunity for interdisciplinary work in history and the social sciences for classroom teachers, high-school department chairmen and supervisors, as well as others interested in acquiring greater competency in the social sciences and greater proficiency is teaching and supervision

Doctoral Program
Purpose: To prepare secondary departmental chairmen, supervisors, curriculum directors, teacher-education personnel and college instructors in the social sciences and pedagogy
Social Foundations and Philosophy

Master's Program
Purpose: Although a master's degree in social foundations or philosophy of education is inadequate by itself, the program is designed for 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 and want one.

Doctoral Program
Purpose: To prepare college-level instructors in the fields of history and philosophy of education, comparative education, and educational sociology.

Special Education and School Psychology

Master's Program (without thesis)
Purpose: To prepare teachers, supervisors and consultants in special education at elementary- and secondary-school levels; within the field of special education the student may emphasize preparation to work with the following kinds of exceptional children: mentally retarded, emotionally maladjusted, physically handicapped, hearing impaired and hearing impaired; specific master's degree programs are offered in mental retardation and in behavior disorders; program in mental retardation is geared to two groups: major group comprises individuals who have a background in mental retardation and some experience; other group represents persons who are entering the training program at the M.A. level with no previous experience in the field; latter group is required to complete selected courses from the undergraduate sequences as prerequisites to their M.A. program; behavior disorders program emphasizes preparation to work with children who have primarily affective, but may also have cognitive and psychomotor dysfunction.

Educational Specialist
Purpose: To provide sufficient training and experience to enable graduates to be competent directors of local, regional and state special education programs; successful completion qualifies the graduate for certification in Iowa to serve as director of special education; provides for specialization in administration of special-education programs, mental retardation and behavior disorders; Ed.S. granted upon completion of a prescribed two-year, post-baccalaureate program; designed primarily for practitioners who want additional professional preparation beyond the M.A. degree but do not choose to develop the more specialized research skills required for the Ph.D. degree.

Doctoral Program in Mental Retardation
Purpose: To prepare students for positions in teaching, research and consultative work.

Doctoral Program in Administration of Special Education
Purpose: To provide sufficient training and experience to enable graduates to be competent directors of local, regional and state special-education programs; usual practice is for the student to take coursework and practicum in a second area of specialization to provide additional depth of training and experience; in addition, he or she must complete coursework and seminars in the various areas of specialization to develop competence in the administration of special-education; he or she takes coursework in theory and practice in the Division of Educational Administration, and a series of courses, short-term practice, observation and internship experiences in special-education administration; internships include anxiety; for general Graduate College administration and graduation requirements, see the "Graduate College" section of the Catalog.

College of Education

7C244J Practicum in Vocational-Educational Counseling or. err. Practicum in counseling offered with vocational and educational problems and supervised experience in University Counseling Service; prerequisite: TC1232, TC525

7C543P Practicum in Personal-Adjustment Counseling or. err. Practicum in counseling offered with personal and interpersonal problems and supervised experience in University Counseling Service; prerequisite: TC1232, TC525

7C544J Practicum in Counseling Psychology or err. Supervision of students enrolled in counseling practicum; prerequisite: consent of instructor

7C654J Research in Counseling or err. Prerequisite: consent of instructor

TC4430 Thesis in Vocational-Educational Education or err. Prerequisite: consent of instructor

Educational Administration

7D280J Foundations of School Administration 3 or 4 err. For majors in school administration, emphasis on processes common to all phases of educational administration; conceptual framework for administration of education and use of sound materials relating to communication, decision making and organizational theory.

7D290J Computer Applications in Education 2 or 3 err. Principles of selected data processing and computer use with applications in educational administration, instruction and research.

7D291J Introductory Systemic Analysis and Operations Research 2 or 3 err. Applications of systems analysis and operational research methods to educational planning and decision making. Methods include linear programming, queueing, decision models, inventory, games and network problems.

7D292J Leadership and Administration 3 or 4 err. Responsibilities of the principal for scheduling, assignment and selection of teaching personnel, record keeping, employee motivation, guidance, discipline, business administration; prerequisite: TC2301 or consent of instructor

7D293J Elementary-School Principalship 3 err. Organization, supervision and administration of elementary schools; curriculum development, instructional policy and personnel relationships; role analysis and measurement of administrative, basic administration in administrative programs

7D294J Elementary-School Organization Patterns 3 err. Organizational approaches, studied with specific attention devoted to emerging patterns of schools as new trends in instructional programs.

7D295J Current Issues in the Structure and Governance of Education 2 err. Organizational structures of roles of educational administrators at local, intermediate, state and national levels; role of political forces for stability and change at all levels.

7D296J School Building Relationships 3 err. or 4 err. Relationships between public schools in social institutions and society; basic concepts of organization and management processes; agents of organization.

7D297J Administration of Professional Personnel 3 or 4 err. Problems of recruitment, evaluation, induction, pre-service, in-service, tenure and retention policies influencing professional personnel of schools.

7D298J Counseling and Psychotherapy 3 or 4 err. Survey of career counseling and psychotherapy; behavior scientists and appropriate diagnostic techniques for use in counseling and psychotherapy programs; helps students select appropriate diagnostic techniques for use in counseling and psychotherapy programs.

7D299J Research, Development, and Program Planning in Education 3 or 4 err. Planning for design, construction, finance, evaluation, and maintenance of school buildings and sites and development of staff and maintenance of school buildings and sites.

7D300J Principles of School Administration 2 or 3 err. Principles of school administration: organization and staffing of school systems; organization and staffing of school systems.

7D301J School Board and Site Administration 3 or 4 err. Principles of site administration; organization and staffing of public education systems; economic implications of public education; determination of policy and practice in financing of public schools; non-local and local agencies; administration of school systems; principles of succession programs and organizing systems of state support of public education.

7D302J School Building and Site Administration 3 or 4 err. Theory and practice of construction and building techniques; budgeting procedures and consideration of data relevant to project management.

7D303J Theories of School Administration 2 or 3 err. Theory and practice of personnel, organizational development, and evaluation; central and departmental principles of school administration; planning and organizing systems of state support of public education.

7D304J Financial Management of Local School Systems 2 or 3 err. Theory and practice of personnel, organizational development, and evaluation; central and departmental principles of school administration; planning and organizing systems of state support of public education.

7D305J Legal Aspects of Educational Administration 3 or 4 err. Theory and practice of personnel, organizational development, and evaluation; central and departmental principles of school administration; planning and organizing systems of state support of public education.

7D306J Educational Administration 3 or 4 err. Theory and practice of personnel, organizational development, and evaluation; central and departmental principles of school administration; planning and organizing systems of state support of public education.
College of Education

7E-101 Methods in Elementary-School Social Studies 2 q.h.
Principles and content for grade kindergarten through sixth. Development of work units, evaluation of student progress, testing, instructional methods.

7E-102 Methods in Elementary-School Science 2 q.h.
Objectives, content, and teaching-learning activities for elementary school science. Improvement of teaching techniques and pattern in selected areas.

7E-103 Methods in Social Studies and American History 2 q.h.
Methods used in teaching social studies and American history to children in grades kindergarten through sixth. Basis for teaching methods and presentation of subject matter.

7E-107 Reading 2 q.h.
Preparation for teaching reading to children in grades kindergarten through sixth. Effects of various factors on reading. Use of visual aids in teaching reading.

7E-127 Methods in Mathematics 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in grades kindergarten through sixth in mathematics. Developments in teaching methods.

7E-128 Methods in Art 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in art in grades kindergarten through sixth. Development of teaching methods.

7E-131 Methods in Music 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in music in grades kindergarten through sixth. Development of teaching methods.

7E-132 Methods in Foreign Languages 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in teaching foreign languages in grades kindergarten through sixth. Development of teaching methods.

7E-140 Methods in Physical Education 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in physical education in grades kindergarten through sixth. Development of teaching methods.

7E-141 Methods in Health Education 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in health education in grades kindergarten through sixth. Development of teaching methods.

7E-142 Methods in Recreation and Guidance 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in recreation and guidance in grades kindergarten through sixth. Development of teaching methods.

7E-143 Methods in Business Education 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in business education in grades kindergarten through sixth. Development of teaching methods.

7E-144 Methods in Home Economics 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in home economics in grades kindergarten through sixth. Development of teaching methods.

7E-145 Methods in Environmental Education 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in environmental education in grades kindergarten through sixth. Development of teaching methods.

7E-146 Methods in Vocational Education 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in vocational education in grades kindergarten through sixth. Development of teaching methods.

7E-147 Methods in Special Education 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in special education in grades kindergarten through sixth. Development of teaching methods.

7E-150 Methods in General Education 2 q.h.
Objectives, methods of instruction, and evaluation of pupil achievement in general education in grades kindergarten through sixth. Development of teaching methods.

7E-151 Methods in Elementary-School Social Studies 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in social studies. Experience of teaching techniques which characterize new approach in social studies. Development of teaching methods.

7E-152 Methods in Elementary-School Mathematics 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in mathematics. Experience of teaching techniques which characterize new approach in mathematics. Development of teaching methods.

7E-153 Methods in Elementary-School Science 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in science. Experience of teaching techniques which characterize new approach in science. Development of teaching methods.

7E-154 Methods in Elementary-School English 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in English. Experience of teaching techniques which characterize new approach in English. Development of teaching methods.

7E-155 Methods in Elementary-School Art 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in art. Experience of teaching techniques which characterize new approach in art. Development of teaching methods.

7E-156 Methods in Elementary-School Music 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in music. Experience of teaching techniques which characterize new approach in music. Development of teaching methods.

7E-157 Methods in Elementary-School Foreign Languages 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in foreign languages. Experience of teaching techniques which characterize new approach in foreign languages. Development of teaching methods.

7E-158 Methods in Elementary-School Business Education 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in business education. Experience of teaching techniques which characterize new approach in business education. Development of teaching methods.

7E-159 Methods in Elementary-School Home Economics 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in home economics. Experience of teaching techniques which characterize new approach in home economics. Development of teaching methods.

7E-160 Methods in Elementary-School Physical Education 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in physical education. Experience of teaching techniques which characterize new approach in physical education. Development of teaching methods.

7E-161 Methods in Elementary-School Health Education 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in health education. Experience of teaching techniques which characterize new approach in health education. Development of teaching methods.

7E-162 Methods in Elementary-School Recreation and Guidance 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in recreation and guidance. Experience of teaching techniques which characterize new approach in recreation and guidance. Development of teaching methods.

7E-163 Methods in Elementary-School Business Education 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in business education. Experience of teaching techniques which characterize new approach in business education. Development of teaching methods.

7E-164 Methods in Elementary-School Music 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in music. Experience of teaching techniques which characterize new approach in music. Development of teaching methods.

7E-165 Methods in Elementary-School Foreign Languages 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in foreign languages. Experience of teaching techniques which characterize new approach in foreign languages. Development of teaching methods.

7E-166 Methods in Elementary-School English 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in English. Experience of teaching techniques which characterize new approach in English. Development of teaching methods.

7E-167 Methods in Elementary-School Art 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in art. Experience of teaching techniques which characterize new approach in art. Development of teaching methods.

7E-168 Methods in Elementary-School Mathematics 2 q.h.
Objectives, content, and teaching-learning activities for elementary school for preparation of instruction in mathematics. Experience of teaching techniques which characterize new approach in mathematics. Development of teaching methods.
### 7P148 Statistical Methodology in Educational Research I
3 s.h.
Introduction to Bayesian and regression methods; applications in analysis of educational data; conditional probability rule; Bayes theorem; analysis of potential outcomes; Beta-binomial analysis; censored models; discrimination and regression theory; same as Statistics 225-137; prerequisites: 7P149 or equivalent.

### 7P149 Statistical Methodology in Educational Research II
3 s.h.
Contemporary techniques in 7P148; emphasis on real data analysis; applications of statistical methods; emphasis on educational research; same as Statistics 225-138; prerequisites: 7P148 or equivalent.

### 7P150 Measurement for the Classroom Teacher
3 s.h.
Interpretation and use of standardized test results; development of classroom tests and evaluation of pupil achievement; elementary statistical concepts relating to interpretation of test scores.

### 7P170 Psychological Reading
5 or 4 s.h.
Psychological and linguistic analysis of reading process; implications for teaching methods and materials; factors relating to reading performance.

### 7P173 Reading Clinic: Diagnosis
3 or 2 s.h.
Evaluation of diagnostic tests of reading ability; clinical diagnosis in practice; incorporation of test; remedial techniques. Prerequisites: 7P170.

### 7P181 Theories and Conditions of Classroom Learning
3 s.h.
Review of contemporary theories of learning; application of learning principles to classroom setting.

### 7P182 Cognitive Processes in Classroom Learning
3 s.h.
Theories of cognitive development; concept formation; problem solving; styles and strategies of teaching; application of cognitive theory to classroom learning.

### 7P183 Motivation in Education
3 s.h.
Theory of motivation; application to education; evaluation of current research trends.

### 7P188 Group Processes in Education
3 s.h.
Theories and research in group dynamics; application to education; evaluation of techniques for assessing interaction processes.

### 7P191 Special Readings and Projects
2 or 3 s.h.
Supervised individual study; prerequisites: senior standing and consent of instructor.

### 7P211 Adult Learning
3 s.h.
Designed for individuals whose interest and professional responsibilities involve teaching older adults; theories of learning and teaching; classroom applications considered; readings in literature on teaching; opportunities for small group interactions and individual projects.

### 7P234 Advanced Educational Measurement
3 s.h.
Survey and critical review of current views of programmatic measurement; primary emphasis on educational research; applications of statistical techniques.

### 7P240 Selected Applications of Statistics
3 s.h.
Prerequisites: 7P149 or Statistics 225-137 and Psychology 211. Design of statistical methods for analyzing single classical experiments; applications of statistical concepts to the design and evaluation of curricula in science; emphasis on the a-b and Poisson, Poisson estimates and correlations, categorical data analysis, sampling theory, applications of regression and correlation; same as Statistics 213-140 or equivalent.

### 7P243 Intermediate Statistical Methods
1-3 s.h.
Logic of causal inference; chi-square and other tests of statistical hypotheses; small sample error theory; interval estimation; introduction to analysis of variance and selected nonparametric techniques; prerequisites: 7P143 or equivalent; same as Statistics 228-140.

### 7P244 Advanced Statistical Methods
3 s.h.
Regression analysis and correlation techniques; multiple, partial, curvilinear, sequential, reliability, and factorial analysis; correlation matrix; sampling theory applied to regression analysis and correlation; prerequisites: 7P141 and 7P143 or Statistics 225-137 and Psychology 211.

### 7P246 Application of Multivariate Statistical Techniques
2-3 s.h.
Applications of advanced multivariate statistical techniques in educational research; techniques include factor analysis, multivariate analysis of variance, canonical correlations and discriminant analysis; prerequisites: 7P244.

### 7P247 Design of Experiments
3 s.h.
Theory and practice of planning and statistical analysis of experimental studies; testing of hypothesis about linear contrasts among means in single-factor and multifactor experiments; applications of factorial designs and repeated measures designs, prerequisites: 7P240 or equivalent; same as Statistics 225-139.

### 7P247 Distribution-Free Statistical Methods
2 or 3 s.h.
Theory and development of nonparametric statistical techniques; includes measures of central tendency and analysis of variance; special emphasis on relationship with classical parametric processes, same as Statistics 225-153; prerequisites: 7P243 and consent of instructor.

### 7P248 Data Processing
3 s.h.
Computer data processing with special emphasis on Fortran language used by computer at University Center; use of Computer Center statistical library; preparation of data to be submitted to computer; use of computer in statistical analysis of data and research data; prerequisites: consent of instructor.

### 7P250 Analysis and Use of Classroom Tests
3 s.h.
Rules of scoring, test-placement, bias testing, test administration, test construction, test analysis, grade assignment; prerequisites: 7P131 or consent of instructor.

### 7P251 Educational Measurement and Evaluation
3 s.h.
Use of standardized tests; source of test information and critical evaluation of reliability and validity data; interpretation of scores and profiles; prerequisites: 7P131 or equivalent.

### 7P252 Theory and Techniques in Educational Measurement
3 s.h.
Mathematical theory underlying educational and psychological measurements; philosophical issues in achievement tests construction, estimation of test reliability and validity, derivation of scores, scaling and equating test batteries; prerequisites: 7P250 and 7P257 or equivalent and consent of instructor.

### 7P255 Testing Methods I
3 s.h.
Theory and procedures used in different testing methods; application of those procedures to problems in such fields as value judgments, personality and attitude.

### 7P256 Testing Methods I
3 s.h.
Continuation of 7P255, in which is presented tests of textual and reading ability; same as Psychology 213-141.

### 7P260 Individual Instruction in Educational Psychology
1-3 s.h.
Prerequisite: consent of instructor.

### 7P281 Seminar: Educational Psychology I: Research and Teaching
1-2 s.h.
Prerequisite: educational psychology; current instructional research, critical evaluation of research in educational psychology; prerequisite: consent of instructor.

### 7P282 Seminar: Educational Psychology II: Psychology of Learning
1-2 s.h.
Psychology of learning as related to classroom practice and curriculum organization; prerequisite: consent of instructor.

### 7P283 Seminar: Educational Psychology III: Social Psychology
1-3 s.h.
Social psychology of education; problems of society and societal roles; school as social system; individuals and subcultures; nature and dynamics of instructional groups, prerequisite: consent of instructor.

### 7P334 Seminar: Educational Psychology IV: Mental Health in Education
1-2 s.h.
Prerequisite: consent of instructor.

### 7P338 Seminar: Educational Psychology V: Human Relations in Education
1-2 s.h.
Prerequisite: consent of instructor.

### 7P339 Seminar: Educational Psychology VI: Advanced Seminar in Educational Psychology
1-3 s.h.
Prerequisite: consent of instructor.

### 7P340 Seminar: Educational Psychology I: Research and Teaching
1-2 s.h.
Evaluation and review of current literature in educational psychology prerequisite: consent of instructor.

### 7P341 Seminar: Educational Psychology II: Social Psychology
1-3 s.h.
Prerequisite: consent of instructor.

### 7P342 Seminar: Educational Psychology III: Advanced Seminar in Educational Psychology
1-3 s.h.
Prerequisite: consent of instructor.

### 7P343 Seminar: Educational Psychology I: Research and Teaching
1-2 s.h.
Experimental investigations of reading process; emphasis on discrimination, associative and language variables; analysis of theory, experimental methods, research findings and problem areas; prerequisite: consent of instructor.

### 7P344 Seminar: Educational Psychology II: Social Psychology
1-3 s.h.
Prerequisite: consent of instructor.

### 7P345 Seminar: Educational Psychology III: Advanced Seminar in Educational Psychology
1-3 s.h.
Prerequisite: consent of instructor.
78:190 Individual Projects in Laboratory Practice 1 to 3 s.h. Projects concerned with correlation and instruction related to programs in education in which student teaching occurs; under direction of university supervisor of student teaching, write a report or project.

78:191 Observation and Laboratory Practice in the Secondary School 2 s.h. School or arr. Affords student teachers opportunities to acquire some experience of professional life in a regular school under instruction of the regular class teachers or student supervisors in junior and senior high school. Prerequisite: consent of instructor.

78:192 Observation and Laboratory Practice in the Secondary School 2 s.h. School or arr. Continuation of 78:191. Prerequisite: consent of instructor.

78:193 Literature for Adolescents 3 s.h. Reading and evaluation of literature suitable for junior and senior high school students; same as Library Science 21:91 and English 8:194.

78:194 Methods: Reading in Secondary School 2 or 3 s.h. Methods and materials used in developing reading instruction in junior and senior high school.

78:197 Aesthetic Education 3 s.h. Introductory course designed to acquaint art education students (and other interested education students) with aesthetic model for education; study arts acts serve within framework of general currents related to other subjects; understand how art, aesthetics, and education interact; make aesthetic judgments in aesthetic dimension.

78:203 Professional Seminar (66:47) 2 s.h. Restricted for M.A.T. candidates only; prior to internship or student teaching.

78:210 Seminar: Problems in Junior-High-School English 2 s.h. Consideration of specific approaches in teaching English at the junior high school level.

78:220 Supervision of Foreign Languages 2 s.h. Research and practice in methods and principles of instruction in foreign languages at secondary school level. Same as Seminar 33:177.

78:255 Supervision of Mathematics 2 s.h. Same as Mathematics 226:915. Prerequisite: 226:930 if equivalent or consent of instructor.

78:256 The Teaching of Geometry 2 s.h. Current developments in teaching of secondary school geometry and related and supplementary content.

78:257 Teaching Mathematics in the Junior High School 2 or 3 s.h. Survey of methods, materials and current developments for junior high school mathematics; including teaching of arithmetic, problem solving, introductory algebra and informal geometry.

78:283 Teaching Mathematics in the Secondary School 2 or 3 s.h. Mathematical programs and their implementation.

78:284 Supervision and Administration of Math 2 s.h. Training in supervision of secondary school mathematics with consent of instructor.

78:284 Music Education Workshop: Instrumental Music in the Secondary School 1 to 3 s.h. Same as Music 23:220.

78:285 Curriculum and Development in Art Education 2 s.h. Problems and responsibilities of art supervisor including curriculum planning, financing, supervision, training and reporting; study of trends in curriculum development in art education; curriculum evaluation, administration, organization, preparation, and evaluation; same as 70:240 and 105:241.

78:286 Supervision and Administration for Boys 2 s.h. Designed primarily for administrators and experiment teachers who wish to better understand key functions and procedures in administrative education. Emphasis upon role of supervisor in improvement of instruction; various types of teacher education are discussed.

78:285 Problems of Science Education 2 s.h. cur. of study. Focuses on issues of research design, evaluation of current studies, planning of pilot studies and implementing microteaching process in science education; required of all graduate students in science education; may be repeated; same as 77:230.

78:291 Construction of Teaching Materials for Science Instruction 3 s.h. Preparation of special laboratory materials for instruction in new elementary, junior high and senior high school courses; more attention to other teaching materials as they pertain to study of an experimental self-constructed or small groups in academic level of most interest, same as 79:271.

78:293 Advanced Methods Science Education 2 s.h. Intending modern philosophy of science teaching; experience with science teaching in inquiry-oriented methodology taught offered in current elementary and college teaching; required of all graduate students in science education; same as 79:272.

78:293 The Science Curriculum 3 s.h. National programs in secondary and college levels; observation and involvement with parts of programs; analysis of similarities, differences, trends since General Science 430; prerequisite: previous work in philosophy of science.

78:294 Supervision of Science 3 s.h. Practical experience in planning and techniques characterizing practice of science supervisor; special work with articulation of K-12 program and situations arising from coordinating programs at any level in junior, senior high schools; science supervisors at regional, state and national levels; "practicing" science for junior and senior high school science supervisors; same as 79:250 and General Science 57:254.

78:295 Structure of Science and Its Application in Science Teaching 3 s.h. Relationship among nature of science and science teaching: primary purpose to bring science teacher to understand specific structure within which facts and ideas of science fit; emphasizes how this information affords methodology, curricula, structure of specific courses, etc.; required of all Ph.D. candidates in science education; prerequisite previous work in philosophy of science.

78:296 History of Science and Its Role in Science Instruction 3 s.h. Extends science teacher's knowledge of science history and ability to apply that knowledge in teaching and teaching science courses, combines treatment of scientific advances and growth of current science themes in science with systematic consideration of use of science history in science teaching, science teaching in other countries, presentation of a number of important scientific papers, case studies and biographical material in teaching and course construction; required of all Ph.D. candidates in science education; prerequisite previous work in history or philosophy of science.

78:298 Workshop in Teaching Speech 2 s.h. Same as Speech 36:176.

78:376 Curriculum Development in the Social Studies 2 or 3 s.h. For school administrators, curriculum specialists and experienced social studies teachers. Major areas include current status of multidisciplinary curricula, trends growing out of curriculum research and development in past decade; problems involved in curriculum development and investigation; study required.

78:371 Building Resources and Teaching Units in the Social Studies 3 s.h. For novice teacher who wishes to build resource or teaching units; materials and methods for building resource or teaching unit; special emphasis placed on interpretation of current developments.

78:375 Current Issues, Approaches and Materials in Social Studies 3 s.h. Emphasizes inquiry practice for experienced teachers who will have opportunity to observe participants in and create inquiry episodes; techniques include case studies, plus brainstorming, laboratory teams and role clarification.

78:378 Workshop: "Ways of a Course of Study" 2 or 3 s.h. Designed to facilitate the development of a specific course of study in the area of race and conflict. Emphasis placed on development of effective teaching procedures.

78:379 Advanced Techniques of Socialization in Education 2 or 3 s.h. For experienced school administrators and other supervisory personnel; new curricular material examined; problems of initiating curricular change considered; types of performance and hierarchical strategies developed for improving teacher effectiveness.

78:379 Social Studies-Junior-High-School and Middle-School Organization and Administration 2 or 3 s.h. History of junior high school and development of curriculum structure; study of recent trends in school organization and assessment and early adolescent pupil; program organizing, preparing programs of study, coordinat-

78:381 Junior-High-School and Middle-School Curriculum 2 or 3 s.h. Comparison of programs in junior high school and middle school, objectives and content in various subject areas; current trends, curriculum planning in middle school.

78:381 Junior-High-School Curricululm 2 or 3 s.h. Upgrading instructional program and consideration of special instructional problems in secondary school, emphasis on group counseling.

78:381 Secondary-School Curriculum 3 s.h. Theory and development of secondary school curriculum; analysis of components of curriculum, study and discussion of problems and issues in various subject areas.

78:381 Individual Instruction in Secondary Education 2 or 3 s.h. Prerequisite: consent of instructor.

78:388 Introductory Research in Art Education 3 s.h. Study of methods of inquiry used for research in art education and related disciplines; empirical, conceptual, descriptive, and experimental, philosophical, descriptive preparation and evaluation of proposal; methods of research design; same as 70:306.
prerequisite consent of instructor and completion of M.A. programs in behavior analysis.
751205 Seminar: Advanced Problem in Teacher Education for Prospective Teachers of Children and Youth with Behavior
Disorders or arr.

Perspective on problems dealing with program design, program goals, methods, experiences, and evaluation practices; enrollment, evaluation, certification, accreditation, and program processes limited to external student; prerequisite consent of instructor
752365 Seminar: Sexual Psychology Services 3 s.h.
Selected topics, preparation, and presentation of research projects, document studies only; prerequisite consent of instructor
752434 Research Practicum in Special Education 1 s.h.
Area of special research in mental retardation, study or research projects are designed, particular attention to planning, managing, and reporting research; students assigned to current projects for practical experience in research; prerequisite consent of instructor
752436 Seminar: Program Development in Special Education 3 s.h.
Prerequisite: consent of instructor
752437 Seminar: Current Issues in Special Education 3 s.h.
Prerequisites: 752365 and consent of instructor
752360 Practicum in College Teaching 3 s.h.
Prerequisite: consent of instructor
752382 Field Service in Special Education Internship 3 s.h.
Prerequisite: consent of instructor
752380 M.A. Thesis in Special Education 3 s.h.
Prerequisite: consent of instructor
752385 Guided Research in Special Education 3 s.h.
Prerequisite: consent of instructor
752389 Ph.D. Thesis in Special Education 3 s.h.
Prerequisite: consent of instructor

Educational Media
751616 Operation of AV Equipment 1 s.h.
Prerequisite and practice in operating still and motion-picture projectors, record recorders, record players, audio-visual units, copy machines and dynamic areas
751610 Selective and Utilization of Instructional Media 2 s.h.
Prerequisite: for students who expect to teach, but does not require demonstration; provides experience in selecting, using, and evaluating instructional materials; basic techniques for developing teacher-media-instructional materials; prerequisite: 752365 which can be taken concurrently
751628 Theory and Practice of Educational Communication 3 s.h.
Relate media technology instructional to problems of teaching and learning; "state of the art" of "new media" technology; research finds how behavioral science and instructional programs, prerequisite: 751610 which can be taken concurrently
751627 Planning and Production of Instructional Materials 1 s.h.
Theory and practice of planning and producing instructional materials that can be developed by classroom teacher; exposure to designing, displaying, enlisting, constructing, deploying, and simple testing and photographic techniques; prerequisite: 751628 or consent of instructor
751625 Practical Production of Instructional Materials II 1 s.h.
Development of instructional materials using still or motion-picture photography, audio-visual techniques, basic skills covered; effective production self-instructional programs using selected media; prerequisite: 751617 or consent of instructor

751630 Communication Through Drawing 2 or 3 s.h.
Principles of formal drawing, observation, and practice in use of line, tone, and shapes used in drawing; issues related to in-depth exploration of line art experience necessary
751631 Principles and Techniques of Graphic Communication or arr.
Language and design of graphic communication materials; principles for psychology and art; experiences in making and using graphic symbols; formal drawing, layout, and design, and simple lettering techniques, no art background necessary
751635 Survey of Educational Media Research or arr.
Investigation of research from behavioral science, communications technology, and meaning design problems as related to systems of instruction and mediated learning experiences
752360 Administration of Educational Media Programs 3 s.h.
Prerequisites of organizational and personal management as applied to directing media program; prerequisite: 752427 or 752428 or equivalent
752427 Educational Media and the Systems Approach to Instruction or arr.
Planning for instruction through systematic development of learning units effectively utilizing media, methods, and media; prerequisite: consent of instructor
752428 Research Methods in Educational Media or arr.
Research practices, instructional design considerations and writing for publication; prerequisite: 752427, 752428, 752431 and consent of instructor
752431 Educating Educational Media or arr.
Classroom techniques that promote the productive communication of ideas among students; prerequisite: consent of instructor
752433 Individual Instruction in Educational Media or arr.
Selected topics in special research area of specific interest to student; prerequisite consent of instructor
752435 Practicum in Educational Media or arr.
On-campus, supervised administration and other on-going and/or teaching supervision in University Audionolocent Center and/or the College of Education
752439 Internship in Educational Media or arr.
On-campus, supervised administration and otherDissimilar experiences in public schools, special interest in industry
752493 Special Topics in Educational Communication and Technology or arr.
Designed for the needs of special-interest groups, to provide improved study of special concepts; varies each semester; prerequisite: consent of instructor
752493 M.A. Thesis Educational Media or arr.
Prerequisite: consent of instructor
752493 Educational-Specialist Research in Educational Media or arr.
Prerequisite: consent of instructor
752493 Ph.D. Thesis Educational Media or arr.
Prerequisite: consent of instructor

Intervisual
751601 Current Issues in Education 2 s.h.
Seminar for discussion implications for educational practice of recent important trends in field; potential for current research to readings to share in group discussions; emphasis is designed to provide opportunities for exchange of ideas among students and by remote students from all divisions at College of Education
751605 Information Technology and Education of the Future
Culturally Different 2 s.h.
Readings and discussion to understand efforts of cross-cultural issues and deprivation on science education and school achievement combined with field project of student's choosing; prerequisite consent of instructor
The College of Engineering comprises six departmental subdivisions. Programs are offered leading to the Bachelor of Science, Master of Science and Doctor of Philosophy degrees in chemical, civil, electrical, industrial, and management, and mechanical engineering, and to the M.S. and Ph.D. degrees in mechanics and hydraulics.

Any of the undergraduate programs may be combined with the Bachelor of Arts in the five-year option, and any department may sponsor the general Bachelor of Science degree in engineering for the student electing to pursue interdisciplinary studies of a broader nature. Such flexibility of program arrangement is one feature of the engineering curriculum at Iowa. First implemented in 1969, this curriculum consists of four stems extending through all four years of undergraduate study. The four stems are socio-humansitic studies, mathematics, basic and applied science, and analysis and design. The analysis and design sequence begins with Introduction to Engineering in the first semester of the freshman year and terminates with departmental specialization on an interdisciplinary basis in the senior year.

Undergraduate students in engineering at Iowa take more than one-third of their instruction in common with students in other colleges, and interdisciplinary interests are encouraged. The College is accredited by the Engineers Council for Professional Development.

Degree Requirements

Baccalaureate Degrees

The Bachelor of Science degree in engineering requires at least 128 semester hours of credit. 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.

All undergraduate students in engineering must complete a social science sequence totaling at least six semester hours of credit in courses chosen from the departments of Anthropology, Economics, Geography, Journalism, Political Science, Psychology, Social Work or Sociology. All undergraduate students in each engineering option must satisfy the College of Liberal Arts historical-cultural core requirement, or complete a historical-cultural sequence totaling at least six semester hours of credit in courses chosen from the departments of American Civilization, East Asian Languages and Literature studies, Classics, English, History, Linguistics, Philosophy, Speech and Dramatic Arts or the schools of Art, Music or Religion. Advanced courses in any foreign language department will also satisfy the historical-cultural requirements. Studio courses in art and music are not acceptable.

Departmental course and hour requirements in engineering are designated in the curriculum outlines of each department.

The Combined Program

In response to an increasing demand for engineers with strong backgrounds in the humanities, social sciences and languages, 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 engineering or in a designated department of engineering. By proper scheduling of coursework in consultation with advisors from the College of Liberal Arts and Engineering, the student in the combined program can meet the baccalaureate degree requirements of both colleges in five academic years.

Professional Registration

Admission to practice professional engineering is governed by the laws of each state and requires registration. The minimum standards 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 examination on engineering fundamentals given at the University near the time of graduation. Completion of registration as a "Professional Engineer" requires an advanced examination following professional experience.

Faculty

Because the College recognizes the value of interchange between faculty and students, core courses are taught largely by senior faculty. Recognizing that a university faculty has a responsibility for the production as well as the dissemination of knowledge, the College seeks to achieve a balance between teaching and research. Members of the faculty in Engineering represent a wide range of theoretical, instructional, research and consulting experience and have made significant contributions to the professional literature in their areas.

Facilities

The Engineering Library

The Engineering Library is the center of College activity. Its collection includes 32,000 books and 750 periodicals. It is equipped with microfilm and microfiche readers.

Chemical Engineering Laboratories

The Department of Chemical Engineering is located in the Chemistry-Botany Building. Its main laboratories include pilot-
plant equipment for the study of industrial evaporation, distillation, drying, fluid flow and heat transfer. A section of the laboratory devoted to nuclear technology contains a subcritical nuclear reactor, a pulsed neutron generator and a reactor simulator. Laboratories have recently been added for biomaterials research. Smaller laboratories are provided for investigations of plastics and other engineering materials. Laboratories for individual research are available to graduates; students are equipped with chromatographs, analog computers and other instruments.

Electrical Engineering Laboratories
The instructional laboratories of the Department of Electrical Engineering include dynamic systems, digital systems and control systems laboratories, and a general-purpose laboratory for special projects. Research laboratories are equipped for investigations in plasma physics, signal analysis, electronic circuits and devices, and digital systems. A computer laboratory is provided for undergraduate and graduate student use for study and research in analog, digital and hybrid computation and simulation.

Environmental Engineering Laboratories
Facilities for environmental engineering teaching and research are located in the Phillip F. Morgan Sanitary Engineering Laboratory, University Water Treatment Plant and the Department of Preventive Medicine and Environmental Health of the College of Medicine. Research in water pollution abatement is conducted primarily in the Morgan Laboratory located at the Iowa City University wastewater treatment plant. This laboratory is especially equipped for pilot-plant projects and contains a full-scale activated sludge aeration tank, as well as an activated sludge pilot plant. The wastewater treatment plant is used as a full-scale system for research. Water quality control and limnological research are conducted at the New University Water Treatment Plant.

Industrial Engineering Laboratories
The Department has laboratories equipped for research in the principal areas of materials and processing, including materials science, powder science, metal cleaning, cutting and fabricating. Human factors laboratories are equipped to investigate basic motor capabilities and the effects of visual and environmental variables. Unique equipment for the measurement of human factors includes electronic timing, force sensing, recording and computation equipment.

Mechanical Engineering Laboratories
The Mechanical Engineering laboratories contain instruments and equipment for experimental investigations in a variety of fields. These fields include thermodynamics, thermal systems, heat transfer, gas dynamics, behavior of materials, control systems and machine dynamics. The laboratories provide educational experience in all important scientific areas on which mechanical engineering is based and valuable experience in modern methods of measurement and analysis including use of modern computers.

Structures and Materials Testing Laboratories
These laboratories are equipped for the determination of physical properties of materials of 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 and photoelastic equipment for the accurate measurement of deformations under load. The structural laboratory also contains a prestressed concrete structural members. A humidity control room and curing rooms are also available. A soils laboratory contains consolidation and triaxial testing equipment of the latest design. Special equipment is available for negative pore water pressure studies and model flowing tests.

Hydraulics Laboratory
Located on the west bank of the Iowa River at the end of the University dam, this laboratory houses the latest facilities for undergraduate and graduate laboratory instruction, and for basic and applied research by staff and students in the area of hydraulics and fluid mechanics. The equipment includes an IBM 1600 data acquisition and control system; for online analysis of experimental data, a 330-foot towing tank, several flumes and wind tunnels, a low-temperature flow facility for investigation of ice phenomena, a dispersion flume and a wave tank.

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 for computer cards.

Placement Services
Students and alumni can avail themselves of the placement services 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 interviews and on job opportunities.

Institute of Hydraulic Research
The Institute of Hydraulic Research has earned international recognition for its research and educational activities in the area of fluid engineering since it was organized in 1937. Current research is oriented toward problems related to environmental pollution, bioengineering, river hydraulics, and instrumentation and data handling for fluids research. Student participation in all research and consulting activities characterizes the Institute's operation.

Student Organizations and Activities
The entire College of Engineering student body is organized as the Associated Students of Engineering. Engineering students publish a monthly periodical, the Iowa Tidbits.

Student branches of the American Institute of Chemical Engi-
ners, the American Institute of Industrial Engineers, the American Society of Civil Engineers, the American Society of Mechanical Engineers, and the Institute of Electrical and Electronic 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 Epilson, honorary civil engineering fraternity; Eta Kappa Nu, honorary electrical engineering fraternity; and Pi Tau Sigma, honorary mechanical engineering fraternity, recognize the work of outstanding students in their respective fields.

Admission

* To qualify for admission to the College of Engineering, an applicant must have:
  * Completed the American College Tests with a composite standard score of 24 or above and a standardized score of 24 or above in the mathematics battery;
  * Successfully completed at least one and one-half units of algebra and one unit of plane geometry; and
  * Ranked in the upper one-half of his high school graduating class.

High school physics and chemistry are recommended for all applicants.

After reviewing the records of an applicant who does not meet minimum admission requirements, the Director of Admissions may admit the applicant unconditionally, admit him or her on probation, require a summer session, trial enrollment or deny admission.

Undergraduate Transfer

The applicant must submit a formal application and official transcript of all college work. Each applicant should have:

* Completed at least analytic geometry or its equivalent;
* Maintained a cumulative grade-point average of at least 2.25 (C-8), based on a 4.0-point marking system; and
* Attained satisfactory scores on the American College Tests.

A maximum of 66 semester-hours credit (or the equivalent) from a junior college will be accepted for a baccalaureate degree.

The Director of Admissions will review individual records of applicants who do not meet recommended requirements, and may offer probationary admission.

Graduate Students

Applicants for admission to postgraduate study in any college of the University must meet the general requirements for admission to the Graduate College.

General Engineering Courses

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<th>Credit Hours</th>
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<td>E111 Introduction to Engineering</td>
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Disciplines of creative activity and selection of problems for which study and research activities are most appropriate are as follows:

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<th>Topic</th>
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Chemical Engineering

Information in industry through various channels available, conducted as seminar in group activity, with knowledge obtained by reading, with practical work of increasing visibility, application of feedback to individual work, and development of self-chose projects, fourth hour earned by writing well-prepared and well-organized paper or report; prerequisite: senior standing.

Communication in Industry

For liberal arts and engineering students, to maximize awareness of relations between technical and humanistic elements, to understand the impact of technological developments on the modern society, to evaluate the ethical, social, and environmental consequences of technical progress.

Undergraduate Programs

The undergraduate programs provide the basis for professional training in engineering, particularly that which deals with matter undergoing chemical change. Most chemical engineering graduates are employed in the chemical industry or in the plastics, rubber, synthetic fiber, pharmaceutical, and oil industries.

Graduate Programs

The programs leading to the M.S. and Ph.D. are more flexible than the undergraduate program. The emphasis is on research, and graduates are employed in research and development of chemical manufacturing processes. About one-third of the program is devoted to a research project, and a thesis is required for each degree.

The principles of chemistry, physics, equilibrium, and rate processes which are fundamental to chemical engineering have wide application, and this has resulted in interdisciplinary re-search involving biomedical problems, dental materials and envi-
Courses Primary for Undergraduates

5201:98, 82, 84, 86 Professional Seminar
6 cr. hr.
Lectures and discussions on topics of current interest in chemical engineering; required of juniors and seniors in chemical engineering; prerequisite: Junior standing.

5210:105 Chemical Reaction Kinetics 3 cr.
Chemical-reaction-rate theory reviewed and applied to design of reactors for chemical and chemical-process operations on large scales; prerequisite: 52:101, 141, 152; Chemistry 4122.

5212:20 Process Calculations 3 cr.
Applications of laws of conservation of mass and energy in solution of industrial problems; rates and dynamics; energy balance; material balance; methods of numerical computation; three lectures; prerequisite: Mathematics 320-36, 322.

5212:60 Chemical Industries 3 cr.
Technology and economic relations of principal chemical industries; process descriptions, flow sheets, descriptions of type of instrument and control used in processes; two lectures; prerequisite: Chemistry 414.

5213:29 Structure of Materials 2 or 3 cr.
Principles of chemistry and physics applied to understanding of properties of materials for engineers and materials scientists; phase diagrams and microstructure of metals and a giving properties; polymer formation; crystal, whiskers, ceramics, and composites; two lectures and one laboratory; prerequisite: Chemistry 4-6, 611.

5214:10 Design for Energy and Momentum Transfer 4 cr.
Design of chemical processes and equipment for conversion of materials or transfer of heat; based on physical chemical principles; three lectures; prerequisite: 52:101, 121.

5214:11 Mass-Transfer Operations 4 or 3 cr.
Thermodynamic bases and design of equipment for molecular transfer of mass, including distillation, absorption, extraction, mixing, drying, related processes for mass and energy transfer; three lectures; prerequisite: 52:101, 133; Chemistry 4131.

5214:15 Unit-Operations Laboratory 2 cr.
Laboratory study of equipment and operations of chemical engineering; practice of chemical engineering equipment; two laboratory periods; prerequisite 52:140.

5215:00 Unit-Operations Laboratory 2 cr.
Catalytic hydrogenation; the use of catalysts as independent units; two laboratory periods; prerequisite 52:141.

5216:00 Analysis-Computer Laboratory 1 cr.
Design and testing of basic analyzing circuits; use of analog computer to solve engineering problems; one laboratory period; prerequisite: Mathematics 322-37.

5216:20 Chemical-Engineering Thermodynamics 3 cr.
Fundamentals of thermodynamics required and applied to chemical-engineering problems of energy transfer, physical, and chemical equilibrium, material balances; two lectures; prerequisite: 52:151, Chemistry 4112, 132.

5216:40 Economics of Design 3 cr.
Economic principles applied to design and operation and optimization of chemical process plants; these lectures; prerequisite: 52:141.

5216:105 Chemical-Engineering Processes Design 3 or 4 cr.
Incorporative course in design of chemical processes and process equipment, requiring application of process analysis, thermodynamics, and operations theory, process design, economics, prerequisites: 52:141, 110, 115.

5218:00 Survey of Chemical Industry 1 cr.
Field trip to leading chemical plants in St. Louis or Chicago; four days of inspection, discussion of current problems; two lectures; prerequisite: 52:101, 141.

5219:00 Introductory to Nuclear Science and Engineering 2 or 3 cr.
Practical experiences in nuclear reaction, basics principles, terminology, problems, and computer use in engineering or science.

5219:14 Special Problems 1-6 cr.
Prerequisites: consent of instructor.

Courses Primary for Graduates

5221:07 Heat Transfer 2 cr.
Theory and practice of industrial heat transfer; problems in steady-state heat transfer, convection, conduction, radiation, boiling, condensation, two lectures; prerequisite: 52:140, 141.

5222:00 Fluid Flow I 2 cr.
Molecular flow phenomena and flow operation; two lectures; prerequisite: 52:140, 141.

5223:00 Fluid Flow II 2 cr.
Advanced theory and problems on fluid flow in pipe lines and process equipment; two lectures; prerequisite: 52:140, 141.

5224:00 Distillation I 2 cr.
Thermal and applied treatment of vapor-liquid equilibria and fractionation of binary systems; two lectures; prerequisite: 52:140, 141.

5225:00 Distillation II 2 cr.
Fractionation of multicomponent systems; two lectures; prerequisite: 52:140, 141.

5226:00 Extraction 2 cr.
Theory and calculations for adsorbate-laden and liquid-liquid extraction equipment; two lectures; prerequisite: 52:140, 141.

5227:00 Separation Processes 2 cr.
Theory and calculations for equipment for absorption of gases in water and absorption of gases on solids; two lectures; prerequisite: 52:140, 141.

5228:10-12 Process Safety 2 cr.
Comprehensive problems in dealing with, filtration, and other separations involving treatment of solid materials; two lectures; prerequisite: 52:140, 141.

5230:00 Meteorological & Aerospace Applications of Thermodynamics 2 cr.
Selection of a meteorology and thermodynamics, particularly those affecting atmospheric pollution, power generation, climate, community planning, and process design; prerequisite: consent of instructor.

5232:10 Design for Bioreactors 2 cr.
Review of principles of cell culture and other biotechnology devices for human body, with specific design applications to suspension, individual projects and report; prerequisite: consent of instructor.

5241:00 Separations Processes 3 cr.
Design and economic analysis of equipment for separation of solids and other equipment for human body, with specific design applications to design projects and report; prerequisite: consent of instructor.

5242:00 Design for Bioreactors 3 cr.
Review of principles of cell culture and other biotechnology devices for human body, with specific design applications to suspension, individual projects and report; prerequisite: consent of instructor.

5243:00 Design for Bioreactors 3 cr.
Review of principles of cell culture and other biotechnology devices for human body, with specific design applications to suspension, individual projects and report; prerequisite: consent of instructor.

5244:00 Design for Bioreactors 3 cr.
Review of principles of cell culture and other biotechnology devices for human body, with specific design applications to suspension, individual projects and report; prerequisite: consent of instructor.

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Review of principles of cell culture and other biotechnology devices for human body, with specific design applications to suspension, individual projects and report; prerequisite: consent of instructor.

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Review of principles of cell culture and other biotechnology devices for human body, with specific design applications to suspension, individual projects and report; prerequisite: consent of instructor.

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Review of principles of cell culture and other biotechnology devices for human body, with specific design applications to suspension, individual projects and report; prerequisite: consent of instructor.

5248:00 Design for Bioreactors 3 cr.
Review of principles of cell culture and other biotechnology devices for human body, with specific design applications to suspension, individual projects and report; prerequisite: consent of instructor.

5249:00 Design for Bioreactors 3 cr.
Review of principles of cell culture and other biotechnology devices for human body, with specific design applications to suspension, individual projects and report; prerequisite: consent of instructor.
Civil Engineering

Department chairman: Harrison Kane
Degrees offered: B.S., M.S., Ph.D.

Undergraduate Program

Civil engineering is the engineering of constructed facilities: of buildings, bridges, tunnels and dams; of harbors and airports; of waterways, railways and highways; of water power, irrigation, drainage and water supply; of sewerage and waste disposal and environmental-health systems.

The course of study in civil engineering at Iowa builds on the new College of Engineering curriculum and provides the basis for further depth of study in areas of specialization such as structural and foundation, environmental or transportation engineering.

Topics of study include transportation systems, water quality and air pollution control, solid-waste management, structural analysis and design, and soil mechanics. Additional specializations, or greater breadth, may be achieved through the selection of appropriate technical electives.

Undergraduate Curriculum

Freshman Year

4:1 Principles of Chemistry I 3
4:6 Elementary Chemistry Laboratory 2
8:54 Literature and Composition I-II 8
32M:35,36 Mathematics I-II 10
51:12 Introduction to Engineering I-II 8
51:8 Statics 2

Total 33

Sophomore Year

22M:37,38 Mathematics III-IV 6
51:6 Thermodynamics I 4
51:11,12 Dynamic Systems Analysis I-II 6
51:13 Materials Science 3
51:9 Dynamics 3
51:18 Mechanics of Fluids and Transfer Processes 4
51:19 Mechanics of Deformable Bodies 3
51:1012 Sociohumanistic Electives 3

Total 32

Junior Year

22S:59 Probability and Statistics for Engineering and Physical Sciences 3
51:21,22 Principles of Design I-II 6
53:35 Structural Analysis I 4
53:41 Civil Engineering Design I 3
53:61 Flow Systems in Environmental Engineering 3
53:61,82 Professional Seminar 2
53:161 Principles of Environmental Engineering 3
53:173,174 Transportation Engineering I-II 6
51:1001 Sociohumanistic Electives 3

Total 31

Senior Year

29:42 Physics I 3
51:25 Electromagnetic Theory 4
53:83,84 Professional Seminar 0
53:100 Civil Engineering Design II 3
53:180 Senior Seminar 1
53:184 Soil Mechanics 3
51:1012 Sociohumanistic Electives 9
51:88 Technical Electives 9

Total 32

Graduate Programs

Work is offered in the general areas of environmental engineering and environmental science, structural engineering and foundations, traffic engineering and transportation planning, public works engineering, and water resources engineering. The environmental-engineering and science program is an approved interdisciplinary graduate program carried out cooperatively with the Department of Preventive Medicine and Environmental Health in the College of Medicine.

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. Undergraduate degrees in chemistry or the biological sciences are especially suitable for advanced studies in the environmental engineering program. 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").

Master of Science

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.
Courses Primarily for Graduates

52:174 Transportation Engineering II 3 s.h.
52:175 Transportation Safety 2 or 3 s.h.
52:177 Traffic Engineering I 3 s.h.
52:186 Advanced Structural Analysis 3 s.h.
52:187 Engineering Properties of Soils 3 s.h.
52:189 Advanced Fluid Mechanics 3 s.h.
52:190 Advanced Soil Mechanics 3 s.h.
52:191 Fluids and Molecular Fluids 3 s.h.
52:192 Fluids and Molecular Fluids 3 s.h.
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52:279 Fluids and Molecular Fluids 3 s.h.
52:280 Fluids and Molecular Fluids 3 s.h.
52:281 Fluids and Molecular Fluids 3 s.h.
Graduate Programs

The programs leading to the Master of Science and the Doctor of Philosophy are more flexible than the undergraduate program. Both thesis and independent study programs are available, and other may be followed by a Ph.D. program of study. The Department of Electrical Engineering, having a wide application and this has resulted in interdisciplinary research in areas such as computer simulation in biomedical problems. Graduate students are encouraged to take courses in several interdisciplinary areas. Opportunities are available for the graduate student to choose his or her own interests and participate in a creative effort. Some financial aid is available for the qualified student.

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 and through the independent study sessions.

Admission Requirements

The normal admission requirement of the Department is at least a 2.7 grade-point average on all courses in electrical engineering, mathematics and physics for M.S. students, 3.0 for Ph.D. students. An M.S. student with a grade-point average less than 2.7, but better than 2.5 on courses in electrical engineering, mathematics and physics, may be admitted on a probationary status. Each application is reviewed on an individual basis. Examinating circumstances may permit deviations from the normal standards.

Master of Science

Thus thesis and nonthesis 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 course work in electrical engineering, not including courses required for electrical engineering undergraduates, and at least nine semester hours in courses of electrical engineering, ordinarily from mathematics and physics. With thesis, up to eight semester hours of the 30 semester hours may be research credit. Without thesis, at least three semester hours of 55:213 Independent Study are required in addition to the 12 semester hours. This Independent Study is to be a special project completed under the supervision of the student's program advisor. The student must also pass the M.S. level in the electrical engineering graduate qualifying examination.

Thesis students must also successfully complete a final examination consisting of an oral defense of the thesis.

Doctor of Philosophy

The Ph.D. degree implies a research degree. It is not awarded for successfully passing a number of courses or examinations alone, but is also based on high-quality research. 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; done in the first year
- Qualification at the Ph.D. level in the electrical engineering graduate 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.

Special Facilities

The Department has laboratories for microwaves, plasma physics, dynamic systems, logic and digital systems, control systems, hybrid computers, and a laboratory for special projects. All students have access to remote terminals connected by telephone to the Computer Center IBM 360/65.

Staff: professors Epley, Lyman; professors emeriti Kurz, Marez, Ware, associate professors Atton, Chayung, Huo, Levy, Koh, Longstreth, Maffet, Robinson, Reddy.

Courses Primarily for Undergraduates

55:1 Logic and Digital Systems

3 s.h.
Introduction to use of fundamental circuits, circuit analysis and synthesis of combinational and sequential circuits, introduction to digital computer hardware, organization and operation; study of subsystems and devices; basic computer; design techniques imposed by integrated circuit fabrication; basic concepts and computer architecture.

55:222 Electrical Circuit I

3 s.h.
Physical study of solid state electronic devices, quantum mechanics, semiconductors, physics and properties, applied quantum mechanics, semiconductors, applied physics, and devices. Applications of computer techniques in circuit analysis and design; programming; 55:132.

55:240 Electrical Circuit II

3 s.h.
Active circuit design based on device from 55:23. Analytic design; basic feedback and feedback theory. Switching circuits and devices, high-frequency applications of solid state devices computer technique circuit analysis theory and circuits; use of modern computer techniques in analysis and design; programming. 55:132.

55:248 Electromagnetic Theory

4 s.h.
Some are permitted. 55:18

55:152 Control and Communication I

3 s.h.

55:156 Control and Communication II

3 s.h.
Control and communication, applications.

55:202 Electrical Engineering Materials and Devices

3 s.h.

55:213 Principles of E.E. Design I

3 s.h.
Computer design. 55:31

55:215 Introduction to Electrical-Engineering Analysis

4 s.h.
Mathematical methods used in analysis of electrical systems, including integral vector calculus, functions of complex variable, theory of residues, special functions. Mathematics 235:52 and Mathematics 239:57

55:216 Principles of E.E. Design II

3 s.h.
Programming. 55:32

55:217 Principles of E.E. Design III

3 s.h.
Programming. 55:32

55:218 Professional Seminar

0 s.h.

55:219 Electromagnetic E.E. Design IV

1 to 3 s.h.
Special topics in electromagnetic engineering for advanced work; programming: 55:3.

55:222 Topics in Electrical Engineering

1 to 3 s.h.
Special topics in electrical engineering for graduate work only; permission: consent of instructor.
Courses for Undergraduates and Graduates

56125 Principles of Communication Engineering I 3 s.h.


56150 Topics in Electrical Engineering 1 to 3 s.h.

Special topics in electrical engineering to be arranged with the instructor and the student's faculty member; prerequisite: consent of instructor.

56193 Advanced Electromagnetics 3 s.h.

Principles of advanced electronic circuits, modulators, detectors, antennas in design and applications, basic integrated circuits principles, prerequisite: 55194.

56190 Control-Systems Analysis 3 s.h.

Fundamentals of linear system analysis and synthesis with applications: bargedown treatment using both frequency and time-domain techniques, application of Laplace Transforms and State Variable Formulations illustrated by treatment of real physical problems, same as Mechanical Engineering 56190, prerequisite: senior standing or consent of instructor.

56191 Control-Systems Synthesis 3 s.h.

Continuation of 55190, emphasis on synthesis; same as Mechanical Engineering 56191, prerequisite: 55190.

56195 Control-Systems Laboratory 2 or 3 s.h.

Computerization between theory and practice obtained through investigation of components and overall system behavior: specifications and design of complex systems outlined; emphasis on computer-aided physical system; prerequisite: 55190 and consent of instructor.

56197 Theory of Linear Networks I 3 s.h.

Systematic formulations of active network optimization equations, 3-port representations, passive network synthesis, active filters; prerequisite: senior standing in electrical engineering.

57117 Electromagnetic Theory 3 s.h.

Continuation of 55117, prerequisite: 55116.

57119 Electromagnetics II 3 s.h.

Fields and time-varying fields, Maxwell's equations, theory and applications, prerequisite: 55117 or graduate standing.

57125 Introduction to Electromagnetics I 3 s.h.

Analysis and synthesis of conduction and sequential switching circuits, basic laws and faults in conduction circuits and design of reliable circuits, syntheses and sequential switching circuits; prerequisite: standing in electrical engineering.

57126 Advanced Computer Organization 3 s.h.

Multidisciplinary system design. microprogramming, evaluation of microprocessor systems, hardware and software, computer architecture, microcomputer systems, software design, computer organization, computer organization, senior standing in electrical engineering or consent of instructor.

57180 Digital Circuits and Systems I 3 s.h.

Introduction to digital circuit principles including logic gates, multivalued, digital circuits, and computers; basic components switching circuits design and implementation; senior standing in electrical engineering or consent of instructor.

57185 Digital Circuits and Systems II 3 s.h.

Comprehensive study in advanced logic circuits and digital systems, prerequisite: 57180 or consent of instructor.

57186 Fundamentals of Energy Conversion 3 s.h.

Introduction to various non-electrical methods of producing electricity, such as solar, windmills, thermoelectric, renewable, and nuclear fuels; prerequisite or senior or graduate standing is any branch of engineering.

57186 Theory of Linear Networks II 3 s.h.

Advanced treatment of network analysis, sources, network synthesis, network analysis, frequency response, and network synthesis in digital systems methodology, prerequisite: 57185.

57187 Biomedical-System Analysis 3 s.h.

Application of control theory to analysis of biological systems such as respiratory, blood-vessels, cardiovascular, thermal regulatory system, development of techniques to facilitate study of dynamic response of biotechnical systems in measurement in physiology; prerequisite: calculus and general physics or equivalent.

57188 Introduction to Statistical-Communication Theory 3 s.h.

Representation of deterministic and random signals, analysis of modulation systems, multiple-station systems and optimum systems; introduction to information theory.

57189 Application of Computers in Engineering Systems 3 s.h.

Application of computers in engineering systems, including systems analysis and simulation, and simulation of computer systems and computer control, with emphasis on introduction to microcomputers; prerequisite: consent of instructor.

57197 Application of Computers in Engineering Systems II 3 s.h.

Continuation of 57196, prerequisite: 57196 or consent of instructor.

57198 Electromechanical Systems 3 s.h.

Electromechanical energy conversion principles, basic rotating machines, direct current machines: theory and applications, alternating current machines: theory and applications; prerequisite: 55112.

57199 Power System Analysis 3 s.h.

A.C.-federated and parallel single- and polyphase transformers, short-circuit, ac-coupling and line-fault models of transmission lines, transients, subtransient, synchronous reactance of synchronous machines, conventional load flow studies, application of symmetrical components in symmetrical fault, conventional fault studies, theory complemented by field study with local power utilities, prerequisite: senior standing in any branch of engineering or consent of instructor.

57190 Laboratory-Physics Physics 3 s.h.

Introduction to laboratory-physics physics: discussion of plasma creation and diagnostics, wave-plasma interaction, collision and plasma effects: experiments to accompany lecture notes on Physics and Astronomy 21010, prerequisite: physics and Astronomy 2101A.

Courses Primarily for Graduates

56210 Advanced-Fluid Theory 3 or 4 s.h.

Linear graphs and electrical networks, inductance, circuits, circuit matrices, topological, flow networks; applications in electrical circuitry; prerequisite: consent of instructor.

56215 Modern Topics in Electrical Engineering I 1 to 3 s.h.

Study of recent developments in general field, primarily by groups, through special arrangements with individual faculty members.

56213 Recent Advances in Electrical Engineering 3 s.h.

 Concurrent study, normally on independent basis, of specialized topics supervised by individual faculty members through special arrangements.

56218 Advanced Mathematical Theory 3 s.h.

Mathematical methods of electromagnetic theory, Green's functions, variational and perturbation theory, random media, applied potential theory, optical propagation; special topics; time permitting. prerequisite: consent of instructor.

56219 Advanced Topics in Electrical Engineering I 3 s.h.

Advanced topics from cellular logic and transitive networks, cellular logic modules, implementation of switching circuits, fault diagnosis and test, combinational, and sequential, switching circuits, system reliability, and the statistical analysis of switching functions, microcircuits, Networks, same as Computer Science 221B/221C, prerequisite: 221A/221B, senior standing in electrical engineering.

56219 Computer-System Studies and Analysis 3 s.h.

Analyzing modeling and analysis techniques in computer system design, such as processor scheduling, I/O scheduling, memory management policies, program behavior and routing, decision analysis, system design, system simulation, system simulation, same as Computer Science 221B/221C, prerequisite: 221A/221B, senior standing in electrical engineering.

56225 Advanced Electromagnetics II 3 s.h.

Continuation of 57117, prerequisite: 57116.

56237 Advanced Topics in Plasma Physics 3 or 4 s.h.

Selected topics in plasma physics to be arranged with consent of instructor.

56230 Noise Theory 3 s.h.

Noise in electronic circuits, random signal theory, Water filters, matched filters, detection devices, prerequisite: 55105 or consent of instructor.

56231 Information Theory and Coding 3 s.h.

Quantitative measures of information, discrete and continuous sources, error correcting, channel capacity, channel coding and decoding, prerequisite: 55105 or consent of instructor.

56232 Coding for Communication and Computation 3 s.h.

Use of coding techniques to improve communication and computation systems, error-correcting codes, threshold and sequential decoding, reliable computations in the presence of errors, prerequisite: 55105 or 55121, or consent of instructor.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>55-232</td>
<td>Principles of Communication Engineering II</td>
<td>3 a.h.</td>
<td>Continuation of 13-12; implementation of digital systems, channel models, waveforms, communication principles; 55-135</td>
</tr>
<tr>
<td>55-241</td>
<td>Research: Electrical Engineering (M.S. Thesis)</td>
<td>1 to 6 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-242</td>
<td>Research: Electrical Engineering (Ph.D. Thesis)</td>
<td>5 or 6 a.m.</td>
<td></td>
</tr>
<tr>
<td>55-250</td>
<td>Seminar: Communication Systems</td>
<td>1 to 3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-251</td>
<td>Seminar: Digital-Computer Systems</td>
<td>1 to 3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-252</td>
<td>Seminar: Switching Theory</td>
<td>2 or 3 a.h.</td>
<td>Individual or group study of switching theory principles; consent of instructor</td>
</tr>
<tr>
<td>55-253</td>
<td>Seminar: Coding</td>
<td>2 or 3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-260</td>
<td>Sampled Data-Control Systems</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-265</td>
<td>Fault-Tolerant Computer Systems</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-266</td>
<td>Research: Control Systems</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-268</td>
<td>Research: Control Systems</td>
<td>2 or 3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-270</td>
<td>Seminar: Mechanical Engineering I</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-271</td>
<td>Seminar: Mechanical Engineering II</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-272</td>
<td>Mechanical Engineering</td>
<td>2 or 3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-273</td>
<td>Engineering Mathematics</td>
<td>2 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-274</td>
<td>Complexity Theory and Techniques</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-275</td>
<td>Dynamic Systems Analysis</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-276</td>
<td>Materials Science</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-277</td>
<td>Materials Processing</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-278</td>
<td>Materials Engineering</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-279</td>
<td>Materials Science</td>
<td>3 a.h.</td>
<td></td>
</tr>
<tr>
<td>55-280</td>
<td>Materials Science</td>
<td>3 a.h.</td>
<td></td>
</tr>
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**Freshman Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>4-1</td>
<td>Principles of Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>4-6</td>
<td>Elementary Chemistry Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>5-7</td>
<td>Literature and Composition I-11</td>
<td>3</td>
</tr>
<tr>
<td>51-1-2</td>
<td>Introduction to Engineering I-11</td>
<td>2</td>
</tr>
<tr>
<td>51-1-1</td>
<td>Engineering Mathematics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-14-17</td>
<td>Mathematics III/IV</td>
<td>6</td>
</tr>
<tr>
<td>51-11-12</td>
<td>Dynamic Systems Analysis I-12</td>
<td>6</td>
</tr>
<tr>
<td>51-15</td>
<td>Materials Science</td>
<td>3</td>
</tr>
<tr>
<td>51-16</td>
<td>Mechanics of Solids</td>
<td>3</td>
</tr>
<tr>
<td>56-24</td>
<td>Materials Processing</td>
<td>2</td>
</tr>
<tr>
<td>56-127</td>
<td>Engineering Management Science</td>
<td>3</td>
</tr>
<tr>
<td>56-128</td>
<td>Materials Science</td>
<td>2</td>
</tr>
<tr>
<td>56-129</td>
<td>Soilmechanics electives</td>
<td>2</td>
</tr>
</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>22S-25</td>
<td>Probability and Statistics for Engineering and Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>29-92</td>
<td>Physics I</td>
<td>3</td>
</tr>
<tr>
<td>51-6</td>
<td>Thermodynamics I</td>
<td>4</td>
</tr>
<tr>
<td>51-21-22</td>
<td>Principles of Design I-11</td>
<td>6</td>
</tr>
<tr>
<td>51-25</td>
<td>Electromagnetic Theory</td>
<td>4</td>
</tr>
<tr>
<td>56-81</td>
<td>Professional Seminar</td>
<td>1</td>
</tr>
<tr>
<td>56-132</td>
<td>Engineering Statistics</td>
<td>3</td>
</tr>
<tr>
<td>56-133</td>
<td>Technical electives</td>
<td>3</td>
</tr>
<tr>
<td>56-134</td>
<td>Soilmechanics electives</td>
<td>2</td>
</tr>
</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-141</td>
<td>Introduction to Operations Research</td>
<td>4</td>
</tr>
<tr>
<td>54-164</td>
<td>Information Systems Design</td>
<td>3</td>
</tr>
<tr>
<td>56-164</td>
<td>Design of Methods and Measurement Systems</td>
<td>4</td>
</tr>
<tr>
<td>56-165</td>
<td>Materials elective</td>
<td>2</td>
</tr>
<tr>
<td>56-166</td>
<td>Soilmechanics elective</td>
<td>5</td>
</tr>
<tr>
<td>56-167</td>
<td>Technical electives</td>
<td>10</td>
</tr>
<tr>
<td>56-168</td>
<td>Science- care elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total** 128

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Industrial and Management Engineering

Department chairman: Hans L. Soepakram
Degrees offered: B.S., M.S., Ph.D.

**Undergraduate Program**

The general nature of industrial engineers' work is the design and implementation of productive systems involving optimal use of resources—humans, material, and financial. The systems involved may range from extremely large ones to small sub-systems. In arriving today and tomorrow for the conservation and improvement of this world's environment, the importance of such optimal systems design can be hard to overemphasize. The abilities of the industrial engineer provide, therefore, unique capability for significant contributions to the welfare of the world society.

Employment opportunities for the industrial engineer are among the most varied of any of the engineering fields. The industrial engineer may hold a staff advising position managing employment in an organization. He or she may be in line units participating directly in management decisions and may work with other professionals as a member of a team. The work may be for a manufacturing firm, for a service company such as an airline, railroad, bank or hospital, or for a government agency. Because of his or her vital participation in management decisions, the industrial engineer has many opportunities for advancement.

Undergraduate students become directly involved in the design of real world's systems. Recent upper-level students have completed projects for a number of organizations, including hospitals, Goodwill Industries, printing companies, banks and wholesalers, and a variety of manufacturing industries.

The undergraduate curriculum in industrial engineering requires a strong foundation in management, mathematics, design and socio-humanistic studies. Departmental electives include operations research, statistics, computer science, materials processing and physical metallurgy.

**Undergraduate Curriculum**
Strongly recommended co-ob luminate electives include:

31:1 Elementary Psychology
31:155 Human Engineering
31156 Psychology in Management
Science Core Electives:
59:82 Physics II
51:18 Fluids and Transfer Processes
51:19 Mechanics of Deformable Bodies or a biological science course

Graduate Programs

The purpose of the industrial and management engineering graduate programs at both M.S. and Ph.D. levels is to provide a modern, highly flexible curriculum of graduate studies. As far as feasible, each student's course of study will be based on individual background and career objectives. Course selections suitable for emphasis in engineering management, human factors, operations research, applied statistics, materials and processing, or quality assurance are available.

Research carried out by graduate students is frequently of an interdisciplinary nature involving, for instance, environmental improvement, health and educational systems, and corporate planning. In addition to research for the M.S. and Ph.D. programs, students may participate in a research project by registering for an individual investigation course. Research can also be carried out during the summer sessions.

Financial support is available through a limited number of scholarships, fellowships, traineeships, loans and assistantships. Stipends vary from a full tuition scholarship of $410 to a fellowship that might amount to over $5,000 for a calendar year of graduate study. Awards are based on the student's academic record, financial need and upon an assessment of the student's potential contribution to the Department's program and to the profession.

Master of Science

Students may be admitted from accredited baccalaureate curricula in any engineering discipline and the mathematical or physical sciences with a minimum grade-point average of 2.5 (A = 4) or an acceptable score on the Graduate Record Examination Aptitude Test (minimum 450 Verbal, 600 Quantitative). Students may be considered for conditional admission with a 2.3 grade-point average. Students may also be considered for admission from biological or social science programs.

The minimum M.S. program requires 30 semester hours of coursework and research. Thesis and nonthesis programs are available. Most students, however, are encouraged to obtain the master's degree with thesis. Each student's plan of study is determined individually through consultation with his or her adviser and is approved by the degree committee.

Entering students will find some background in computer programming, probability and statistics, engineering economics, human factors, or psychology helpful preparation. Compensating coursework may be required for students with nonengineering backgrounds. Each program will be evaluated on an individual basis.

To be eligible for the M.S. degree the student is required to maintain a minimum grade-point average of 3.0 or a minimum of 30 semester hours of graduate work.

Industrial and Management Engineering

The nature of the final examination will be specified by the examining committee. It may comprise both written and oral parts. The examination will explore further the student's course preparation and/or the student's defense of his or her thesis or appropriate individual investigation.

Doctor of Philosophy

Students may be admitted from accredited baccalaureate curricula in any engineering discipline and the mathematical and physical sciences with a minimum grade-point average of 3.0 or an acceptable score on the Graduate Record Examination Aptitude Test (minimum 500 Verbal, 700 Quantitative). Students may also be admitted from biological or social science programs on an individual basis. A qualifying examination may be required.

Admission to degree candidacy requires a minimum grade-point average of 3.25 on relevant graduate work and the demonstrable capability for individual achievement. No foreign language is required.

Upon completion of the coursework specified by his or her committee and upon recommendation by the major adviser, the student will be admitted to the comprehensive examination. During this examination (both written and oral) the student will be examined over the advanced coursework in his or her 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 satisfactorily completed this examination, the student is a full candidate for the Ph.D. and normally has only to complete and defend the dissertation.

Graduate students interested in low air transportation can participate in dual programs, which incorporate either a number of legal and industrial engineering courses or a number of courses in transportation and aeronautical engineering.

Laboratories of the Department of Industrial and Management Engineering include various human factors and materials processing laboratories, a systems design laboratory and a computer laboratory. Excellent supporting facilities and staff also exist in computer science, statistics, psychology and other engineering disciplines.

In cooperation with the Quad Cities Graduate Study Center, the Department offers a full extension program in Engineering Management and Industrial Engineering in the Quad Cities Area.

In addition, the Department has a guided self-study program available to students on and off campus.

Staff: profreors Derian, Leona, Lichtenwasser, Simon; associate professors Bedlow, Bemshakker, Mielnik, Ramberg; assistant professor Hafey

Courses Primarily for Undergraduates

5824 Materials Processing I 3 or 4 a.h.
Processing of industrially important materials by casting, welding, forming, non-production tools and techniques, numerical control, planning of manufacturing operations.

5851 Professional Seminar 3 or 4 a.h.
Guest lectures, studio reports and assemblies, required of junior students in Industrial and Management Engineering.

5852 Professional Seminar 1 a.h.
Guest lectures, studio reports and assemblies, required of senior students in Industrial and Management Engineering.
Mechanical Engineering

Department Chairman: Robert G. Haring
Degrees offered: B.S., M.S., Ph.D.

Undergraduate Programs

The undergraduate program in mechanical engineering prepares the student for a career in engineering with an emphasis on the technical areas of thermal energy systems and the conversion of thermal energy to mechanical energy, mechanical systems and machines, and design and control of these systems.

Mechanical engineers may become members of enterprises such as manufacturing organizations, research organizations, federal government and state agencies, and private consulting organizations. The area of work may include product design, facility planning, plant operation, research and development, and sales. After attaining experience, the mechanical engineer may be asked to apply his or her analytical ability and technical background to broader problems, including management of resources and general planning.

The undergraduate curriculum provides a substantial number of electives in both the technical and socio-humanitarian areas. In consultation with his or her advisor, a student can plan to develop capabilities to meet individual goals within the framework of the curriculum. All upperclassmen are strongly encouraged to undertake individual projects involving either an experimental or analytical design solution to a current problem.

Undergraduate Curriculum

Freshmen Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Subject</th>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/1</td>
<td>Principles of Chemistry I</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4/4</td>
<td>Elementary Chemistry II</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>4/5-6</td>
<td>Literature and Composition I-II</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4/7-8</td>
<td>Calculus</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>4/1-2</td>
<td>Introduction to Engineering I-II</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4/8</td>
<td>Statics</td>
<td>2</td>
<td>2</td>
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Sophomores Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Subject</th>
<th>1st Semester</th>
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<td>Dynamics</td>
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<td>Mechanics of Materials I</td>
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<td>Mechanics of Fluids and Transfer Processes</td>
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<td>Thermodynamics I</td>
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<td>Socialism Technology</td>
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Mechanical Engineering

Junior Year

| Probability and Statistics for Engineering and Physical Sciences | 3 0 3 |
| Physics I | 0 3 3 |
| Principles of Design I-II | 3 3 6 |
| Electromagnetic Theory | 4 0 4 |
| Experimental Engineering | 4 0 4 |
| Thermodynamics II | 0 3 3 |
| Sociocultural Electives | 3 3 5 |
| Technical Elective | 0 3 3 |
| Total | 17 15 32 |

Senior Year

| Physics II | 3 0 3 |
| Design I-II | 3 1 6 |
| Sociocultural Electives | 3 6 9 |
| Technical Electives | 6 7 13 |
| Total | 16 16 31 |
| Total | 128 |

Graduate Program

Graduate programs leading to the Master of Science, both with and without thesis, and to the Doctor of Philosophy degrees 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 Department in keeping with the belief that the student's program can best be developed individually within the framework of the College requirements. It is felt that both the appropriateness of the student's program and his or her depth of achievement in it is adequately assured by the advisor and through a review by the examining committee. As soon as possible after admission, each student should select a Department faculty member who by mutual agreement will serve as major advisor to the student. The major advisor will assist the student in planning all aspects of his or her graduate program and usually will serve also as the research advisor. The Department of Mechanical Engineering cooperates in interdisciplinary doctoral programs, including the Program in Applied Mathematical Sciences (see "Graduate College").

Admission Requirements

The minimum requirements for admission to a graduate program in mechanical engineering are the same as those for the Graduate College. Although graduate students in mechanical engineering will ordinarily have a baccalaureate degree in mechanical engineering or a closely related field from which they are interested in interdisciplinary programs may be admitted, it is recommended that their qualifications and objectives find them suitable.

Master of Science

The Master of Science degree with thesis requires a minimum of 30 semester hours of academic credits, 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 certain well-qualified students who have the approval of their faculty advisor.

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 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 amount of fellowships, traineeships, assistantships and scholarships are available to graduate students who qualify. Some are awarded on the basis of competition, others are the results of appointments.

Facilities

All undergraduates use the mechanical engineering laboratories in regular coursework, as well as in doing their individual project assignments. These laboratories are equipped with general-purpose engineering instrumentation, as well as specialized equipment for experimentation in heat transfer, compressible flow, fatigue behavior of materials, automatic control and analog computation. The College of Engineering shop is available to construct special apparatus such as may be needed for graduate theses.

Staff:

professor Anderson, Horst; Leno, Mados, Stephens, Trommel; assistant professor Lundquist; associate professor Chen Chou, Schols, Spencer; assistant professor Smith

Courses Primary for Undergraduates

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Mechanical Engineering

used as thermal elements, temperature and its measurement, power generation and refrigeration, prerequisite course of instructor

56:105 Analog Methods in Mechanical Engineering 3 s.h.
Demonstration and use of various mechanical devices and models for analysis and design of mechanical elements and systems, prerequisite course of instructor.

56:108 Aerodynamics 3 s.h.
Fundamental principles of flow applied to aircraft vehicles. Equations of fluid motion, Bernoulli equation, vortex flow, lift and drag; prerequisites: 56:131, Mathemat 120:14 and 15.

56:109 Heat and Mass Transfer 3 s.h.
Principles of heat transfer by conduction, convection, radiation, principles of heat transfer and applications to the solutions of engineering problems; prerequisite: 56:104 or consent of instructor.

56:121 Intermediate Methods of Fluids 3 s.h.

56:129 Intermediate Heat Transfer 3 s.h.
Study and analysis of conduction, natural and forced convection, radiation, heat transfer in boiling and condensing, graphical and numerical solutions and applications; prerequisite: 56:120, Mathematics 56:12.

56:130 Control Systems Analysis 3 s.h.
Fundamentals of linear systems analysis and synthesis with application to linear compartmental treatment using both frequency and time domain techniques emphasized; critical advantages of Laplace transform and state variable formulations illustrated by treatment of real physical problems; same as Electrical Engineering 55:160, prerequisite: senior standing or consent of instructor.

56:132 Kinetics 3 s.h.
Characteristics of connected mechanical systems; kinematic analysis of linkage mechanisms; fundamentals of dynamic analysis; introduction to problems of linkage four-bar mechanisms; use of computer techniques in both analysis and synthesis.

56:133 Mechanical Vibrations 3 s.h.
Fundamental aspects of mechanical vibrations; free vibration and forced vibration with and without damping, single- and two-degree-of-freedom systems matrix formulation, influence coefficients, eigenvalues and normal and principal vibration modes; Lagrange's equation, nonconservative systems; prerequisite: Engineering 55:17 and Mathematics 56:12.

56:134 Nuclear Reactor Extractions 3 s.h.
Principles and characteristics of heat from nuclear power plants, introduction of temperature distributions, thermal stress, heat transfer, fluid flow and rate of power required for continuous operation of industrial shielding and cooling, with respect to design problems; prerequisite: 56:120.

56:145 Process Dynamics 2 or 3 s.h.
Advanced treatment of classical thermodynamics; boundary kinetic theory; elementary statistical thermodynamics; selected topics, prerequisite: 56:134 or equivalent and consent of instructor.

56:146 Process Dynamics Laboratory 2 or 3 s.h.
Experimental study in fluid flows; substantive and empirical flow instrumentation and measurement; fundamentals of thermodynamics, wind tunnel and shock tube experiments.

56:147 Boundary Layer 3 s.h.
Principles of boundary layer theory from micro to macro for compressible viscous flow, general properties of Navier Stokes equations and exact solutions treated in boundary layer processes, prerequisite: 56:171.

56:148 Complex Fluid I 3 s.h.
Basic concepts, fluid dynamics of perfect gas and shock waves, method of characteristics and hodograph method, subsonic, supersonic, transonic, flow in and around blunt bodies, same as Mechanics and Hydraulics 56:120, prerequisite: 56:121 or equivalent.

56:149 Complex Fluids 3 s.h.
Introduction to statistical mechanics, nonequilibrium classical and quantum mechanics, prerequisite use of Fourier's method, Fermi-Dirac distributions, equilibrium properties of interacting systems; introduction to non-equilibrium statistical mechanics, prerequisite: 56:144 or equivalent.

56:160 Engineering Analysis 3 s.h.
Analytical approach to engineering problems; emphasis on rigorous and logical attack; prerequisites: senior standing.

56:161 Control Systems Synthesis 2 or 3 s.h.
Continuation of 56:130, emphasis on synthesis as Engineering 55:160, prerequisite: 56:130.

56:162 Control Systems Laboratory 0 s.h.
Correlation between theory and practice obtained through investigation of concepts and studied systems behavior; specification and design of complex systems; same as Electrical Engineering 55:162, prerequisite: 56:130 and consent of instructor.

56:165 Fall Mechanics 2 s.h.
Fundamental concepts of friction and propagation of failure-base experiment; experimental evidence concerning failure fracture, influence of complex states of stress, damage without failure, surface, size, temperature effects, date interpolation and applications, prerequisite consent of instructor.

56:166 Theories of Failure In Design 2 s.h.
Combination of the mechanical behavior of solids in variety of applications; definition and criteria of failure; yield phenomenon, linear elastic fracture mechanics; fracture strength, Kc, Kic, stress, strain, energy; prerequisite consent of instructor.

56:168 Propulsion 3 s.h.
Classification of basic propulsion devices, theoretical analysis of important characteristics of each class, design considerations, prerequisite: 56:111.

56:190 Modern Topics in Mechanical Engineering 3 s.h.
Identification of areas of mechanical engineering technology significantly related to current and foreseeable needs of society, analysis of needs with applications of existing design methodology, review of the development of design techniques, prerequisite: senior standing.

56:195 Seminar: Mechanical Engineering 1 s.h.
Final reports and discussions on recent advances in contributions to field of mechanical engineering; prerequisite senior standing.

Courses Primarily for Graduates

56:200 Kinetic Theory of Gases 3 s.h.
Fundamental treatment of kinetic theory of gaseous topics: kinetic; Boltzmann equation; 56:171, quantum mechanics, selection of special solution techniques; application; prerequisite: 56:146 or equivalent and consent of instructor.

56:221 Advanced Thermodynamics 3 s.h.
Advanced topics: heat analysis and synthesis, prerequisite: 56:144 or equivalent.

56:222 Mechanical Design 3 s.h.
Advanced design and analysis, prerequisite: 56:120 or equivalent.

56:230 Advanced Heat Transfer 3 s.h.
Selected topics in heat transfer, prerequisite: 56:124 or equivalent.

56:235 Advanced Aerodynamics 3 s.h.
Advanced course in graduate students with background in thermodynamics, gas dynamics, fluid mechanics; advanced topics in classical aerodynamics.

56:250 Advanced Mechanical Vibrations 2 s.h.
Wave form and vibration analysis for the motion of beams in flexure; computer solutions for special cases and general linear system vibrations; prerequisite: 56:133.

56:254 Boundary Layer II 3 s.h.
Advanced topics in boundary layer flow, turbulent boundary flow, methods in pipe and channel flows, jets and wakes, prerequisite: 56:140.

56:255 Finite Elements 3 s.h.
Basics and discretization equations, stability of parallel flow, boundary-layer flow, computational flow, boundary layer flow, deformation, finite element, boundary element, boundary layer, finite element, and Navier-Stokes equations.

56:256 Magneto-hydrodynamics Flow Phenomena 3 s.h.
Basic magneto-hydrodynamics systems and associated governing equations, plasma properties and dielectrics analysis, from boundary layer, boundary layer flow, boundary layer flow, boundary layer boundary layer; boundaries, and solution to elastic waves, in application to power generation and magneto-hydrodynamics drag.

56:260 Convective Heat Transfer 3 s.h.
Solution to general conduction equation by separation of variables; by integral transform techniques; boundary and initial boundary value problems and essential solutions.

56:271 Convective Heat Transfer 3 s.h.
Boundary layer differential and integral equations, momentum and heat transfer for inviscid and viscous flows over flat plates, cylinders, and spheres; temperature-dependent fluid properties, convective at high velocities, mass transfer formulations and solutions.
Mechanics and Hydraulics

68232 Radiative Heat Transfer
3 a.h.
Thermal radiation properties, radiant interchange among surfaces separated by radiatively nonparticipating media, radiant energy transfer through absorbing, emitting, scattering media.

68235 Dynamics of Nonpotential Flow
3 a.h.
Effect of internal vibrations, dissipation and resonance, initiation, phase transformation on fluid flow, sound and acoustics, shock waves, sound front, steady body theory, singular perturbation techniques, applications of boundary theory and nonlinear wave phenomena; perturbation conics of instructor

68236 Computational Fluid Dynamics
3 a.h.
Continuum of Navier-Stokes physics, numerical methods, including approximation methods in high speed flow theory, real gas, viscous and collision effects, compressible viscous phenomena.

6 to 3 a.h.
Formal discussions on recent advances in thermal fluid sciences; prerequisite: consent of instructor

68238 Advanced Engineering Analysis
2 to 6 a.h.
Advanced analytical topics with applications in fluid flows, vibrations, fluid mechanics, heat transfer.

68240 Sample Data Control System
3 a.h.
Unified treatment of digital and analog data control system with emphasis on design and synthesis, uses in Electrical Engineering 55.200, prerequisite 58.130

68241 Nonlinear Control Systems
3 a.h.
Topics and principles most useful in area of nonlinear control problems, uses in Electrical Engineering 55.201, prerequisite 58.130

68242 Optimal Control Systems
3 a.h.
Sample as Electrical Engineering 55.242

68243 Stochastic Control Systems
3 a.h.
Probability theory and random variables, including probability axioms, jointly distributed random variables, and conditional probability and expectations; stochastic processes, including random differential equations, normal, Markov and other processes; optimization theory: linear programming, stochastic optimal control theory, uses in Electrical Engineering 55.243, prerequisite: consent of instructor

68244 Advanced Control Systems
3 a.h.
Formal discussions on recent advances in control system analysis and synthesis, prerequisite: consent of instructor

68246 Research, Mechanical Engineering
er. a. v.
Research for fulfillment of advanced degree requirements; prerequisite consent of Department chairman and faculty advisor

Mechanics and Hydraulics

Acting Department Chairman: Kwan Rim

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

There are several areas of specialization possible in the Department. The programs accommodate those who are primarily interested in solid mechanics, fluid mechanics and hydraulic engineering, or a combination of them. A program in water resources development combines work in hydraulic engineering and sanitary engineering and is based on courses in the Mechanics and Hydraulics Department and the Civil Engineering Department.

The Department of Mechanics and Hydraulics also cooperates in interdisciplinary doctoral programs with the Program in Applied Mechanics and Applied Mathematics.

The Department 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 Department and devote about half time to teaching. The Institute has unusually sophisticated instrumentation with strong emphasis on electronic observation and processing of data. The mechanics of solids program has good laboratory facilities, including equipment for frequency and magnitude of load application, equipment for electronic observation, and photographic equipment, in addition to the usual testing machines.

Admission Requirements
Graduate students are expected to have an undergraduate major in mechanical or civil engineering. Those with majors in mathematics or physics initially must take some undergraduate work in the College of Engineering concurrently with their graduate program.

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 3.50, usually 3.00 is expected. Ph.D. candidates should have had a 3.50 grade-point average in their master’s degree work. Applicants must meet the general admission requirements of the Graduate College (see “Graduate College”).

Mater of Science
The master’s degree can be secured by earning fifteen semester hours of credit in an approved course of study. Approximately half of these hours are required and the other half selected by the student with the approval of his or her advisor. The M.S. thesis is optional, but when chosen it usually occurs about six semester hours of credit. Candidates for the degree are expected to have a minimum grade point near 3.00 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 Department.

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 for its cultural value. Ability to pass the examinations for the first year of a language is accepted in lieu of actual enrollment. Furthermore, students from non-English speaking countries are allowed to use English as their foreign language and to take a year or at least six hours of English at the appropriate level.

A thesis supervisor is appointed for each graduate student, with considerable attention to the student’s wishes. Undergraduate College rules, the comprehensive examination must be taken by the next to the last academic period and the final examination, entirely on the dissertation, culminates the program.

Financial Aid
There is a considerable amount of support available for graduate students. In addition to federal traineeships, NDEA or NSF, graduate research assistantships are available from the Graduate College upon recommendation from the Department, and a significant portion of contract work relies on enlisting a number of graduate students as research assistants.
58231 Continuum Mechanics 3 s.h. Foundations of general (classical) theory of continuum mechanics; introduction to tensors, theory of differentials and motion of continua, some principles of Cauchy, basic principles of classical mechanics, general treatment of relations of continuous substances; prerequisite: 58132.

58233 Three-Dimensional Boundary Laminar 3 s.h. Equations of laminar and turbulent motion in a triply-orthogonal cartesian coordinate system; first and second-order boundary layer approximation; methods and Blasius's equation; review of two-dimensional theory; general boundary layer theory and its applications; laminar and turbulent flows, classical and modern analysis; general principles and their solution by numerical methods; some more advanced theory (less) and experimental practical applications; prerequisite: 59122 or 59130.

58239 Paved Control 3 s.h. Pavement characteristics, damage determination, load characterization, fatigue, and pavement deterioration, economic considerations; prerequisite: 59111.

58243 Optimization of Structural Systems I 3 s.h. Plane-dimensional optimization (1947) applied to optimal structural design and other design problems in flexible structures; dynamic, strength, displacement constraints; various structural systems; optimization methods developed; prerequisite: Mathematics 2284-105.

58248 Optimization of Structural Systems II 3 s.h. Continuation of 59243 to infinite dimensional problems; determination of optimum cross-sectional distribution of material in structural systems; minimum weight, strength, stiffness; prerequisite: 59243.

58247 Stability of Structural Systems 3 s.h. Stability criteria, theory of buckling, information theory, numerical methods; beams, plates, arches, structures; buckling behavior; plastic buckling, etc.; prerequisite: 59127 or consent of instructor.

58280 Mechanics of Sediment Transportation 2 to 4 s.h. Laws governing fluid velocity, applications to particulate suspension; dispersion motion, bed forms, bed load, suspended load, coastal mass problems; theory and experimental study; prerequisite: 59120.

58290 Environmental Degradation Processes 2 s.h. Review of chemical diffusion theories; dispersion of environmental and particulate matter in aqueous chemical fluids; selected topics including mechanics of erosion and thermal pollution; prerequisite: 59130 or equivalent.

58291 Wave Mechanics 3 s.h. Analysis of wave propagation phenomena in continuous media; engineering applications; prerequisite: 59270 or consent of instructor.

58292 Surface Waves in Fluids 3 s.h. Theory of infrasonic and shallow-water waves; high-order theories; Kelvin, Kelvin, solitary waves; wave solutions and other aspects of approximation; solution of special boundary problems; diffusion of waves; linear shallow-water; classical capillary; waves in bounded basins; initial-value problems.

58293 Coastal Hydrodynamics 3 s.h. Water waves, tides, harbor configurations, coastal structures; stability of waves and sediment transport in estuaries, beaches, and evolution.

58294 Theory of Shells 3 s.h. General theory of thin shells; use of analysis; general analysis of cylindrical shells and shells of revolution; prerequisite: 59135.

58295 Plasticity 3 s.h. Constitutive theory of plasticity; boundary shell problems; torsion, general theory of pure shear; finite strain analysis and contact principles; prerequisite: 59131.

58296 Theory of Viscoplasticity 3 s.h. Linear theory of visoplasticity; formulations of upper and lower bounds; theory of viscoplasticity; prerequisite: 59135 or equivalent.

58297 Advanced Numerical Analysis 3 s.h. Partial differential and integral equations by finite differences, finite elements and characteristics (transient) errors, numerical stability, converges, accuracy, solution methods, scientific computation, emphasis on numerical problems, examples drawn from acoustics, diffusion, fluid mechanics, wave propagation, etc.; prerequisite: 59129 or consent of instructor.

58298 Seminar: Water-Resources Development 2 s.h. Interdisciplinary seminar on environmental, economic, engineering aspects of water resources development; prerequisite approval of Department; more as Civil Engineering 59129.
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 professional and personal 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 through which graduate degree programs are supervised and coordinated. The Graduate College is responsible for the review and approval of proposals for new graduate programs and for the periodic survey and evaluation of existing programs. Through its administration of scholarship, fellowship and research funds, the Graduate College encourages research and 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.

Faculty
The graduate faculty comprises University faculty and administrative personnel in the ranks of assistant, associate and full professor. An 11-member Graduate Council, elected from and by the graduate faculty, is the executive committee of that body and is advisory to the dean of the Graduate College.

Advanced Degree Programs
The University offers graduate programs leading to the Master of Arts, Master of Science, Master of Business Administration, Master of Arts in Teaching and Master of Comparative Law degree; 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.A.
- American Civilization—M.A., Ph.D.
- Anthropology—M.S., Ph.D.
- Anthropology—M.A., Ph.D.
- Applied Mathematical Sciences—Ph.D.
- Art—M.A., M.F.A., Ph.D.
- Astronomy—M.S.
- Biology—M.S.
- Business Administration—M.A., M.B.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—M.A., Ph.D.
- Civil Engineering—M.S., Ph.D.
- Classics—M.A., Ph.D.
- Comparative Law—M.C.L.
- Comparative Literature—M.A., Ph.D.
- Computer Science—M.S., Ph.D.
- Criminal Law and Procedure—M.S.
- Cultural Anthropology and Linguistics—Ph.D.
- Dental Hygiene—M.S.
- Dental Prosthodontics—M.S.
- Dance—M.A., M.F.A., Ph.D.
- Economics—M.A., Ph.D.
- Education—M.A., M.A.T., Ed.S., Ph.D.
- Electrical Engineering—M.S., Ph.D.
- English—M.A., M.F.A., Ph.D.
- Environmental Engineering—M.S., Ph.D.
- French—M.A., Ph.D.
- Geography—M.A., Ph.D.
- Geology—M.S., Ph.D.
- German—M.A., Ph.D.
- Greek—M.A.
- History—M.A., Ph.D.
- Home Economics—M.S., M.S.
- Hospital and Health Administration—M.A., Ph.D.
- Industrial and Management Engineering—M.S., Ph.D.
- Journalism—M.A.
- Latin—M.A.
- Law Enforcement and Corrections—M.A.
- Library Science—M.A., M.L.S.
- Linguistics—M.A.
- Mathematics—M.S., Ph.D.
Mechanical Engineering—M.S., Ph.D.
Mechanics and Hydraulics—M.S., Ph.D.
Microbiology—M.S., Ph.D.
Molecular—M.A., M.F.A., M.D., Ph.D.
Nuclear Science and Technology—M.S.
Nutrition—M.S., Ph.D.
Nutrition—M.S., Ph.D.
Osteopathic—M.S., Ph.D.
Obstetrics and Gynecology—M.S.
Oncology—M.S.
Ophthalmology—M.S.
Oral Diagnosis—M.S.
Oral Pathology—M.S.
Orthodontics—M.S.
Orthodontics—M.S.
Orthodontics—M.S.
Orthopaedics—M.S.
Orthopaedics—M.S.
Orthopaedics—M.S.
Orthopaedics—M.S.
Orthopaedics—M.S.
Orthopaedics—M.S.
Orthopaedics—M.S.
Orthopaedics—M.S.
Pathology—M.S.
Pathology—M.S.
Pathology—M.S., Ph.D.
Pharmacology—M.S., Ph.D.
Pharmacology—M.S., Ph.D.
Physical Education for Men—M.A., Ph.D.
Physical Education for Women—M.A., Ph.D.
Physical Therapy—M.A.
Physiotherapy—M.S., Ph.D.
Physiology and Biophysics—M.S., Ph.D.
Political Science—M.A., Ph.D.
Preventive Medicine and Environmental Health—M.S., Ph.D.
Psychology—M.S.
Psychology—M.S., Ph.D.
Radiation Biology—M.S., Ph.D.
Recreation Education—M.A.
Religious Studies—M.A., Ph.D.
Research—M.A.
Science Education—M.S., Ph.D.
Social Studies—M.A.
Social Work—M.S.W.
Sociology—M.S., Ph.D.
Speech—M.A., Ph.D.
Speech Pathology and Audiology—M.A., Ph.D.
Statistics—M.S., Ph.D.
Teaching—M.A., M.S.
Urban and Regional Planning—M.A., M.S.
Zoology—M.S., Ph.D.

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 $3,000 and $1,750 for half-time assistant; assistant also eligible for tuition scholarship; nonresident assistant's (one-quarter time or more) tuition and fees reduced to resident rates.

University Teaching-Research Fellowships
For doctoral students and first-year graduate students entering doctoral programs; typical stipends of $4,000 a year on a year-around basis, for as many as four years; recipients have teaching and research assignments, but may carry full course loads at the same time; one year out of four and all summer, recipients have full time to pursue research, studies, or writing.

Scholarships
Up to full tuition and fees.

Graduate Fellowships
$3,000 for the academic year.

NDEA Title IV Fellowships
For prospective college teachers pursuing the doctorate; provides stipends of $3,400-2,800, which include summer study, plus $500 for each dependent and full tuition.

NSF Traineeships
For students interested in social, biological or physical science; provides stipends of $2,400-2,800, which include summer study, plus $500 for each dependent and full tuition.

EPDA Part-E Fellowships, College-Teacher Program
Designed to prepare college or community-college instructors; provides 12-month stipend of $2,400 for the first year and $2,800 for the second year, plus full tuition and $500 annually for each qualified dependent. The provisions are subject to change.

University and National Defense Education Act loans are available through the University's Office of Student Financial Aids.

Many departments offer additional support through traineeships, 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 secure a formal admission statement from the Director of Admissions. Applicants may obtain the proper forms from the Director of Admissions, The University of Iowa, Iowa City, Iowa 52240.

In addition to these forms, the officer transmits from each undergraduate and graduate institution attended must be submitted to the Director of Admissions by the designated deadline prior to the session in which admission is expected. Admission applications must arrive no later than July 15 for first-semester enrollment, December 15 for second-semester enrollment or May 1 for summer-session enrollment.

B. Graduate Record Examination

All applicants prior to consideration for admission should take the Graduate Record Examination (GRE) or, for applicants to graduate programs in business administration, the Graduate Record Test for Graduate Study in Business (ATOSB). Applicants for whom admission data are complete, with the exception of scores on the GRE or the ATOSB, may be admitted if they meet all other requirements. The GRE or the ATOSB 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 and its weight in the decision on admission of a student is left to the departments. Some departments in fields where GRE Advanced Tests are available require these in addition to the APPE. Inquiries about the Graduate Record Test should be addressed to the executive of the department in which the applicant is interested.

C. English for Foreign Students

Prior to consideration for admission, foreign students whose native language is other than English must take and pass the TOEFL (Test of English as a Foreign Language), unless they have received a degree from an accredited college or university in the United States, Canada or Quebec, Australia or New Zealand. The examination is given at various times of the year and in many centers throughout the world. Inquiries should be addressed to the Director, TOEFL, Educational Testing Service, Princeton, New Jersey 08540.

Foreign students transferring from unfinished degree programs of other universities in the United States who have not taken this examination, or who have received a grade lower than the minimum established by the Graduate dean, must take the TOEFL examination and receive a passing grade prior to consideration for admission. The Graduate College will advise the departments of those students who are taking the TOEFL test. Individual departments may require such students to take and pass a course at The University of Iowa in English usage designed especially for foreign students.

D. Early Admission

A student who is within four semester hours of having satisfied all the requirements for the bachelor’s degree at The University of Iowa or any other accredited college may be given conditional admission.

E. Candidacy

Admission to the Graduate College is not the equivalent of acceptance as a candidate for an advanced degree, which must be earned through work successfully completed at The University of Iowa. (See “Section XII. Master’s Degrees” and “Section XIV. Doctor’s Degrees.”)

F. Declaration of Major and Degree

Every applicant for admission must indicate on the application form the department or degree program or certificate program of his or her major interest and the degree, certificate or professional objective he or she intends to pursue. The only exceptions to this regulation are the limited number of applicants registered as special students. (See definition of “special status” in next paragraph.) Changes in the major or degree status may be made in the course of a student’s graduate study with the approval of the department to which the transfer is proposed. To initiate such action the student must file a change of major or degree status in the Office of Admissions.

G. Status upon Admission

All students upon admission fall into one of the following categories:

1. Regular—Students who have met the minimum requirements for admission and who have been accepted by the department, or interdepartmental degree program, for work leading to a graduate degree or certificate or stated professional goal.

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 graduate work before being admitted to the regular status. To be admitted on a conditional basis, the student must be recommended by a department, which will assume responsibility for advising him or her. (See minimum grade-point requirements, “Section I. H.”) The student on conditional status must achieve regular status within two sessions of registration in the Graduate College by obtaining a grade-point average of at least 2.50 and acceptance of the major department, or be dismissed.

3. Special—Students in receipt of a valid bachelor’s degree
Graduate College

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 Admis-
sions. Special graduate students are not eligible for a graduate degree or for a certificate in a certificate program.

4. Summer Session—Students with a valid bachelor's degree and at least a 2.3 grade-point average may register only for one summer session without being accepted by a department or col-
lege. (See "Section 14" below.) The deadline for application for admission to the summer session will be determined by the direc-
tor 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.

II. Minimum Requirements for Admission

Graduates of any college or university accredited by regional accrediting associations may be admitted to the Graduate Col-
lege, if their academic records meet the required standards. At the master's level, a minimum grade-point average of 2.3 is required for admission to conditional status. A minimum of 2.5 is required for admission to regular status. The grade-point aver-
age is computed only on graduate work if the student has com-
pleted at least 12 graduate hours. If the student has not completed 12 graduate hours, the grade-point average is com-
puted upon the undergraduate and graduate work completed. In cases in which a student applying for admission has a grade-
point average below the minimum required, but has a Graduate Record Examination score above a point to be designated by the Graduate dean, his or her papers shall be forwarded to the department concerned for examination and decision.

Students applying for admission to a doctoral program must meet a minimum GPA of 2.7 based on completed graduate work, or the entire record of collegiate work if the student has less than 12 semester hours of graduate credit.

Departments, or committees in charge of interdepartmental degree programs, may, and often do, set higher minimum admis-
sion requirements than those set forth above for the University as a whole. Information concerning departmental or program requirements must be obtained directly from the executive of the department concerned.

For State Board of Regents' formal admission requirements, see "Appendix" of the Catalog.

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 an undergraduate credit may be substituted for one hour of graduate credit, with registration limited to a credit 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. Nine semes-
ter 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. Change 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 adviser 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. Students applying for full-time status as graduate students, if their instructor, may register for not more than six semester hours during a semester or three semester hours during the eight-week summer session.

E. Restriction on Credit to Faculty

Persons who hold facultv rank of assistant professor (including asstant clinical professor) or above at The University of Iowa may earn no credit toward an advanced degree at this institution.

F. Retroactive Registration

No form of retroactive registration is permitted.
study, thesis or research, with the signed approval of the instructor concerned and the Graduate dean.

H. Extramural Registration
Registration for work done off campus is accepted for residence credit under the following circumstances:
1. Traveling Scholar Program of the Committee on Institutional Cooperation; (see "Section III");
2. Research at approved locations under the direction of members of the 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. C" 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"); and
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; and
2. Correspondence courses.

I. Extramural Fees and Privileges
Students registered for extramural courses for graduate residence credit must apply for admission to regular status (see "Section I. G") and pay established fees. (See "Section XII. F" for special fees applicable to post-comprehensive registration, which should not be confused with extramural registration for residence credit.)

J. 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. Not more than nine semester hours of graduate correspondence work can be accepted for credit for an advanced degree. Such credit must be acceptable for the student’s Plan of Study and must be earned after the student has attained graduate status. A student enrolled for residence credit may not register for correspondence courses without the approval of the executive of his or her major department and of the Graduate dean.

K. System of Course Numbers
Courses primarily for graduate students are numbered 200 or above in each department. Courses open to and carrying credit for both graduate and undergraduate students are numbered from 100 to 199. Courses below 100 are not accepted for graduate credit.

L. Auditing of Courses
In special cases, and upon the recommendation of the instructor and the advisor, 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.

M. 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 entire registration is canceled. This regulation may be waived only by the Graduate dean on the recommendation of the Student Health director or the Student Counseling Service. If a student cancels registration after the deadline date, he or she must obtain permission from the dean of the Graduate College before he or she is permitted to re-register.

Section III. Traveling Scholar Program
A. Purpose
The program under the auspices of the Committee on Institutional Cooperation representing 11 universities in the Midwest will enable a graduate 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 first 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 scholar arrangement.
2. After agreement by the student’s adviser and the faculty member at the host institution, graduate dean 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 desiring additional information should inquire at the office of the Graduate College.

C. Conditions
CIC Traveling Scholars will normally be limited to one semester or two 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-register; otherwise, the student shall be restored to good standing.

B. Doctoral Students

For a doctoral student the minimum required grade-point average on graduate work at The University of Iowa is 2.70. A doctoral student whose performance falls below this level will be placed on probation. If, after completing eight more semester hours of graduate work at this University, the cumulative grade-point average remains below the required level, the student shall be dropped from the program and denied permission to re-register unless he or she applies and is accepted for another degree or certificate program. If the condition of probation is met, the student is returned to good standing.

C. Departmental Regulations

In addition to the above Universitywide requirements, departments may establish higher requirements, which then determine the individual student's standing with regard to probation and dismissal. Whenever departments raise standards, the new regulations will apply only to new students and not retroactively to the disadvantage of those already in the degree program. Departments must notify the student, the Graduate dean, and the Registrar of actions affecting a student's standing.

D. Restriction on Students on Probation

A student on probation shall not be permitted to take comprehensive or final examinations leading to any degree or certificate, nor may the student receive any graduate degree or certificate.

Section V. Credits

A. Transfer of Graduate Credit

Graduate work at other institutions will be entered on the student's permanent record by the Registrar and a report of this action will be sent to the student, his or her major department and the dean of the Graduate College. Credit for these courses toward an advanced degree at Iowa must have the approval of the major department and the dean of the Graduate College.

B. Residence Transfer Credit

Residence graduate credit from another Iowa Regents' University may be counted as residence credit in this institution, provided such work is acceptable by the student's major department on the basis of the department's determination of its applicability toward the degree. (See Sections 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 adaptations of standing rules as the Graduate council may authorize from time to time to meet group or individual situations. The value of such credit in satisfying requirements for a degree will be determined by the major department with the approval of the dean.

E. Cancellation of Registration and Proportional Credit for Students Entering Military Service

1. Students who leave within the first six weeks of the semester receive no credit.

2. Students who leave within the period of seven to nine weeks receive one-half credit.

3. Students who leave within the period of 10 to 12 weeks receive two-thirds credit.

4. Grade reports for the one-half and two-thirds credit periods: (a) instructors report grades only as Pass or Fail; (b) credit is to be assigned on the basis of total registration minus thesis and seminar; (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 twelfth week receive full credit.

6. Grade reports for the full credit 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—withdrawn without credit, R—registered and U—unsatisfactory.

C. Audit

E is assigned when a student registered for no credit attends as an auditor throughout the course; if the student drops the course before the close of the term, W is assigned.

D. Incomplete

The grade of I is to be used only when a student's work during a session cannot be completed because of illness, accident or other circumstances beyond the student's control. In registrations for thesis, research or independent study, the S/U grades may be applied. (See next paragraph. "E") 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 with F's
from the spring semester are exempt from completing the course
during the succeeding summer session.
Specific deadlines for the submission of student work to the
faculty and for the faculty's reports: on A 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 incompletion; 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, re-
search, readings, independent study and special projects. S-
satisfactory means that the student receives credit for the work;
U—unsatisfactory means that he or she receives no credit. Nei-
ther 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 request the Graduate dean for per-
m ission to use grades of S and U as described 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 understood by the instruc-
tor 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 pro-
gram provided that the instructor of the course and the student's
departmental advisor approve the registration. Arrangements for
S/U grading in these courses are accomplished by filing 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 changes from letter grades to S/U grades or vice-
versa will be allowed after these dates.

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 or an
ATOSB score above a point to be designated by the Graduate
dean; (d) a satisfactory rate of progress in completing the pro-
gram.
2. Preference will be given to candidates for the doctoral de-
gree.
3. Recommendations for graduate scholarships may be made
to the Graduate College by the appropriate department execu-
tive, 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 comprehensive fee assessed. Scholarships will be cred-
ted to the student's University account.

B. Graduate College Fellowships

Fellowships are awarded by the Graduate College upon recom-
pendation by departments to students with outstanding aca-
demic 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 estab-
lished by the Graduate dean in consultation with the Graduate
council.

C. Faculty Research Assistantships

Faculty research assistantships are awarded to qualified gradu-
ate students and serve two purposes: (a) to provide research
service to professional members of the academic staff and (b) to
provide apprenticeship experience for graduate students who are
in training in research. Not more than 20 hours of service per
week are required of a half-time assistant. Other part-time serv-
ices are scaled in proportion, and a limited academic schedule is
permitted (see "Section II. D"). Appointments are ordinarily
made for the nine-month academic year, but appointments may
be made for other periods of time by special arrangement. Sus-
penda vary with the qualifications of the appointee and the
amount of service rendered. Faculty research assistants ap-
pointed 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 depart-
ments in March of each year, although applications may be
considered at any time. Applications should be made on the form
provided by the Graduate College, and should be accompanied
by recommendations and/or a letter summarizing the student's
qualifications.

D. Graduate Assistantships

These assistantships serve two purposes: (a) assistance in the
instructional program of the University and (b) the preparation
of future college teachers. In order to achieve both aims,
scholarship-supported graduate students who show exceptional
promise as teachers are selected for graduate assistantships. All
appointments are made by the dean of the appropriate college on
recommendation of the department.

E. Eligibility for Scholarships, Fellowships and Research Assistantships

Scholarship, fellowships 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 the financial aid and/or student status is ter-
minated. In no instance may a student be promised or tendered
an appointment until after approval for admission to the Gradu-
ate College by the Director of Admissions.
Section X. Master's Degrees

A. Kinds of Degrees
Master's programs requiring a minimum of 30 semester hours lead to the Master of Arts degree, Master of Science degree, Master of Business Administration degree, Master of Arts in Teaching degree and such other master's degrees as are approved by the Graduate faculty.

B. Plan of Study
The applicant for a master's degree must file a plan of study approved by the adviser and the departmental executive with the Graduate College within the semester 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 and set forth in the University Catalog for each department.

C. Major and Related Fields
The plan of study should provide for reasonable concentration in the major field of interest and, 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 in residence at this University, of which eight semester hours on campus are required. (See "Section II. H. Extramural Registration.")

E. Reduction of Old Credits
Credits for a master's degree dating back more than 10 years from the semester in which the degree is to be conferred are not counted toward fulfillment of degree requirements. This rule may be waived by the dean in cases affected by military service.

F. Limit on Law, Medical or Dental Courses
Work taken by a student in the College of Law or in basic science courses in the colleges of Medicine or Dentistry 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 course 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 for the master's degree 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 adviser and the major department. Work completed while registered for a professional degree in the colleges of Law, Medicine or Dentistry will be counted as part of the residence requirement for nonteaching 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 require-
ments 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 prepara-
tion shall be counted as credit toward the minimum require-
ment. 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 charac-
teristics not later than four weeks before the convocation at
which the degree is to be conferred. (See Graduate College publi-
cation: "Requirements for Graduate Theses.") After approval by
the Graduate College and by the thesis committee, a final copy
of the thesis must be deposited with the Graduate College not
later than 10 days before the convocation.

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 Commit-
tee.")

I. Master's Degree Without Thesis
A master's degree without thesis, consisting of at least 30 semes-
ter hours of graduate study, may be awarded upon the comple-
tion of a curriculum prescribed by a department and approved
by the Graduate Council.

J. Final Examination
The requirements for all master's degrees include a final exami-
nation, which, at the discretion of the major department, may
be written or oral or both. Such an examination will not dupli-
cate course examinations. It will be evaluated by the examining
committee as satisfactory or unsatisfactory with two unsatisfac-
tory votes making the committee report unsatisfactory. The re-
port of the final examination is due in the Graduate College not
later than 48 hours after the date of the examination or, in the
case of those departments giving a general examination rather
than a thesis examination, not later than the last day of the
graduate examination period.

If the examining committee so recommends, a candidate who
fails the examination may present himself or herself for reexami-
nation, but not sooner than the next regularly scheduled exami-
nation period in the following term (semester or summer ses-
sion). 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 depart-
ment. 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 Al. 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, produc-
ing, stage design, musical performance, composition, instrumen-
tation, poetry, fiction and translation. Central to the program,
the thesis may consist of a novel, paintings, 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 work-
ing toward the Master of Fine Arts degree, but the student must
meet all requirements for each degree separately, with a mini-
mum combined total of 60 semester hours of graduate credit.

For other requirements see "Section X. B. Plan of Study"); "C.
Major and Related Fields"; "E. Reduction of Old Credits"); "H.
Master's Degree with Thesis"; "J. Final Examination"; and "K.
Examining Committee."
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 total of at least 52 semester hours in graduate social work, including a research project; and
3. A final comprehensive examination, written or oral or both, covering all work for the degree.
The curriculum is organized into four general areas: social work practice, human growth and behavior, the social services, and research. During the two-year graduate program, classwork is combined with field experience in social agencies or social work departments. Since classwork and field practice are arranged sequentially, students can enter the School of Social Work only in September.
For other requirements, see "Section X. B. Plan of Study"; "E. Reduction of Old Credits"; "F. Limit on Law, Medical or Dental Courses"; and "K. Examining Committee."

Section XII. Doctor's Degrees
A. Character of Degree
The University awards two doctorates, the Doctor of Philosophy and the Doctor of Musical Arts. The Doctor of Philosophy degree indicates marked excellence in research or other creative work, and superior comprehension in the discipline. The Doctor of Musical Arts degree indicates marked excellence in performance and pedagogy.

B. Prerequisite
The candidate must present evidence of having completed a satisfactory amount of undergraduate work in the subject proposed for investigation or, in the case of deficiency, 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 expected 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 discipline, at this University, beyond the first 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 a one-third-time assistantship 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, a listing of courses in progress or to be completed after the comprehensive examination, and the tools of research in which competence has been certified.

E. Reduction of Old Credits
Courses taken 10 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 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.

F. Limit on Professional Courses
Work taken by a student in the college of Law or in basic science courses in the colleges of Medicine or Dentistry, while he or she is enrolled for a professional degree, may be credited to a graduate program leading to a doctoral 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's 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.

G. Joint Program for Master's and Doctoral Degrees
Those students who expect to continue their training through the doctoral 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.

H. Requirement in Foreign Languages
There is no Graduate-Collegewide 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 University Catalog under the doctoral programs of each department. 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.

I. 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 has been certified.

The comprehensive examination is not a deferred qualifying examination. It is intended to evaluate the candidate's mastery of his or her subject 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 convened 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 report 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 "unsatisfactory 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 vice provost's department should promptly send a written report to the Graduate College giving the date of removal of "reservations."

In case of a report of unsatisfactory in a comprehensive examination, the candidate may grant the candidate permission to present himself or herself for reexamination not sooner than four months after the first examination. The examination may be repeated only once, at the option of the department.

J. Postcomprehensive Registration

The student is required to register each semester after passing the comprehensive examination until the degree is awarded. He or she must register for the courses, research and dissertation necessary to complete the plan of study. If, after having completed all such registrations, the student is not ready to submit the dissertation and take the final examination, he or she may meet the continuing registration by paying a special minimum fee for each semester. It being understood that no registration for the summer session is required unless the student is taking a degree at the end of that session. If a student fails to register, he or she may not be admitted to candidacy unless he or she has submitted an application and been approved by an advisor, the departmental executive and the Graduate dean.

K. Dissertation for the Doctoral Degree

Two copies of the dissertation must be presented at the office of the Graduate College not later than four weeks before the convocation at which the degree is to be conferred and deposited therein in final form 10 days before commencement. Regulations regarding preparation of the dissertation copy shall be promulgated by the dean of the Graduate College. Dissertations will be microfilmed and thus made available on a permanent basis. An abstract of the dissertation, not to exceed 600 words of text, is to be deposited with the dissertation. The abstract must be approved and signed by the dissertation adviser. The abstract is published in the journal of Dissertation Abstracts. One copy of the dissertation typecript is bound and indexed at the University Music Library.

If the dissertation is in some nonprint form (e.g., painting, statue, performance or music) the librarian in charge of these help the student and faculty adviser work out an appropriate method of preparing the accompanying manuscripts, if such help is needed. Once the manuscript is accepted, it is treated the same as any other.

Written dissertations shall be made available to all members of the examining committee not later than two weeks before the date of the examination.

L. Dissertation Fee

A nonrefundable dissertation fee is charged each candidate to cover the cost of the above processing of the dissertation and abstract.

M. 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 context of the investigation. The final examination may not be held until the next session after passing the comprehensive examination nor 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 College office not later than 48 hours after the date of the examination. The final examination will be evaluated as satisfactory or unsatisfactory.
factory. 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.

N. 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 request the dean for permission to replace one of the five members of the Graduate faculty by a recognized scholar of professorial rank from another academic institution. A member of the Graduate faculty from outside the major department is required in those cases where a related field outside the major department is included in the comprehensive examination. For the final examination one member of the committee must be a member of the Graduate faculty from outside the major department.

Upon recommendation of the major department, the Graduate dean may appoint additional qualified persons (not necessarily members of the Graduate faculty) to serve as voting members of the examining committees, and at his or her discretion the Graduate dean may add a member to the committee.
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 place 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 torts and a course in appellate advocacy. Before they graduate, all must take a second course in constitutional law and a course in criminal procedure. All other second- and third-year courses are elective.

Students are encouraged to sign up for independent research with faculty members. Additionally, the College has instituted a second-year empirical research project.

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, and earn a grade of C or above in the course.

The Joint Program

In addition to its regular program 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 perform “double duty” and 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.

Master of Comparative Law (M.C.L.)

The degree Master of Comparative Law may be granted to selected foreign law school graduates who complete a program of satisfactory study for two consecutive semesters and one summer session, and who submit an acceptable thesis. Applicants must meet admission requirements of the Graduate College. In addition, the admissions committee may require them to complete the Law School Admission Test.

Summer Session

A six-week summer session, offering a limited number of courses, is available to students who have completed at least one year of law school at Iowa or elsewhere. The session runs from early June to mid-July. Students may enroll for up to six semester-hour courses per term. To be eligible, an applicant from another school must submit a statement from the dean of that school, indicating the applicant is in good standing and eligible to continue there.

The Independent Study Unit permits qualified graduate students or law students in the University facilities for further study following the close of the summer session. Advance permission is required by the College of Law in order to undertake an independent study project.

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 writing.

The Advocate

Written, edited and published by law students, The Advocate provides a vehicle for College of Law students, officials, expression 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, drafting 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, the Cedar Rapids Legal Aid Society; students are also involved in bluebonnet corpus and civil projects at the Men's Reformatory in Winterset, a habens 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.

Student Organizations

Law student organizations at Iowa include the Order of the Coif, a national honorary whose membership is drawn from the top 10 percent of the senior class; the Iowa Society of International and Comparative Law, Phi Delta Phi and Phi Alpha Delta, national law fraternities; Kappa Beta Phi, national law society; 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 committees.

Facilities

The Law Building contains a library and air-conditioned classrooms. With its collection of approximately 100,000 bound volumes, the law library is an outstanding research facility. A broad open-stack policy makes it readily available to students. Agricultural Law Center, created by the State Board of Education, is nationally and internationally reputed. It conducts legal-economic research with Iowa State University and the United States Department of Agriculture.

Fees and Expenses

In addition to regular tuition and fees, books and supplies average about $750 a year. Housing costs and personal expenses vary with individual circumstances.

Financial Aid

The College requires all students to enroll for a full schedule, and encourages accepting 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 College of Law, the College offers research assistantships with substantial stipends. Assistantships are awarded to high-ranking third-year students who have demonstrated ability for research and scholarship. About one-third of the student body have scholarships.

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, with corporations and in private practice, both in the very large law firms in the great urban areas of our country and in small firms throughout the country. There are many law opportunities to practice law in Iowa, and in recent years approximately half of the graduating

law students have availed themselves of these opportunities. Each year numerous law firms, corporations and government agencies visit the University to recruit students from the College of Law.

Admission

Prelaw Studies

No pre-admission 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 understanding of human institutions and values, and increased facility of thought.

Admission Requirements

Beginning students may enter the College of Law only in the fall semester. Unless for good cause shown, a student must apply for admission by May 1 preceding the fall semester in which he or she wishes to enter. The applicant is responsible for seeing to it that, before the final date for submitting applications, each college or university he or she has attended has sent an official transcript to the University, or, if the student has registered with it, has the official transcript sent to the University, or, if the student has registered with it, that he or she should request information forwarded from the Law School Data Assembly Service, Princeton, New Jersey. An application fee of $10.00 must accompany applications from those who have not completed their undergraduate work in residence at The University of Iowa.

The applicant must present a baccalaureate degree from an accredited college or university prior to commencing work in the College of Law. To be considered for admission, the applicant should have attained a cumulative grade-point average of at least 3.0 on all college work undertaken (A = 4).

Each applicant for admission must complete the Law School Admission Test administered by the Educational Testing Service, Princeton, New Jersey, and have his or her score forwarded to the College of Law. Except upon a showing acceptable to the admission's committee, the admission's committee will not consider applications from students who do not have their test scores forwarded to the College of Law before April of the year they intend to enroll.

Fulfillment of the specific requirements for admission listed above does not assure admission to the College of Law. From the applicants meeting the minimum requirements, the admission's committee of the College will select those who appear to be best qualified for the study and practice of law. The admission's committee may require personal interviews of applicants. The College participates in the University's Educational Opportunities Program and considers applicants from disadvantaged backgrounds on an individual basis.

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
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.


Clearance

81/186 Civil Procedure I 3 s.h.
Procedures relating to jurisdiction of persons, jurisdiction of subject matter and venue of both federal and state courts; pleadings, counter pleadings, answer and reply; motion for judgment on pleadings and summary judgment motions: trial procedures, and discovery available in present-day practice: society's impact on federal civil litigation process: as individual rights are protected and procedures are modified by job assigned by society.
81/186 Civil Procedure II 3 s.h.
Decisions involving modern rule practice, including motion for summary judgment, joint不影响: the cumulative weighted average of 65 or 60 or more for the first two semesters, but whose weighted average of 45 or 60 or better during the second semester, will be permitted on probation on a second semester may achieve 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 Requirements

Residence Requirements

To satisfy residence requirements, a student must enroll for a minimum of 26 semester hours of credit for each of three academic years, the academic year being defined to exclude summer sessions. Satisfaction of the residence requirements during any single semester of the academic year requires a student to enroll for at least 12 hours of credit. A student wishing to register for more than 14 hours of credit during any one semester must have special permission from the dean.

Scholastic Requirements

Numerical grades may be translated into letter grades for purposes of comparison as follows:

100-90 = A
90-75 = B
75-65 = C
65-50 = F
50-40 = P
40-30 = D
30-20 = F
20-10 = F
0 = F

A first-year 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 60 or better during the second semester, will be permitted on probation for the third semester. They must achieve 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.
9166 Poverty and the Law Seminar
En. 100
Urban environment control, education of democracy in planning process, housing programs designed to meet needs of ghetto
9164 Student Rights Seminar
En. 100
Selected legal problems arising within university or emphasis on student rights, including such topics as academic due process and free speech
9168 Taxation: Corporate Acquisitions Seminar
En. 100
Income tax consequences which flow from various kinds of corporation adjustments, including statutory mergers, asset acquisitions, and stock acquisitions; prerequisite: 91272 or 91278 Federal Taxation
College of Medicine

Administrative Staff
Dean John W. Estabrook
Associate Dean: Robert Barker, John D. MacQueen, Wendrow W.
Morris, Paul M. Steinhorn
Assistant Dean, Student Affairs: Spring L. Baker
Assistant Dean, Continuing Education: Richard M. Caplan
Assistant Dean, Medical Education: Bronsonn Hospital, Dale Malven
Benjamin L. Sten.
Assistant Dean, Allied Health and Coordinator of Community Health
Clare Program: A. William Honaday
Assistant Dean, Veterans Hospital Affairs: Richard G. Ebertoff

The University of Iowa is the only institution in Iowa offering the degree Doctor of Medicine. Its College of Medicine, which
marked its centennial year in 1970, was one of the first univer-
sity-based centers of medical education established in the Mid-
west. It has earned international recognition for its pioneering
contributions to medical science and for its general excellence.
The College of Medicine is accredited by the American Medi-
ical Association and the Association of American Medical Col-
leges. The College 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.

Because the College is both physically and administratively an
integral part of a major university, its students have opportu-
nities to pursue a full range of academic and cultural interests.
At the same time, the College contributes significantly to the
strength of the University; for example, more than 1,500 non-
medical students enroll each semester in basic science courses
administered by the College of Medicine.

The M.D. Program
The Doctor of Medicine program which the College introduced in
the fall of 1969 differs in several significant ways from the
traditional format of medical education. Its two-year introduc-
tory phase comprises three semesters of basic medical science
and one semester of progressive orientation in clinical medicine.
The third year comprises 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 interests.

Combined M.D.-Graduate Programs
students who want to pursue the M.D. degree in combination
with 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 Stud-
ent 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 in radiation biology. In addition, graduate degree
programs leading to the Master of Science degree are offered in
ophthalmology, orthopedic surgery, otorhinolaryngology, pathology,
psychiatry and surgery.

Faculty
All members of the medical faculty have full-time appointments;
their work in practice and research is part of, not apart from,
their work in teaching. Many have earned national and interna-
tional honors and are listed in Who's Who American Men in
Medicine or American Men of Science.

Facilities
The College of Medicine is housed in the U of I Health Center,
which also includes the colleges of Dentistry, Nursing and Phar-
macy. An $85-million expansion program begun in 1969 will
make this one of the most advanced, comprehensive health
science centers in the United States. Its present and projected
facilities include:

General Hospital
The 810-bed General Hospital provides facilities for teaching all
major medical specialties and for full programs of internship
training and residency in all major specialties. More than 30,000
patients are admitted, and more than 110,000 outpatients are
seen annually.

Children's Hospital
Children's Hospital houses orthopedic surgery, physical medi-
cine, and rehabilitation; a rehabilitation center; and the Universi-
ty's physical therapy training unit. It has a 160-bed capacity.

Psychiatric Hospital
With clinical and research laboratories in neuropsychology, bio-
chemistry and psychology, Psychiatric Hospital has facilities
for complete study of patients. It has 60 beds for adults and 35
beds for children. Four hundred inpatients are admitted annu-
ally, and more than 9,500 outpatients are seen. The electromy-
geographic laboratories serve the entire Health Center.

Hospital School
The Hospital School for Severely Handicapped Children pro-
vides educational opportunities for 60 physically-handicapped
and educable mentally-retarded children on both a residential
and a day-school basis. Its interdisciplinary program involves professional personnel from medicine, psychology and educational, professional psychology, social work, nursing and therapy in activities which integrate patient care with research and professional training.

The Oakdale Campus
The 525-acre Oakdale campus is located seven miles northwest of the Health Center. Its 351-bed hospital houses the state tuberculosis treatment center, an alcoholics treatment unit, medical technology training laboratories and classrooms, and toxicology laboratories. Also on the Oakdale campus are pediatrics research laboratories, the offices and laboratories of the Institute of Agricultural Medicine's accident prevention section and Health Center research animal-care facilities. A Model Clinic for Family Practice was opened in 1972 to serve the rural community adjacent to the campus and to provide a teaching base for the Department of Family Practice.

The Veterans Administration Hospital
The 440-bed Iowa City Veterans Administration Hospital is an integral part of the Health Center. Interns, residents and medical students may receive much of their clinical training here. Several of the major facilities of the Health Center are based in the VA Hospital, including laboratories for the transplantation program, highly-specialized laboratories in nuclear medicine and special units for the study of metabolic and gastrointestinal diseases. The VA Hospital also offers unique training opportunities in the fields of clinical pharmacology, gastrointestinal, cardiology, nephrology and applied immunology.

The Health Sciences Library
Scheduled for 1973 completion, the new Health Sciences Library Building will permit consolidation of the basic collections of the University's health-science colleges. Architecturally innovative, the new building will include a 24-hour study area and group-study areas. Now numbering approximately 65,000 volumes, the College of Medicine collection covers all branches of medical science. In addition the College subscribes to more than 1,200 periodicals.

Other Facilities
The new Basic Sciences Building houses five departments of the College of Medicine. Other teaching facilities are located in the Medical Research Center and in the Medical Laboratories Building, which also houses the State Hygienic Laboratory.

Admission
Applications are accepted 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 15. A fee of $10.00 must accompany applications 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.

Preliminary to the specific requirements for admission does not assure admission to the College of Medicine. From the appli-cants meeting the requirements, the admissions committee of the College of Medicine will select those who appear to be best qualified for the study and practice of medicine. Each applicant must file with the Office of Admissions the completed application form and an official transcript from each college or university attended. Applicants who have completed the baccalaureate degree and required courses five or more years before seeking admission to the College of Medicine will be considered by the admissions committee under exceptional conditions.

The applicant must have completed at least three years (96 semester hours) of college study, including the following specific courses or subject areas with appropriate laboratory:

- **Physics**: a complete introductory course;
- **Mathematics**: college algebra and trigonometry; or advanced college mathematics, if the student completed college algebra and trigonometry in high school;
- **Chemistry**: as a minimum, a complete introductory course in organic chemistry, which would ordinarily follow a complete introductory course in modern general chemical principles; and
- **Biological science**: a complete introductory course in the principles of animal biology, or zoology and botany (but not botany alone), and one advanced course in biology.

To be considered for admission, an applicant must have attained a grade-point average of at least 2.5 (A = 4) for all college work undertaken. Because the quality of work in premedical science is basic to success in medicine, special attention will be given by the admissions committee to grades in science. Where the college offers an option to take courses on a pass-fail basis it is expected that applicants will take the required science courses on a graded basis.

Preference will be given to applicants with high scholastic standing who are residents of Iowa, but consideration will also be given to outstanding nonresidents. Applicants for admission are required to take the Medical College Admission Test administered by the Association of American Medical Colleges. Applicants are requested to complete this test in May or October of the year preceding that for which they are applying for admission. Students may make arrangements to apply for this examination through the University's Evaluation and Examination Services.

Personal interviews will be arranged as desired by the admissions committee. Accepted applicants must make a $50.00 deposit within two weeks after notification of favorable action on the application. This deposit will not be refunded but is credited toward the first year's fee payment.

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.

Admission to Advanced Standing
A transfer student may be eligible for advanced standing if he or she meets the admission requirements for students entering
at this school; has satisfactorily completed courses qualifying him or her for advanced standing; has achieved high scholastic standing; and submits a statement from the dean of the school from which he or she is transferring, showing work done at that school.

Unqualified Students
Applicants for admission to the College of Medicine who are not degree candidates but who want to register for special subjects will be admitted to any lecture or laboratory course only upon comprising 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
Promotions committees appointed by the dean and consisting of designated members of the faculty under whom the courses have been taken will, at the close of the academic year, review the accomplishments of the students and determine their eligibility for advancement. In making their decisions the committees 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.

Graduation Requirements
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 branches of the curriculum must have been attained, and all other requirements of the College satisfied.

Financial Aid
The College of Medicine currently awards approximately $141,000 in full-resident tuition scholarships to approximately 175 students each year. These scholarships are usually distributed equally among the four College classes. Merit are awarded on the basis of need, although, in accord with the donor's wishes, some are awarded on the basis of merit. These scholarships vary in value from $500 to $1,500.

Annual summer research fellowships are awarded on the recommendation of the sponsoring faculty members. Loans are available to medical students on the basis of their 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, as do most of the need-based scholarships. Smaller and shorter-term loans are usually available through the office of the College of Medicine.

The College is closely committed to the Educational Opportunity Program, both academically and in terms of financial aid.

Nondepartmental Courses
80:190 Genetics for Medicine Students 1 cr. Credit course for medical students, normally taken during second semester; review of general genetics (usually independent) and progress study and classification of genetic and congenital deformations seen in clinical medicine.

80:199 Illustrations and Scientific Methods (Sophomore Level) 3 cr. Individualized, programmed review of basic sciences; emphasis on statistical concepts required to critically evaluate medical literature; topics include descriptive statistics, probability, populations and sampling, interpretation of statistical significance tests, regression and correlation, presentation and discussion with clinical faculty coverage of basic principles and exemplars of epidemiology and clinical trials.

80:189 Neuroanatomy and Behavior 3 cr. Full-year course devoted to correlating and integrating basic sciences core of information with clinical experiences of junior and senior years, includes departmental information and development of skills in history-taking, physical diagnosis, laboratory diagnosis and related material which will prepare student for related clinical curricula.

80:181 Designing Learning Programs for Health-Related Education 2 cr. This course will provide design and evaluation of educational programs. emphasis will be placed on the development and evaluation of educational programs; emphasis on educational processes and design methods for educational programs; emphasis on educational processes and design methods for educational programs.

80:182 Learning Strategies for Health-Care Education 2 cr. Role of health specialist in teacher: explored; role of learning strategies employed in teaching discussions, observations, micro-experiences and micro-systems resident learning environments; activities included in teacher's background.

80:280 Facilitating Learning in Health-Care Education 2 cr. Role of health-care educator as facilitator and learning facilitator explored in detail.

80:290 Student Experience (Part 1) 2 cr. Part of the experience studies program.

80:292 Health-Care Education and the Health-Service Industry 2 cr. Comprehensive overview of health service industry, particularly as related to both initial preparation and continuing education of health-care personnel.

Anatomy
Intern Coordinating Committee Chairman: R. S. Heinl
Degrees offered: Ph.D. (Bio. only) only to students with primary orientation in human health sciences.

The Ph.D. in anatomy is awarded on recognition of original work done in experimental biology, usually with an emphasis on structure-function relationships and often with a more immediate applicability to human biology than is the case of similar work in zoology. The candidate will be required to have proficiency in the three basic anatomical areas—gross anatomy, microscopic anatomy, neuroanatomy. Usually they will also take courses in such related fields as physiology, biochemistry and endorotology.

The courses listed under these titles as "Advanced Human Anatomy," "Problems" and "Research" involve a somewhat independent, in-depth work on selected topics, including the methodology of teaching anatomy.

Special Faculty Strength
Members of the Departmental faculty possess expertise in areas such as hematology, endocrinology, neurology, biology of cancer and calculated issues in electron microscopy. The faculty have done innovative work and shows special interest in modern techniques used in the teaching of various aspects of anatomy.
Admission
Work leading to an advanced degree in anatomy in the Graduate College may be taken by properly qualified students. For admission procedures, see "Graduate College."

Staff: professor Halton, Kaesler, Mcetolf, Napolitan; associate professors Karlans, Mollart, Schmidt; assistant professors Aydlett, Bright, Erlandsen, Parsons, Robinon, Searls, Varmat; assistants in instruction Mcetolf, Fidler

Courses

401 Elementary Human Anatomy 4 a.h.
Primary for students of nursing and dental hygiene
402 Microanatomy for Dental-Hygienic Students 3 or 4 a.h.
Cells, primary tissue and organs; emphasis on oral and related structures; includes histology.
601-101 Human Gross Anatomy for Dental Students 6 a.h.
Regional dissections of entire body with major emphasis on head and neck; includes microanatomy; open to graduate students with consent of instructor.
601-102 Microanatomy for Dental Students 6 a.h.
Cells, primary tissue and organs; emphasis on oral and related structures; includes histology. Students must have consent of instructor.
601-103 Gross Human Anatomy for Medical Students 7 a.h.
Regional dissections of entire body. Includes lectures and conferences; for graduate students; prequisite consent of instructor. First semester.
601-105 Gross Anatomy for Medical Students 4 a.h.
Cells, fundamental tissues and microanatomy of organ systems; for medical students; first and second semester. Prequisite: for graduate students consent of instructor; first semester.
601-107 Neurology and Behavior 5 a.h.
Introduction to study of elements, organization and functions of central nervous system; behavior, conformance, abnormalities and degeneration; required of graduate students in anatomy; consent of instructor required for other graduate students taking course; same as NS. 31107 and NS. 31110.
601-108 Special Microanatomy 5 a.r.
Advanced study of special structure of organs; emphasizes histology, including staining and equivalent courses in Department of Pathology.
601-109 Human Anatomy 5 a.h.
Anatomy of the upper extremity, which is a prerequisite.
601-110 Human Anatomy and Neuroanatomy 2 a.h.
Considers nervous system, which is a prerequisite.
801-115 Human Development 3 a.h.
Lectures and demonstrations including the experimental basis for understanding microanatomy.
801-126 Deducted Human Anatomy 3 a.r.
Specific aspects of gross or microanatomy; prerequisite: consent of Department head.
801-206 Teaching Workshop in Anatomy 2 a.h.
Practical applications of eductional psychology to teaching of anatomy; formulation of course objectives, teaching methodology, test construction and evaluation, etc.
801-208 Problems 3 a.r.
Practical applications of eductional psychology to teaching of anatomy; formulation of course objectives, teaching methodology, test construction and evaluation, etc.
801-207 The Vasclal Nervous System 3 a.r.
Autonomic nervous system as its components, structural relationships and functions, including central mechanisms, primarily for medical graduate, offered upon sufficient demand.
801-235 Review of Anatomical Neurology 3 a.r.
Important elements of recent serval systems, emphasis on peripheral nervous system and brain stem with special attention to the cerebellar and brain-stem structures. Includes conferences, motion pictures and models.
801-290 Embryology for Medical Students 5 a.h.
Some work to be done by first semester students; covers work in embryology given in first half of second semester (see review)

Anesthesia

Department Head Jack Wmey

For nearly 60 years medical students at The University of Iowa have received clinical instruction in the administration of anesthetics and other related activities of the Department. Moreover, it is probable that the country's first residency training program in anesthesia was established at Iowa in 1922.

The program is approved by the American Board of Anesthesiology and has graduated well over 200 specialists. About 20 percent of these former residents are in academic medicine, and 16 have served as heads of academic departments of anesthesiology.

The teaching, service and research activities of the Department have traditionally had, as their background, the administration of anesthetic agents for the relief of pain during the thousands of surgical procedures performed every year in the University Hospitals. During the last 20 years or so, however, activities outside the operating room have received increasing emphasis. Among them are diagnostic and therapeutic procedures for relief of severe and intractable pain; consultations involving problems of sedation, airway management and cardiorespiratory support; and substantial participation in the activities of the Recovery Room and Intensive Care Unit.

Undergraduate students and medical students in the specialty; help to develop in the junior student some concepts and technical skills related to resuscitation, airway management and the care of the comatose patient; and offers the senior student three intense study in any and all phases of the Department. Wide clinical experiences, well-designed seminars and teaching conferences and ongoing research activities develop in the postgraduate student, or resident, the intellectual depth and skills required of a specialist in anesthesia.

Staff: professors Buebion, Meyers, associate professor Deibacker, Scholl, assistant professors Baetison, Geoga, Ghosin, Hornick, Kodman, Orems, clinical assistant professor Tantocci

Courses

601-206 Clinical Anesthesia for Junior Students 7 a.h.
Introduction to general aspects of management of anesthetized patient; establishment of patient-surgeon and evaluation of cardiovascular system includes; mechanics in regional and local block, is appropriate.

601-215 Clinical Anesthesiology 4 a.h.
Intravenous and surgical procedures in various forms of anesthesia for surgical patients, patient leaves begins techniques of general, epidural, and perioperative anesthesia; instruction in mechanics, use of drugs and various anesthesia systems and in techniques of monitoring and in respiratory and cardiovascular function and the various methods of measurement. In-
cluded are clinical anesthesia seminar, basic science seminar, and morbidity and mortality conference; four students; subscription time: four to eight weeks; offered all year
116011 Intensive Care
Students attend seminars in evaluation and treatment of seriously ill patients in Intensive Care Unit; artificial ventilation, evaluation of pulmonary function and monitoring of microcirculation are included; special stress applied to postoper- ative surgical patients and those needing prolonged ventilatory assistance; fluid balance and acid-base problems thoroughly emphasized; two students; subscription time: four or eight weeks; offered all year; prerequisite: four hours 110110 Clinical Anesthesia
106183 Clinical- Anesthesia Seminar
1 or 2 a.h.
One-hour evening seminar discussing various problems encountered in clinical anesthesia; correlations made between clinical anesthesia and disease states; 10 students; subscription time: 16 or 32 weeks; offered September to June
116574 Morbidity and Mortality Conference
1 or 2 a.h.
Two-hour group discussion of recent problems in clinical anesthesia; particular stress applied to improved patient care in intensive care units; 10 students; subscription time: 16 or 32 weeks; offered all year
116006 Anesthesiology Research: Human Function
4 or 8 weeks
Research in anesthesiology on effects of agents and situations which alter mental function; laboratory animal studies strongly encouraged; one student; subscription time: four to eight weeks; offered September to January; prerequisite consent of instructor
116171 Anesthesiology Research: Neurocircuitry
Pharmacology
4 or 8 weeks
Participation in research on drug effects on neurocircuitry and action potential generation utilizing microelectrode techniques; two students; subscription time: four to eight weeks; offered September to June; prerequisite consent of instructor
116102 Anesthesiology Research: Central Nervous System
4 or 8 weeks
Research in anesthesiology on central electrical activity of humans complete technique; one student; subscription time: four to eight weeks; offered September to June; prerequisite consent of instructor
9 or 8 a.h.
Research is a well-defined project relating to anesthesia; one student; subscription time: two to eight weeks; offered September to January; prerequisite consent of instructor
Biochemistry
Department
Head: Carl G. Vestling
Degrees offered: B.A., B.S., B.M.
For a description of the undergraduate programs, see "College of Liberal Arts"
Graduate Programs
Both the M.S. and Ph.D. degrees are offered. Financial support is available to all students who qualify and are selected for the Ph.D. program. Minimum entrance requirements include an undergraduate grade-point average of 2.9 (A = 4.0) with a 3.0 average in science courses and a score of 1250 on the combined verbal and quantitative parts of the Graduate Record Examina- tion Aptitude Test. In addition, there are prerequisites of college- level courses in mathematics through calculus, physics, biology and physical chemistry. All graduate students take 99.265 Biochemistry (a survey) and 99.261 Research Techniques in their first semester, and 99.266, 99.261 and 99.282 Seminar in the second semester. After consult- ation with the staff, the new student is assigned to a research laboratory for 99.261. Ordinarily, no more than two students are assigned to the same laboratory. An advisory committee consisting of the 99.261 instructor and two other faculty members helps
Dermatology and Syphilology/Family Practice

99:150 Applied Biochemistry 2 a.h. Lecture, seminar, conference course dealing with industrial, public health, clinical, pharmaceutical and entomological applications and implications of biochemistry, prerequisite: 99:120

99:150B Seminar, Research, independent Study (Honors) 2 to 6 a.h. Students pursue courses of independent study and research in areas of interest to them. Assignments made by student with faculty member in advance of enrollment in course, recommended for honors students

99:161 Biochemistry 4 a.h. Course designed for dental and pharmacy students in professional colleges who have not had equivalent biochemistry course. course covers essentials of biochemistry and pharmacy students. Course concludes with advance of enroll- ment in course, recommended for honors students

99:161B Biochemistry 4 a.h. Course designed for medical students; other students admitted as per consulta- tion with staff, lecturers, laboratory directors or other small group conferences. Major objective to develop useful and analytical ability in treatment of clinical problems into biochemical components

99:162 Biochemistry 2 a.h. Discussion of crystallographic and solution measurements of proteins, enzymes, ribonucleic acid, and deoxyribonucleic acid. Interactions between proteins and nucleic acids. Course concludes with advance of enrollment in course, recommended for honors students

99:163 Biochemistry of Subcellular Structures 3 a.h. Combination of interactions, structures and biochemical roles of complex and com- plementary molecules in particulate and soluble components of the cell, such as membranes, cell walls, chromosomes, and organelles. Also, organelles and cytoplasm, prerequisite: Biochemistry 99:120, 125 or consent of instructor

99:165 Enzyme Catalysis 3 a.h. Chemical and physical nature of active sites of enzymes; catalytic action of living systems structures to catalytic function: various facts and functions of enzyme structure, kinetic and catalytic parameters, homeostasis and catalytic function with various substrates, effects of inhibitors, activators and denaturants, the role of each such factor in biologic and biochemical function, prerequisite: Biochemistry 99:120, 99:140 or consent of instructor

99:183 Bio-Organo-Metallic Chemistry 3 a.h. Organic chemical basis of enzyme-catalyzed transformations, such as iron and dinitro hydroxy radical transformation, mechanism predominance of enzymes in biologic transformation, and requirement for enzyme catalysts role of enzymes and cofactors in catalysis; prerequisite: Biochemistry 99:120, 99:140, 125

99:200 Clinical Biochemistry 3 a.h. Experiences in biochemical laboratory emphasizing on correlation of biochemical findings with clinical and diagnostic observations. Students gain an understanding of clinical biochemistry laboratory, its methodology and utilization, with particular emphasis on correlation and interpretation of laboratory results from analysis of specimens from patients; prerequisite: Biochemistry 99:120, 99:140 or consent of instructor

99:201 Spectrophotometry of Biological Materials 3 a.h. Transformation of theory of electronic and molecular spectra emphasis on applications used for analysis of biological and foodstuffs; teaches absorption curves and the study of the relation of the concentrations of various components to the absorption of the samples; prerequisite: Biochemistry 99:120, 99:140, 125

99:202 Molecular Endocrinology 3 a.h. Physical and chemical aspects of hormone interactions with cells, and the role of hormones in the regulation of body functions. Students gain an understanding of the regulation of hormone action by non-genetic means, prerequisite: Biochemistry 99:120, 99:140, 125, 141 or consent of instructor, Zool- ogy 99:122

99:203 Neurobiochemistry 3 a.h. Structure and function of the nervous system; introduction to basic concepts and principles of neurons, receptors, and their interaction. Blood brain barrier, biochemi- cal neurotransmitters, excitability and neural function; synaptic theory, regulatory pathways, neurotic concepts of learning and memory, prerequisite: Biochemistry 99:120, 99:140, 125, 141, 142

99:204 Research Techniques 4 a.h. Only for students enrolled in biochemistry, tutorial training is developed and application of basic techniques in laboratory of staff members; first and second semesters

99:205 Biochemistry 4 a.h. Only for students enrolled in biochemistry; prepares them for reading and interpretive pattern of process knowledge, four lectures, discussions and assignments; fall semester

99:206 Biochemistry 5 a.h. Only for graduate students in biochemistry, orientation of 99:261, which is prerequisite, four lectures, discussions and assigned readings; second semester

99:208 Seminar 1 a.h. Required of graduate students in biochemistry; weekly presentations by visiting and local speakers; credit; students participate in small, arranged student-family group, first and second semesters

99:250 Research 1 a.h. Programs arranged with individual faculty members, open only to enrollment of students in biochemistry

Dermatology and Syphilology

Department Head: Robert G. Cornyn

The aims of the Department of Dermatology are the teaching of medical students and training of residents, care of patients with skin disease, and research in the field of dermatology. This is one of very few dermatology programs in the country with a required rotation for medical students; each junior student spends two weeks in the clinic and attends nine one-hour lectures. A good cross section of patients is available, due to the mix- ture of private and clinic patients, including a large number referred from the Student Health Service. Various electives are available during the senior year, including further clinical experience, dermatopathology and dermato logic research.

Staff: professor Coplas, Carrie, Radcliffe; associate professor Fritsch; assistant professor Zulaklie

Courses

99:1 Dermatology Clerkship 2 a.h. Introductory course, compulsory; junior, senior students, case presentations

99:2 Dermatology Elective 3 a.h. Senior students may spend two to six weeks in advanced clinical experience, dermatologic surgery and special assignments

99:25 Dermatopathology 2 a.h. Each senior student spends two weeks full time in dermatology clerkship

99:999 Special Studies 2 a.h.

Family Practice

Department Head: Robert E. Radiel

Courses appropriate to the field of family practice are included throughout the four-year medical curriculum. In the senior year a variety of electives is available, intended to trace the student in the skills of family medicine. These electives include rotations at Broadowsk Family Country Hospital, Doe Medicine, Mercy Hos- pital, Mason City; St. Luke's-Merry Hospitals, Cedar Rapids; University Hospitals and the Oakdale Family Practice Model Office, Iowa City; and preceptorships with selected family physi cians throughout the state. There is also ample opportunity for independent study during this year.

The Department offers a three-year residency program, graduate- ates of which are eligible for certification by the American Board of Family Practice. The program concentrates on the training of physicians to provide continuing and comprehensive care to the total family unit. Residents are trained in the basic concept of health care; this concept integrates the patient, allied health
professors and the physicians in providing comprehensive family-oriented care. The program is intentionally flexible to allow each resident freedom to tailor his or her training to in

dividual particular interests and needs and includes a broad exposure to internal medicine, pediatrics, obstetrics and gynecol-

ogy, psychiatry, medical and surgical subspecialties and commu-

nity medicine.

Two major elements of training are utilized—the Family Practice Model Office and hospital-based clinical experience. The Family Practice Model Office is located on the Oakland campus and is designed to mirror as closely as possible private physicians' offices in the community. Here each resident devel-

ops a model office practice and sees patients by appointment. He or she is responsible for the continuing care of patients who select him or her as their family physician, and the student maintains total responsibility for the care of these patients throughout the three years of training. Within the unit, the student learns the principles of practice management by par-

ticipating in the organizational and administrative decisions re-

quired to manage a private office.

The hospital-based clinical experience is a unique combination of exposure to practice in the University Hospitals in Iowa City and Mercy Hospital in Mason City. Rotations are specifically designed to provide a breadth of experience in more than one setting.

Staff: professor Rakita; associate professor Bryan; clinical assistant

professors Martin, Moenner, Parker, Wistner

Courses

Senior Electives

118/101 Family-Practice Clerkships: Broadlawns Polk County Hospital, Des Moines 4 to 8 h.

Four- to eight-week course, available all year, involving assignment to clinical services of Internal Medicine, Pediatrics, Obstetrics and Gynecology, and Surgery; experience individualized where possible; supervision by faculty practice residents and physicians in charge of services.

118/102 Emergency Room: Broadlawns Polk County Hospital, Des Moines 4 h.

Four-week course, available all year, involves participation in care of patients seen in emergency room and但是如果 clinical schedule follows hospital patient intake service and continues to participate in his or her own patients in treatment to return when possible; supervision by family practice residents and physicians.

118/103 Ambulatory Clinic: Rehabilitation Unit, Des Moines 4 h.

Student participates in management of care and rehabilitation phase of physical medicine and rehabilitation; involvement of patient's general physical condition coupled with growth and transition to rehabilitation; Department of Psychiatry will participate in psychological assessment when indicated; four-week course, available all year.

118/104 Preventive/Psychiatry in Family Practice

Preventive services available with adult family physicians in Iowa; representing society of rural and urban practices, both solo practitioners and those practicing in varying group sizes; four- to eight-week course available all year.

118/105 Family-Practice Clerkship: Cedar Rapids 4 to 8 h.

Prep to eight-week course, available all year, involves exposure to clinical services of Internal Medicine, Pediatrics, Psychiatry, Obstetrics and Gynecology, and Surgery; experience individualized as much as possible.

118/106 Emergency Room: Cedar Rapids 4 h.

Assignment to emergency room of either St. Luke's or Mercy Hospital under supervision of family practice resident on call and staff physician experience include care of those patients coming to emergency room and participation in care of patients in hospital on surgical wards; available all year.

118/107 Community-Hospital Clerkship 4 h.

Preliminary exposure to community medicine and breadth of subspecialties; family physicians have local hospital and community practice; student works as any of several community

hospitals in Iowa under supervision of staff family physicians and participates in hospital care of patients on all services; four-week course; available all year.

118/108 Team Approach to Health Care 4 h.

Teaches maximum utilization and efficient coordination of all health personnel; working in Oakdale Model Office with dental work; multi-faceted clinical assignment including general medicine, surgery, pediatrics, obstetrics and gynecology, psychiatry, and rehabilitation; also involves supervision of student in their capability to determine the best course of care for the problems that occur in their patients and the most efficient manner in which they treat patient care; all four-week courses are available.

118/109 Independent Study 2 h.

Student works with associate or Department in investigative study of his or her choice in area of family medicine, community medicine, community health, and social welfare; research or study of limited scope and extent, available all year, with subscription time of two-weeks which may extend to four weeks for four semester hours of credit.

118/115 Family Practice: Mason City 4 h.

Rotation on variety of services at Mercy Hospital, or with family physicians, selected by student to represent skills and breadth of experience required for the provision of comprehensive medical care; supervision by teaching staff at Mercy Hospital; four-week course; available all year; may be repeated.

118/106 Special Study: Family Practice

w. arr.

For students wishing to arrange special clerkships, which may include foreign rotations, with prior approval from Department, complete application and individual

-arranged Elective (a fee is available in defer's office) to be submitted 30 days prior to beginning of rotation; allow minimum of 30 days to complete form; subscription time and other details to be arranged.

Genetics

See "College of Liberal Arts"

Hospital and Health Administration

See "College of Liberal Arts"

Human Nutrition

Administrator: Thomas A. Anderson

Health Administration

Degrees offered: M.S., Ph.D. (qualifications for American Dietetic As-

sociation membership also offered via internship program)

The program in human nutrition is administered by a College of Medicine-Graduate College advisory committee. Lecturers, thesis advisors and seminar participants are se-

lected from the faculties of the College of Medicine, Education, Business Administration and Engineering, and the Department of Home Economics.

The Dietetic Internship

The Dietetic Internship prepares the student for American Diet-
etic Association membership, establishes a base for study to-

ward the M.S. or Ph.D. degrees and encourages cultural internships. Applicants must meet requirements of the American Dietetic Association, 620 North Michigan Ave., Chicago 60611, and the U of I Graduate College.

The Intern earns a minimum of 12 semester hours of graduate credit in nutrition seminar, clinical nutrition and hospital dietary administration. Opportunities are readily available for the pur-

suit of individual interests in clinical, metabolic and administra-

tive research and study. University Hospitals pay interns a stipend which partially covers educational expenses.
The Master of Science Degree

There are opportunities for the M.S. graduate in teaching at the junior college level and above; in hospital, school and company food service administration; in public health; in clinic and hospital-patient service; in clinical research; and in consulting. The M.S. requires at least 30 semester hours of planned graduate credit (including thesis) and satisfactory performance in oral and written examinations. The student's course of study depends on his background and interests. These may include biochemistry, physiology, microbiology, public health, child welfare, psychology, education, marketing, computer science, statistics, labor and personnel management, and food science.

The Master of Science student may choose to emphasize with a thesis or in-depth study one of these areas of professional practice:

Clinical Dietetics

The student develops and practices skills necessary for the nutritional care of patients and clients. He or she practices as a member of a team of health professionals. Specific skills include recognition of individual differences in patients' nutritional needs and methods of meeting those needs; effective communication; and acceptance and/or delegation of authority and responsibility. Learning experiences occur primarily in the hospital setting. Time is also spent determining and providing nutritional needs to well infants, pregnant women, the aged and groups seen in a clinical setting.

Dietetic Administration

The student develops and practices skills necessary for direction and supervision of a large group feeding operation which meets the consumers' nutritional needs. Skills include application of problem-solving techniques in personnel and plant management, and food production and service. The hospital is the "laboratory," but nonhospital facilities are also observed.

Nutrition Education

Practice is provided in teaching patients, colleagues, physicians, medical students, personnel and special interest groups. Innovative teaching methods are encouraged. The emphasis is on the development of behavioral objectives as a basis for content and evaluation.

Nutrition Research

Metabolic and/or physiologic processes are investigated. At the M.S. level, the research is usually part of a larger study conducted by a senior investigator. The student has a variety of choices of topics and advisers.

Supplemental Activities

Students are encouraged to attend medical grand rounds, pediatric grand rounds and special lectures and conferences.

Supplemental opportunities are provided by affiliated agencies, such as the Iowa State Department of Health, Iowa Hospital Schools, Head Start Program, Iowa Diabetic Association and Iowa Model Rural Health Center.

Special programs

Independent study (projects) are available to out-of-Department students. Biannual, one-day conferences are held to present the latest findings in nutrition — "Diet Therapy, U.S.A."

The Doctor of Philosophy in Human Nutrition

The graduate program leading to the Ph.D. degree may be undertaken by students who have completed the master's degree or who will combine the Ph.D. program with the M.D. or D.D.S. requirements. The exceptional student may be allowed to complete work for the Ph.D. and bypass the master's degree. The program usually requires three years to complete and is designed to prepare the student for careers primarily in research and teaching. It is directed by the Nutrition Advisory Committee of the Graduate College.

Prerequisites include mathematics through calculus, physics, organic chemistry, analytical chemistry, physical chemistry, biochemistry and physiology. Courses in foods and microbiology are highly desirable. Each student must select a particular specialty wherein he or she can concentrate studies and research. Areas of research may include both animal and human nutrition in healthy or sick adults and children, with emphasis on metabolic processes. The individual field of specialization may include any of a wide variety of subjects, including epidemiology, ecology, food chemistry, metabolic errors, etc.

During the first year or two, a doctoral student may take a number of lecture courses and seminars, after which he or she qualifies for candidacy for the doctoral degree. Research is usually begun early in the program.

The actual program of instruction includes courses in nutrition, coursework in other areas to support the research problem and future professional goals, research — usually in a laboratory — and research tools. The degree candidate will have opportunities to assist in the teaching of students as part of his or her overall experience.

Advisory Committee: professor Bean, Connor (Internal Medicine) Filner, Read (Pediatrics), Dryer (Biochemistry), Osborn, Osman (Home Economics), Lavelle (Preventive Medicine), Mason (Surgery); associate professors Anderson (Pediatrics), Crowley, Hubel, Brown (Internal Medicine), Ross (Pathology), Bryan (Family Practice), Segink (Biochemistry and Pediatrics); assistant professor (Internal Medicine), Spector (Biochemistry), Healy (Pediatrics), instructor Burmeister (Preventive Medicine)

Courses

65/301 Nutrition Seminar 1 5 h.
Preparation of current research findings in nutrition, therapeutic and administrative areas.
65/302 Nutrition Seminar 2 5 h.
65/303 Clinical Nutrition 3 to 4 h.
Nutritional aspects of disease and illness, emphasizing therapeutic and role of food presented by medical and allied staff: lectures, demonstrations, bedside rounds, conferences, and patient consultations.

65/936 Projects in Nutrition 1 to 4 h.
Consideration of 65/936 but may be taken as an independent unit.
65/937 Projects in the Nutrition or arr.
Advisory, research, educational, or food science, metabolic studies: introduction to research.
65/939 Projects in Nutrition or arr.
Internal Medicine

Department Head: James A. Cifton

The Department of Internal Medicine is concerned with the diagnosis, prevention and treatment of diseases of adults. Members of the Department with special interests are organized in divisions: allergy-immunology, cardiology, clinical pharmacology and toxicology, gastroenterology, hematology, infectious disease, renal and hypertension disease and rheumatology.

Undergraduate Program

Members of the Department bear a major share of the teaching of second-year students in the course "Introduction to Clinical Medicine" in which students begin to learn the pathophysiology, signs, symptoms, complications, prevention and treatment of diseases. In addition to this, they are taught to obtain histories, to perform physical examination and to plan a rational approach to diagnosis and treatment.

In the third year, students are assigned for nine weeks to medical services at University and Veterans hospitals, under the guidance of the house staff and Department members, and actively participate as members of the ward teams in diagnosis and treatment.

In the fourth year, students may select a clinical experience to fit their own plans from among 47 courses offered by general medicine and the specialties.

Graduate Program

The Department offers straight and mixed internships and an approved residency program of high quality. In addition, most specialty divisions offer clinical and research fellowships for periods of one to two years. These permit the development of special knowledge and skills relevant to the specialty. Candidates for internship are accepted from approved medical schools. Post-doctoral fellows who have obtained their Ph.D.s are also accepted for programs in which the major focus is laboratory research.

Facilities

Teaching occurs on the medical services and in the laboratories of the University hospitals in Iowa City, and in the Veterans Administration hospitals in Iowa City and Des Moines.


Courses

72011 Clinical Medicine for Junior Medical Students 5 s.h.
72011 General Medicine Diagnostic Clinic 2 s.h.
Assignment for first day is a general diagnostic clinic: clinical evaluation of medical problem; emphasis on diagnosis and management of common medical problems present in clinical practice, as well as emphasis on management of office practice, processing of patients and communications in ambulatory health care. Six students; subscription twice to four weeks; offered fall only.
72032 Medicine-Consultation Service 2 s.h.
Emphasis on development of skills in assessment and reevaluation of patients for hospitalization and ambulatory treatment while using consultation; two students; subscription twice; offered all year.
72035 Clinical Allergy-Immunology 2 s.h.
Experiences in diagnosis and treatment of problems in allergy and immunology. Emphasis on diagnosis and management of common allergic diseases; experiences in consultation with other departments. Six students; subscription twice to four weeks; offered all year.
72036 Medicine Consultation Service 2 s.h.
Emphasis on development of skills in diagnosis and reevaluation of patients for consultation; six students; subscription four weeks; offered all year.
72051 Survey of Immunology 3 s.h.
Lectures, discussion and demonstrations in basic principles of immunology and immunopathology; students: subscription twice; fall semester.
72060 Research in Immunology 1-2 s.h.
Pulmonary disorders: disciplines to one or more areas chosen from those with which the faculty is familiar. Six students; subscription twice per month; offered fall only.
72080 Clinical Allergy-Immunology 2 s.h.
Experiences in diagnosis and treatment of problems in allergy and immunology. Emphasis on diagnosis and management of common allergic diseases; experiences in consultation with other departments. Six students; subscription twice to four weeks; offered all year.
72085 Clinical Cardiology University Hospitals 4 s.h.
Development of breadth and depth in diagnostic and therapeutic problems encountered in clinical cardiology; participation in patient care and consultation with referring physicians on patients seen in Cardiology and Internist Care Units, University Consultations and Collaborative Diagnostic Fellowship Unit. Emphasis on the recognition, pre- and postoperative conditions, severe cases; consultation with referring physicians on patients seen in Cardiology and Internist Care Units. Six students; subscription twice per month; offered all year.
72095 Clinical Cardiology / VA Hospital 4 s.h.
Emphasis, in elective on second, in breadth and depth in diagnostic and therapeutic problems encountered in clinical cardiology. Training in experimental cardiology; medical-surgical patients seen in acute postoperative period, however, greater experience in treatment of patients with acute myocardial infarction; consultation with University patient care in 18-bed Cardiology Ward and Coronary Care Unit; one student; subscription twice; fall, offered all year.
72050 Diagnostic Cardiac Catheterization Laboratories University Hospitals 2 s.h.
Working up patients admitted for cardiac catheterization; personal involvement in use of new techniques in evaluation of cardiovascular dynamics and in
Microbiology

Department Head: J. R. Porter
Degrees offered: B.S., M.S., Ph.D.

Microbiology

(For a description of the undergraduate program, see "College of Liberal Arts")

Students are admitted as Ph.D. candidates only. As such, they are expected to demonstrate a broad and thorough knowledge of microbiology. All candidates must show capacity for doing independent research and writing a satisfactory doctoral dissertation.

In general, the graduate student will be expected to have fulfilled the requirements for an undergraduate major in microbiology. This includes the electives or their equivalents as determined by the Department. Usually there is no language requirement for an advanced degree. Substitutions may be made in the case of students who have completed their work for a professional degree (M.D., D.D.S.) and wish to continue in the study of a particular phase of microbiology.

The grade-point average for all work must be 2.7 or better.

The M.S. degree (with thesis) may be awarded after completion of part of the requirements for the Ph.D. degree. It is intended for students desiring either to continue their graduate work or to take up other professional work for which training in research is needed. A thesis based on the candidate's own research is required for the master's degree, and the student will be expected to pass an oral examination on the thesis. In no case will the M.S. degree be granted to a candidate with less than 36 semester hours of graduate credit (includes research credit).

Al candidates for advanced degrees will be expected to assist in teaching in the Department during their course of study. (See "Graduate College").

Facilities

Microbiology is housed in a new $16-million Basic Sciences Building. Located on the east perimeter of the University's Health Center complex, the building provides the most advanced facilities ever designed for teaching and research in microbiology, anatomy, physiology and biophysics, biochemistry, and pharmacology.

The Department is a participant in the National Science Foundation's University of Iowa "center of excellence" program in the biological sciences.

The Department cooperates with affiliated departments in the various colleges on the campus, affording ample opportunity for students to avail themselves of the University's diverse course offerings, seminar programs and joint-research efforts. For example, courses and seminars in genetics, ecology and electron microscopy are taught on an interdepartmental basis.

Professors: Dr. J. R. Porter, chairman; Dr. E. H. Becker, Hoffm. Markovitz, Richardson, St. Bath; assistant professor Butler, Crouch, Feins, Feldhau, Johnson, Rodrigues, Walker.

Courses

410 Microbiology

Principles and methods essential to study of microorganisms, their bacteriology and identification, microorganisms involved in infectious diseases; clinical microbiology.
Neurobiology

Committee Chair: L. Van Orden

Neurobiology is an interdisciplinary program comprising these courses:

50:110 Neurobiology and Behavior
5: 4 h.

60:207 The Visceral Nervous System
6: cr. arr.

60:208 Review of Anatomical Neurology
6: cr. arr.

99:203 Neurobiochemistry
6: 4 h.

72:281 Advanced Neurophysiology (Muscle)
6: cr. arr.

72:282 Advanced Neurophysiology (Sensory Physiology)
6: 4 h.

72:283 Advanced Neurophysiology (Biophysics of Excitable Membranes)
6: cr. arr.

72:284 Advanced Neurophysiology (CNS, Control of Locomotion and Posture)
6: cr. arr.

31:125 Brain Function and Learning
6: 4 h.

31:137 Sensory Processes
6: 4 h.

31:227 Introduction to Psychological Physiology
6: cr. arr.

31:228 Neuroendocrinology and Behavior
6: cr. arr.

31:229 Neural Mechanisms and Learning
6: 4 h.

31:230 Biochemistry and Behavior
6: 4 h.

31:271 Psychobiology
6: 4 h.

Same as 3:254
3:254

3:272 Psychoneurological Laboratory
3: cr. arr.

31:320 Behavioral Pharmacology
6: 4 h.

31:321 Seminar: Chemical Influences on Behavior
6: 4 h.

31:335 Seminar: Brain Mechanisms and Behavior
6: 4 h.

31:336 Seminar: Physiological Psychology
6: 4 h.

31:337 Seminar: Neurophysiology
6: 4 h.

31:342 Seminar: History of Neuropsychology
6: 4 h.

3:256 Physiology of Hearing
6: 4 h.

37:124 Comparative Physiology
6: 4 h.
Neurology

Department Head: Asadullah S. Qasem

Neurology is a segment of medical science concentrating on organic disorders of the brain, spinal cord and peripheral nervous system, their diagnosis and management. Medical student teaching and postgraduate training in this field carefully integrated with patient care, has long been a significant function of the Department.

Dr. Saha is a past president of both the American Neurological Association and the American Academy of Neurology, is one of the authors of a leading textbook in the field and set the pace for a Department whose greatest strength is clinical management of patients with neurological diseases.

The Department is the Central Registry for the International Cooperative Ankylosing Spondylitis Project, funded by the National Institute of Arthritis and Musculoskeletal and Skin Diseases, and collaborates with the Department of Ophthalmology in sponsoring the Neurological Center, which is supported by the National Institute of Neurological Diseases and Stroke. The Neurological Center is concerned with research in pathophysiology of the nervous system and the eye.

Members of the Department also contribute regularly to the neurologic literature.

The Department offers clinical and research training to junior and senior medical students, contributing to the Doctor of Medicine degree. In addition, an active three-year residency program in all facets of the neurological sciences is pursued, leading to board certification in neurology for such trainees. In conjunction with the Department of Psychology, the Department of Neurology also offers appropriate clinical training contributing to the degree of Doctor of Philosophy in Psychology.

The activities of the Department include clinical training in neurology, electrophysiology, and in conjunction with other departments, pediatric neurology, pathology, neuroangiography and neuropathology. A well-equipped neurochemistry laboratory is available for research and clinical studies in epilepsy, and in cooperation with the Department of Physiology and Biophysics, the Department operates an active muscle physiology laboratory.

Staff: professor Saha, Van Allen, associate professor Fincham; assistant professors Taylor, Nibbelin.

Joint Appointments: professor McCormick (Neurobiology), Beaton (Psychology-Neurology), Knott (Electroencephalography-Neurology), associate professor Bell (Pediatrics-Neurology), associate professors Dee (Psychology-Neurology), Lorkovic (Neurology-Physiology), Syl (chief of Neurology Service, Iowa City VA Hospital); research associate Schonfeld (Neurology-Physiology).

Courses

6415 Lectures to Nursing Students 2 a.h.
Ward teaching and bedside examinations in small groups, or management of neurological patients, junior year.
6416 Lectures to Occupational Therapists 2 a.h.
Fundamentals of neurology as applied to occupational therapy; second semester.
6417 Advanced Basic Neurology 2 a.h.
Special lectures and demonstrations in basic neurology, particularly neurophysiology and neurochemistry, and concentration on staff and visiting members.
64187 Neurology-Neurosurgery Conference 1 a.h.
Review of patients presenting diagnostic problems common to both departments.
64115 Principles of Neurology 2 a.h.
Lectures, demonstrations and case presentation of neurological disorders usually treat by therapy; anatomy of nervous system reviewed and methods of technical testing of nerve damage demonstrated.
64203 The Atheroscleosis Dilemma 2 a.h.
Analysis of etiology and pathogenesis, classification and physiopathological correlations, same as 11217.
64204 Clinical Neuropsychiatry 3 a.h.
Conception of brain-behavior-relationship in man, analysis of behavioral disturbances associated with central nervous system dysfunction; current application of psychological test methods for determining central nervous system status as 13508.
64206 Advanced Clinical Neurology 6 a.h.
Intensive period of experience dealing with diagnosis and management of patients with neurologic disease; other inpatient service areas may be elected, but not simultaneously; student performs initial assessment of patient and, through clinical problems, becomes responsible for patient care.
64251 Research Projects in Clinical Neurology 12 a.h.
Student plans and conducts, with instructor, original projects of clinical research in areas of neurological disease. Concentration on experimental demonstration of disease or neuromuscular disease; research of appropriate quality submitted for publication; advanced arrangements must be made for student's thesis research and written report submitted by the end of the academic year.
64302 Electrophysiology in Neurology 8 a.h.
Daily afternoon sessions in EMG for performing electrophysiologic procedures; patients referred from all areas of hospital on wide range of sleep-related neurologic disease; opportunities provided for original study work; by arrangement, may be combined with other elective, one student; course period: three months, after second year.
64303 Neurology Seminar 1 a.h.
Weekly, one-hour sessions on various topics in neurology, presented by neurology residents and discussed by staff, 10 students; course period: 16 weeks, offered all year.
64344 Neurochemistry 4 a.h.
Introduction to the chemical special areas of biochemical chemistry as related to neurological disease; selected demonstrations of laboratory techniques; one student; course period: one quarter, offered all year.
Ophthalmology

Ophthalmology is a medical and surgical specialty concerned with research, diagnosis, and treatment of diseases of the eye and its adnexa, including correction of refractive errors.

The teaching program is designed for the training of medical students and resident physicians but is also available to graduates in biological sciences. The primary purpose is to qualify medical graduates for careers in ophthalmology.

Emphasis is placed on a scientific approach to problem-solving in diagnosis and treatment. The training program lasts three and a half years, of which six months are reserved for a laboratory or library study project.

Clinical facilities are available at three locations besides University Hospitals. The clinical training program culminates in qualification for the examination of the American Board of Ophthalmology.

The Master of Science degree is not offered as a primary professional objective but testifies to specialization in laboratory skills applicable to ophthalmology. The degree program can be pursued concurrently with the clinical training program, or independent of it. The usual requirements for the Master of Science degree apply. A thesis has to be defended.

The Department maintains several research laboratories: tumor diagnosis, including electron microscopy; toxicology, microbiology, and histopathology; and behavioral research. Fellowships and research projects are available.

The Department sponsors internationally an symposium, annually a national conference and a statewide program of continuing education.

Several subspecialties are represented in the Department: ocular pathology and physiology, pediatric ophthalmology, retinal disorders, glaucoma, neuro-ophthalmology, electrophysiology, contact lenses and refractive service, and medical and surgical ophthalmic photograpy.

Two features of the Department are outstanding: a large full-time faculty, and the opportunity to prepare for a career of teaching and research in ophthalmology.

Staff: professors Bland, Leitfeder, Winkler, associate professors Kolden, Oosigou, Thompson; assistants professors Barton, Golden, Phelps, Scott; research associate Alans, Baste; associates Brown, Friderich

Courses

67/100 Electro in Ocular Pathology 3 a.h.
TWO-WEEK PROGRAM

TWO-WEEK COURSE

S-27/101 Electro and Ocular Physiology 1 a.h.
TWO-WEEK COURSE

S-27/102 Elective in Nerve-Ophthalmology 2 a.h.
TWO-WEEK COURSE

S-27/103 Elective in Ocular Surgery 3 a.h.
TWO-WEEK COURSE

Ophthalmology

Department Head: President C. Bland
Degrees offered: M.D., Ph.D., M.S.
Residency

The assumption of in-resident responsibility and the opportunity for clinical and operating-room experience are the important aspects of residency training.

The first-year resident gains clinical training in anesthesiology through a four-month rotation in the Department of Anesthesiology. Previous advanced training in physical diagnosis, physiology, pharmacology and pathology now assume greater clinical significance. Increased responsibility in the operating room as surgeon and first assistant further develops surgical judgment and skills.

The development and implementation of a research project under staff supervision greatly enhances the value of the residency.

The senior resident assumes responsibility for major oral surgical cases during rotations in the University and VA hospitals. Each resident is assigned on a rotational basis as a clinical and didactic coordinator and assumes responsibility with the staff for clinic operation and departmental activities.

Upon completion of the internship and residency, the student will have completed the educational requirements for examination by the American Board of Oral Surgery.

Staff: Professors Hale, McLane; associate professors Higa, Kent, Thacker, assistants professors Wallon, instructors Lorton, Wood

Courses for Graduates

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>87102</td>
<td>Hospital Procedures</td>
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<tr>
<td>87103</td>
<td>Basic-Science Review</td>
<td>4.0</td>
</tr>
<tr>
<td>87104</td>
<td>Principles of Oral Surgery</td>
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<tr>
<td>87105</td>
<td>Principles of Anatomy</td>
<td>1.0</td>
</tr>
<tr>
<td>87106</td>
<td>Principles of Rehabilitation</td>
<td>1.0</td>
</tr>
<tr>
<td>87107</td>
<td>Surgical Anatomy</td>
<td>1.0</td>
</tr>
<tr>
<td>87108</td>
<td>Radiation Therapy</td>
<td>1.0</td>
</tr>
<tr>
<td>87109</td>
<td>Oral Surgery</td>
<td>1.0</td>
</tr>
<tr>
<td>87111</td>
<td>Literature Seminars and Journal Club</td>
<td>1.0</td>
</tr>
<tr>
<td>87113</td>
<td>Pediatrics</td>
<td>1.0</td>
</tr>
<tr>
<td>87115</td>
<td>Physical Diagnosis</td>
<td>1.0</td>
</tr>
<tr>
<td>87116</td>
<td>Principles of physical diagnosis, second session</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Basic principle of tissue handling and surgical technique
Orthopedic Surgery
Department Head: Carroll S. Larson
Degree offered: M.B., Ph.D.

The Department offers two types of postgraduate residency programs—a four-year integrated clinical program in which the resident participates simultaneously in inpatient care, outpatient care and surgery, and a five-year program for residents interested in academic careers.

The Clinical Program
During the various rotations, the resident gains experience in trauma, children's orthopedics, adult orthopedics, neurology, rehabilitation, prosthesis and orthotics, rheumatology and basic sciences related to orthopedics. During the first year, residents are required to take specialized courses in anatomy, bone histology, biochemistry, physiology and pathology.

A weekly seminar covers biomechanics, kinesiology and selected clinical subjects.

Residents attend the Northwestern University courses on lower extremity and juvenile amputees and prosthetics.

The Academic Program
This program begins at the end of the internship year. After completion of the clinical work outlined above, the resident devotes two years to research. The research may be in any field in which the resident is interested, provided it is basic science research in one of the orthopedic laboratories or a basic science department. The research may culminate in a master's or doctor's degree.

Departmental Laboratories
The orthopedic laboratories deal with problems in these major research areas:

Biochemistry—The biochemistry of mucopolysaccharides and collagen, both normal and those altered in polyphospho disulfi de and scoliosis.

Biochemistry—in conjunction with the College of Engineering, biomechanical problems of the upper extremity and biomechanics of the hip and the gait.

Cell Biology and Pathology—ultrastructural studies on normal bone, cartilage, tendons and muscles, and on those altered by experiment and disease.

Tissue Transplant and Radiopaque Stain—skin, bone and cartilage transplantation and the immunological aspects of these problems.

Facilities
The Department is housed in Children's Hospital, and has an active service in the nearby Iowa City Veterans Administration Hospital.

Facilities include 120 beds, an outpatient clinic, a specialty laboratory, a specialty radiology unit, a brace shop and physical therapy facilities.

The outpatient clinic sees approximately 85 patients a day.

Specialty clinics deal with such problems as accidents, club feet, congenital dislocated hips, neuromuscular disease, metabolic diseases, amputations, hips, knees, hands, splints and trauma.

Approximately 1,500 major operations are performed each year under auspices 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 visually impaired.

Staff: professor Boskey, Piar, Larson, Fosme, Cooper, professor emeriti Stearns, Paul, associate professor Pedrazzi, assistant professors Scottman, Stauffer, instructor Sprague

Courses
762 Principles of Orthopedics 2 s.h.
For basic medical students through year two. Credit toward Orthopaedic Surgery for Senior Medical Students 4 s.h.
An introduction to the technique and basic science of orthopedic surgery. Emphasis is placed on principles rather than on specific techniques.
76219 Fundamentals of Orthopedics 2 s.h.
For senior medical students only, prior approval of instructor required. Lectures, demonstrations and case presentations of orthopedic diseases from an anatomic, surgical and patient management viewpoint.
76219 Advanced Principles of Orthopedics 2 s.h.
Demonstrates current concepts and controversies on surgical treatment of primary orthopedic disease. Emphasis on principles of surgery for specific conditions.
76319 Postgraduate Courses in Orthopaedic Surgery 4 s.h.
Observation of all phases of clinical orthopedics. Clinical, ward, operation, research and rehabilitation in the treatment of hand, foot and limb injuries. Required for residents in orthopedics.
76211 Pathology (1st, 2nd) 2 s.h.
Weekly conference to present and discuss all cases operated upon in preceding week. In addition, any cases of interest to the residents are presented.
76212 Induction Conference 2 or 3 s.h.
Weekly conference to present and discuss all cases operated upon in preceding week. In addition, any cases of interest to the residents are presented.
76315 Postgraduate Conference 2 s.h.
Weekly conference to present and discuss all cases operated upon in preceding week. In addition, any cases of interest to the residents are presented.
76315 Preclinical Management 2 s.h.
For senior medical students, one hour weekly for eight weeks, assignment to trauma service. Full participation in care of patients under three surgeons.
76316 Laboratory Experience 2 s.h.
For senior medical students, one hour weekly for eight weeks, assignment to trauma service. Full participation in care of patients under three surgeons.
76316 Anatomy of the Extremities and Back 2 s.h.
Weekly laboratory course with material available for in-depth discussion and for written essay of surgical approaches.
Otolaryngology and Maxillofacial Surgery

Department Head: Brian F. McCabe
Degree offered: M.B.

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 anatomy, 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 palate; disorders of the vestibular mechanism; facial plastic surgery; pediatric and geriatric hearing problems; voice problems; prenatal endoscopy; surgery of deafness; and all the areas usually considered otolaryngologic.

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, speech and hearing, 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 junior most training research. All senior faculty members participate in research and all residents are advised to participate in this research 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, cleft palate, collagenase in temporal bone disease, anatomy of the temporal bone, EEG audiometry, pathology of the temporal bone and electrophysiology of the inner ear.

The majority of these research programs receive federal support.

Graduate Course in Otolaryngology

The postgraduate training program in otolaryngology is in accordance with the requirements of the American Board of Otolaryngology. The program comprises a four-year course consisting 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 residency and runs from June 1 to October 15 of each year.

After passing an oral and/or written examination, the student enters the clinical phase of the course, which includes supervised clinical and operative work, clinical conferences, and seminars pertinent to the practice of otolaryngology and its related fields. A limited number of resident physicians can be accepted each year. Applicants must be graduates of a recognized class-A medical school and must have completed an internship of one year and one year of general surgical training in an approved program.

Upon successful completion of the four-year course, which must include an acceptable thesis, candidates are awarded the Master of Science degree. To complete the requirements, the student must earn at least 30 semester hours of credit, one-third of which must come from the basic science group.

Elective courses of study to broaden the individual's cultural knowledge may be taken by students capable of additional work. Staff: professors McCabe, Adams, L. Baurains, Litton, Morris, Olin, Siapenetschek; professors emeriti Liel, Reger; associate professors Anderson, Karmarka, Smith, VanDorn; assistant professors Aharonn, Harker, Krause, LaVelle, Mendel, Nuerain, Yoo; research associates Kuhl, Rya, Tharp, Vander-Haar, Winden, instructors Talbot, Fellows P. Bernstein, Ulrich

Courses

68:203 Basic Otolaryngologic Science

68:204 Advanced Otolaryngologic Science

68:206 Otolaryngologic Clinics

68:207 ENT Pathology

68:210 Research Techniques in Otolaryngology

68:211 Clinical Conference in Otology and Rhinology

Maxillofacial Surgery

68:212 Diagnosis and Treatment of Trauma

68:213 Clinical Conference in Maxillofacial Surgery

68:215 Seminar in Maxillofacial Rehabilitation

68:216 Maxillofacial Prosthetics

Clinical experiences: residents train in a variety of surgical fields, including microsurgery, plastic surgery, and maxillofacial surgery. Residents are required to participate in research projects and to present their results at scientific meetings.

Otolaryngology and Maxillofacial Surgery
Pathology
Department Head: George D. Pensick
Degree offered: M.S.

The Department offers a wide range of formal courses and training programs variously designed for medical, dental and graduate students, as well as for those seeking special training leading to certification in anatomic and clinical pathology by the American Board of Pathology.

Medical and Dental

Instruction for the M.D. and D.D.S. degrees is provided through courses in general and systemic pathology. Courses in both areas are designed to fulfill tightly-structured educational objectives, and utilize a variety of learning experiences: lectures, self-instructional tape-slide, programmed-texts, autopsies, laboratory tours, clinicopathologic conferences and small group discussions of selected case material.

The courses in general pathology introduce the student to the general responses of the body and to various types of injury, including inflammation, neoplasia, immune responses, etc. During the courses in systemic pathology, the student learns to apply these general principles to a study of the specific disease entities as the responses occur in the various body systems. Integrated with these courses is a systematic introduction to the principles and applications of laboratory medicine to the understanding and diagnosis of disease processes.

A variety of programs is available for students who wish to pursue in depth special topics in pathology during other periods of their medical or dental training. Special courses in both anatomic and clinical pathology are offered to electives to senior medical students. In addition a limited number of externships and clerkships are available to predoctoral students.

Graduate

Coursework leading to the Master of Science degree in pathology is available to students of medicine and medical technology. The program is quite flexible in design, to accommodate the special interests and experiences of the individual student. In general it is structured around a research project pursued under the guidance of a selected faculty member; but it allows the student adequate opportunity for formal coursework in pathology and other basic sciences.

Postdoctoral

The Department is approved for two straight internships in pathology and 18 residencies, covering a training span of up to five years. The programs are designed to utilize the patient population of both University Hospitals and Clinics, and the Iowa City Veterans Administration Hospital.

There is systematic rotation through the various laboratory services, including surgical pathology, autopsy pathology, medical chemistry, medical microbiology, hematology and blood bank. Adequate opportunity is afforded for concentrated study in such subspecialties as neuropathology, dermatopathology and gastroenterologic pathology.

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, lungs, hematopoietic tissues, heart and blood vessels, as well as medical microbiology, medical chemistry, hematology and blood banking.

A special postdoctoral training program is also offered in medical chemistry designed for Ph.D. biochemists.

Medical Technology

The Department of Pathology is responsible for the Medical Technology Program leading to the Bachelor of Science degree and certification by the Board of Registry of Medical Technologists of the American Society of Clinical Pathologists. (See "Medical Technology" under "College of Liberal Arts.")

Facilities

The undergraduate programs are supported by a recently-remodeled student laboratory, as well as conference rooms for small group discussions.

At present the Department houses a newly-remodeled modern histopathology laboratory equipped for efficient processing of tissue specimens; a special stain laboratory; a special neuropathology histotechnique laboratory; an autopsy room with two dissecting tables; a cytopathology laboratory; an immunopathology laboratory; and a Departmental library.

Modern automated equipment is in operation in medical chemistry and hematology, and computerization programs are being developed. A service laboratory and a training laboratory are available in medical microbiology. Research facilities consist of individual faculty laboratories and three electron microscope laboratories.

Expansion plans call for doubling the available space and consolidating laboratory operations. This will include construction of new clinical laboratories and teaching facilities.

Staff: Professors Fisher (Oral Pathology), Kopeka, McCormick, Pensick, Rodina, Routh (Biochemistry), Stansier, Warner; Associate Professors Givler, Kent, Korns, Ron, Schochet; Assistant Professors Barrett, Nichol, M. L. O'Connor, Plasky, Shacklett, Simmons; Clinical Professor Coors (Henry Hospital, Iowa City); Clinical Associate Professor Coors (VA Hospital, Des Moines); Clinical Assistant Professor Keridon (Broadlawns Hospital, Des Moines); Medical Technology Program coordinator Gloria Смотрите следующее: J. E. O'Connor, Paint, Schwabauer, Winkel.

Courses

All courses are open to instructor consent.

1001 Introduction to Medical Technology 1 a.h.
Examinations of medical technology in various diagnostic laboratories, professional organization, certification and professional organizations of other laboratory professions.

1002 Medical Technology: Preventive Care or arr.
Relation through all sections of clinical pathology service laboratories; under supervision, performance developed in the field of laboratory procedures on patient specimens, and organization of service laboratories learned in this principles of Pathology

1 a.h.
Laboratory and demonstrative emphasis on tumors, mechanisms and principles of tumor dissemination and ability to communicate in these terms; topics include inflammation, infection, elements of park, deficiencies, degeneration and acute and chronic metabolic anomalies. An advisory course for allied health professionals.
Pharmacology

70004 Pediatric Endocrinology and Diabetes 4 s.h.

70005 Neonatal Pediatrics and Pediatric Intensive Care 2 s.h.

Program consists of aspects of 70005 with care of seriously ill infants in Pediatric ICU. Two weeks.

70006 Neonatal Pediatrics 2 s.h.

Student participates in design and conduct of original studies designed to answer ques-
tions on diagnosis, treatment and prevention of medical problems experienced by neonates. 
maximum two students; four weeks.

70008 Consultative Ambulatory Pediatrics 2 s.h.

Can be repeated to interests of individual student, who participates in pediatric 
specialty clinics in any combination selected; maximum six students; four weeks.

70009 Community Pediatrics 4 s.h.

Emphasis on public health aspects of pediatrics, including analysis of community health 
resources, identification of community needs, development of new programs for screening or disease prevention, immunization and school health, maximum 
two students; four weeks.

70010 The Multihaptonal Child 2 s.h.

Emphasis is on coordinating diagnostic workup of a child with multiple 
problems, mental and/or psychosocial, two weeks.

70011 Primary Health Care of the Child with Chronic Health Problems 3 s.h.

Combines elements of primary care and pediactric care, four weeks.

70012 Growth, Pediatric Nutrition, Gastroenterology and Renal Disease 4 s.h.

- Four-week elective emphasizing clinical aspects of growth and nutrition in pediatrics, 
  metabolism, endocrinology and obesity including sick children, clinical as-
  pects, approach to the patient, research activities, maximum eight students; 
  four weeks. 

70013 Growth, Pediatric Nutrition, Gastroenterology and Renal Disease 4 s.h.

- Four-week elective focusing on clinical aspects of growth, nutrition and 
  renal disease, students desiring to specialize in this area may elect this course 
  for this area, maximum eight students; four weeks.

70014 Community Pediatrics: Preventive Pediatrictan 4 s.h.

Provides exposure to private practice of pediatrics; student observes and partici-
pates with practicing pediatricians in daily office and hospital care of children. 
November, December, January, February; four weeks.

70015 Community Pediatrics: Johns Hopkins Hospital, One Month 4 s.h.

- Gives student opportunity to work in community-based hospital and gain experi-
  ence in care of patients seen in daily practice and in special programs referred to 
  in children's hospital; one student; four weeks.

70016 Pediatric Hematology 4 s.h.

- Centers on concepts and clinical approach to hematological prob-
  lems in children; one student; September through May; four weeks.

70017 Pediatric Neurology 4 s.h.

- Close work with fellows and staff members, taking part in academic activities of 
  this unit, including Dermatological, one student; September through May; 
  four weeks.

70018 Child Development Clinic 4 s.h.

- Intern is to learn certain screening tests for developmental and emotional problems in 
  children, and learn to analyze in low-income communities; for these problems: one 
  student; September through May; four weeks.

70019 Pediatric Cardiology I 4 s.h.

- Emphasis on clinical activities, observing cardiac patients, 
  and gaining some exposure in cardiac catheterization, ECG and radiology; 
  physical examination of heart and pericardial disease, and in care and 
  treatment of congenital and acquired heart disease; electives: two students; 
  two weeks.

70020 Pediatric Cardiology II 4 s.h.

- One-week seminar presenting pertinent topics in pediatric cardiological; two 
  weeks. (Integrated into course, see above). two weeks.

70021 Pediatric Hematology 4 s.h.

- Two-week seminar presenting pertinent topics in pediatric hematology; two 
  weeks. (Integrated into course, see above). two weeks.

70022 Pediatric Cardiology 4 s.h.

- Time spent on any of pediatric services—neurology, surgery or pediatrics, care 
  wards, dress patient responsibility under supervision of resident and assisting 
  physicians; three students; four weeks.

70023 Evaluation of Child Behavior 4 s.h.

- Includes evaluation and treatment of children's behavior problems, four students; 
  four weeks.
research can usually be completed with four years' graduate work beyond the bachelor's degree. The Ph.D. is awarded upon acceptance of a dissertation and satisfactory performance at the final oral examination.


Courses

7101 Medical Pharmacology 4 s.h.
Lecture-laboratory: pharmacologic action and therapeutic use of drugs acting on central nervous system not included; first semester, sophomore year.
7111 Pharmacology for Dental Students 6 s.h.
Lecture-conference-laboratory: Pharmacologic actions and therapeutic use of drugs concerned, emphasis on tissue of special interest in dentistry; second semester, freshman year.
71105 Introduction to Pharmacology 3 s.h.
Pharmacology and experimental approaches to drug research; emphasis on concepts and toxicology of biological systems; chemotherapeutics and meperidine theory included; no prerequisites, first semester.
71300 Lecture-laboratory: general principles; open to students in pharmacy and qualified graduate students; preprerequisite biology and organic chemistry; second semester.
71105 Pharmacology and Toxicology 3 s.h.
Continuation of 71102; lecture-conference-laboratory; emphasis on topics of special interest in pharmacology; open to students in pharmacy; first semester.
71330 Drugs: Their Nature, Action and Use 3 s.h.
Lecture-discussion: principles of drug action and drug toxicity; specific classes of drugs covered include anesthesia, anti-inflammatories, sedatives, stimulants, hallucinogens, narcotics and others; open to all students; course material general to students not having strong background in science; no prerequisites; first semester.
71001 General Pharmacology 4 s.h.
Same as 71102; prerequisites: introductory courses in physiology and biochemistry, and consent of instructor.
71005 Pharmacology Research 1 or 2 s.h.
Consult Department head for permission to register.
71105 Cardiovascular Pharmacology 3 s.h.
Disorders of the circulatory system; effects of drugs on specific areas of the cardiovascular system; emphasis on mechanisms of action of cardiovascular drugs; prerequisite: consent of instructor; first semester, alternate years; offered 1971-72.
71105 Biochemical Pharmacology 3 s.h.
Lecture-laboratory on the biochemical basis of drug absorption, distribution, excretion, metabolism, receptor interactions and enzyme inhibition; prerequisite: consent of instructor required; alternate years; offered 1971-72.
71105 Biophysics and Biostatistics 3 s.h.
Presents fundamental applications of physical and mathematical principles in design of experiments and interpretation of biological data; intended for students' majors, analysis of variance, linear regression, chi-square, Fisher's exact probability, Mann-Whitney U test, principles of biometry and experimental design; laboratory exercises consist of statistical data and designing experiments; prerequisite: consent of instructor; may be taken by free-year graduate students with proper background.
71105 Special Topics in Pharmacology 1 s.h.
Consult instructor for permission to register.
71105 Toxicology 3 s.h.
For pharmacology majors and others interested students; selected topics in pharmacology, toxicology and mechanisms of drug and injury induced effects, methods of evaluation, and laboratory evaluation; major safety evaluation, forensic and environmental topics; prerequisites: consent of instructor; second semester, alternate years; offered 1970-71.
71105 Mechanisms of action of drugs affecting renal transport systems; prerequisites: introductory courses in physiology and pharmacology, general chemistry and courses in pharmacology; first semester, alternate years; offered 1971-72.

71216 Clinical Toxicology 1 s.h.
Acute poisoning and treatment; general topics on toxicology; prerequisites: 71105 Medical Pharmacology or equivalent; first semester.
71205 Clinical Pharmacology and Therapeutics Lecture and Lab 5 s.h.
Lecture and laboratory; clinical aspects and therapeutic use of drugs, special emphasis on pharmacologic approach to treatment of chronic illness; forthird and fourth-year medical students, pharmacy students, other premedical students; same as 71330 Internal Medicine; second semester.

Physical Therapy

See "College of Liberal Arts".

Physiology and Biophysics

Department Head C. Adron H. Hogen
Degrees offered: M.S., Ph.D.

This program is intended primarily to prepare the student for a career of research and teaching, usually at the college, graduate and professional school levels. Graduate training in physiology and biophysics usually progresses to the Ph.D. degree. Those who successfully complete the program often postdoctoral research fellowships in their area of interest for one or two years before applying for positions of their choice.

Prerequisites for graduate study include one year each of biology, physics, chemistry, political chemistry, and physical chemistry. The undergraduate major is not narrowly prescribed, and the graduate student group commonly includes persons with baccalaureate degrees in biology, chemistry, physics, mathematics and engineering.

The Ph.D. program begins with the early completion of deficiencies in prerequisite courses and the acquisition of further knowledge and capability useful to the particular program goals. The selection of courses is determined by the individual's evolving interests and by consultation with a faculty advisor. Teaching experience is gained through supervised participation in course offerings of the Department.

Comprehensive examinations are taken usually by the end of the second year of graduate study. One or two years later, when the candidate has attained competence in independent scholarship—primarily through research under the immediate supervision of an adviser—the final examination takes place. This consists of the defense of a thesis. No candidate is recommended for the degree Doctor of Philosophy until, with the approval of the adviser, the thesis dissertation has been prepared for formal publication and the manuscript has been accepted for publication in an appropriate scientific journal.

Applicants whose career goals would not best be served by the Ph.D. may, with the assistance of the Department, develop a program leading to the M.S. degree. Acceptance as an M.S. candidate is contingent on faculty approval of the program of study. Fellowship support is available for doctoral students.

Facilities

The Department is housed on the top two floors of the Basic Sciences Building, a new facility for research and teaching. In addition, a new unit for research in neurophysiology is operating.
at the Oskaloosa Campus about six miles west of the main health-science campus.

Faculty

Department faculty members are active in many different areas of research in physiology and biophysics. Many have received world-wide recognition for achievements in their respective fields.


Courses

72:15 Introduction to Human Physiology 4 s.h.

Basic concepts of human physiology: introduction. Zoology 1. Chemistry 1. and 2 for equivalent, student of anatomy; three lectures, one laboratory and one discussion weekly.

72:102 Physiology of Exercise 4 s.h.

Basic concepts of coordination and delayed adaptation to vigorous exercise and recovery; topics to include: muscle function, metabolic requirements and recovery; endocrine responses to exercise; effects of exercise on cardiovascular and pulmonary systems; effects of exercise on the cardiovascular and pulmonary systems; effects of exercise on the cardiovascular and pulmonary systems; effects of exercise on the cardiovascular and pulmonary systems; effects of exercise on the cardiovascular and pulmonary systems.

72:103 Neurophysiology and Behavior 4 s.h.

Interdisciplinary study of organization and function of nervous systems; same as 50:103. 60:107, 71:207 and 72:107. biologic support, requirements and methods for graduate students in physiology; prerequisites: consent of instructor.

72:119 Endocrinology for Medical Students 1 s.h.

Same as 50:119 and 60:119; for graduate students; core course in endocrinology; given first half of second semester; eight weeks.

72:141 Analytical Study of Physiology 2 s.h.

Designed for students of physical and engineering sciences to provide a background basis in applied physiology to their training in biological problem; includes basic concepts of physiology; emphasis on concepts dependent upon physical theory; prerequisites: two full years of physical or engineering course and introduction to differential equations; first semester.

72:142 Analytical Study of Physiology 2 s.h.

Continuation of 72:141; similar study process: particularly strong background. 72:41 can be a prerequisite to 72:142, but otherwise no previous life science required.

72:151 Intermediate Physiology 4 s.h.

Lectures and laboratories of physiology, emphasis on principles of physiology, required readings for earlier physiologists. Herein undergraduates; five lectures, four laboratories; prerequisites: consent of instructor; first semester.

72:152 Intermediate Physiology 4 s.h.

Lectures and laboratory dealing with principles of physiology and detailed treatment of organ systems and cell types; required of dental students; open to graduates and Honors undergraduates; emphasis on physiology of man in the course of his normal life; prerequisites: consent of instructor; first semester.

72:199 Research in Physiology and Biophysics 4 cr.

For graduate students who are not master's or doctoral candidates of Department of Physiology and Biophysics; prerequisite: consent of head of the Department.

72:201 Introduction to Biophysics 4 s.h.

Physiologic concepts and physiological problems; such topics as bioelectricity, biochemistry, cell structure and function, and flow and diffusion in living systems; emphasis on preparation for lectures in physiology, physics and chemistry; includes: two lectures, two laboratories and one research laboratory per week; first semester, alternate years; offered 1973-74.

72:202 Advanced Physiology of Exercise 4 s.h.

Selected topics from advanced physiological effects of exercise on physiological systems; required for graduate students majoring in physiology; topics include: muscle function, metabolic requirements and methods for graduate students in physiology; prerequisites: consent of instructor; second semester.

72:203 Advanced Physiology of Exercise 4 s.h.

Selected topics from advanced physiological effects of exercise on physiological systems; required for graduate students majoring in physiology; topics include: muscle function, metabolic requirements and methods for graduate students in physiology; prerequisites: consent of instructor; second semester.

72:208 Endocrinology for Medical Students 1 s.h.

Same as 50:208; discussion of selected topics; open to graduates; prerequisites: consent of instructor; fall semester.
Preventive Medicine and Environmental Health

Department Head: E. P. Jacobson

Preventive medicine may relate to the individual patient when knowledge and techniques from medical, social and behavioral sciences are applied to prevent disease or its progress, or it may encompass the whole community by applying the knowledge and skills of medical and allied sciences in an organized community effort to maintain and improve the health of groups of individuals. Environmental health is the study and control of the 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 1883, 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 sanitary science and other areas of public health, including epidemiology and communicable disease control, institutional and food sanitation, industrial hygiene, toxicology and health administration. Many graduates of the Department have gone on to national and international achievement in public health work.

In 1955 the Department sponsored the development of the Institute of Agricultural Medicine, the first in the western hemisphere dedicated to the study of the occupational health problems of the agricultural worker. Since then the Institute has achieved national and international recognition for its study of the health problems associated with the diseases of animals transmitted to man, agricultural accidents and the effects of pesticides on human health. The varied programs of the Institute provide practical training for students of the health professions as well as for medical students at the graduate and postgraduate levels.

The Department excels in its biostatistics program, where undergraduate and graduate instruction is provided by a nationally-recognized faculty. Departmental programs are enhanced through affiliations with the State Hygienic Laboratory, the University Environmental Health Service, Health Service in Housing and the Department of Civil Engineering.

The Department has traditionally offered degrees at the master's and doctoral levels with emphasis in preventive medicine, environmental and occupational health. The Department is presently (1971-72) undertaking a comprehensive revision of its curriculum and program offerings to provide instruction in the newer concepts of the community and social aspects of health. A new undergraduate major in environmental science is being developed.

Courses

03:101 Health Science I
03:3 or 4 s.h.
Section 1 — Health: Nutrition: requirements of human health; stresses and adjustment of physical, social and cultural environments; diseases of man and their treatment; three semester hours. Section 2 — Health Care Systems: historical and current approaches to delivery of health care; prospects for future health care delivery systems; two semester hours.

03:102 Health Science II
03:3 or 4 s.h.
Section 1 — Environmental Health Sciences: Fundamentals of social, cultural and physical environments; food and nutrition; three semester hours. Section 2 — Environmental Management: Health law and regulations; organizations engaged in environmental management; economic and administrative problems associated with pollution prevention; two semester hours.

03:153 Public Health Aspects of Food and Housing
2 s.h.
Lectures on aspects of food and food production and processing, with laboratory, prescriptive and field training included: open to seniors and graduate students; 3 credits (in progress).

03:140 Medical Parasitology
4 s.h.
Helmints, protozoa and other parasites of public health importance; their life cycles, intermediate hosts, methods of diagnosis and prevention, lectures, demonstrations, reference and laboratory; medical technology and undergraduate student requirement; four semester hours.

03:180 Biostatistics
2 or 3 s.h.
Elementary course in statistical methods, primarily for students engaged in research in medical and related subjects; may be taken by qualified individuals interested in research in biological fields; same as Statistics 226:101.

03:1911 Biostatistical Methods in the Biological Sciences
2 or 3 s.h.
Biostatistical methods and concepts particularly appropriate for biomedical research; topics include descriptive methods, elementary probability, distributions, populations and samples, methods for assessing percentage data and paired and unpaired experimentation, analysis of variance, regression analysis, analysis of residuals, clinical trials and epidemiology; same lectures as the Biostatistical Methods in the Biological Sciences, same examinations; same as Statistics 226:102.

03:1911 Biostatistical Methods in the Biological Sciences
2 or 3 s.h.
Techniques of constructing and analyzing sample surveys including general methods of estimation, properties of estimators, simple random sampling, stratified sampling, ratio and regression estimation, systematic sampling, quota sampling, multiple or cluster sampling; prerequisite Statistics 226:23, 226:41 or equivalent; same as Statistics 226:102.

03:1911 Occupational Health
3 s.h.
Lectures, discussion, demonstrations and field trips dealing with health and safety factors in industrial environments and the application of methods of protecting mankind.

05:102 Research: Preventive Medicine and Environmental Health
2 or 1 s.h.

05:120 Seminar
0 or 1 s.h.

05:200 Thesis
0 or 1 s.h.

Psychiatry

Department Head: George Winokur

The Department of Psychiatry is engaged in teaching medical students in two areas. It provides medical students with instruction directed toward their acquisition of expertise in handling various problems in living. Further, it presents a systematic and
comprehensive evaluation of the diagnosis, ideology, natural history and treatment of the various psychiatric diseases.

To accomplish this, the Department participates in the neurobiology course and presents a course in the preclinical years which is concerned with clinical diagnosis. In the junior year there is a six-week clerkship on the psychiatric wards and outpatient clinics directly under auspices of the Department or affiliated with it.

The Department also functions as an Accredited Residency Program in Psychiatry which can lead to certification. This three-year residency provides extensive experience in inpatient psychiatry, outpatient psychiatry and child psychiatry.

Among the unique characteristics of the Department is its ability to be flexible in offering clerkships, externships and research opportunities to medical students. This flexibility is also characteristic of the residency program, in that a resident may choose from a number of clinical areas and may spend a considerable amount of time in original investigation.

The basic science areas of neurochemistry, cytogenetics, neurophysiology and electrophysiology are well represented in the Department, offering both the medical student and the resident an opportunity to profit from association with faculty working in these fields.

Psychology also runs a large program concerned with behavior therapy, group therapy and experimental psychology.

The major teaching areas are the wards, clinics and laboratories of the Iowa Psychopathic Hospital, the psychiatry area of the Veterans Administration Hospital and such diverse places as the Iowa City Mental Health Center, the General Hospital of the University of Iowa and the Mental Health Institute in Independence.


Courses
773 558 Clinical Psychiatry for Junior Medical Students 6 h.
Sociology of mental illness, including current views and existing psychiatric patients in Psychopathic Hospital, through a six-week period; history taking, mental examination and interviewing.
770 108 Research Psychiatry or. ar. 5 h.
Research in psychiatry; the basic principles of scientific methodology essential for special investigations in biological or psychological problems related to psychiatry.
770 106 Research Psychiatry or. 1 h.
Combination of 770 108, but may be taken as independent unit.
770 207 Seminar: Biology of Behavior 2 h.
Biological basis of behavior, genetics, constitutional, psychological, biochemical, genetic and physiological factors in relation to normal and abnormal behavior and relations of these factors to therapy.
773 116 Research in Psychiatry 1 h.
772 281 Electroencephalography 2 h.
Readings, discussions, laboratory practice in clinical and experimental electroencephalography, equipment and technique, qualitative interpretation and systems. Instruction in patient care techniques.
3 h. 772 281 Research in Psychiatry or. 1 h.
772 131 Problems in Psychiatry or. 1 h.
Open to seniors in law and medicine; mental disease considered from medical-legal view by various clinicians and law students.

Radiation Biology
Department Head: Titus C. Evans
Department degrees offered: M.S., Ph.D.

Radiation biology is the study of the properties and biological effects of radiotopes and ionizing radiations, such as X-rays, and the use of these radiation tools in the study of living processes. The field comprises parts of several disciplines, among them biology, physics and chemistry.

Undergraduate Courses
Two courses, 77 103 introductory Radiation Biology and 77 106 Radiological Safety and Health Physics, are open to undergraduate students and should be of interest to those who plan to enter medicine, nuclear medical technology, environmental health or similar programs.

Graduate Programs
The M.S. degree in radiation biology is usually taken by students who plan to stop their training, at least temporarily, to take employment at a technical level. The program is utilized by students who later complete work for the Ph.D. in a related field.

The Ph.D. program in radiation biology is open to graduate students with a background of study in physics, chemistry, mathematics, biology, health sciences, veterinary medicine or engineering. Students completing this program find professional appointments in departments of radiology or nuclear medicine, or in cancer research centers.

After the student has completed the introductory course he or she may elect to emphasize one or more aspects of radiation biology. The details of his or her program are built around previous training, interests, abilities and career objectives.

Some students elect to emphasize training in physical aspects, such as radiological physics or health physics. Others major in biological aspects. In either case a broad base rather than specialization is the goal.

The properly-prepared student will have had several courses in biology, chemistry, physics and mathematics before starting a graduate program. In addition he or she should have a reading knowledge of science French or German and should have competence in statistics or computer programming before completing the Ph.D. program.

In addition to formal courses, the programs involve small-group conferences and discussions. Laboratory exercises are emphasized, and the student has an opportunity to become acquainted with many types of instruments and techniques.

Students will have at least one semester of experience as teaching assistants, and at least one as research assistants. A limited number of paid assistantships and fellowships are available.
Special Facilities

The Radiation Research Laboratory has several X-ray generators and a small neutron generator. Students and staff members also have access to other radiation sources, such as the X-ray gamma source in the Department of Radiology and the reactor of the Biology Division at Argonne National Laboratory.

The Radiation Research Laboratory has a variety of radiation detectors and counters, including liquid scintillation counters and a small animal whole-body counter, and it has access to the human whole-body counter at the Iowa City Veterans Administration Hospital.

The Laboratory also has an electron spin resonance spectrometer, an ultraviolet spectrometer, an automatic cell counter and particle size, an electron microscope and shadow coat, and facilities for preparing histological sections of tissues—fixed or frozen—and autoradiographs.

Three air-conditioned rooms provide convenient housing for the small laboratory animals used in research and teaching.

Special Faculty Strengths

The faculty has had many years of teaching and research experience in radiation biology. All are members of the Radiation Research Society and a number are members of such societies as the International Association for Radiation Research, American Roentgen Ray Society, Radiological Society of North America, Society of Nuclear Medicine (of which one faculty member was president) and Health Physics Society.

The Laboratory has been the office of the managing editor of Radiation Research since the inception of the Radiation Research Society.

Staff members have served on executive boards and advisory committees of the American Cancer Society, the National Council Radiation Protection and Measurements, and state and University radiation protection programs.

Some faculty also participate in the Visiting Radiation Biologist Program of the American Institute of Biological Scientists.

Faculty members have authored or co-authored numerous papers and chapters of books dealing with radiobiological effects, uses of radiobiology, and cancer research and therapy.

Staff: professors Evans, Osborne, Riley, Jackson; associate professors Chen, DeGraw; assistant professors Coop, Sooy; post-doctoral fellows Sharp

Courses

71/118 Introductory Radiation Biology 4 1/2
Characeristics and biological effects of ionizing radiation; properties and uses of radiation equipment. Introduction to the biological basis for protective procedures; laboratory techniques in the use of radiation detectors, monitoring devices, radiobiological techniques, characterization of radiation effects; preparation of instructor.

71/108 Environmental and Radiobiological Health Physics 3 3/4
Lectures, discussion, laboratory exercises: radiation hazards, control regulations, problems of design and use of radiation facilities in medical, academic and industrial situations; standard and emergency procedures for controlling radiation hazards. Exposures and dose measurements in radiation and environmental protection, personal and public health; basis of physics or chemistry of Arizona state instructors. The duration of these rotations through the various subspecialties is adjusted to the individual's studies. The radiation programs for the post-doctoral fellows Sharp.

Staff: professors Christie, Cornell, Evans, Jackson, Latourrette, Osbourn, Petersen, Riley; authors: Lillian Grill, Kerr, associates: professors Chen, Jackson, Dolein; assistant professors Brown, Tapan K. Chaudhuri, Tuhin K. Chaudhuri, Guthrie, Lunera, Sandrock, Schaprio, Sooy; instructors: Ehrhardt, Ingersoll, associate Ciarini, Go, Hahn, Rice, fellow Suzuki
Courses
74501 Introduction to Radiology 3 h.
Basic concepts in radiologic diagnosis of disease, abdominal and bone diseases; natural macrovascular techniques; aids and techniques of radiation therapy; an introduction to Radiation therapy.
Prerequisite: consent of the instructor; offered September through July.
74502 Clinical Radiology 2 h.
Physical methods used to create images through utilization in gastrointestinal, urologic, bone, chest and musculoskeletal radiology; two students per sub-committee; laboratory methods, interpretation of images of various organs; student rotation in Radiology; subscription time: two weeks; offered September through July.
74503 Radiologic Procedures 2 h.
Interpretation of radiologic examinations of patients. May confer with other diagnostic and medical staff, including two students; program of instruction in Radiology; subscription time: two weeks; offered September through July.
74504 Angiography 2 h.
Clinical indications, technique and interpretation of abdominal and pelvic angiographic procedures; one student; program of instruction in Radiology; subscription time: two weeks; offered September through July.
74505 Neuroradiology 2 h.
Clinical indications, techniques and interpretation of neuroradiologic procedures; cerebrovascular and peripheral vascular procedures; one student; program of instruction in Radiology; subscription time: two weeks; offered September through July.
74506 Radiation Therapy 2 h.
Radiation therapy in modalities of cancer therapy: indications, techniques, objectives; two students; subscription time: two weeks; offered September through July.
75507 Nuclear Medicine 2 h.
Clinical application of nuclear medicine, scanning theory and techniques of diagnostic and interventional nuclear medicine; program of instruction in Radiology; subscription time: two weeks; offered September through July.

Surgery
Chairman: Bishop E. Jaffe.
Vice-Chairman: Lawrence B. DeBastiani.
Degree offered: M.D.
The Undergraduate Program
Programs are available only to medical students and to qualified individual students in associated health sciences. The undergraduate program in surgery develops awareness of surgical therapy in the treatment of disease. Exploration is placed upon basic emergency techniques; trauma, oncology; normative, pre-interventional and interventional therapy and trauma, endocrine disease, particularly of the breast; transplantation; thoracic-cardiovascular conditions; and neurosurgery. A majority of the courses involve patient-oriented discussions and practical exercises interspersed with operating room experience. However, there are lectures and seminars on specific topics.
Special programs in selected topics of surgical research, independent study and clinical experiences outside the University Hospitals complex are available to individual senior medical students by special arrangement with the faculty. Admission requirements are those of the College of Medicine, except in the case of specific topics designed for students of the associated health sciences.
Graduate Programs
The graduate program leading to a master's degree in surgery combines coursework in allied scientific fields with a year of intensive research in surgical problems either in the clinic or the laboratories. The program is designed primarily for surgical residents who plan a career in academic surgery; it is available only to medical students and to qualified individual students in associated health sciences.
The content of the master's program, both with respect to required coursework and laboratory investigation leading to the thesis, is determined by the resident involved and his or her faculty advisor, in consultation with the Department head.
Special programs in basic science and clinical research are available to interested residents, but they carry no academic credit unless they are related to a master's degree program.
Required: GRE Aptitude Test
Undergraduate major in the field of graduate study.
One year devoted full time (or equivalent) to research.
Thesis—Formal, publishable, defended in oral exam.
Facilities
The Department's Belzer Unit provides a unique opportunity to investigate problems involved in the preservation of organs harvested for transplantation. The Departmental Biochemistry laboratory provides the equipment, space and technical expertise necessary to support a wide spectrum of basic science metabolic research projects. The Departmental Burns Unit, the only one of its kind in the state, provides adequate patient material for both clinical and basic science research.
The Faculty
Special faculty strengths are centered in the fields of pathophysiology and problems of severe burns, the surgical control of morbid obesity, inflammatory bowel disease, the pathophysiology of biliary tract disease and pediatric surgery. The thoracic-cardiovascular and neurosurgeons have particular expertise in the clinical management of the spectrum of diseases in their specialties.
Both the undergraduate and graduate programs in surgery provide opportunity for a unique combination of patient-care-oriented experience and basic surgical research designed to give the interested student a deep awareness of the place of surgery among the physician's skills.
Courses
75101 Basic Emergency Techniques 1 h.
Six-week primer course in emergency medical technician: emphasis on pre-clinical examination and application of certain medicinal methods.
751111 Introduction to Clinical Medicine
Multidisciplinary course designed to prepare medical student for junior clerkship. Service of history and physical examination; sitting resident in recognition and treatment of acute disease complications.
75601 Clinical Surgery Clerkship
8 h.
First course in clinical surgery; required of junior medical students.
75707 Neurology-Neurosurgery Conference 1 h.
Case study.
75130 Principles of Surgery
Case study.
75135 Undergraduate Physical Therapy
Administrative Staff

Dean: Evelyn R. Barrett
Assistant Dean, Graduate Program: Elzie Zammusen
Assistant Dean, Undergraduate Program: Mildred Frei
Coordinator, Articulation Project: Adrian Bahnemann
Director, Continuing Education: Pearl Zarnovitz
Ph.D., B.S., M.A.

With the colleges of Medicine, Dentistry and Pharmacy, 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 a major and modern university.

The bachelor's degree program for licensure as a registered nurse is fully approved by the state licensing agency, the Iowa Board of Nursing. In addition, both the baccalaureate and the graduate programs are accredited by the Department of Baccalaureate and Higher Degree Programs of the National League of Nursing, which is the professional accrediting agency for college and university programs of nursing education.

Undergraduate Program

The purpose of the undergraduate program is to prepare professional nurses with competencies relevant to contemporary and emergency health care systems and to provide a basis for graduate study.

Graduates of this program are employed in a variety of health agencies and settings, such as hospitals, clinics, extended care centers, nursing homes, public health agencies, industries, governmental agencies and the armed services.

The baccalaureate program comprises coursework in four areas: communication skills, the social, biological and physical sciences basic to nursing; the student's choice of electives; and professional nursing. Graduation normally requires four academic years and 124 semester hours of credit.

Preparatory coursework for the study of nursing includes chemistry, anatomy, physiology, human growth and development, microbiology, and nutrition, in addition to the College of Liberal Arts' core sequence in rhetoric, the historical-cultural area and literature.

Junior- and senior-year courses include medical-surgical, maternal and child health, psychiatric, public health and senior nursing, as well as literature, sociology and some electives. Studies of nursing theory are coordinated with opportunities for related supervised nursing practice in the University Health Center, the Iowa City Veterans Administration Hospital, other local hospitals and nursing homes, and selected public health agencies.

There are three ways to enter the College of Nursing's undergraduate curriculum:

- In the fall semester after completing 30 hours of a required sequence of courses;
- In the eight-week summer session after completing a two-year prescribed sequence of general education and science courses;
- By transferring from another college with advanced standing; this avenue is also available to the registered nurse who has completed prescribed general education and science courses.

The Cooperative Plan

In cooperation with The University of Iowa College of Nursing, 11 institutions of higher education have developed a planned curriculum offering which will satisfy the two-year sequence of courses required for entry into the College of Nursing. The College offers an academic counseling service to all students enrolled in this plan.

The cooperating institutions are: Iowa State University, Ames; the University of Northern Iowa, Cedar Falls; Iowa Central Community College, Fort Dodge; North Iowa Community College, Mason City; Marshalltown Community College, Marshalltown; Muscatine Community College, Muscatine; Upper Iowa College, Fayette; Briar Cliff College, Sioux City; Morning-side College, Sioux City; Simpson College, Indianola; Luther College, Decorah.

Expenses

Students pay the general University fees throughout the program. The initial cost of a student's uniform, which includes three uniforms and two caps is approximately $60.00. This amount is payable at the end of the freshman year. The student also will need to purchase white shoes, bandage scissors and a watch with a sweep second hand. Senior students are required to provide their own means of transportation for Family and Community Health Nursing.

Financial Aid

In addition to the assistance available to University students generally, there are special sources of assistance to nursing students including federal loans made available through the Nurse Training Act of 1971.

Student Organizations

College of Nursing students have their own Association of Nursing Students and are also eligible for membership in the State and National Association of Nursing Students.
Undergraduate Requirements

To graduate, the student must complete the 126-semester-hour required program; must achieve at least a 2.0 grade-point average in general education as well as in nursing coursework; and must complete the last 30, or 45 of the last 60, semester hours at The University of Iowa.

Academic Standards

To be considered for admission to the College of Nursing, the applicant should have a cumulative grade-point average of at least 2.5 (A = 4) for all college coursework taken.

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 whom it deems to be best qualified. The committee may require personal interviews.

Faculty Advisors

Faculty advisors from the College of Nursing are available to help prospective nursing students plan their programs, and each student in the College works with a faculty advisor.

Application Deadlines

Applicants with one year of college work are admitted to the College of Nursing as sophomores in the fall semester only and must apply between July 1 and April 15 of the year before their anticipated enrollments. Applicants with two years of college work who are prepared to enter the College for the summer session must apply by November 15 of the sophomore year. Registered nurses are admitted in both the fall and spring semesters; they must apply by April 15 for the fall semester, or by November 15 for the spring semester.

Master of Arts

Accredited by the National League for Nursing, this program offers majors in medical-surgical nursing, nursing of children, psychiatric nursing, and nursing service administration. It provides preparation for positions in nursing as clinical specialists, teachers, supervisors, or administrators.

Admission

Graduate students in nursing register in the Graduate College, and degrees are conferred by that College. The general requirements of the Graduate College relating to admission apply with the following special requirements:

- A Bachelor of Science degree in a nursing program which includes a public health nursing theory and practice (applicants not meeting this condition will meet individually designated course requirements);
- Evidence of the fulfillment of the legal requirements for the practice of nursing (licensure in Iowa is not required);
- A grade-point average of 2.7 in the baccalaureate program, or demonstrated ability in graduate courses as indicated by the Graduate College (conditional admission to the nursing major granted to applicants with grade-point average of at least 2.7; and, for purpose of taking non-nursing courses, to applicants with grade-point averages of not less than 2.5).

Program Requirements

Registration for elective requirements is possible in any term, but initial enrollment in advanced nursing courses which are offered sequentially is limited to the fall semester. Curricula in the clinical majors are designed to be completed in three semesters and those in nursing service administration in two semesters and a summer session.

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 30 semester hours, and must be approved by the dean and adviser. 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 nonthesis students. A written general examination is required of all degree candidates.

Financial Aid

The College of Nursing participates in the Professional Nurse Traineeship Program as administered by the Division of Nursing, U.S. Public Health Service, and in the National Institutes of Mental Health training program. Grants made to the University under these programs provide a limited number of traineeships for students who are preparing for positions as nurse specialists, teachers in schools of nursing, and supervisors and administrators in nursing services. Awards are made after the student has been accepted for full-time study, but a preliminary application may be filed when the application for admission is submitted. This assistance is restricted to citizens of the United States. Funds may be obtained from the Graduate Program Office, College of Nursing, The University of Iowa.

Degree Requirements

Medical-Surgical Nursing—30 semester hours

96-232-234 Advanced Medical-Surgical Nursing 8 s.h.
92-120 Research Methodology 3 s.h.
96-220 Research in Nursing 2 s.h.
96-299 Thesis 6 s.h.
Statistics 3 s.h.
Electives from one related area (physiological or behavioral sciences) 8 s.h.

Nursing of Children—31 semester hours

96-242-244 Advanced Nursing of Children 14 s.h.
96-120 Introduction to Methods of Nursing Research 3 s.h.
96-220 Research in Nursing 2 s.h.
96-128 Perspectives in Nursing 2 s.h.
11 s.h.
Thesis 6 s.h.
(For foreign language requirements, see University catalog)

96-422-424 Advanced Nursing of Children 14 s.h.
96-120 Introduction to Methods of Nursing Research 3 s.h.
96-220 Research in Nursing 2 s.h.
96-128 Perspectives in Nursing 2 s.h.
11 s.h.
Thesis 6 s.h.
(For foreign language requirements, see University catalog)
96:230 Nursing Research
Analysis and critical appraisal of nursing theory and nursing research; summarization of research findings; completion of research proposal; prerequisite: 96:103, statistics
4 s.h.

96:233 Advanced Medical-Surgical Nursing I
Contemporary insights in natural, behavioral, and applied sciences for derivation and formulation of concepts and principles underlying methods for nursing interven-
tion; focus upon analytical approach to major problems encountered in care of medical-surgical patients with provision for clinical experience
4 s.h.

96:234 Advanced Medical-Surgical Nursing II
Continuation of 96:233, which is prerequisite
4 s.h.

96:235 Advanced Nursing of Children I
Growth and development of child; philosophy of child care; health promotion
and anticipatory guidance; experience with well children in variety of settings
available
4 s.h.

96:236 Advanced Nursing of Children II
Children's response to illness and hospitalization; care of ill child in variety of
settings; operating responsibilities in facilitating optimum health care for children
3 s.h.

96:237 Advanced Nursing of Children III
Individualized plans of care in selected clinical or functional areas; investiga-
tive studies and clinical conferences; prerequisite: 96:236
3 s.h.

96:238 Advanced Psychiatric Nurses I
Selected theories of psychiatric development and principles and techniques of
nursing interventions with individuals and families with psychiatric-mental health
problems; prerequisite: 96:234
3 s.h.

96:239 Advanced Psychiatric Nurses II
Principles of group dynamics and group therapy, consultative practice, applica-
tions of nursing theory and intervention in variety of institutional and community
settings; prerequisite: 96:238; prerequisite: 96:233
3 s.h.

96:230 Clinical Practice in Psychiatric Nursing
Supervised practice experiences in providing psychiatric nursing intervention for
individuals, family and groups; supervised consultative assistance in nursing pro-
cess of ward care and in general hospital to assist them in further developing
skills in meeting emotional needs of patients; prerequisite: 96:237; continuation
of 96:238
5 s.h.

96:230 Advanced Psychiatric Nurses III
3 s.h.
Continued emphasis on integration of psychiatric nursing theory and practice in
context of working with mental health needs of society; student-selected programs
experience and exploration of issues and concerns in psychiatric nursing; prerequi-
5 s.h.

96:239 Clinical Nursing I
Clinical nursing concepts, concepts and practices, contemporary health care trends
influencing clinical nursing; clinical care analysis with integrated clinical experi-
ence
5 s.h.

96:239 Clinical Nursing II
Continuation of 96:239; prerequisite: 96:238
5 s.h.

96:230 Nursing Service Administration I
Administrative concepts and organizational theory control in understanding com-
plex nature of modern community hospital; small group discussion using case
method of studying nursing administration
5 s.h.

96:230 Nursing Service Administration II
Functions of nursing department in complex hospital with special attention in
planning, budgeting, staffing, and control; group discussion of nursing administra-
tion case and analysis of action alternative; prerequisite: 96:230
5 s.h.

96:230 Supervision in Nursing
Supervisory process in providing nursing care in health agencies
5 s.h.

96:239 Thesis
5 s.h.
College of Pharmacy

Administrative Staff
Dean: Dele E. Wurster
Deans Emeritus: Rudolph A. Gummer
Director, Pharmaceutical Services: William W. Teter
Associate Directors, Pharmaceutical Services: Susan E. Kimes, Wanda L. Kerri
Coordinator, Hospital Pharmacy: Meredith C. Guggan
Director, Hospital Pharmacy Services: Harold J. Black
Degree offered: B.S., M.S., Ph.D.

Pharmacy is a physical science dealing with the preparation and dispensing of medicinal products. The pharmacist is trained to identify, analyze, select, combine and standardize these medicines and serve his or her community as a prime source of information on health topics.

Although he or she possesses a variety of tasks in and out of the community pharmacy, the pharmacist is basically a specialist in the science of drugs. He or she must understand their composition, chemical and physical properties, manufacture and uses, and activity in the normal individual as well as in the ill patient, and he or she must be familiar with tests for the strength, purity and efficacy of drug products. The pharmacist is prepared to compound and dispense prescriptions written by health practitioners. Prescribers rely on the pharmacist for information about various drugs, their availability, activity, toxicity, contraindications, etc.

Nearly everyone is familiar with the community pharmacist and the pharmacy in which he or she practices. The size and type of practice may vary—community pharmacies may be large or small, operated by individuals or by corporations. The practitioners who staff these pharmacies make up the majority of practitioners. Over 100,000 men and women practice in community pharmacies.

Another smaller group of pharmacists is employed in hospital pharmacy work. The government also employs pharmacists in the Public Health Service and the armed forces.

An area which has a growing need for pharmacists is industry. This includes pharmaceutical manufacturing, where pharmacists are found in various areas of research, development, manufacturing, control, marketing and advertising. In addition to these pharmacists, numerous others are pharmaceutical salespeople. Pharmacy training is especially valuable to these men and women who are responsible for acquainting physicians, dentists and other members of the health team with new drug products.

In the United States more people are receiving total health care than ever before. This expansion of health care will continue. Young men and women in pharmacy will face new challenges, expanded responsibilities and an ever-increasing growth in practice areas. As increasing need for pharmacists is related to many factors. These include a longer life span; a greater demand for drugs, especially among the older age groups; a broader range of specific drugs for more diseases; greater interest in preventive medicine; higher standards of medical care; growth of health insurance and medical-care prepayment plans; federal health plans and federal support of health colleges; a burgeoning population; and greater demand for more physicians and dentists, hospitals, nursing homes and extended care facilities. These factors combine to point out the short-range prospects as well as long-range opportunities for pharmacists.

The College of Pharmacy has an enrollment of approximately 350 undergraduate majors. Approximately 60 graduate students are pursuing master's and doctor's degrees in the College.

With the colleges of Medicine, Nursing and Dentistry, the College of Pharmacy is an integral part of the University Health Center.

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.

The Bachelor of Science Program

In the College of Pharmacy students in the Bachelor of Science program receive professional training in education in a variety of fields, such as physical pharmacy, professional practice, industrial pharmacy, biopharmaceutics, (drug absorption), inorganic and organic medicinal chemistry, pharmacology (chemistry and actions of drugs derived from plants and other natural sources), administrative pharmacy (pharmacy operations) and institutional pharmacy (clinical pharmacy and hospital pharmacy).

Basically, the Bachelor of Science program in pharmacy comprises one year of prepharmacy studies, taken in the College of Liberal Arts at Iowa or in any accredited community or liberal arts college, and four years of pharmacy studies.

It is possible to transfer into the College of Pharmacy after two years of college-level work at an approved institution. A student entering the College after two years of preprofessional study can complete the professional program in three years if the preprofessional study includes, in addition to the basic pre-professional requirements, at least eight semester hours in organic chemistry, from five to eight semester hours in biology or zoology, three or four semester hours in economics, three semester hours in accounting and three to four semester hours in quantitative analysis.

The professional curriculum includes a minimum of 18 semester hours of electives. Through his or her choice of electives, the student may focus on such special areas as hospital pharmacy, industrial pharmacy or pregraduate study.

Graduation from the undergraduate program in pharmacy requires at least a 2.0 (C) cumulative grade-point average. Any student whose cumulative average falls below 2.0 is placed on academic probation; a student on academic probation is limited...
to 12 semester hours of coursework. A student on academic probation for the third time is subject to review by the College's scholarship and admissions committee.

**Graduate Programs**

Master of Science and Doctor of Philosophy programs are available in administrative pharmacy, pharmaceutics, medicinal chemistry, pharmacognosy and industrial pharmacy. A Master of Science degree is available in hospital pharmacy. A special brochure of these programs may be obtained from the dean of the College of Pharmacy.

**Facilities**

The College of Pharmacy Building is centrally located on the University's main campus, in close proximity to the College of Medicine, University Hospitals, the Basic Sciences Building, a Health Sciences Library scheduled for 1971 completion and other units of the Health Center.

Completed in 1963, the Pharmacy Building is a five-story structure especially designed to provide the most advanced facilities for a comprehensive program of pharmacy education. In addition to classrooms, an auditorium and the pharmacy library, the building houses well-equipped separate laboratories and a greenhouse for instruction at the undergraduate and graduate levels in the various areas of specialization.

The College has an industrial pharmacy laboratory which serves as a teaching unit as well as a service division of the College. Here undergraduate and graduate students learn methods of large-scale pharmaceutical product development.

The Hospital Pharmacy in the University Hospitals is a teaching unit of the College of Pharmacy. From it, all medicines and related necessities are supplied to the General, Children's and Psychopathic hospitals. Pharmacy students are given laboratory and classroom experience in the clinical pharmacy program, under supervision of clinical instructors and hospital Pharmacy staff members, in all areas of the University Hospitals, Veterans Administration Hospital and the Oakdale installation. Here the students work with other health professionals and have the opportunity to study drug therapy in hospitalized patients, under the supervision of clinical instructors in pharmacy and medicine.

**Admission**

For general University admission requirements and procedures, see the "Admission" or "Graduate College" sections of the Catalogue.

**Undergraduates**

The college work outlined below meets the minimum academic requirements for admission to the College of Pharmacy:

- **Rhetoric:** eight semester hours; applicants from approved colleges may satisfy this requirement by presenting six hours of credit in English composition and rhetoric and two in speech, or by presenting eight hours of credit earned in a one-year rhetoric course
- **Inorganic chemistry and qualitative analysis:** eight semester hours
- **College algebra and trigonometry:** six to eight semester hours

- **Physics:** eight semester hours; although physics is required, a suitable biology or zoology course can be taken instead; physics will then be taken in the first professional year.

Economics and accounting are suggested as additional courses to be included in preprofessional study. Students who present minor deficiencies in meeting the above requirements may be admitted to the College of Pharmacy upon recommendation of the director of admissions and the College of Pharmacy.

To be considered for admission to the College of Pharmacy, the applicant must have earned at least a 2.0 (A = 4) cumulative grade-point average on all college course work attempted.

**Transfer Students**

Students who transfer into the College of Pharmacy 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, accounting and quantitative analysis. Students who plan to remain in a community college for two years before transferring to the College of Pharmacy should consult the dean of the College of Pharmacy 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 of residence in The University of Iowa College of Pharmacy is required for the degree (minimum 30 semester hours).

Students transferring from nonpharmacy colleges 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.

**Expenses and Financial Aid**

For information about expenses, see "Admissions and Housing." For information about financial aid available to University students generally and to College of Pharmacy students only, see "Scholarships and Loans."

**The Professional Curriculum**

**First Year**

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<tr>
<th>First Semester</th>
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<tr>
<td>46:13</td>
<td>Pharmacy Calculations 3</td>
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<td>6:121</td>
<td>Organic Chemistry 1 3</td>
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<td>37:3</td>
<td>Principles of Animal Biology 5</td>
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<td>Quantitative Analysis 4</td>
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Total semester hours 15
Second Semester
46:14 Pharmacy: Orientation 3
46:16 Pharmaceutical Chemistry: Inorganic 3
4.122 Organic Chemistry II 3
4.141 Intermediate Chemistry Laboratory I 2
or 6E:1 Economics 4
Elective 3
Total semester hours 17

Second Year
First Semester
46:23 Pharmacy: Solids 3
99:161 Biochemistry 4
61:157 Microbiology 4
Elective 3
Total semester hours 14
Second Semester
46:26 Pharmacy: Institutional Practice 2
46:28 Pharmacy: Solutions 4
6A:2 Accounting 3
Elective 6
Total semester hours 15

Third Year
First Semester
46:131 Pharmaceutical Chemistry: Organic 3
46:31 Pharmacy: Polyphasic Systems 4
72:151 Intermediate Mammalian Physiology 5
Elective 3
Total semester hours 15
Second Semester
46:132 Pharmaceutical Chemistry: Organic 3
46:35 Pharmaceutics 4
71:101 Pharmacology 5
46:110 Clinical Pharmacy: Case Study 2
Elective 3
Total semester hours 17

Fourth Year
First Semester
46:41 Pharmacology 5
46:43 Pharmacy: Professional Practice 3
46:45 Pharmacy: Administrative 3
46:113 Clinical Pharmacy: Laboratory 3
71:103 Pharmacology and Toxicology 4
Total semester hours 15-17
Second Semester
46:64 Pharmacy: Professional Practice 3
46:46 Pharmacy: Administrative 3
46:52 Pharmacy: Senior Seminar 1
46:112 Clinical Pharmacy: Laboratory 2-4
91:130 Law in a Technological Society 2
Elective 3
Total semester hours 14-16

Professional Electives
46:100 Pharmacy Projects 1-3
46:104 Pharmacy Biopharmaceutics 2
46:106 Industrial Pharmacy 3
46:107 Hospital Pharmacy: Survey 3
46:108 Hospital Pharmacy: Survey 3
46:133 Pharmaceutical Chemistry: Drug Analysis 3
Staff: profs. blass, cannon, carow, guillory, lach, zaepf, assoc. profs. barnschofer, bightley, kerr, norwood, parrott, rosati, smith, tester, assoc. profs. black, chin, gagnon, instrs. ayr, dixon, fry, hepler, kent, west, clin. instrs. cophy, seale, shuler, williams

Undergraduate Pharmacy
AGC 1 Pharmacy Calculations 3 s.h.
AGC 14 Pharmacy: Orientation 2 s.h.
AGC 61 Pharmacy: Organization 3 s.h.
AGC 63 Pharmacy: Profession 3 s.h.
AGC 161 Pharmacy: Practice 3 s.h.
AGC 163 Professional Development 3 s.h.
AGC 165 Professional Development 3 s.h.
AGC 167 Professional Development 3 s.h.
AGC 169 Professional Development 3 s.h.
AGC 171 Professional Development 3 s.h.
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Unanswerable
The University recognizes that creative activity is an indispensable function if its teaching 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 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 assists the Vice-President for Educational Development and Research in a regular advisory capacity. The Council consists of nine faculty members with widely recognized personal involvements in basic research or creative activity. Members include two each from the physical, biological and social sciences and the humanities, and one 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 actively involved officers and committees of the University, the Office of the Vice-President for Educational Development and Research currently supports the following programs:

Faculty Research Assignments
Under the rules of the State Board of Regents, a faculty member may be assigned to devote full time to a specific research or creative project for a semester. Appointments may be for either the first or second semester.

Old Gold Summer Faculty Research Fellowships
These fellowships provide an opportunity for faculty members to devote full time to research or creative work during the summer months. The program is designed to give support to work that will result in additions to knowledge or to substantial progress in creative activity. Awards are given for the initiation of a project, the continuance of its progress or its completion.

Junior Faculty Health-Related Research Grants
These grants are made to support the initial research efforts of junior faculty (i.e., below the rank of associate professor), other than those in the colleges of Medicine and Dentistry, who wish to do health-related research. Funds for these grants come from an institutional award made annually to the University by NIH.

Computer Project Grants
These grants are awarded several times a year to support innovative and extraordinary uses of the computer. Any member of the faculty, staff or student body is eligible to apply.

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 clerical 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; for the purchase of specialized equipment for use in specific research projects; and for honoraria 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:

University Computer Center
The role of the Computer Center is to provide 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 partially funded by the National Science Foundation, involving several colleges in Iowa and Illinois. Conversational programming by way of typewriter terminals is also available. Although the Center is a distinct entity from the Computer Science Department, there is an interchange of students, faculty and ideas between the two staffs. The Center provides educational and consultative services, compatible with its resources, to help users prepare projects for computer analysis.
University Scanning Electron Microscope Laboratory
This laboratory was established in September 1971 to provide facilities and technical assistance to research programs involving the use of a scanning electron microscope (SEM). Located in the Zoology Building, the laboratory is equipped with a Cambridge Stereoscan S4 having a resolution of 130 Å and a useful magnification range of 30 to 50,000 diameters; 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.

Office of Research Services and Administration
This office maintains a resource library of information on public and private agencies which provide funds for research and study. Included are references to post- and post-doctoral fellowship awards, as well as application forms when available. Also 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 correctness of 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.

Office of International Education and Services
This office assists students and faculty wishing to explore research and education opportunities in overseas locations. See "Other Service Units."

Related Units
Although not directly connected with the Office of the Vice-President for Research, these units have a special role in the conduct of research at the University:

Agricultural Law Center
See "College of Law"

Center for the Advanced Study of Communication
See "Journalism" in "College of Liberal Arts"

Center for East Asian Studies
See "East Asian Languages and Literatures" 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"

Child Development Clinic
The Child Development Clinic is an out-patient facility and is a division of the Department of Pediatrics in the University Hospitals. The primary role of the Clinic is as a diagnostic clinic for developmental problems in children. The Clinic will provide a comprehensive study on any child under 17 years who has problems suggestive of mental retardation, problems associated with poor school performance 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 and to permit studies of normal human physiology, biochemistry and pharmacology. The Center is supported completely by the National Institutes of Health, on a semi-permanent basis, by annual 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 legislatives in political development. It provides research training 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.

The Institute of Agricultural Medicine
The Institute of Agricultural Medicine, housed in the Agricultural Medicine Research Facility on the Gelade Campus, is a part of the Department of Preventive Medicine and Environmental Health, College of Medicine. Research, teaching and extension activities are centered on the safety and health problems of those who live in rural Iowa by occupation or choice. The Iowa Community Pesticide Study and Accident Prevention Laboratory are portions of the Institute.

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 publication 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.

Iowa Center for Education in Politics
Supported by gifts from foundations and others and headquar-
tered in the Division of Extension and University Services, the Iowa Center for Education in Politics coordinates activities at all colleges and universities in Iowa. To encourage students to become active in political affairs, the Center sponsors programs to help teachers improve their teaching about politics at the high school level. These programs are planned in cooperation with leaders of the legally recognized political parties of the state and college teachers and administrators.

Iowa Center for Research in School Administration
The Iowa Center for Research in School Administration serves local school districts on a membership basis. Services to schools include data gathering and reporting, research reports and special reports. Contract work encompasses computer scheduling, mark and attendance reporting, equipment accounting, school surveys and other projects defined by school districts. Developmental activity in educational management systems is coordinated at the Center. The staff includes graduate students and specialists with University professors as supervisors.

Iowa Center for Toxicology and Biochemical Pharm-
acology
The Iowa Center for Toxicology and Biochemical Pharmacology is an integral part of the Department of Pharmacology and is devoted to research in toxicology and biochemical phar-
macology. Broadly, these include research on the disposition of drugs and poisons, their metabolic fate, the biological adaptation and regulation associated with their use, studies on their stereo-
logic and toxic effects and their mechanism of action at the molecular level. Doctoral degrees in pharmacology are offered.

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. Its research has been disseminated in scholarly journals and in a reprinted series and monograph series. The Center's community surveys are on tape in its data bank and are readily available for secondary research by graduate students and fac-
ulty. The staff is currently engaged in a study of the economic absorption and cultural integration of minorities in an industrial community.

The Laboratory for Political Research
The Laboratory for Political Research is a research and training facility for the Department of Political Science. It provides tech-
ical assistance to faculty members engaged in research. This assistance includes both the data collection and analysis phases of research. It is involved in graduate education, directly training students to utilize the computer in their own research. It also provides empirical data that can be used in graduate courses and seminars. For undergraduate education the Laboratory works with professors in developing curriculum materials which utilize empirical data and the computer for instructional purposes.

Neurorency Center
The Neurorency Center is supported by the National Institute of Health under a program-project grant. The Center sponsors research projects of importance to the fields of ophthalmology and neurology and is administered by these departments. The intimate relationship of the eye and its innervation with the central nervous system provides the basis for collaborative stud-
ies. Special emphasis is given to speech disorders resulting from brain disease and to defects in cerebellar and visual sensation secondary to disorders of the nervous system. Projects which provide histological and chemical correlates if disorders of the nervous system are also sponsored.

Radiation Research Laboratory (Radiation Biology)
Effects of sublethal radiation and utilization of radiation in bio-
logical and medical investigations are the concern of this labora-
tory. Cancer cells, as well as normal ones, are studied, regarding kinetics and radiation sensitivity. M.S. and Ph.D. programs are help-
ful for those preparing for science, radiobiology, health physics, radiological physics, cancer research, etc. The Laboratory's intro-
tductory course deals with radiation physics, radiation effects and uses of radiocopes. It is open to advanced undergraduate students who may plan to enter medicine, nuclear medical tech-
nology or similar programs.

The Social Science 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 250 studies are now in-
cluded in the Archive, covering most of the social science disci-
plines. In addition the Archive supports a large number of computer programs that can be used for data analysis. Those wishing assistance in utilizing the data of the Archive or com-
puter programs supported by the Archive can call on the person-
nel of the Archive.

Transportation Safety Research Center
The Transportation Safety Research Center was organized in 1968 to provide a focal point for research in transportation safety matters. Its primary mission is to stimulate and conduct this research through utilization of the vast resources at the Univer-
sity. Examples of activities, other than research, are the develop-
ment and conducting of a traffic engineering education program, and the organization and conducting of the Governor's Highway Safety Conference. TSRC serves as a catalyst for transportation safety activities.
The Extension Division was established by special appropriation of the General Assembly of Iowa to "render a large service to the Commonwealth and to the people of Iowa by carrying out to every part of the State the knowledge, 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 shares and cooperates with many other parts of the University in this larger service to the people of Iowa. Moreover, it performs several other functions, some of which are campuswide and others of which are both campuswide and statewide. The Division's organization and services include the following:

**Bureau of Instructional Services**

**Correspondence Courses**

Correspondence courses are available to students who want to earn credit toward a degree at The University of Iowa or at some other college or university and to those who wish to enroll for the satisfaction of special requirements for professional advancement, 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 a correspondence course.

Students who do not want credit toward a degree at The University of Iowa are permitted to register for any correspondence course in which they have an interest and sufficient preparation to enable them to do the work of the course. Approval by an official adviser of the college in which the student is enrolled is recommended for each such registration if degree credit is to be allowed.

An enrollment fee of $4.00 is assessed each new student. The course fee is $17.00 per semester hour for all enrollments. Fees are payable at the time of registration.

Departments offering courses by correspondence study include Accounting, Anthropology, Business Administration, Chemistry, Classics (Latin), Drawing, Economics, Education, English, Geography, History, Home Economics, Journalism, Library Science, Mathematics, Music, Physical Education, Police Science, Political Science, Psychology, Religion, Romance Languages (French, Spanish), Social Work, Sociology and Speech Pathology.

**Armed Forces Institute Courses**

The University of Iowa, in cooperation with the Department of Defense, through the United States Armed Forces Institute, offers many correspondence courses at reduced rates to men and women in the armed services. The plan provides that the student pay only an enrollment fee and the cost of test materials.

**Veterans Administration Courses**

Veterans may enroll for correspondence courses under Public Law 550. The Veterans Administration provides for the payment of course fees, without any allowances for subsistence or books and supplies.

**Education for Veterans**

The Veterans Readjustment Benefit Act of 1966 includes provisions for educational benefits under the Educational Assistance for Veterans and Inservice Personnel.

**Extension Classes**

A limited number of extension classes is offered off campus in Liberal Arts, Business Administration, Education and Engineering. Classes are scheduled at the request of public school officials, or where professional groups and industry indicate a specific need for educational services. Courses offered in Business Administration and Engineering are scheduled on a contractual basis, whereas courses in Liberal Arts and Education, although scheduled on request, require a minimum of 20 enrollees to be officially started.

**European Studies Program**

Coursework for credit is offered to interested students abroad.

**The Saturday Class Program**

This Program serves part-time students on the Iowa City campus, with credit and noncredit course offerings open to undergraduate, graduate or unclassified students at a tuition rate of $30.00 per semester hour. Courses are offered from all schools and departments of the University. Through this office, a program of continuing education, University Studies for Women, is currently being developed.

**Adult Education Advisory Service**

This Service within the College of Education provides consultative and guidance service on the problems of adult education programs with respect to organization, technique, subject matter and other aspects of continuing education in the community.

**Audiovisual Center**

The mission of the Audiovisual Center is to assist in the improvement of the teaching-learning process through the effective use of educational media. Services and facilities available to University faculty, staff and students include:

**Media Development**

A staff of media consultants is available to assist faculty members.
and students in the solution of their instructional problems related to the planning and design of learning systems, facilities and media. Short-term assignment to the Audiovisual Center of faculty or graduate assistant aide is encouraged. All Audiovisu
Center for Conferences and Institutes

The Center serves as the principal agency of the University for developing, coordinating, conducting and supporting continuing educational programs on campus for nonresident adult groups.

High School Debating and Public Speaking

In cooperation with the Department of Speech and Dramatic Art, the Division sponsors cross-examination debate, extempo
Bureau of Educational Research

Standardized tests and scales developed through research by staff members and graduate students at The University of Iowa are published and distributed on a nonprofit basis to schools, public agencies and industrial firms in the State of Iowa and throughout the nation. In addition, many other widely-used, commercially-produced standardized tests and scales with established national reputations are carried in stock for distribution, in most cases at the publisher's list price. Buyers order test needs from one source to save time and transportation costs. Orders received for items regularly carried in stock are usually shipped within 24 hours. Items not carried in stock are furnished at a special service at a carrying charge above the publishers' price.

Service to Adult Education Groups

The Division seeks to aid state and local associations, organizations and clubs in the planning, preparation and conduct of their programs and services.

Department of Publications

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. Campus Stores is an on-campus distribution agency which sells manuals, lab notebooks and other special instructional materials.

The University of Iowa Press

The University of Iowa Press is the agency of the University established to publish the significant results of scholarly re
search. The imprint is controlled by the University Editorial Board, composed of faculty members appointed by the vice-president for research and dean of the Graduate College, who serves as an ex officio member of the Board. The director of publications for the University also serves ex officio on the Board and directs the operation of the Press.

**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 in teaching and research is carried on under the auspices of Iowa State University, 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-around research are available.

**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 north of Iowa City. The tracts total approximately 620 acres. One tract is reserved for biological research, the other for University-wide activities. Developments in the area to date include provision of a levee road, water supply, electric power, maintenance storage facilities, a boathouse and sailing facilities, field archery course, facilities for handicapped persons and picnic area.

**Institute of Public Affairs**

This agency serves as a research and training link between the University and public officials and units of government on the local and state levels in Iowa. Through the Institute, related areas of the University and their research facilities are brought in contact with the problems faced by public officials in the state. The Institute maintains a full-time research and training staff.

A close cooperative relationship exists between the Institute, the League of Iowa Municipalities and similar organizations of public officials.

Publications of the Institute include handbooks for various groups of governmental officials, as well as the results of research studies and surveys concerning specific governmental problems.

Short courses and interserve training programs for government officials are held on the University campus and other locations.

**Bureau of Police Science**

The Bureau offers a series of law enforcement courses through correspondence study. In addition, the Bureau offers a variety of services to law enforcement agencies, including entrance and promotional examinations, general administrative or specialized surveys, and specialized training programs. It also carries out research programs in areas of public safety. Upon request by law enforcement agencies, the Bureau conducts personnel examinations, administrative surveys and record surveys.

**Iowa Center for Education in Politics**

The Division serves as the headquarters of the Iowa Center for Education in Politics. (See "Research Activities.")

**Iowa Community Services**

The Division serves as administrative and fiscal agent for Iowa Community Services, 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 activities which will assist in solving those problems and approves proposed programs submitted by colleges and universities in Iowa. The program was authorized by the U.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 Division of Higher Education and 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 these activities involving discipline articulation, the Office extends its activities to the private two- and four-year colleges in the state. Regional and national activities of approval, accreditation and consultation often extend this jurisdiction beyond state lines.
Health Affairs
In addition to the colleges of Dentistry, Medicine, Nursing and Pharmacy, numerous University programs and agencies offer health services to students, the community and the state.

The Bureau of Dental Health Education
The Bureau of Dental Health Education is sponsored jointly by The University of Iowa and the Iowa State Department of Health. The Department of Health provides the personnel, salaries and office supplies. The University provides the office space and equipment.

The Bureau's primary purpose is to promote a program of dental health education in the public and parochial schools of the state. The present 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 objectives, authoritative material is developed and provided to the classroom teacher. The preventive aspect of the program is emphasized through 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. Referral cards encourage systematic and regular examinations in a dental office where the completion of the necessary work is recommended.

Direct Health Services
Located on the University campus and carefully integrated on its program are five major health units of The University of Iowa which render direct health services to the people of the state. Each is supported by appropriation from public funds, and each devotes its major effort to the provision of service. However, to the extent that the provision of the service may also aid in the preparation of special teaching, these service organizations are integrated in the University program. They are administered under the general University organization.

University Hospitals—Medical and surgical treatment of patients referred by physicians
Psychopathic Hospital—Care, treatment and maintenance of committed and voluntary patients
State Hygienic Laboratories—State bacteriological laboratory service to city, county and state governments, physicians and others
University Hospital School—Evaluation, management, special education and research pertaining to physically handicapped and mentally retarded children; (see University Hospital School)
Oakdale Hospital—Treatment of tuberculosis and rehabilitation of patients with other chronic diseases

Iowa Mental Health Authority
Federally funded under the Public Health Service Act (P.L. 79-487), the Authority is under the fiscal supervision of the Board of Regents, but has its own policy board, the Mental Hygiene Committee, established under Iowa Code. Located at Psychopathic Hospital, the Iowa Mental Health Authority is the central administration for Iowa's 24 community mental health centers, which provide local services for 78 percent of the Iowa population. The centers are private nonprofit corporations.

The Authority provides consultation on federal construction grants and staffing grants. It maintains a casework and pamphlet service which provides free educational materials throughout the state. Consultation, staff development, recruitment, standards and research are provided to Iowa's mental health centers. The Authority consults with communities about developing local services and performs liaison and planning activities with other local, state and federal programs in the mental health delivery system.

University Hospital School
The University Hospital School includes a residential service program for physically handicapped children and a day-school program for mentally retarded children. Its unique function under a University administration provides numerous training opportunities for University students, and broadened possibilities for investigative endeavors. Two sections operate as one administrative unit within this program.

The Children's Rehabilitation Section provides treatment and education for children whose physical handicaps make it impractical for them to attend their local school. The objective of this care in the University Hospital School is to rehabilitate each child sufficiently through special treatment and education so that eventually he may return to his home community for continued education and treatment. Residential care is provided. Age range extends to 21 years. Approximately 60 children receive inpatient services at a given time.

A comprehensive program of special management for the child is available in the fields of medical, dental and nursing care; communication skills; various therapies; special education; physical education; industrial arts; homemaking; music; and social services. In addition to thorough initial evaluation and periodic rechecks of handicapped children are provided on an outpatient basis prior to admission to this section. Through this activity it is intended that parents may be given pertinent instructions regarding the care of their child at home. An attempt is made to give attention to all of each child's problems, as far as possible.

The Pine School Section has as its main functions educational research, teacher training and community services. Classroom
instruction is provided by means of special education for selected preschool and elementary school children who are mentally retarded and living in the Iowa City area. The children's schedules include physical education, music, homemaking, industrial arts and organized recreational activities. Attendance in the Pine School Section is on a day basis only. These children live at home and are transported daily to and from the University Hospital School.

Additionally, three other programs are housed in this University Hospital School complex: the Office of Services for Crippled Children; the Child Development Clinic of the Department of Pediatrics, serving as an outpatient diagnostic and guidance service in the field of mental retardation; and the Children's Research Unit, undertaking investigative work relative to the child who has suffered neurological damage and mental retardation, either singly or combined.

Training opportunities for prospective workers, particularly for graduate students, are afforded in most aspects of the aforementioned programs. Part-time positions and graduate assistantships are available to students from various colleges in the University. Supervised experience is offered in the fields of special education, child welfare, speech pathology, occupational therapy, physical therapy, physical education, social work, music, nutrition, nursing, medicine, homemaking and some other areas.

State Services for Crippled Children

Crippled Children's Services are supported by federal appropriations through the United States Department of Health, Education and Welfare and by state appropriations through the University Hospitals and the University general fund. The purpose of these services is to provide facilities for diagnostic, treatment for selected cases and assistance in planning for home and local care for crippled children. Services are available to children under the age of 12 years.

Diagnostic field clinics are conducted annually in communities throughout the state and on the University's Offdade Campus. Medical examiners at the field clinics are staff members in the departments of Pediatrics, Orthopedic Surgery, Otolaryngology and Internal Medicine. Diagnostic services are also provided in the areas of speech pathology, audiology and clinical psychology.

Special care programs are operated for children who have rheumatic fever, cystic fibrosis, phenylketonuria or muscular dystrophy. There are research and care programs for mentally retarded and multiply handicapped children, and premature and other high-risk infants.

Field workers in public health nursing, physical therapy and medical social service provide follow-up care for crippled children who have been examined at diagnostic field clinics or in departments at the University Hospitals. This agency subsidizes a graduate training program in audiology and speech pathology within the University, and other special training programs for University staff members.

Reading Clinic

The Reading Clinic, a teacher-training unit within the College of Education, provides a diagnostic and corrective service for school children having reading difficulties.

Council on Speech Pathology and Audiology

The Council coordinates clinical services in speech pathology and audiology offered in the Department of Speech Pathology and Audiology, Department of Otolaryngology and Maxillofacial Surgery, University Hospital School, State Services for Crippled Children and the Veterans Administration Hospital.

Other Service Units

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 proper care for specimens which come to 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 North American mammals include the American bison, the antelope, the mountain lion, the American moose and the beaver.

A large and well-known bird habitat exhibit is the "Lazasa Island Cyclema." This is a complete representation of a bird island of the Hawaiian group. Other habitat exhibits include The Bering Sea, the Louisiana Swamp, the "Ferl Migration and "Cranes on South Dakota Prairie." The crane exhibit includes both the sandhill crane and the rare whooping crane, as they appear on the prairie during migration.

The major invertebrates phyia are represented in several exhibits and include such familiar groups as the arthropods, mollusks, echinoderms and coelenterata.

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.

Several exhibits relate to the geology of Iowa and include typical fossil specimens.

Office of International Education and Services

Combining the responsibilities of several widely-dispersed offices, the new (1971) Office of International Education and Services (OIES) is the focal point for all University international activities, resources and interests.

The OIES helps foreign students and professionals with immigration, registration and academic questions and helps to house short-term foreign visitors sponsored by such groups as the State Department and AID.

The International Center is an integral part of the OIES cultural and educational program for students, faculty and community individuals and groups.

The OIES advises American students of opportunities to work, travel and study abroad. Faculty members can seek OIES advice and assistance with grants and fellowships involving foreign or international perspectives. The OIES is the campus Fulbright adviser for both graduate and faculty awards, as well as...
for the International Research and Exchanges Board (Irex).

The OIES takes an active interest in promoting cooperation between the various aspects of international studies—foreign language and area programs, comparative studies, foreign language departments and technical assistance projects.

The Office of Public Information and University Relations, University News Service

The Office of Public Information and University Relations is a multifaceted operation that includes the University News Service, which serves to foster understanding, within the University community and generally, of the University's aims and activities.

The Office of Public Information and University Relations publishes Spectator, Faculty Newsletter, Staff Newsletter and the University Operations Manual; provides campus tours; and publicizes other programs for University guests; prepares display and exhibit materials; provides copy and photos for a number of publications; assists groups seeking University speakers; and provides public service programs for Iowa radio and television stations.

University News Service supplies University news and information to mass media, gathers and prepares informative material for special and general interest periodicals, helps prepare special University publications, answers requests for information and help with writing, photography, and broadcasters who visit the campus.

Public Information and News Service personnel also help plan and promote campus events.

Two News Service staff members work exclusively with the various University teaching science departments and agencies to aid public understanding of University activities in medicine and allied fields. The Sports Information Service responds to media needs for information about the University's intercollegiate athletic programs.

University News Service also conducts a public information internship program to provide working experience for graduate and undergraduate students anticipating careers in specialized writing or in public relations for higher education. Other students work or observe in the various OPI offices from time to time, in cooperation with the School of Journalism's practicum program.

U of I Alumni Association

The principal agency through which Iowa students continue their identity with the University after they leave campus is the University of Iowa Alumni Association. Organized in 1867, the Association's purpose is to include graduates and former students throughout the world.

The Association's continuing objectives are to identify alumni with the University; to strengthen public recognition of the University as an institution vital to the stability and welfare of the state and nation; and, through organized alumni effort, to help 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 is organized to help the University obtain the greatest possible benefit from private giving. A private nonprofit corporation, the Foundation raises funds to help the University in reaching its educational objectives through three major programs: annual giving, capital campaigns and planned or deferred giving. Organized in 1956, the Foundation has been empowered to solicit and receive gifts and bequests; to accept trusts subject to the conditions imposed thereon; and to hold, administer, manage, use or distribute gifts, bequests and trusts, all for the benefit of The University of Iowa. As a private 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 scholarships, fellowships, student loans, library acquisitions and faculty research grants.

Annual Giving

Each year alumni and friends of the University make many thousands of gifts through the Foundation for a great variety of purposes. Their combined effect upon the strength of the University is very great, and the superiority of a number of the University's programs is largely owing to the annual financial support of its alumni and friends.

Capital Campaigns

The Foundation also conducts campaigns to raise capital funds for special needs on campus. Two of such campaigns in recent years supported the construction of the Health Sciences Library and the Museum of Art. Funds for such projects come from many sources and are the results of efforts of many people concerned with the University's welfare.

Planned and Deferred Giving

Individual financial situations vary a great deal, and finding financially sound giving programs for individuals is another service of the Foundation. Such efforts include both publications and consultation. The Foundation also acts as trustee of many trust funds for the ultimate benefit of the University.

Office of Facilities Planning and Utilization

The office serves in direction and coordination of the planning, design and construction of University buildings and other physical facilities. The office provides analysis of current and projected needs necessary to formulate University schedules and new building programs. The office is responsible for the assignment of classrooms and other academic facilities on the campus. The office operates under the Vice-Provost for University Administration.

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 employees. The office also provides data analysis and management of personnel systems. The University Personnel Office is responsible for the administration of the Board of Regents Merit System and the Unemployment Compensation Act. It also participates in certain aspects of the academic personnel program and in payroll requirements and establishes personnel record data for both faculty and staff employees.
All financial assistance available to University of Iowa students from general University sources is administered by the Office of Student Financial Aid. 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 52240, or College Scholarship Service, Box 881, Evanston, Illinois 60204. When it receives a copy of the parent's statement, the Office of Student Financial Aid 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 Aid.

Application deadlines are February 1 for entering freshmen, April 1 for upperclassmen and transfer students.

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 grade-point average.

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. A student meeting these requirements will receive the award, whether or not he or she elects to participate in the Honors Program.

Educational Opportunity Grants
Available to a limited number of undergraduates unable to attend college or university without such assistance, EOP grants range from $200 to $1,000 a year but cannot exceed one-half of the recipient's total assistance. There are no specific academic requirements for an EOP grant, but the applicant must have shown academic or creative promise.

National Defense Education Act (NDEA) Loan Fund
This is the University's largest source for long-term education loans. Undergraduate students may borrow up to $1,000 a year and $5,000 overall; graduate students may borrow up to $3,500 a year and $10,000 overall. Applicants must be citizens or permanent residents of the United States. Freshmen have preferences. An upperclassman must be in good academic standing and be making normal progress toward a degree. No interest is charged while the borrower is in at least a half-time student. Loans are repayable at three percent interest beginning nine months after the borrower concludes his course of study. Ten percent of the loan obligation is canceled each of the first five years the borrower is employed full-time teaching.

Health Professions Scholarship and Loan Program
Students are eligible to apply for a Health Professions Scholarship and/or 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. Repayment of the loan portion is arranged with the school at the time of graduation or at the time the student ceases to be a full-time student.

Law Enforcement Education Program
This Program consists of a federally-funded program of loans and grants. Loans can be up to $1,800 per year, and grants can be for a maximum of $300 per semester or $600 per quarter to be used for actual cost of tuition and books. To be eligible for the loan program, a participating school must have more than 15 hours of courses 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. Cancellation provisions are available with the loan program.

Guaranteed Loans
Borrowers negotiate directly with banks or other private lending agencies. About half the banks in Iowa participate in the program. Lending institutions in most other states participate in this or similar programs. The maximum loan is for $1,500 a year. Repayment begins when the borrower concludes his or her course of study.

University Loan Funds
Short-term loans of up to $800 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 Aid. The most numer-
 Scholarships and Loans

Our opportunities are in University food service and hospitals. Hours range from 10 to 30 a week; the University recommends a maximum of 20.

Work-Study
Much of the part-time work available through the Office of Student Financial Aid is provided under the federal Work-Study Program, whose purpose is to engage 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 employees work experience related to their educational goals.

Scholarships, Fellowships, Assistantships
Unless special conditions are noted, the sources listed below and in the Loan Funds section are open to all students in the area for which they are listed.

All-University

ALCOA Foundation Scholarship—Funds in mathematics, physics science or engineering, $500.

Amoco Scholarship—Students who show above-average academic records who have achieved leadership in extracurricular activities requiring special ability, such as seminars or music.

Boeing Scholarship—Students who have a preference for Boeing.

Burr O'Conor Memorial Scholarship—Awarded by the Director of Alumni, School of Business Administration, Scholarship Director and the Director of Student Financial Aid must be a member of the board of directors of the scholarship or the scholarship's affiliates and be a graduate of the University of Iowa.

Nearly all scholarships, fellowships, and assistantships are governed by the University of Iowa.

Business Administration

ALCOA Foundation Scholarship—Junior or senior in accounting; Arthur Anderson & Co. Scholarship—Senior or junior in accounting; Bruin Engineering Scholarship—Junior or senior in engineering.

Deficit Reduction Scholarship—New students in the business administration.

Engineering

ALCOA Foundation Scholarship—Junior or senior in engineering.

Bedford Engineering Scholarship—Junior or senior in engineering.

Burr O'Conor Memorial Scholarship—Awarded by the Director of Alumni, School of Business Administration, Scholarship Director and the Director of Student Financial Aid must be a member of the board of directors of the scholarship or the scholarship's affiliates and be a graduate of the University of Iowa.

Nearly all scholarships, fellowships, and assistantships are governed by the University of Iowa.

Athletic

Nile Kinnick Memorial Scholarship—Awarded in April or May to a junior student who is the leader of the Nile Kinnick, for his senior year at the University of Iowa, by the Athletic Department of the University and administered by the University of Iowa Scholarship Office and the University of Iowa Scholarship Office and the University of Iowa Scholarship Office.

Test and Graduate Memo—Awarded by the Director of Athletics and head coaches in football, basketball, football, track and wrestling, given annually to a student athlete at the University of Iowa, with a preference for student athlete. The scholarship must be a member of the board of directors of the scholarship or the scholarship's affiliates and be a graduate of the University of Iowa.

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Metlife Fisk Clements Scholarship
F. M. Stover Engineering Scholarship
Engineering Honors Scholarships—Outstanding freshmen and transfer students;
Ingrid Fisk Clements Scholarship
The Frank Educational Foundation Trustee Scholarship—Students in courses related to education;
Lloyd A. Exner Scholarship
Lambert Scholarship—Civil Engineering
C. P. McNeill Scholarship
Minnesota Mining and Manufacturing Company Scholarship
Mississippi Scholarship—Chemical and mechanical engineering
Howard W. Nelson Memorial Scholarship
Paul Zeller Scholarship—$1,000 to $3,000
Student Aid Scholarships—See All-University
Western Electric Foundation Scholarship in Engineering—Tuition, fees, books

Graduate
Approximately one-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 Apointments” in “Rules and regulations of the Graduate College.”

The following are the primary sources of assistance:

Teaching and research assistantships—Available in most departments; stipends range between $3,000 and $3,750 for half-time assistant; assistants are also eligible for tuition scholarships; nonresident assistants’ (one-quarter time or more) tuition and fees are reduced to resident rates.

University teaching-research fellowships—For doctoral students and first-year graduate students entering doctoral programs; typical stipends of $4,000 a year on a year-round basis, for as many as four years; recipients have teaching and research assignments, but may 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.

Graduate fellowships—$3,000 for the academic year

NDIGA Title IV fellowships—For prospective college teachers pursuing the doctorate; provides stipends of $2,400-$2,800, which includes summer study, plus $500 for each dependent and full tuition.

NSF research fellowships—For students interested in social, biological or physical science; provides stipends of $2,400-$2,800, which includes summer study, plus $500 for each dependent and full tuition.

EPDA Part E fellowships—College teacher program—Designed to prepare college or community college instructors; provides a 12-month stipend of $2,400 for the first year and $2,600 for the second year, plus full tuition and $500 annually for each qualified dependent.

The provisions described above are subject to change.

University and National Defense Education Act loans are available through the University’s Office of Student Financial Aids.

Many departments offer additional support through traineeships, 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.

A number of industrial corporations and philanthropic organizations annually provide graduate fellowships in certain departments at the University. Information may be obtained from the departments. The University also participates in fellowship and traineeship programs of the National Science Foundation, National Institutes of Health, Atomic Energy Commission and National Aeronautics and Space Administration, and in the National Defense Education Act Fellowship Program and the Education Professions Development Act. Information may be obtained from the Graduate College or departmental office.

Law
Counsel Scholarships
Michael Connors Financial Aid Fund
Edgar C. Cory Memorial Scholarship—Preference to Iowa residents
Des Moines Scholarship
Ellen Scholarship
Harold J. Gallergher Scholarship and Law Fund
Graduate Scholarship
Claire E. Hamilton Scholarship—Outstanding second-year, outstanding third-year student; $1,000 each
Harmond Scholarship
Iowa Law School Foundation Scholarships
James Trail Iowa Academy Scholarship
Legio Scholarship
Harry M. Hess Memorial Scholarship Fund
Patrick Scholarships—Applying to the Class of the Law School
William H. Rehmke Scholarship Fund
Joseph F. Sorenson Scholarship Fund—In name of tuition; preference to Iowa residents, graduated from Creston or another Iowa college
Lindell and Walter L. Forrest Fund
Joe B. Tye Fund—Available for Marine Letter King Scholarships

Liberal Arts
Core Scholarships—See All-University
Margaret Foster Hogg Memorial Scholarship—Home economics senior; resident tuition
Old Gold Honour Scholarships—Honors Program students apply to Honors Program director
George Lawton and Janie Sidlow Scholarship—Freshmen and sophomores planning to major in Chinese language and civilization; $500 Patrick Scholarship
Presidential Scholarship—Act majors, preference from Warren County, Iowa; $1,250
Robert W. Russel Scholarship—Men from Midwest, particularly Iowa, interested in studying actuarial science; $50 student aid scholarships—See All-University
Wybicki Scholarships

Journalism
James W. Blackman Scholarship—High school senior planning to enroll in the School of Journalism; $1,000; paid $100 sophomore year, $500 junior year, $300 senior year.
Henry R. Bunker Scholarship—Fifth-semester journalism major; $1,000, paid $500 second semester of junior year, $300 each semester of senior year
Dorothy Times-Des Moines Scholarship—$750, paid $50 junior year, $500 senior year.

John and Marilyn Wimsatt Jones Scholarship—Up to $1,000
John F. Krygier Scholarship in Journalism and Advertising—Annually vary
George S. Peck Scholarship—High school seniors planning to enroll in journalism; $350, paid $100 junior year, $200 senior year
Quill and Scroll Foundation Scholarship—High school seniors planning to major in journalism; $300, paid $30 freshman year, $250 sophomore year.
Scholarships and Loans

Romney Advertising Internship—To give outstanding student in advertising an opportunity for agency experience between junior and senior years. $500 School of Journalism Internship Scholarship—Freshmen, sophomores, juniors, seniors.

Seagram's Scholarship—For a freshman minority student who is also eligible for Special Admissions to the University. $1,000 Richard and Alice Sackler Scholarship—$1,000. High school senior planning to study in the School of Journalism, past $500 freshmen years. $500 sophomore year. Open to students from all backgrounds. $200 Women's Scholarship—$200. $200 WMT News Scholarship—Radio-television journalism student; recipient spends summer observing and participating in WMT station's operations; $1,500.

Medicine

(Announced upon recommendation of the College faculty committee and dean.)

Richard D. Piatt Memorial Scholarship—$1,000 resident tuition

Janet E. Rogers Memorial Scholarship—$1,000.00 non-resident tuition

Anna Birkett-Dawson Scholarship—Women student from Baltimore or its immediate area in Zeta

Esquire of Iowa Scholarship

Jeanne Annachini and Gwendolyn C. Keller Scholarship—All resident tuition

Jean Waddington Scholarship

Jane Zahn Scholarship

Mary E. Kline Medical Scholarship—Full resident tuition

Elizabeth Smith Excellence Medical Scholarship—Senior women

Phoebe Medical Scholarship

Jean and John R. Power Scholarship—Iowa residents; $1,500.00 in 2023.

Dr. Theodore E. Wills Scholarship

Nursing

Psychiatric Mental Health Nurses Stipends—$20,000 plus tuition, fees, health insurance, social security, and travel for graduate studies in psychiatric mental health nursing

Army Nurse Corps Student Nurse Program—Two-year, full-time, on-campus program, covered by U.S. government as stipend.

Veteran's Administration Nursing Program—Stipend, educational plus program

Professional Nursing Education Program—Tuition, room, board, and some room subdivisions, and a monthly stipend for full-time students

Nursing Student Health Insurance—$100.00

Public Health Nursing Fellowship Program—Tuition, fees, board, and room enrollment, monthly stipend for full-time students

Available to: Full-time graduate students in the College of Nursing; must be a U.S. citizen.

United States Public Health Nursing Student Loan Program—Assists graduate students with educational expenses while attending school

United States Public Health Nursing Scholarship Program—Up to $1,500 per academic year, depending on financial need

Conrad A. Hilton Foundation Public Health Nursing Scholarship—Up to $2,000 per academic year, depending on financial need

University of Iowa Community Health Nursing Program—Tuition and stipend for full-time graduate students

Stipend equals $2,000 per academic year for full-time students.

American Foundation for Pharmaceutics Education Scholarship—Students in the last three years of study, maximum: 500.00

Carroll University—Scholarship—4-year university

John W. Weir Foundation Scholarship—Full scholarship, maximum: 5,000.00

Mayo Foundation Scholarship—3-year minimum, full scholarship

Pharmacy

American Foundation for Pharmaceutical Education Scholarship—Students in the last three years of study, maximum: 5,000.00

Cary Scholarship—4-year university

John V. Weir Foundation Scholarship—Full scholarship, minimum: 5,000.00

Mayo Foundation Scholarship—3-year minimum, full scholarship

Walter J. Teems Scholarship—Student who has completed first year with minimum 3.5 average for minimum of 28 semester hours; $275

Reserve Officers Training Corps

ROTC Scholarships—Amended: $300 annually, for freshmen, 2-year program, $300 monthly stipend

Army ROTC—Scholarships—$2,000 annually, for freshmen, 2-year program, $2,000 monthly stipend

WMT News Scholarship—Radio-television journalism student; recipient spends summer observing and participating in WMT station’s operations; $1,500.

Loan Funds

All-University

Carri Grant Fund

Daughters of the American Revolution Student Loan Fund—Junior and senior women, residents of Iowa; $2500 annually

Don's Loan Fund—$300.00 emergency.挖掘loan

Dolphins Club Loan Fund—Priority for Dophils Club members

Fulmer Fund Memorial Loan Fund—See General Expenses

Ford Foundation Grant—See Engineering

General Loan Fund

Chen-Ens General Student Loan—All majors or graduation, short-term

Heritage Loan Fund

Womens and Men Hope Loan Fund—All majors, residents of Iowa, students

Health Professional Student Loan Fund—Pilot medical education, dental, and pharmacy students, federal loan, interest-free during recipient’s full-time registration, repayment during 10-year period, beginning three years after recipient terminates full-time study in medicine, dentistry, or pharmacy

Institutional Student Council Loan Fund—Foreign students; $10,000 maximum per school year

Iowa City Bell 1921 Credit Student Loan Fund

Iowa City Bankroll Loan Fund—$1,000, conditional interest-free during recipient’s full-time registration, repayment during 10-year period, beginning three years after recipient terminates full-time study in medicine, dentistry, or pharmacy

Iowa Student Loan Fund—Short-term

Oil and Gas Development Loan Fund

Director's Loan Fund

Donaldson Loan Fund—Special education

Pharmaceutical Foundation Loan Fund—Future pharmacists graduate students in pharmacy, graduate students in pharmacy, interest-free during recipient’s full-time registration, repayment during 10-year period, beginning three years after recipient terminates full-time study in medicine, dentistry, or pharmacy

Old Gold Development Loan Fund

Possession Loan Fund

Principal Loan Fund

Career Guidance Loan Fund—Repayment starts 15 years after graduation

Student Loan—Specific needs

Loan Fund

Second Loan Fund—Specific needs

Student Loan Fund—Non-credit

Student Loan Fund—Specific needs

Student Loan Fund—Specific needs

Student Loan Fund—Specific needs

Student Loan Fund—Specific needs

Student Loan Fund—Specific needs

Student Loan Fund—Specific needs

Student Loan Fund—Specific needs

Student Loan Fund—Specific needs

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Scholarships and Loans

Brene Memorial Student Loan Fund
Gilson Rogers Scholarship Loan Fund of the Association of American Women
Dentistry—First-year women students: $1,000 maximum.
Iowa Dental Association Students Loan Fund—Freshmen
Eisinger Loan Fund for Special Students
Old Gold Development Loan Fund
Start Loan Fund

American Dental Trade Association—Sorcerers
International College of Dentists/USA section

Scholarship Loan Fund
Charles W. Crow Loan Fund

Dental Hygiene
Alpha Kappa Gamma Loan Fund—Seniors, second-year junior
Iowa Dental Association Women’s Auxiliary Loan Fund
Wiseau Pubic Loan Fund—Preference to graduate students
Charles H. Brumback Memorial Loan Fund
Iowa Dental Hygienists’ Association Loan Fund

Engineering
College of Engineering Loan Fund—Short-term
Iowa City Engineering Club Loan Fund
Ford Foundation—Replaces professional loans to future engineering students, apply to Dean, College of Engineering
Ross Stichter Iowa Memorial Loan Fund—$25.00 per-semester loan
Phil P. Morgan Student Loan Fund—See Graduate

Law
American Bar Association Loan—Second and third-year students, up to $1,500 per year, repayable after graduation.
Iowa Law School Loan—Long term; repayable at three percent interest, beginning one year after graduation
Law School Foundation Loan—Short-term
Law School Foundation—Short- and third-year students, short-term

Liberal Arts
Thomas Cole Loan Fund—Graduating students
Brownlow Loan Fund—Students who have completed at least one year

Medicine
(Issued by the Dean of the College)
Brock Loan Fund
Iowa Medical Student Loan Fund—Graduate of the College of Medicine Loan Fund—Sophomore through senior year
Iowa Medical Tuition Loan Plan—Iowa residents who agree to practice general medicine in Iowa for at least five years after completion of medical training, state fund, provides tuition up to three years
Eisinger Loan Fund for Medical Students
College of Medicine Loan Fund
George M. Middle, Loan Fund
Frank Roberts Memorial Loan Fund
Shawnee Medical Foundation/Iowa Medical Society Medical Student Loan—At the sophomore, junior and senior classifications and at the freshman level in the case of specific hardship
Shawnee Trust Fund—Iowa residents
Shaw Foundation Loan Fund

Nursing
Nursing Student Loan Program—Full-time nursing students; Federal funds, interest-free during student’s full-time registration; repayable at three percent interest, beginning one year after recipient terminates full-time registration, forgivable at the rate of 0.5 percent per year of full-time employment as professional nurse to public or nonprofit private institutions, up to 50 percent of balance accrued at beginning of such employment
Eisinger Loan Fund for Nursing Students

Reserve Officers Training Corps
Lt. Col. Stafford W. Burch Foundation Loan Fund—Advanced Army ROTC students

Low Memorial Student Loan Fund
Phi Epsilon Kappa Loan Fund—Physical attendance for men, women
Good Samaritan Fund Loan Fund—Computer science students
S. C. Williams Loan Fund—Sophomores or seniors

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(Issued by the Dean of the College)
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Iowa Medical Student Loan Fund—Graduate of the College of Medicine Loan Fund—Sophomore through senior year
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Eisinger Loan Fund for Nursing Students

Reserve Officers Training Corps
Lt. Col. Stafford W. Burch Foundation Loan Fund—Advanced Army ROTC students
Alumni and friends of the University have provided many awards, prizes and honors in recognition of students' special achievements. Detailed information on criteria and procedures for the selection of recipients may be obtained from the administration office. Generally, recognition is in the form of certificates, plaques, medals, desk sets or similar items; cash awards of $500.00 or more are indicated in the following list:

**General**

Alpha Chi Sigma Award—Male with highest scholastic standing for the two semesters of graduate work in dentistry, clinical engineering or biomedical materials; Outstanding Alumnus Award—$50,000, senior, for efforts in self-sustenance while maintaining scholastic standing.

Beta Sigma Eta—Honorees of board membership

Fong Award—Senior with highest scholastic average among students elected to Phi Beta Sigma as freshmen.

Foundation Award—Outstanding potential in radio broadcasting at University of Texas.

Hyde Award—$5,000 active Morton Board member

Hudson Award—$5,000 government bond; junior women most nearly exemplifying qualities and characteristics of Mrs. Virgil M. Hudson, to the University community.

Hughson Award—Junior; academic excellence, critical judgment, character, formal and comprehensive courses for women's and professional offices

Kan Y. Meathe Award—$5,000, leadership, loyalty and devotion to University with the highest scholastic average awarded to senior.

Pamela Johnson Award—$5,000, leadership, achievement, participation in student activities.

**Athletic**

Athletic Board Award—Graduating senior with outstanding achievements in athletics and scholarship.

Athletic Scholarship Cup—Numerous winners in a variety of intercollegiate sports; highest scholastic average business senior and varsity squad member sophomore year.

Parent-Student-Teacher Scholastic Award—Senior with highest test-averaging senior outstanding in scholarship.

Phi Eta Sigma—Graduating students who have studied in one or more law schools.

Women's Intercollegian Conference Athletic Achievement Medal—Outstanding junior with highest scholastic average winning outstanding in scholarship and scholastic achievement.

**College of Business Administration**

Beta Alpha Psi (Beta Alpha Psi) President with highest scholastic average

Beta Gamma Sigma Award—Highest-ranking junior member

Beta Sigma Pi—Senior with highest scholastic average in the College.

Iowa State of College of Business Administration Outstanding Junior Averaging Senior Award

Phi Gamma Nu, Ep—Outstanding senior woman in the College.

**College of Dentistry**

Alpha of General Dentistry Award—Outstanding senior graduate in dentistry.

Alpha Omega Award—Graduating with highest scholastic average.

American Academy of Oral Pathology—Senior with the highest interest, academic achievements and promise in the field of oral pathology.

American Academy of Oral Radiology Award—Senior with highest interest in radiology.

American Academy of Periodontology Award—Outstanding student in periodontics.

American Association of Endodontics Award—Senior: highest proficiency and interest in endodontics, and exemplifying A.A.E. ideals.

American Association of Orthodontics Award—Senior: exceptional interest in orthodontics and exemplifying American ideals.

American College of Dentist Award—Senior: outstanding paper on topic assigned by A.C.D.

American Dental Society of Anesthesiology Award—Senior: outstanding ability and interest in general anesthesia.

American Society of Dentistry for Children Certificate of Excellence in Dentistry for Children.

Black Dog Company Award—Senior: best essay on subjects chosen by Dean of College.

Walter Collins Junior Dentistry Award—Outstanding junior in clinical operative dentistry.

Dental College of Illinois Award—$50,000, senior or junior student or student scholarship, professional attitude, character, personality

Dental College of Illinois Award—$1,000, highest scholastic standing senior year.

Dental Supply Company Award—Outstanding senior in prosthodontics.

Finance Mentorial Award—Senior: excellence in basic sciences, interest in oral manifestations of systemic diseases.

William G. Mawhine Mentorial Award—Dental graduate within advanced studies in dental prosthesis or allied medical sciences.

Mark L. Saint Award—Outstanding achievement in oral research.

International College of Dentists Award—Outstanding senior, performance professional growth and development, upper four of class.

Iowa State Society of Oral Surgeons Award—$75,000, most promising senior in oral surgery.

Larson Periodontal Award—Top senior in periodontics.

Mead Award—Outstanding scholarship and achievement.

Pfeifer, T. Marlottor Mentorial Award—Senior for excellence in periodontics.

Study Club Award—Two freshmen showing highest scholastic performance and promise.

Junior with demonstrated potential and professional promise.

Studler M. Howell Achievement Award—Senior Dental Hygiene student on basis of responsibility and leadership, scholarship, academic performance and professional attitude.

Widow's Fund--Dental Hygiene Scholarship Award—Senior. Membership in the Dental Hygiene student based on scholarship, character and professional potential.

**Dental Hygiene**

Sigma Nu Alpha—The national dental hygiene honor society decs to member dentists who rank highest in scholarship and who exhibit qualities necessary for professional growth and success; membership limited to 5 percent of the senior class and based on faculty recommendations.

Studler M. Howell Achievement Award—Membership in the American Dental Hygienists' Association is awarded for one year to a senior dental hygiene student who has demonstrated qualities of leadership, scholarship and clinical proficiency; partly sponsored by the Iowa Dental Hygienists' Association.

**College of Engineering**

A.A.E. Award—Outstanding Junior Engineer Award—Freshmen, upper-division high-achieved, senior.

Auburn University Engineering Award—Freshman, upper-division high-achieved senior.

College of Engineering Award—Graduating senior.

Delta Kappa Chi—Senior, ranking senior.

American Academy of Civil Engineers Award—Senior, ranking senior.

American Society of Mechanical Engineers Award—Senior, ranking senior.
American Society of Test Engineers Award—50 years in mechanical engineering: Lifetime achievement, interest in test and production engineering. Edward E. Kings Award—Highest ranking senior student in civil engineering; Michelle F. Clements Scholarship. Dick Egge Pic Award—Junior in electrical engineering: Highest scholarship average first two years.

Finance and General Scholarship

Institute of Electrical and Electronic Engineers Award—Three best papers presented before the IEEE Radio Corporation laboratories. Edward A. Eder Award—Junior in electrical engineering: Scholarship, character, professional promise, to Department and/or College.

Phi Sigma Alpha Award—Senior in mechanical engineering: Greatest personal development during two years.

Phi Kappa Pi Award—Highest scholarship standing in freshmen.

The Sigma Beta Award—Undergraduate, highest in competition based on popularity, scholarship, service to College.

College of Law


Hughes Bernetrnan Competition—$200 and $100; best papers on copyright law.

James S. Rar Bar Association Award—$100, graduating senior; highest all-around standing, ranking scholarship and demonstrated legal capacity and leadership qualities.

Murray Price—Junior, superior commitment and ability.

Supreme Court Day—Supreme—Four Junior Arguements winners participating in Supreme Court Day requests before Iowa Supreme Court.

College of Liberal Arts

American Institute of Chemistry Award—Outstanding senior in chemistry. 

Anne Price—$100; best essay relating to the science of government.

CHS Group Award—Outstanding women with highest average in anthropology, economics, political science, psychology or sociology (major among departments).

Claw Memorial Award in Competition—Major major

The Duchess Award—$100, junior in physics.

Don's Award—$100; freshman, sophomore, junior in history.

Margaret Foster Hall Award—Rhonda economics junior.

Johnson Memorial Prize—Graduating senior; all coursework in College; highest academic rank in class.

Leslie Prize—Business

Bore Award—Highest standing in 3rd and 4th year.

Cox'—General excellence in philosophy.

Cretz Excellence in Great Literature and Narrative, by Examination.

Latin: Sophomore, equal to Latin language, by examination.

Mathematics: Undergraduate; median of 1500 or below, by examination.

Science: Ongoing efforts, plant taxonomy, analytical geometry, and differential and integral calculus.

Sallie Award:—Senior women; highest standing in American history.

Pearce Price—Junior in chemistry, highest scholarship standing.

Phi Lambda Pi Award—Junior in chemistry, highest scholarship standing.

Phi Lambda Theta Prize—Senior woman; highest scholarship, personal qualities, promise in education, qualifications for teaching career.

Phi Omega Phi—Senior woman; highest promise for graduate study.

Phi Rho—La Salle Prize Award—Outstanding senior in social science, $100.

Greater Iowa State Award—Junior in social studies; highest standing in political science or related studies.

Mary Coryell J. Award—Advanced degree in human economics;

William Persons Prize—Excellence in German language and literature.

Journalists

Larry Green Community Journalism Award—$100; junior; demonstrates current and outstanding promise in news media work.

Luker A. Brewer Jr.—Grading; highest in scholarship, leadership, promise.

Poe Price Women's Award—Outstanding senior woman.

Johnson Memorial Prize in Journalism—Best news, sports and feature stories for The Daily Journal.

Bush-Booth Memorial Award—Senior women high scholarship record, demonstrated interest in development of human understanding and human rights.

Journalism Alumni Club Mark Award—Freshman, sophomore, junior, senior; first and second in class.

Cedar Rapids Gazette News Photography Award—Best Daily Iowa paper photos. sob Productions, Iowa Memorial Award—Junior in journalism; Moos is in journalism.

State Broadcast Writing Award—Outstanding junior, graduate or undergraduate for distinguished achievement in interpretative writing. 

Self-C. T. Jones News Award—Graduate students, for distinguished achievement in research. 

Jacob S. Benjamin Award—Outstanding enterpises, ability in new writing.

Howard A. Schmeck Award—Senior underwriting editor; Brewer Kay McKinnon Chi Omega Award—Outstanding male graduate.

College of Medicine

Walter L. Herring Award in Biochemistry—Outstanding scholarship. 

H. Thomas Award—$500; best paper presented at Student Research Conference.

Margaret F. Bozeman Memorial Award—Outstanding student in pathology.

Junior A. C. O. C. S. Society Prize—$100, senior; best research paper or statistical review in medicine or surgery.

Junior Medical Society Award—Outstanding senior student in medical school.

Large Award—Two outstanding students of each sex.

John T. McGrath Award in Preventive—Outstanding freshman in gross anatomy.

Boys Town—Supreme—Best exemplifying ideals of modern American physician.

Uplift Achievement Award in Pediatrics—Outstanding senior.

College of Nursing

American Legion 40 8 Club Scholarship Award—$200 for juniors for seven years.

Lauren Gerace Memorial Scholarship Award—$250 for sophomore for seven years.

C. C. C. L. E. A. Award—$200; senior, excellence in clinical practice.

Maude E. More Award in Nursing—$100 to a student in nursing.

Plumbers Alarm scholarship—$100 to a junior for seven years.

John E. E. Meador Memorial Scholarship—To a sophomore or junior student.

College of Pharmacy

Benedict Prize—Senior; greatest contribution through course-related activities. 

Leber Award—Distinction in scholarship, leadership.

College of Pharmacy Excellence Award—Outstanding junior, senior; highest academic achievement.

Jackie Taylor—Outstanding senior; potential for outstanding leadership.

Gregory Pharmacy Award—$500; junior, minimum 3.0 average, professional record.

Navy Drug Company Scholarship—Available to anyone; minimum 3.0 average, minimum 10 years medical or health science.

Food, Drug, and Cosmetic Research Award—$500; junior, senior; minimum 3.0 average, professional record in pharmacy.

Geigy Pharmacy Award—$500; junior, senior; minimum 3.0 average, professional record in pharmacy.

Johnson Memorial Award—Outstanding senior; highest in scholarship, leadership, promise.

Poe Prize Awards—Highest scholarship in subjects related to pharmacy.

New Memorial Award—Senior; outstanding achievement in pharmacy teaching.

Pharmacy Faculty Award—$100; outstanding senior.

Ruth Phelps—Outstanding senior in resumed science.

Ruh Oel Prize—First-year sophomore in science.

Scholarship—Excellence in organic chemistry.
Forensics
Forensics Association Award—Achievement through undergraduate participation in intercollegiate speaking activities.

Life Organization of Phi—Mortar, lifetime speech council honor society for college forensics.

Memorial Trophy—In memory of Carl Edward Johnson, a junior forensics major, who died in a car accident.

Northern Intercollegiate Speech League—NASL second place winners, Northern, 1993.

Military
Award for Communications and Electronics Award—Fourth-year cadet training in electronic engineering, electronics technology or communications engineering.

Electrical Engineering Corps of America Award—Second or third-year cadet training in electronic engineering, electrical engineering or communications engineering.

Army ROTC
Army ROTC Achievement Award—Second-, third- and fourth-year cadet training in electronic engineering, electrical engineering or communications engineering.

Army ROTC Association of the United States Army ROTC Award—Outstanding third-year cadet.

AUSA History Award—Outstanding senior student in history major.

Army ROTC Leadership Award—Second-, third- and fourth-year cadet training in electronic engineering, electrical engineering or communications engineering.

Superior Cadet Award

Air Force ROTC
Air Force Space Award—Awarded to the sophomores or junior cadet making the most outstanding contribution in research and report development of the AFROTC detachment.

Air Force Space Award—Outstanding cadet in the AFROTC detachment.

Army ROTC
Army ROTC Achievement Award—First-, second- and third-year cadet training in electronic engineering, electrical engineering or communications engineering.

Army ROTC Association of the United States Army ROTC Award—Outstanding fourth-year cadet.

AUSA History Award—Outstanding senior student in history major.

Army ROTC Leadership Award—First-, second- and third-year cadet training in electronic engineering, electrical engineering or communications engineering.

Superior Cadet Award

Honorary and Recognition Groups
Membership in the following organizations is based on high scholarship and/or other factors as indicated.

Awards, Honors and Prizes

Forensics Association Award—Achievement through undergraduate participation in intercollegiate speaking activities.

Life Organization of Phi—Mortar, lifetime speech council honor society for college forensics.

Memorial Trophy—In memory of Carl Edward Johnson, a junior forensics major, who died in a car accident.

Northern Intercollegiate Speech League—NASL second place winners, Northern, 1993.
Human Rights

The University is guided by the precept that in no aspect of its programs there shall be differences in the treatment of persons because of race, creed, color, sex or national origin, and that equal opportunity and access to facilities shall be available to all. This principle governs the admission, housing and education of students. It is reflected in policies governing programs of extracurricular life and activities and in the employment of faculty and staff. The University works cooperatively with the Iowa City community in furthering this principle. The University's Committee on Human Rights works within the Board of Regents policy, as follows:

Preamble

(a) The Constitution of the United States of America and the State of Iowa call for political liberty and equality and afford the equal protection of the laws to all persons. The University shall strive to establish policies and practices bearing the vision of the founding fathers and thereby the solemnly professed democratic goals.

(b) The General Assembly of the State of Iowa enacted the Iowa Civil Rights Act of 1965. The clear intent of this law is to assure that the rights to equal treatment of the people of Iowa shall not be abridged.

(c) In recognition of Iowa's national policy public and the obligations incurred by all units of state government by the Fulbright Amendment to the United States Constitution, the Board of Regents directs the following in its policy:

Statement of Policy—The Board of Regents has a special obligation to have its operations serve as a model for business, industry, labor and education. Neither the Board of Regents nor any official who is responsible to the Board of Regents shall, therefore, in policy or in practice, discriminate on the basis of race, color, religion, national origin, sex or ancestry.

(d) Disputes, assignments and advancement of executive personnel—The Board of Regents and all officials who are responsible to the Board of Regents and all students who are responsible to the Board of Regents shall appoint, advance and advance employment on the basis of merit and ability. Each institution under the Board of Regents shall provide a policy and procedure for employees to file complaints when they believe their rights have been violated. Each such institution shall also establish procedures for the review and resolution of complaints filed against the Board of Regents or any of its officials. The Board of Regents shall issue a policy and procedure to implement this paragraph.

(e) Disputes, assignments and advancement of executive personnel—The Board of Regents and all officials who are responsible to the Board of Regents and all students who are responsible to the Board of Regents shall at all times conduct their work and employment in a manner that is consistent with this policy. Each institution under the Board of Regents shall provide a policy and procedure for employees to file complaints when they believe their rights have been violated. Each such institution shall also establish procedures for the review and resolution of complaints filed against the Board of Regents or any of its officials. The Board of Regents shall issue a policy and procedure to implement this paragraph.

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1. Regulations Common to the Three Institutions

A. Admission of Freshman Students

An applicant must meet the requirements in this section or is expected to meet any special requirements for the curriculum, school or college of his choice. He must submit a formal application to admissions and must have attended high school for a period of one or more years prior to the summer term of the year of his admission. The applicant must indicate whether he is a student in the upper one-half of his graduating class and who means that specific curriculum requirements will generally be admitted upon completion of high school; he must also indicate where he plans to attend college. A student who is not in the upper one-half of his graduating class may be admitted if he presents satisfactory evidence, as to his performance on certain examinations at the discretion of the admissions officers. (1) he submitted secondarily, (2) he is designed for transfer, (3) he is expected to meet a specific requirement for admission to a given curriculum shall also be expected. (4) for admission to a given curriculum will also be expected. (5) for admission to a given curriculum will also be expected. (6) for admission to a given curriculum will also be expected...

B. Admission of Undergraduate Students to Transfer from Other Colleges

1. Students from accredited colleges and universities: Transfers of credit are given full value if credit with the exception of courses in those colleges and universities accredited by the North American College and Secondary School Commission or the American Association of Universities.

2. Each applicant shall submit an official transcript, the official transcript, and shall submit a formal application to the admissions officers of the American Association of Colleges and Secondary School Commission or the American Association of Colleges and Secondary School Commission. Each applicant shall be expected to meet a specific requirement for admission to a given curriculum. Each applicant shall be expected to meet a specific requirement for admission to a given curriculum.

3. Each applicant shall submit a formal application to the admissions officers of the American Association of Colleges and Secondary School Commission or the American Association of Colleges and Secondary School Commission.

4. Each applicant shall submit a formal application to the admissions officers of the American Association of Colleges and Secondary School Commission or the American Association of Colleges and Secondary School Commission. Each applicant shall be expected to meet a specific requirement for admission to a given curriculum.
A. The University of Iowa

All applicants for admission to any college of The University of Iowa must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Students may not be enrolled until they have been officially admitted by the University Admissions.

1. College of Business Administration

Applications for admission to the College of Business Administration should be submitted to the Director of Admissions. Applicants who are admitted to the business school may elect to enter The University of Iowa in the College of Business Administration or to enter any other college of the University of Iowa. All students who are accepted for admission to the College of Business Administration must have a minimum grade-point average of 2.0 on all college transcripts and on all college and university transcripts.

2. School of Accountancy

Applicants for admission to the School of Accountancy must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Accountancy may elect to enter The University of Iowa in the School of Accountancy or to enter any other college of the University of Iowa.

3. School of Business

Applicants for admission to the School of Business must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Business may elect to enter The University of Iowa in the School of Business or to enter any other college of the University of Iowa.

4. School of Continuing Education

Applicants for admission to the School of Continuing Education must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Continuing Education may elect to enter The University of Iowa in the School of Continuing Education or to enter any other college of the University of Iowa.

5. School of Education

Applicants for admission to the School of Education must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Education may elect to enter The University of Iowa in the School of Education or to enter any other college of the University of Iowa.

6. School of Engineering

Applicants for admission to the School of Engineering must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Engineering may elect to enter The University of Iowa in the School of Engineering or to enter any other college of the University of Iowa.

7. School of Law

Applicants for admission to the School of Law must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Law may elect to enter The University of Iowa in the School of Law or to enter any other college of the University of Iowa.

8. School of Medicine

Applicants for admission to the School of Medicine must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Medicine may elect to enter The University of Iowa in the School of Medicine or to enter any other college of the University of Iowa.

9. School of Public Health

Applicants for admission to the School of Public Health must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Public Health may elect to enter The University of Iowa in the School of Public Health or to enter any other college of the University of Iowa.

10. School of Social Work

Applicants for admission to the School of Social Work must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Social Work may elect to enter The University of Iowa in the School of Social Work or to enter any other college of the University of Iowa.

B. Transfer credit from a junior college will not be accepted if the student is not a member of the University of Iowa student body at the time of transfer. Transfer credit may be accepted if the student is a member of the University of Iowa student body and meets all requirements for admission to the University of Iowa.

C. Application Deadlines

Applicants for admission must submit the required materials for admission and the necessary official transcripts and other required documentation to the admissions office of the appropriate college at least 10 days prior to the beginning of registration for the semester for which the student is applying. Applicants for admission from states who are required to take the College Board SAT or ACT must submit their scores to the admissions office of the appropriate college at least 10 days prior to the beginning of registration for the semester for which the student is applying. The deadline for submission of these materials is 10 days prior to the beginning of registration for the semester in which the student is applying.

II. Supplemental Specific Requirements for Each Institution

The following requirements are in addition to those given in section I above.

A. The University of Iowa

All applicants for admission to any college of The University of Iowa must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Students may not be enrolled until they have been officially admitted by the University Admissions.

1. College of Business Administration

Applications for admission to the College of Business Administration should be submitted to the Director of Admissions. Applicants who are admitted to the business school may elect to enter The University of Iowa in the College of Business Administration or to enter any other college of the University of Iowa. All students who are accepted for admission to the College of Business Administration must have a minimum grade-point average of 2.0 on all college transcripts and on all college and university transcripts.

2. School of Accountancy

Applicants for admission to the School of Accountancy must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Accountancy may elect to enter The University of Iowa in the School of Accountancy or to enter any other college of the University of Iowa.

3. School of Business

Applicants for admission to the School of Business must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Business may elect to enter The University of Iowa in the School of Business or to enter any other college of the University of Iowa.

4. School of Continuing Education

Applicants for admission to the School of Continuing Education must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Continuing Education may elect to enter The University of Iowa in the School of Continuing Education or to enter any other college of the University of Iowa.

5. School of Education

Applicants for admission to the School of Education must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Education may elect to enter The University of Iowa in the School of Education or to enter any other college of the University of Iowa.

6. School of Engineering

Applicants for admission to the School of Engineering must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Engineering may elect to enter The University of Iowa in the School of Engineering or to enter any other college of the University of Iowa.

7. School of Law

Applicants for admission to the School of Law must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Law may elect to enter The University of Iowa in the School of Law or to enter any other college of the University of Iowa.

8. School of Medicine

Applicants for admission to the School of Medicine must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Medicine may elect to enter The University of Iowa in the School of Medicine or to enter any other college of the University of Iowa.

9. School of Public Health

Applicants for admission to the School of Public Health must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Public Health may elect to enter The University of Iowa in the School of Public Health or to enter any other college of the University of Iowa.

10. School of Social Work

Applicants for admission to the School of Social Work must submit a formal application for admission to the required official transcripts and other supporting material, as required, to the Director of Admissions. Applicants who are admitted to the School of Social Work may elect to enter The University of Iowa in the School of Social Work or to enter any other college of the University of Iowa.
General Basis for Admission

Fullfilment of the specific requirements for admission does not lessen 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 best qualified. Applicants for admission to Pharmacy shall have graduated from an approved high school or have an equivalent amount of training.

College Work

The college work as outlined below will meet the minimum academic requirements for admission to the College of Pharmacy. The minimum should include 20-22 semester hours of college level work, exclusive of credit in military and air science and physical education. The semester hour requirement must include:

Elective courses approved by the College of Liberal Arts and the College of Pharmacy.

All applicants must have completed four semester hours of college credit in college level science. Applicants from the College of Liberal Arts at The University of Iowa should also complete a four-semester-hour course in logic and biology. Applicants who transfer from other accredited colleges may, if necessary, complete the college logic and biology requirement after admission to the College of Nursing.

All applicants are required to complete the American College Test. Applicants who are graduates of associate degree or diploma programs of nursing must have successfully passed the examination for registered nurses before admission to nursing courses.

To be considered for admission, an applicant should have obtained a cumulative grade-point average of at least 3.0 on all college work undertaken. The grade-point average is based on the marking system of The University of Iowa, in which a grade of "A" is equivalent to 4.0. Other marking systems will be evaluated by the Office of Admissions.

Fullfilment of the specific requirements for admission listed above does not lessen admission to the College of Nursing. From the applicants meeting the minimum requirements, the admissions committee of the College of Nursing will select those applicants who, in their judgment, appear to be best qualified. The Nursing admissions committee may require personal interviews of applicants.

Address all inquiries regarding admission to the Center for Admission, The University of Iowa, Iowa City, Iowa. Applicants with no previous preparation in nursing may apply in preference to their own preparation for their expected enrollment. Applicants with previous preparation are recommended to complete the program in the same manner, except that they may be admitted after the fall or spring semester. The closing date for nursing applications shall be April 15 for fall semester and November 15 for spring semester.

7. College of Nursing

Applicants for admission to the undergraduate program in nursing must present a minimum of 20 semester hours complete in an accredited liberal arts college, including satisfaction of the following minimum requirements:

Elective—University of Iowa transfer applicants must have satisfied the elective requirements of the College of Liberal Arts at The University of Iowa.

Applicants from other institutions may qualify by completing at least 60 semester hours of credit in English composition and one semester hour of credit in speech.

Mathematics—All applicants must have completed two semesters of algebra, a semester of trigonometry, and a semester of college algebra. A grade of "C" or better in each semester is required. Applicants who transfer from other institutions may meet the requirement by presenting evidence of college level work, exclusive of credit in the college of liberal arts, with grades of "C" or better in the courses presented.

Biology—All applicants must have completed four semester hours of college credit in college level biology. Applicants from the College of Liberal Arts at The University of Iowa should also complete a four-semester-hour course in human anatomy and physiology. Applicants who transfer from other accredited colleges may, if necessary, complete the human anatomy and physiology requirement after admission to the College of Nursing.

All applicants are required to complete the American College Test. Applicants who are graduates of associate degree or diploma programs of nursing must have successfully passed the examination for registered nurses before admission to nursing courses.

To be considered for admission, an applicant should have obtained a cumulative grade-point average of at least 3.0 on all college work undertaken. The grade-point average is based on the marking system of The University of Iowa, in which a grade of "A" is equivalent to 4.0. Other marking systems will be evaluated by the Office of Admissions.

Fullfilment of the specific requirements for admission listed above does not lessen admission to the College of Nursing. From the applicants meeting the minimum requirements, the admissions committee of the College of Nursing will select those applicants who, in their judgment, appear to be best qualified. The Nursing admissions committee may require personal interviews of applicants.

Address all inquiries regarding admission to the Center for Admission, The University of Iowa, Iowa City, Iowa. Applicants with no previous preparation in nursing may apply in preference to their own preparation for their expected enrollment. Applicants with previous preparation are recommended to complete the program in the same manner, except that they may be admitted after the fall or spring semester. The closing date for nursing applications shall be April 15 for fall semester and November 15 for spring semester.
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