## GRADUATE PROGRAMS
### AT WICHITA STATE

<table>
<thead>
<tr>
<th>Program and Area</th>
<th>Degree</th>
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<tbody>
<tr>
<td>Accounting (MPA)</td>
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<tr>
<td>Administration (MS)</td>
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<tr>
<td>Administration of Justice (MAJ)</td>
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<tr>
<td>Aerospace Engineering (MS) (PhD)</td>
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<tr>
<td>Anthropology (MA)</td>
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<tr>
<td>Art Education (MA)</td>
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<tr>
<td>Biology (MS)</td>
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<tr>
<td>Business (MBA)</td>
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<td>Chemistry (MS) (PhD)</td>
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<td>Communication (MAC)</td>
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<tr>
<td>Communicative Disorders and Sciences (MA) (PhD)</td>
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<td>Computer Science (MCS, MS)</td>
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<tr>
<td>Counseling (MEd) (EdS)</td>
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<tr>
<td>Creative Writing (MFA)</td>
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<tr>
<td>Economics (MA)</td>
<td>M</td>
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<tr>
<td>Educational Administration &amp; Supervision (MEd) (EdS) (EdD or PhD)</td>
<td>M S D*</td>
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<tr>
<td>Educational Psychology (MEd)</td>
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<tr>
<td>Electrical Engineering (MS) (PhD)</td>
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<td>Elementary Education (MEd)</td>
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<tr>
<td>English (MA)</td>
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<tr>
<td>Fine Arts—general (MFA)</td>
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<tr>
<td>Geology (MS)</td>
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<tr>
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<tr>
<td>History/Public History (MA)</td>
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* A transfer doctoral program offered through an arrangement with the University of Kansas

M = Master     S = Specialist in Education     D = Doctoral
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<th>Program</th>
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<td>Music (MM)</td>
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<td>Conducting (instrumental)</td>
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<td>History/Literature</td>
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<tr>
<td>Performance</td>
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<tr>
<td>piano/organ</td>
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<tr>
<td>piano/pedagogy</td>
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<td>strings/wind/percussion</td>
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<tr>
<td>voice</td>
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<tr>
<td>Theory/Composition</td>
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<td>Physical Therapy (MPT)</td>
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<td>Physics (MS)</td>
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<td>Political Science (MA)</td>
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<td>Psychology—Community/Clinical Psychology (MA)</td>
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<td>Psychology—Human Factors Psychology (PhD)</td>
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<tr>
<td>Public Administration (MPA)</td>
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<td>School Psychology (MEd) (EdS)</td>
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<td>Secondary Education (MEd)</td>
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<td>Sociology (MA)</td>
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<tr>
<td>Spanish (MA)</td>
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<tr>
<td>Special Education (MEd)</td>
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M = Master    S = Specialist in Education    D = Doctoral
# Academic Calendar

## Fall Semester 1991

- **Aug. 19-24**: Fall semester registration
- **Aug. 26**: Classes begin
- **Aug. 31-Sept. 2**: Labor Day, holiday
- **Sept. 16**: Final date for filing Application for Degree card in Graduate School office
- **Oct. 18**: Midterm point
- **Nov. 1**: Priority application due date for spring financial aid awards
- **Nov. 15**: Last day for oral defense
- **Nov. 18-26**: Preregistration period for spring semester (exact dates published in the Schedule of Courses)
- **Nov. 27-Dec. 1**: Thanksgiving recess
- **Dec. 6**: Last day for incomplete grades to be removed
- **Dec. 12**: Last day of classes
- **Dec. 13**: Study day
- **Dec. 14-20**: Final examinations
- **Dec. 21**: Fall semester ends

## Spring Semester 1992

- **Jan. 13-18**: Spring semester registration
- **Jan. 20**: Martin Luther King, Jr. Day, holiday
- **Jan. 21**: Classes begin
- **Feb. 11**: Final date for filing Application for Degree card in Graduate School office
- **Mar. 8-15**: Spring recess
- **Mar. 15**: Priority application due date for fall financial aid awards
- **Mar. 16**: Classes resume
- **Mar. 20**: Midterm point
- **Apr. 1**: Priority application due date for summer financial aid awards
- **Apr. 3**: Final date for withdrawal with nonpenalty grades
- **Apr. 10**: Last day for oral defense
- **Apr. 15-24**: Preregistration period for fall semester (exact dates published in the Schedule of Courses)
- **May 1**: Last day for incomplete grades to be removed
- **May 9**: Last day of classes
- **May 11**: Study day
- **May 12-18**: Final examinations
- **May 19**: Spring semester ends
- **May 23**: Commencement

### Dates for the 1991-1992 Academic Year

<table>
<thead>
<tr>
<th>Month</th>
<th>1991</th>
<th>1992</th>
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<td>AUGUST</td>
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<tr>
<td>SEPTEMBER</td>
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<td>S M T W T F S</td>
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<tr>
<td>OCTOBER</td>
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<td>S M T W T F S</td>
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<tr>
<td>NOVEMBER</td>
<td>S M T W T F S</td>
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<tr>
<td>DECEMBER</td>
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* These dates may be subject to change.
  * Graduate School deadlines to insure graduation that semester.
SUMMER SESSION 1992

MAY

3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31

JUNE

1 2 3 4 5 6
7 8 9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30

JULY

S M T W T F S

1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31

AUGUST

S M T W T F S

1 2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31

SEPTEMBER

S M T W T F S

1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30

OCTOBER

S M T W T F S

1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31

NOVEMBER

S M T W T F S

1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30

DECEMBER

S M T W T F S

1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31

Fall Semester 1992

Aug. 17-22 Fall semester registration
Aug. 24 Classes begin
Sept. 7-11 Labor Day, holiday
Sept. 16 Final date for filing Application for Degree card in Graduate School office*
Oct. 16 Midterm point
Nov. 1 Priority application due date for spring financial aid
Nov. 13 Last day for oral defense*
Nov. 16-20 Preregistration period for spring semester (exact dates published in the Schedule of Courses)
Nov. 25-29 Thanksgiving recess
Dec. 10 Last day of classes
Dec. 11 Study day
Dec. 12-18 Final examinations
Dec. 19 Fall semester ends

* Graduate School deadlines to insure graduation that semester.

These dates may be subject to change.
Spring Semester 1993

Jan. 11-16  Spring semester registration
Jan. 18    Martin Luther King, Jr. Day, holiday
Jan. 19    Classes begin
Feb. 8     Final date for filing Application for Degree
Mar. 12    Midterm point
Mar. 15    Priority application due date for fall financial
Mar. 21-28 Spring recess
Mar. 29    Classes resume
Apr. 1     Priority application due date for summer
Apr. 9     Last day for oral defense *
Apr. 19-23 Preregistration period for fall semester (exact
May 7     Last day for incomplete grades to be removed *
May 7     Bound thesis due in Graduate School office *
May 10    All financial obligations to the University must have been met *
May 11    All departmental requirements must have been met *
May 12-18 Final examinations
May 19    Spring semester ends
May 22    Commencement

Summer Session 1993

June 14    Summer Session registration
June 7     Classes begin, first four-week term
June 11    Final date for filing Application for Degree
            card in Graduate School office *
July 2     Last day of first four-week term; registration
            for second four-week term
July 5     Independence Day, holiday
July 6     Classes begin, second four-week term
July 9     Last day for oral defense *
July 23    Last day for incomplete grades to be removed *
July 30    Summer Session ends

These dates may be subject to change.
* Graduate School deadlines to insure graduation that semester.
## Fall Semester 1993

- **Aug. 16-21**: Fall semester registration
- **Aug. 23**: Classes begin
- **Sept. 4-6**: Labor Day, holiday
- **Sept. 10**: Final date for filing Application for Degree card in Graduate School office *
- **Oct. 15**: Midterm point
- **Nov. 1**: Priority application due date for spring financial aid awards
- **Nov. 12**: Last day for oral defense *
- **Nov. 15-19**: Preregistration period for spring semester (exact dates published in the Schedule of Courses)
- **Nov. 24-28**: Thanksgiving recess
- **Dec. 9**: Last day of classes
- **Dec. 10**: Study day
- **Dec. 15**: Last day for incomplete grades to be removed *
- **Dec. 19**: Bound thesis due in Graduate School office *
- **Dec. 20**: All financial obligations to the University must have been met *
- **Dec. 21**: All departmental requirements must have been met *
- **Dec. 24-26**: Final examinations
- **Dec. 27**: Fall semester ends

## Spring Semester 1994

- **Jan. 10-15**: Spring semester registration
- **Jan. 17**: Martin Luther King, Jr. Day, holiday
- **Jan. 18**: Classes begin
- **Feb. 7**: Final date for filing Application for Degree card in Graduate School office *
- **Mar. 11**: Midterm point
- **Mar. 15**: Priority application due date for fall financial aid awards
- **Mar. 20-27**: Spring recess
- **Mar. 28**: Classes resume
- **Apr. 1**: Priority application due date for summer financial aid awards
- **Apr. 8**: Last day for oral defense *
- **Apr. 18-22**: Preregistration period for fall semester (exact dates published in the Schedule of Courses)
- **May 6**: Last day for incomplete grades to be removed *
- **May 10**: Final examinations
- **May 11**: Study day
- **May 12-18**: Spring semester ends
- **May 19**: Commencement

---

*Graduate School deadlines to ensure graduation that semester.*

**Dates may be subject to change.**
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Graduate Bulletin 1991-93
This catalog is a guide for information only and is not a contract.

The official University address is:
The Wichita State University
1845 Fairmount
Wichita, Kansas 67208-1595
The Graduate School telephone number is:
(316) 689-3095

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Produced by the Office of University Publications
Ellen Horn, Editor
Kent Bagall, Designer
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Mark M. Jong, College of Engineering

The Wichita State University Profile

The Wichita State University is located in the largest city in Kansas, which allows students to enjoy the convenience and educational advantages of a dynamic metropolitan setting. The University encourages multicultural diversity, and has students from all fifty states and more than seventy countries.

WSU students' ages range from fifteen to eighty-one years, with an average age of twenty-eight. Approximately eighty-five percent of the students work full- or part-time. Many classes are offered at night to facilitate attendance and the earning of a degree; some graduate programs can be completed entirely during evening classes.

The 330-acre campus, both modern and accessible, is adorned with fifty-three pieces of sculpture and art by internationally known artists, including Personnages Oiseaux by Joan Miro and Grand Torso of a Man and The Prayer by Auguste Rodin. Wiedemann Hall houses the first world-famous Marcuszserg organ installed in North America. Various recreational areas are on and convenient to campus, including the adjoining 18-hole University golf course.

Wichita State's Ablah Library serves as the nucleus of the library system, housing the main collection, as well as microforms, government documents, and special collections. Combined resources total approximately 2.5 million items, including nearly 900,000 bound volumes and 4,300 journals. The libraries contain specialized resources. All collections are accessed through LUIS, an integrated, automated system which also handles the circulation of books. The libraries offer computerized literature searches, both on-line and through CD-ROM, and they participate in automated borrowing programs with other research libraries.

Library services are located on campus or nearby, including residence halls and affordable housing suitable for families, the University Child Development Center, Handicapped Services, Student Health Services, the Counseling Center, and Placement and Career Services. Wichita State has almost 200 active student groups, and a continuous series of athletic and cultural events on campus.

Recent WSU construction projects include Devlin Hall, which houses the Center for Entrepreneurship; the National Institute for Aviation Research; and an expansion to Ablah Library, which includes a state-of-the-art Media Resources Center. Currently under construction is the Science Classroom and Laboratory Building, which will house the departments of computer science, mathematics, physics, and psychology, as well as the Computing Center and its IBM 3081K+ mainframe system.

Other campus facilities include KMUW Radio, a member of the National Public Radio network; WSU Channel 13, the University's cable television station; the International Reference Organization in Forensic Medicine and Sciences (INFORM); the Savannah Cress Language Laboratory; the Small Business Development Center; the University Gerontology Center, which serves as a resource center and information clearinghouse to assist community agencies and organizations; the WSU Center for Energy Studies; the Social Sciences Research Laboratory; and several computer laboratories for student use, including those in computer science, business, and engineering.

Special campus equipment includes a Varian X1-300 nuclear magnetic resonance spectrometer; a DEC VAX minisupercomputer; a CAD/CAM laboratory with Apollo DN-320 digital workstations; and modern aerodynamic laboratories which include two low-speed wind tunnels, two supersonic wind tunnels, two smoke tunnels, a boundary layer tunnel, and a water tunnel for flow-visualization studies.

Graduate education at Wichita State is affordable, as state funding enables...
the University to maintain relatively low tuition and fees. In addition, several financial assistance programs are available including assistantships, fellowships, scholarships, and loans. The University also offers the opportunity for part-time student employment and cooperative education training positions.

Life at WSU is exciting and enriching. We invite you to visit the campus and see firsthand what we have to offer.

Mission Statement
In December 1986, the Kansas Board of Regents approved the following mission statement for The Wichita State University:

The Wichita State University is an urban university with a focused mission intended to meet the industrial, business, educational, social, and cultural needs of the greater Wichita area. The University's primary goal is to serve citizens in the thirteen-county area surrounding Wichita and Sedgwick County, with special sensitivity to the large number of minority citizens residing in the urban area. Its urban student body is predominantly part-time and beyond the traditional college age, thus requiring special support services.

Programs of study in the liberal arts and sciences, fine arts, business, engineering, education and health and human services lead to the associate through the doctoral degree, but primary emphasis is at the bachelor's and master's level. Building on a foundation in the liberal arts and sciences, the institution's unique role resides in the delivery of programs in the visual and performing arts, engineering, business and education.

Terminal degrees currently approved are the Master of Fine Arts in studio arts and in creative writing; and the Doctor of Philosophy in applied mathematics; chemistry; communicative disorders and sciences; psychology-human factors; and aerospace, electrical, industrial and mechanical engineering. At an appropriate time, the institution will pursue development of a joint doctoral degree with the University of Kansas and Kansas State University in computer science and a freestanding doctoral degree in educational administration.

Research activity will occur principally in those areas with existing terminal degrees and those identified for terminal degrees. Applied research related to industry in the service area is the major thrust of these activities.

Service activities such as those conducted at the Center for Economic Development and Business Research, the Center for Entrepreneurship, the Small Business Development Center, the National Institute for Aviation Research and the Hugo Wall Center for Urban Studies are especially tailored to meet the needs of the institution's service area.

History
Wichita State began as Fairmount College and was operated by the Congregational Church from 1895 until 1926 when by vote of the citizens of Wichita, it became the first municipal university west of the Mississippi.

After 38 years as a municipal university, WSU again changed its status July 1, 1964, when it officially entered the state system of higher education. Now, The Wichita State University is one of six state universities governed by the Kansas Board of Regents.


The City of Wichita
Wichita, the largest city in Kansas and part of a metropolitan area of 400,000, offers the cultural and economic advantages of a big city, but maintains the friendly atmosphere of a smaller town. Home of Beech, Boeing, Cessna and Learjet, Wichita is known as the “Air Capital of the World,” is a regional medical center and also is home to energy and agricultural industries. Public and private schools offer diverse learning opportunities, and numerous cultural activities provide family entertainment year round. Native American, Hispanic, Asian and Middle Eastern groups are typical of Wichita's multi-cultural and ethnic diversity.

The Wichita symphony orchestra plays brown-bag concerts in addition to its regular season offerings, and theater troupes perform presentations ranging from Broadway musicals to Shakespeare in the park. Art museums, historic Cowtown, Botanica gardens, the Omnisphere Science Center, Lake Afton Public Observatory, international fairs, water fun parks and the zoo provide entertainment and culture for people of all ages.

Wichita, the industrial and educational center of Kansas, enjoys a diversified economy. Your neighbors may work at one of the large aircraft plants, they may have careers related to agriculture or energy, or they may be health care professionals in one of the area's regional medical centers.

Wichita provides outstanding career opportunities in a variety of fields. In addition to Beech, Boeing, Cessna and Learjet, many other high tech companies such as NCR, UNISYS, Vulcan Chemicals, Cargill, SafeTite Corporation, IFR, Bank IV, Southwestern Bell, Electrotech and Microtech are located in the Wichita area. Also Pizza Hut, Taco Tico, Koch Industries, Rent-A-Center and Coleman are major local employers with their corporate headquarters in Wichita.

Many of the companies in Wichita have generous tuition reimbursement plans. Thus, they provide their employees with an excellent opportunity to pursue additional graduate education while building their careers.

In short, Wichita is a very "livable" city. The variety of affordable housing suitable for families both near the University and in the surrounding region and abundant, moderate-priced childcare facilities and recreational areas add to its attractiveness. Wichita is stimulating, pleasant and enjoyable, and offers something for everyone.
The Graduate School

Offices: 107 Jardine Hall
Michael Tilford, Dean
Ronald Iacovetta, Assistant Dean
Anne Meservey, Director of Graduate Admissions
Margaret Wood, Office Manager

The Graduate School at The Wichita State University supervises graduate study at the University, establishes standards for admission to graduate work and recommends students who have completed requirements for graduation to the Kansas Board of Regents.

Academic graduate programs at Wichita State include master's, specialist and doctoral programs. The PhD is granted in applied mathematics; chemistry; communicative disorders and sciences (logopedics); psychology-human factors; and in aerospace, electrical, industrial and mechanical engineering. A doctoral transfer arrangement with the University of Kansas is available in educational administration.

The graduate faculty consists of the University president, the executive vice president for academic affairs, the deans of the Graduate School and all other colleges at Wichita State and regular faculty members. Regular faculty are recommended for appointment to the graduate faculty by the chairpersons of their departments and approved by the Graduate Council. Recommendations for graduate faculty status are based on rank (above instructor); degree in the field, or training or experience; scholarly or professional work; and the need for the faculty member to hold graduate faculty status.

The Graduate Council consists of the deans of the Graduate School, ten members of the graduate faculty elected by that faculty, one member appointed by the graduate dean and one graduate student. The council determines and recommends general policies for the Graduate School. The council also advises with the dean on matters pertaining to their academic careers, including changes in their programs.

The primary goals of the Graduate School are to encourage independent scholarship and to develop competence in research or other creative activity. Students are expected to master special fields as well as to develop appropriate methods of inquiry for future professional growth.

General University Policies

Equal Opportunity
It is the policy of The Wichita State University not to discriminate on the basis of race, color, religion, national origin, sex, age, handicap, Vietnam-era veteran status or political affiliation in its education programs, activities or employment policies as required by the Civil Rights Act of 1964 and subsequent amendments (including Title IX of the Education Amendments of 1972), federal executive orders, federal and state regulations and guidelines and the State's Executive Orders. The University is further committed to take affirmative action to assure that equality of opportunity shall exist. Questions concerning discrimination should be directed to James J. Rathig, vice president for student affairs and dean of students, Grace Wilkie Hall.

Student Responsibility
Students at The Wichita State University have the following responsibilities:
1. To consult their advisers on all matters pertaining to their academic careers, including changes in their programs
2. To observe all regulations of their college and select courses according to the requirements of that college
3. To attend all meetings of each class in which they are enrolled (instructors will announce at the beginning of the semester if they consider attendance in computing final grades)
4. To fulfill all requirements for graduation
5. To be personally responsible for fulfilling all requirements and observing all regulations at Wichita State
6. To answer promptly to all written notices from advisers, faculty, deans and other University officers
7. To file an Application for Degree card in the dean's office of the appropriate college at least two semesters before the expected date of graduation
8. To enroll in only those courses for which the stated prerequisite(s) (if there are any) have been satisfactorily completed. Failure to comply with this procedure may result in administrative withdrawal.

Students should also comply with the principles in the following statement, which was adopted by the Student Senate, the Faculty Senate and the Administrative Council of the University:

The Wichita State University reaffirms the principle of intellectual freedom in scholarly activity for University students, and it recognizes the full citizenship rights of students in inquiry, discussion and such actions as they may choose to take on public issues.

The rights and freedoms of students involve concomitant responsibilities. Incumbent on all students, as on all citizens, is the responsibility to observe the University's rules of orderly procedures and the laws of the larger community of which the University is a part. In the matter of actions on public issues, to speak one's opinion, to petition, to distribute literature, to assemble peacefully and hold meetings, to use the persuasion of ideas and other actions within the bounds of orderly and lawful procedures are sanctioned by the University. But infringement on the rights of others, acts or threats of violence to persons, destruction of property, disruption or other interference with the normal functioning of the University and its personnel and other disorderly and unlawful acts will not be countenanced.

Within its sphere of responsibilities the University will afford students proper procedural safeguards to resolve matters in dispute. Those who willfully violate these University standards must expect to face disciplinary action on the part of the institution, which may include reprimand, probation or suspension, consistent with campus provisions for due process.

Academic Honesty
Opportunities for learning at The Wichita State University involve the students' rights to express their views and to take reasoned exception to the views of faculty; to examine all questions felt to be appropriate to a course of study; to be protected from improper disclosure of their views and beliefs; to be examined in a fair and impartial manner; and to be treated with dignity and respect. Students are responsible,
Students who compromise the integrity of the classroom are subject to disciplinary action on the part of the University. Violations of classroom standards include:

1. Cheating in any form, whether in formal examinations or elsewhere
2. Plagiarism, using the work of others as one's own without assigning proper credit to the source
3. Misrepresentation of any work done in the classroom or in preparation for class
4. Falsification, forgery or alteration of any documents pertaining to academic records
5. Disruptive behavior in a course of study or abusiveness toward faculty or fellow students.

A standard of honesty, fairly applied to all students, is essential to a learning environment. Students violating such standards must accept the consequences; penalties are assessed by appropriate classroom instructors or other designated persons. Serious cases may result in discipline at the college or university level and may result in suspension or dismissal. Students accused of abridging a standard of honesty may protect themselves through established academic appeal procedures and are assured of due process and the right of appeal from accusations or penalties felt to be unjust.

Open Records

Students may inspect and review their educational records maintained by Wichita State. According to law, the University is allowed 45 days to respond to the requests, but typically less time is required.

Students wishing to challenge the accuracy of their records are entitled to a hearing, upon written request to the dean of the college in which they are enrolled. The hearing is arranged by the dean.

Students may also receive the names of persons from outside the University who request access to their records and the reason for such requests. Similarly, students may also be informed of requests for records from individuals within the University who normally do not review students' education records.

Information in a student's records will not be released without his or her written permission.

Exceptions to these statements are noted in Public Law 93-380. A copy of the law is available to all students in the Division of Student Affairs, Grace Wilkie Hall.

Accident or Injury

The State of Kansas and the Wichita State University do not insure against accidents or injury to students which may occur during University-sponsored activities on or off campus. The University will make every reasonable attempt to advise students concerning potential danger of accident or injury. Students are expected to act responsibly by taking necessary precautions to prevent accidents. Students are also advised to protect themselves from the financial burden of accident or injury through a personal insurance policy.

Courses

Courses carrying graduate credit are listed in the Graduate Bulletin. Other courses may be taken as supporting courses but are not counted toward an advanced degree and are not computed in a student's graduate grade point average. Only courses numbered 500 and above can carry graduate credit. In some cases courses numbered 500 through 699 are not allowed for graduate credit in student's major field and students should become aware of such restrictions before enrolling.

Courses numbered 500 through 799 may be taken by both undergraduate and graduate students. In such mixed classes a discernibly higher level of performance by graduate students is expected with the nature of this differential performance set by the professor. Graduate students enrolling in such classes automatically earn graduate credit unless the professor requests the Graduate School to have the given enrollment designated on the transcript as "Undergraduate Credit Only."

Courses numbered 700-899 are designed primarily for graduate I students (students who ordinarily have not accumulated more than 30 hours in a graduate program). Courses numbered 900-999 are designed primarily for graduate II students (those who ordinarily have completed more than 30 hours in a graduate program).

In special cases, courses in areas where advanced degree programs are not currently available may carry graduate credit and apply toward an advanced degree in a related field or simply count as graduate credit for some nondegree purpose. Any of these courses applied toward an advanced degree program must have the approval of the student's advisor and the chairperson of the department involved in advance of enrollment.

Graduate School Policies

Admission to Graduate Study

In order to receive graduate credit at the Wichita State University, students must be admitted to some category of study in the Graduate School.

The primary admissions criterion is a bachelor's degree from a regionally accredited institution. The basis on which credits are awarded for the bachelor's degree must be consistent with the policies and procedures for the award of such credit at Wichita State.

Applicants with bachelor's degrees in programs in which credit was awarded for experiences which were outside the control of a regionally accredited educational institution, e.g., credit for life experience, may be viewed as inadequately prepared to undertake graduate study. In such instances, admission to the Graduate School may be denied or prerequisite course work assigned to fill the deficiencies.

Two admission statuses are available in the Graduate School to accommodate qualified students desiring to pursue graduate degrees as well as those simply desiring to earn graduate credit for personal and professional reasons. Courses numbered 500 and above carry graduate credit for students admitted to the Graduate School and enrolling with a Graduate School major code. Classes numbered 800 and above are restricted to graduate students only.

The Graduate School does not deal with teacher certification matters as these are handled by the College of Education Teacher Certification Service Office, 151 Corbin Education Center.

Records required for admission evaluation should reach the Graduate School at least three weeks before registration for the term when admission is desired. Materials received after this date will be processed as the time of staff and faculty permits, but the Graduate School cannot guarantee that final action can be taken in time to allow enrollments for graduate credit.

Because of faculty and facility limitations, there are restrictions on the number of students admitted to some graduate programs and these limits may prevent some students from being admitted although they may otherwise qualify. Since departments having enrollment limitations generally take action on new applicants in March, early application is recommended. Prefer-
ence usually is given to degree program applicants.

To be considered for degree or nondegree graduate status, students must submit a completed Application for Admission and appropriate transcripts (as described below) to the Graduate School, 107 Jardine Hall, The Wichita State University, 1845 Fairmount, Wichita, Kansas 67208-1595.

An admission to the Graduate School remains valid only if students enroll and complete at least one class as graduate students within one calendar year of their admission date.

Graduation Requirements

Several steps are required before a student receives a graduate degree from WSU. Although they are explained in more detail in other sections of the Bulletin, the following list summarizes the requirements:

1. Formal admission to the appropriate degree program.
2. An approved Plan of Study on file in the Graduate School office.
3. Satisfactory completion of prerequisites indicated when admitted.
4. Satisfactory completion of tool or language requirements.
5. An Application for Degree submitted before the set deadline.
6. Removal of all incomplete grades by the deadline specified.
7. Completion of terminal program requirements such as thesis, dissertation, comprehensive examination, etc.
8. Submission of the bound thesis/dissertation or a bindery receipt by the deadline specified.
9. A cumulative graduate grade point average of at least 3.000 for all WSU courses on the Plan of Study and for all graduate work taken at The Wichita State University.

Graduate Degree Program Admission

General Information

Admission to a graduate degree program is based primarily upon an applicant’s previous academic record; therefore, two official transcripts of all previous academic work must be submitted along with the Application for Admission to the Graduate School. Some departments/programs require higher grade point averages than the minimum Graduate School requirements listed below, and other admission credentials (reference letters, Graduate Record Examination(s), etc.). This is particularly true for the PhD programs. Individual department sections of the Bulletin should be consulted about such requirements.

Full Standing

Minimum Graduate School admission requirements for full standing are listed below.

For master’s and specialist programs:
1. A bachelor’s degree from a regionally accredited institution.
2. A grade point average of at least 2.750 based upon the last 60 hours of course work (or nearest semester or term break to this), including any postbachelor’s graduate work.
3. No more than nine hours of background deficiencies in the major field of graduate study desired.

For doctoral programs:
1. Previous degree(s) from regionally accredited institutions.
2. A grade point average of at least 3.000 in the last 60 hours or nearest two years when the bachelor’s degree is the admissions credential. Applicant’s with a master’s degree or with completed graduate course work must have attained at least a 3.250 grade point average.
3. Scores on the General Aptitude Test of the Graduate Record Examination (within the last five years).

Conditional Status

Students who may have background deficiencies in excess of nine hours or who have not submitted required references, examinations, etc., but who otherwise have met the full-standing degree program requirements may be granted admission on a conditional basis.

Students are allowed one semester to submit the remaining credentials, including GRE scores for doctoral program admission, and one year to remove background deficiencies. Transfer to an appropriate nondegree category or to the Division of Continuing Education will result if the necessary conditions are not satisfactorily met.

Probationary Status

Students who do not meet the minimum academic requirements for full-standing degree program admission may be admitted on probation when reasonable evidence exists to indicate their ability to do satisfactory degree program work.

Graduate Nondegree Admission

Students originally admitted to a nondegree category may later reapply for admission to degree program status. A maximum of 12 hours of graduate credit taken while in a nondegree category may be counted in a degree program, provided students have obtained the approval of their major departments and the graduate dean.

Category A

Students who already possess a graduate degree or who do not want to seek a graduate degree at The Wichita State University should apply for admission in this category, if they meet the following requirements:

1. A bachelor’s degree from a regionally accredited institution.
2. A grade point average of at least 2.750 based upon the last 60 hours of course work (or nearest semester or term break to this), including any postbachelor’s graduate work.

Some departments require higher grade point averages and other admission credentials. Individual department sections of the Bulletin should be consulted about such requirements.

Applicants for category A must submit to the Graduate School a completed Application for Admission and two official transcripts of the work for either a previous graduate degree or for a bachelor’s degree.

Admission to this category provides students the opportunity to take courses at Wichita State for which they have the prerequisites. Upon satisfactory completion of a course, credit is placed on a Wichita State graduate transcript. However, only credit earned in courses numbered 500 and above is counted as graduate credit work.

Students who do not meet the 2.750 grade point average requirements may be admitted to this category on probation if reasonable evidence exists to indicate their ability to perform satisfactorily in 800-level or above course work.

Category B

Students not seeking a graduate degree at Wichita State but who want to continue personal and professional development beyond the bachelor’s level through enrollment in certain graduate-level courses, including workshops (courses numbered 750), may be admitted to this nondegree status. Students admitted to this category are restricted to enrollment in courses numbered below 800 for which they have the prerequisites. Admission to category B requires submission to the Graduate School of a completed Application for Admission form and two official transcripts showing the award of a bachelor’s degree from a regionally accredited institution. A copy of a currently valid teaching certificate may be
submitted as an alternate supporting credential.

Credit earned in category B status will be placed on a Wichita State graduate transcript, with graduate credit being awarded for courses numbered 500 and above.

**Guest Students**

Graduate students in good standing at another accredited graduate school may be admitted to Wichita State as guest students, if they have their school's permission to take up to one semester's work at WSU for transfer back to their home institutions. Admission requires the submission of a completed Application for Admission and a signed letter from the graduate dean or the dean's representative at the home institution certifying the student's status there. Such admission is valid for only one semester.

**Graduate Credit for Seniors**

(Senior Rule)

Seniors at Wichita State or neighboring bachelor's-degree-granting institutions may qualify to take work for graduate credit under the Senior Rule. This opportunity applies to students who have an overall grade point average of 3.00 or above in their major field and in upper-division courses and who are within ten hours of completing the bachelor's degree. Work must go beyond the requirements for the bachelor's degree, and the degree must be completed within the semester in which a student takes the graduate work.

Students who wish to earn graduate credit under the Senior Rule must apply to the Graduate School for regular graduate admission and also complete a Senior Rule application form. Approval of the Senior Rule course work is needed from the student's major advisor, the department chairman or graduate coordinator for the department in which the work is to be taken, the undergraduate dean of the student's college and the dean of the Graduate School before any courses can be taken for graduate credit. In addition, students from neighboring institutions must be admitted as undergraduates (possibly as guest students) through the University admissions office.

The completed Senior Rule application must be received in the Graduate School office no later than two weeks prior to the semester of intent.

**International Students**

A $25 nonrefundable application fee is required of international students, except those entering the Graduate School directly after attending Wichita State as undergraduates.

In addition to Graduate School and departmental admission requirements, international students must present a completed official Wichita State Graduate School Statement of Financial Support before necessary visa forms can be issued. International students must also attain a minimum score of 550 on the Test of English as a Foreign Language (TOEFL) taken within the last two years, unless they have attended another United States university in academic courses for a minimum of one year. All academic credentials must be official and translated into English.

International students who qualify for admission to the Graduate School may apply to their department chairperson or the dean of their college for information on graduate fellowships and assistantships. Enrollment in nine hours at the graduate level each semester is mandatory.

International students presently in the United States on a student visa obtained by admission to another U.S. university will not be considered for admission to Wichita State until they have attended the institution issuing their original I-20 for at least one year. Exceptions to this policy require the concurrence, in writing, of the institution issuing the original I-20.

International students requiring student visas are not eligible for nondegree admission status.

**Former WSU Graduate Students**

Students who have completed graduate course work at The Wichita State University but who do not enroll for more than 12 months are placed in an inactive status on the registrar's computer data base. To enroll again, such students need to write or call the Graduate School office and ask to have their records reactivated. Such notification needs to be done at least one month in advance of any planned enrollment.

Because of changes in program requirements, periods of nonenrollment may result in the need to complete an application for readmission to the program. Degree-seeking graduate students are expected to make progress toward their degree in a timely manner (six year time limit for master's and specialist degrees; six to nine years for doctoral degrees). Some departments take action to dismiss students who absent themselves for periods of a year or more.

Students who complete graduate degrees at The Wichita State University are transferred to nondegree, category A, status in the academic field of their graduate degree which allows continued enrollment for graduate credit at WSU. Should such students desire to undertake a new academic program or switch advising areas, a new application for admission to the correct area of work in the Graduate School must be filed with the Graduate School office. New transcripts are not needed in this case.

**Senior Citizen Enrollment**

Persons wishing to enroll under the Senior Citizens Program in courses numbered 800 and above must first obtain the written permission of the instructor.

**Independent/Directed Study Courses**

A primary goal of the Graduate School is to encourage independent scholarship. Thus, graduate students have many opportunities to engage in self-initiated independent study under the supervision of an individual member of the graduate faculty. In addition to traditional titles, such as thesis, research project, internship and practicum, various departments use independent study, special problems, directed readings, individual projects, directed study, etc. to identify opportunities for individual study. The following requirements govern enrollment in independent study offerings:

1. Consent of the instructor must be obtained before enrollment.
2. The content of the study should not be the same as that covered in a regular course (exceptions to this requirement must have the approval of the graduate dean before enrollment).
3. Although scheduled on an arranged basis, there must be a sufficient number of contact hours between the student and supervising instructor during the duration of the independent study to ensure consistency with the amount of graduate credit earned in a regular course offering.
4. No more than six hours of independent study course work (excluding dissertation, thesis and other independent study activities that are terminal requirements for a degree) can be used in a degree program.
5. Each student enrolled in an independent study offering is required to submit an abstract of the project to the supervising instructor at the time the product of the independent study is submitted for evaluation (excluding thesis/dissertation, research projects and other terminal projects required for a degree).

Some departments have specific requirements that must be met before en-
Cooperative Education Program
Cooperative Education is an academic program for undergraduate and graduate students who wish to combine classroom studies with academically related employment by being placed in paid internships closely related to their academic majors. Cooperative Education places students both locally and nationally.

The following description is applicable primarily to undergraduate students. Graduate students desiring to participate in the Cooperative Education program should first consult with their major department and the Graduate School.

By utilizing off-campus resources and expertise, Cooperative Education places students in business, government, industry, health and social agencies. Programs are individually designed enabling students to work directly with professionals in their field while expanding upon knowledge learned in the classroom. Opportunities may occur for students to refine research methods, apply theories in actual field settings, work with advanced technology and design original projects and research.

Students placed in cooperative programs must enroll in specially designated co-op courses and work with a faculty adviser from within their appropriate departments. Each placement is assessed by the faculty adviser for its potential to provide learning experience relevant to the student's professional and educational goals.

Academic credit may be earned through co-op placements as determined by the student's faculty adviser. During the internship, students are expected to meet project requirements assigned by their adviser. Academic credit generally counts toward University degree requirements.

Cooperative Education offers both full- and part-time placements. Students who select the full-time internship option must alternate a semester of full-time enrollment in course work before entering a second full-time position. Alternating placements also carry the status of full-time students and enjoy the accompanying privileges.

Students selecting the part-time option are required to carry a minimum of six hours of course work in addition to their co-op course. Students may enroll in part-time co-op positions during consecutive semesters so long as faculty sponsors determine that meaningful learning experiences exist.

Requirements for co-op participation vary within the different colleges and departments. Requirements for admission to the co-op program generally include completion of 24 credit hours and satisfactory academic standing. Interested students should contact the Cooperative Education Office in 125 McKinley Hall or phone (316) 689-3688. Students are required to complete an application for admission and schedule an interview with the appropriate co-op coordinator.

Advisers
Graduate students admitted in a degree program category are assigned faculty advisers when admitted to the Graduate School. Course work taken without the adviser's expressed approval is not automatically applicable toward a degree.

Students in nondegree status in designated departments are also assigned faculty advisers for consultation purposes. Students should consult their advisers for information on course prerequisites, content and similar matters.

Students admitted to nondegree unassigned status are not assigned faculty advisers and should be aware of this limitation when enrolling.

An adviser assigned at the time of admission to a doctoral program will assist the student in completing initial tasks such as enrollment, coordination of examinations, submission of a Plan of Study and the formation of a Supervisory Committee. Depending on individual department procedures, the adviser may chair an Advisory Committee which will also be involved in the advising activities above. It is also possible for the adviser to be named as Chairperson of the Supervisory or Dissertation Committee.

Enrollment, Drops and Adds
Procedures and times for enrollment are established by the registrar. Graduate students must enroll according to the times (determined alphabetically) published in the Schedule of Courses for any given term. Adherence to the enrollment schedules will minimize problems of unavailable records and other delays.

Students who have not enrolled for two or more semesters prior to a planned new enrollment should call the Graduate School to request preparation of enrollment materials and to clear any problems relating to their planned enrollment.

Once a student has enrolled, classes can be changed only by filing a Drop and/or Add Form with the necessary signatures. Changes of sections also require such action. If these forms are not submitted, an F grade could be recorded for failure to attend the class shown on the original enrollment records.

Fees are charged for late enrollments and drops. Only partial refunds are made after certain cutoff dates. Enrollment or drops normally will not be approved after the twentieth class day. Drops of classes with a W grade are also subject to a time limit established by the registrar.

The Graduate School, (316) 689-3095, has more information about deadlines of these items.

S/U and Audit Enrollments
Certain approved courses numbered 500 and above that carry graduate credit for a student are graded S (satisfactory) /U (unsatisfactory) for all students enrolled. Such courses are identified in the Schedule of Courses, or students enrolling in special offerings for graduate credit will be informed of S/U grading by the instructor if this system is to be used. No more than six hours of work graded S may be used toward the requirements for a graduate degree. Students wishing to transfer graduate course work graded S/U to a degree program at another institution should inquire of that institution's willingness to accept credit graded in this manner before enrolling.

Graduate students may take any course for which they have the prerequisites and which is open to them on the basis of their admission category on an audit (no credit) basis. The tuition and fees are no different for auditing courses than for taking them for credit, but a student's load (total credit hours) does not include audit enrollments. Courses taken on the audit basis may not be recorded for credit. Use of the audit basis for a course must be declared at the time of enrollment.

Administrative Withdrawal
Administrative withdrawal may be initiated by the graduate dean for the following reasons:

1. The student's class attendance is so irregular that in the instructor's opinion full benefit cannot be derived from the course.

2. The student fails to withdraw from one or more classes by the official procedure given in The Wichita State University Schedule of Courses.
3. The student does not meet the conditions for enrollment in courses numbered 800 and above.
4. The student's behavior is prejudicial to Wichita State.

Grades, Probation and Dismissal
Course work for graduate credit is normally graded A, B, C, D or F (see exceptions above). Faculty have the option of assigning an I (incomplete) if they feel that sufficient justification exists for the student's failure to complete the course.

Incomplete for regular courses (excluding research, dissertation, thesis, etc.) must be removed by the end of the next semester in which the student enrolls, summer excluded, or the grade of I will remain. If the preceding time limit is not met and students desire credit, they must reenroll in the course. If students reenroll in a course for which they received the grade of I, the grade is changed to a W for the original enrollment when the grade earned during the repeat enrollment is assigned. The grade earned during the repeat enrollment becomes the grade of record. Faculty members may define other conditions for the removal of incomplete grades within the general framework indicated here.

Graduate credit courses in which grades of C or above are earned cannot be repeated. Grades below C may not be used to satisfy degree requirements, but such courses may be repeated. The grades of all repeated courses that are started six years or less before the end of the semester within which the degree work is completed are averaged with the original grades to determine a student's grade point average.

The graduate grade point average includes only those courses taken at WSU for which graduate credit is earned and for which a regular letter grade (A, B, C, etc.) is assigned. Courses transferred from another institution and graduate credit courses graded S (satisfactory) do not affect the graduate grade point average.

Students admitted to full standing in a degree program, or nondegree category A, will be placed on academic probation if their graduate grade point average falls below 3.000. Students admitted on probation are automatically placed in full standing if they attain a cumulative grade point average of at least 3.000 after the completion of nine hours of graduate credit course work. Students placed on probation after admission are automatically returned to full standing if they attain a cumulative grade point average of at least 3.000 within nine additional hours of graduate credit course work.

Students may be dismissed from their degree program or nondegree category A and placed in nondegree category B if they fail to attain a cumulative grade point average of at least 3.000 upon the completion of nine graduate credits after admission on probation or placement on probation after admission. Students in any category may be dismissed from the Graduate School if they fail to maintain a grade point average of at least 2.000 in all work taken (including undergraduate courses) after admission.

Students also may be dismissed from a graduate degree program if, in the opinion of the graduate faculty offering the program, they are unable to carry on advanced work or make satisfactory progress toward the degree. Students dismissed for this reason may be transferred to a nondegree category.

Exceptions
Departures from the rules and regulations stated in the Graduate Bulletin require the filing and approval of a Request for Exception. Such requests must have the approvals indicated on the form and must state in a logical and coherent manner a rational basis for the requested exception. Forms for such requests are available from the Graduate School.

Unusual and/or substantial deviations from stated rules and regulations require action by the Graduate Council and may involve delays of several weeks.

Load Definitions
At least nine hours of graduate credit course work is defined as full-time graduate enrollment during the fall or spring semester. During the Summer Session, a minimum of six hours is considered full-time graduate enrollment. For graduate assistants working 20 hours per week, six hours constitute a minimum full-time enrollment.

Students enrolling in all or a majority of courses that carry undergraduate credit only must meet the undergraduate requirement for certification as a full-time student (12 hours).

The normal load for graduate students is 12 hours of graduate credit during the fall or spring semester. More hours may be taken with the advisor's approval, but graduate students may not enroll for more than 16 hours per semester (doctoral dissertation credit excluded), or nine hours during an eight-week Summer Session. Students may petition the Graduate School before enrollment for exceptions to this policy.

The course loads of students with teaching or research assistantships are normally reduced in recognition of the work they perform. While the Graduate School sets no official maximum number of hours, other than the 16-hour limit, students holding assistantships should work with their advisers to arrive at a load appropriate to their situations.

Special consideration for thesis and research enrollments may be obtained by petitioning the Graduate School.

Faculty Restrictions
Faculty members of The Wichita State University who hold the rank of assistant professor or higher cannot earn graduate degrees from Wichita State except for unassigned faculty (not attached to a particular college) or faculty members granted specific approval by the Graduate Council. Full-time faculty members may not pursue more than six hours of graduate credit per semester.

Degree Program Regulations
To pursue a graduate degree at Wichita State, students must be admitted to the specific program for which they are seeking a degree. Students may not be admitted to more than one graduate degree program at a time.

Upon the advice and consent of the major department, a maximum of six semester hours of work in one earned master's degree program may be applied to a second master's degree. Such hours must meet the time limit requirement.

Credits Required
All master's degrees require a minimum of 30 credit hours of graduate credit work, including 18 hours in courses numbered 700 and above, excluding workshops. Some programs require more than 30 credit hours, in which cases at least 60 percent of the courses must be numbered at the 700 level or above, excluding workshops. The total number of hours for the doctoral degree varies with the department offering the program, including the division between course work and dissertation hours. At least 60 percent of the hours beyond the master's degree must be in courses numbered 800 and above. Specific program requirements are listed in the individual department's section of the Graduate Bulletin.

Plan of Study
In order to define officially a program of study for a graduate degree, stu-
students must submit in triplicate the Plan of Study form leading to admission to candidacy for the degree no later than one month following the completion of 12 semester hours of graduate credit or the semester prior to the semester of graduation whichever comes first. For doctoral students, approval of a formal Plan of Study by the Dean of the Graduate School determines the requirements, rules and regulations which must be successfully met to complete the degree. It is important, therefore, that the Plan of Study be submitted as soon as possible but no later than the end of the semester in which qualifying examinations are completed.

Students must meet the program requirements in effect at the time the Plan of Study is officially approved. The process of filing an acceptable Plan of Study is not completed until the student and adviser have received approved copies of the plan from the Graduate School. If these copies have not been received approximately three weeks following submission, students should check with the Graduate School office.

A Plan of Study is developed in conjunction with the adviser and signed by the candidate, the adviser (and advisory committee members, if applicable), the chairperson of the major department and the dean of the Graduate School. All academic work completed and planned for the degree must be included in the Plan of Study at the time of submission.

Students may make changes of up to three courses in the Plan of Study that are necessary because of enrollment problems or other circumstances by submitting the Revision to Plan of Study form. More extensive changes may be accomplished by filing a new Plan of Study marked "revised plan."

Failure to meet the deadline for filing an acceptable Plan of Study may result in a delay in graduation or loss of credit planned for use in the program.

Language or Tool Requirements

The Graduate School has no overall language or tool requirements, although such requirements have been established by some departments. Students should consult an individual department's section of the Graduate Bulletin for information regarding such requirements.

Any tool subjects (e.g., foreign language, computer programming, statistics, etc.) required by the major department must be identified in the student's Plan of Study. The completion of this tool is not required prior to submission of the Plan of Study but is required prior to graduation.

Transfer of Credit from Another University

Graduate credit work at another university is not transferred and entered on a Wichita State transcript except in degree programs and only then after completion of all work for the degree, as defined on an approved Plan of Study. Students may transfer, with departmental approval, graduate credit from an accredited graduate school under the following conditions:

1. The credit offering institution is accredited by the cognizant regional accrediting association to offer graduate degree programs appropriate to the level of credit to be transferred, (b) the credit is fully acceptable to that institution in satisfaction of its advanced degree requirement and (c) the credit is applicable in terms of content to the student's program of study.

2. Master's and specialist degree programs requiring fewer than 40 hours may include no more than one-third of the total hours or 12 hours whichever is greater, of graduate work completed at another accredited graduate school. Departments may require lower limits on transfer credit and therefore students should consult individual program descriptions. Doctoral, Master of Fine Arts (MFA), Master of Business Administration (MBA) and other more lengthy programs have special transfer credit allowances, as indicated in their program descriptions.

3. Doctoral programs, with the permission of the student's department, may include a maximum of one-third of the course work hours required, exclusive of acceptable hours in a master's degree.

4. Students assume responsibility for initiating the request for transfer of graduate credit on a Plan of Study. An official transcript containing the requested transfer work must be on file in the Graduate School. If such work is shown on the transcripts provided in support of the original admission to the Graduate School, no new record need be provided. Approval by the major department is necessary to ensure that the course work has been accepted as an integral part of the candidate's program.

5. Courses considered for transfer must have been completed at an accredited graduate school and must carry a minimum grade of B.

6. Graduate credit earned through correspondence courses cannot be used to meet degree requirements.

7. Transfer credit that is accepted must have been in courses started six years or less before the semester in which the degree work is completed.

Extension, Workshop and Correspondence Credit and Credit by Examination

Workshops and extension graduate credit courses may be accepted for graduate credit as a part of a graduate degree program under the following conditions:

1. The work is approved by the major department.

2. The work is approved by the dean of the Graduate School.

3. The work is an integral part of a program planned by the candidate and the adviser and listed on an approved Plan of Study.

4. Graduate credit cannot be earned under a credit by examination program.

5. Correspondence courses are not accepted for graduate credit.

Degree Card Filing

An Application for Degree card must be filed with the Graduate School within three weeks (15 class days) after the beginning of any fall or spring semester in which students plan to finish all requirements for the degree. Students planning to graduate at the end of the Summer Session must file an Application for Degree within one week (five class days) after the beginning of the regular eight-week session even if they plan to enroll for the second four weeks only. In the latter case the degree card must be filed within the first week with an indication of intent to enroll for the second four weeks. If, after a student files a degree card, the degree is not completed, a new card must be filed within the time frame just described for the semester in which requirements for the degree are again expected to be completed.

Failure to meet these deadlines will result in a delay in graduation and in the awarding of the diploma. In these cases, if all work is completed, students need not enroll for the following semester.

Time Limits

Courses started more than six years before the semester in which the degree work is completed may not be used as part of a degree program. In some cases courses taken before this time may be validated. To have courses validated, students must petition the Graduate School and pass a special written examination with a grade of B or better. Transfer courses and work that originally received a grade of C
may not be validated. Courses completed ten or more years before the degree is granted, even if previously validated, may not be used to meet degree requirements.

For doctoral programs requiring a master's degree for admission, the doctorate must be completed within six years from the effective date of admission. In those programs permitting admission directly after the bachelor's degree, the doctorate must be completed in nine years after the date of admission.

Residency
The doctoral student is required to spend at least two contiguous semesters (summers excluded) as a full-time resident student.

Thesis or Research Credit
When a thesis is part of a student's master's degree program, and for all doctoral students, thesis or dissertation or research project credit must show on their graduate transcripts. The transcript will normally carry the grade of I until the thesis or dissertation is completed and students have met the requirements of the supervisory committee and the Graduate School. A grade of B or better is required for an acceptable thesis/dissertation. Thesis or dissertation hours in excess of the minimum required for the degree will be graded S.

Students writing a thesis or dissertation or engaged in research must be enrolled in courses entitled "Thesis," "Dissertation" or "Research" each semester in which they receive advice, counseling or research direction from their advisers. This includes the semester of graduation unless all degree requirements are met prior to the first day of classes. Enrollment is for the number of hours that accurately reflects demands of the students on University faculty and facilities.

Thesis Preparation
All copies of the thesis must be presented on white 8½ × 11-inch paper. The original must be on 20-24 weight bond with a minimum rag content of 25 percent if it is to be bound. Other copies must be on 16-20 weight paper. The thesis must include an abstract not more than one page in length which is to be placed directly after the title page. For additional information about the preparation of the thesis, the student is referred to the Thesis Preparation and Graduation Procedures Manual, produced by the Graduate School, which can be purchased in the WSU Bookstore.

Two bound copies of the thesis in approved form must be filed with the Graduate School and one copy with the department. (See the Graduate School calendar in the Graduate Bulletin for the due date.)

Examinations
Preliminary examinations are administered by several departments to determine students' qualifications for further graduate study. Qualifying examinations are required in all doctoral programs. Refer to the appropriate department's section of the Bulletin or consult with the department for additional information about these examinations. Most departments also require written or oral comprehensive examinations. Committees for these examinations are recommended by the major department and approved by the dean of the Graduate School. Each committee must include at least three members chosen from the faculty. In master's programs final oral examinations are required of all students presenting theses or research projects. Thesis committees include a minimum of three and a maximum of five voting members. Voting members are full or associate graduate faculty or persons from outside the faculty judged to have exceptional competence in the field of research covered in the thesis and who have been approved by the dean of the Graduate School. The chairperson of the examination committee must be a full graduate faculty member or an associate member with temporary authorization to chair the committee. A majority of the voting members must be from the major department. One voting member must be from an academic department outside the major department who is recommended by the student's adviser and approved by the dean of the Graduate School. In doctoral programs the Supervisory (Dissertation) Committee is composed of a minimum of five graduate faculty, with at least four having Full Membership including the chairperson who also must have authorization to chair doctoral committees. At least one member, the graduate dean's representative, must be outside the student's department. In addition to guiding the student to successful completion of the dissertation, this committee conducts the final oral examination.

In the above examinations the candidate passes if no more than one negative vote is cast.

Commencement
One commencement is held each year in May at Wichita State. Students completing degree requirements during the Summer Session or the fall semester preceding Commencement may obtain their diplomas from the registrar's office or request that their diplomas be mailed. These students may attend Commencement exercises the following May, but attendance is not required. Each graduate's name appears in the Commencement program, with the completion date of the award of the degree.

Financial Information

Basic Fees
The current fees, listed below for 1990-91, are subject to change by the action of the Kansas Board of Regents or the state legislature.

<table>
<thead>
<tr>
<th>Fee Type</th>
<th>Tuition</th>
<th>Nonresident</th>
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<tbody>
<tr>
<td>Each semester</td>
<td></td>
<td></td>
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<tr>
<td>Resident</td>
<td>$51.45</td>
<td>$156.00</td>
</tr>
<tr>
<td>Nonresident</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$772.00</td>
<td>$2,340.00</td>
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Student Service Fee-per

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1 through 14 hours-per</td>
<td></td>
<td></td>
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<tr>
<td>credit hour</td>
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<tr>
<td>$12.50</td>
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<td></td>
</tr>
<tr>
<td>15 hours and above-flat fee</td>
<td></td>
<td></td>
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<tr>
<td>$183.00</td>
<td></td>
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<tr>
<td>Student Service Fee-per</td>
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</tr>
<tr>
<td>semester</td>
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<td></td>
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<tr>
<td>$8.00</td>
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</tbody>
</table>

The student fees, required of all students enrolled on the Wichita State campus during the regular semesters and Summer Session, are distributed to pay for Educational Opportunity Fund, parking, Campus Activities Center, athletics, academic and service buildings, Heskett Center, student health services, forensics, Student Government Association, University Forum Board, student publications, concerts, drama and similar items.

Special Fees and Refunds
Prior to each semester, the registrar establishes enrollment dates. Late registration is a special service resulting in extra costs for special staff and facilities. Students who register late are assessed late registration fees as published in the Schedule of Courses.

Students who drop courses are assessed one transaction fee for all courses dropped at the same time. This fee recognizes that in many instances students have occupied space in class which was not available to other students and for the extra cost of staff and facilities to handle the transaction. The amount of the fee is published in the Schedule of Courses.

Refunds of tuition fees will be granted for withdrawals in accordance with dates and regulations published in the Schedule of Courses for the semester.
Fee Waiver Policy
The dean of the student's college, the dean's designee or the dean of admissions and records may authorize a waiver of special fees and/or nonrefundable tuition fees in cases where a schedule change or withdrawal is required because of University regulations, clerical errors, misadvising, class schedule change by the University or other exceptional circumstances beyond the control of the student and determined valid by the college dean or designee. To petition for a waiver, students should request a petition form from the dean's office of their college and return the completed petition form to the dean's office for consideration. Graduate students should petition the Graduate School dean's office. The student is notified of the action taken on the petition. If approved, the student should submit the petition to the controller's office with enrollment, schedule change or withdrawal forms. If the petition is denied, the student may get information from the appropriate college dean on how to file an appeal.

Graduate Assistantships, Fellowships and Scholarships and Loans

Assistantships
Each year Wichita State awards a number of assistantships for advanced study. Grants are made in most departments offering advanced degrees. Graduate assistantships provide for cash stipends up to approximately $8,000. A graduate teaching assistantship may qualify the recipient for cash stipends of approximately $5,400. Assistantships are available to students in counseling and school psychology in the Department of Counseling Education and School Psychology in the College of Education. It is awarded for one academic year and is renewable upon the recommendation of an advisory committee.

Public Administration Affairs Assistantships
Each year Wichita State awards, through the Public Administration Program Committee, a number of graduate assistantships for advanced study in public administration providing for cash stipends of approximately $5,400.

Fellowships and Scholarships
Wichita State awards fellowships and scholarships to graduate students, as described below.

Doctoral Fellowship Awards. Fellowships are awarded to a limited number of graduate students who are admitted to a program of graduate study leading to a doctoral degree and who are in good academic standing. Awards are made primarily on the basis of the academic achievement and potential of the student as a candidate for a doctoral degree. Credentials, such as transcripts of all previous academic work, scores on national or local examinations, experience related to the field of study and evaluations by former teachers, advisers or employers, are used in determining awards. Selections are made on a competitive basis without regard to race, creed, sex or national origin and are generally announced by April 15 for award the following fall. Recipients of doctoral fellowships may not hold employment without the written consent of the department chairperson and the Dean of the Graduate School.

James Chubb Memorial Fellowship. Established in 1971, the fellowship is awarded to a graduate student in the Department of Economics.

The Hugo Wall Fellowships. Established in 1973, these are awarded to outstanding students with an urban affairs or public administration background seeking the Master of Public Administration degree. The fellowships honor the contribution made to public administration by the late Professor Hugo Wall. Applications must be filed with the Public Administration Program coordinator, The Wichita State University, Wichita, Kansas 67208-1595, by March 1 for the following academic year.

The College of Education offers several scholarships to students enrolled in advanced degree programs: the Andrea Ullberg Scholarship is available to students in counseling and school psychology; the Herbert Hannan Scholarship is available to students in educational administration; and the Grand Army of the Republic Scholarship and the Sam and Rosemary Sherr Scholarship are available to students in communicative disorders and sciences.

The WSU Endowment Association and City of Wichita Assistantships. In addition to the regular teaching and research awards, a number of graduate assistantships are provided by The Wichita State University Endowment Association and from the City of Wichita and Sedgwick County mil levy funds. These awards require full-time study or a combination of research assistance and study equivalent to full-time study. The awards are made in graduate program areas judged to have a special need for graduate student support and are based primarily upon a student's academic record, experience and other available supporting evidence. All such awards are made by the graduate dean upon recommendation of the selected departmental chairpersons.

Graduate Student Services

Structure
The Vice President for Student Affairs and Dean of Students is responsible for the coordination and supervision of the Division of Student Affairs. Issues involving student life, development, programs, problems and activities on The Wichita State University campus are addressed by the staff of the division.

The dean of Student Life and Services is responsible for the residence
halls, off-campus housing concerns, handicapped services, fraternities and sororities, student organizations, child development center, veterans, women's activities, placement and career services, student health, student activities, counseling students with problems or concerns and encouraging scholastic achievement.

The dean of University College is responsible for the programs and policies of University College.

An assistant dean of students is responsible for Operation Success, Project Discovery and Upward Bound, the federal TRIO programs for educationally disadvantaged students.

Counseling and Testing

The Counseling and Testing Center provides psychological services and counseling for personal and career/life planning issues. Professional counseling is available on a cost-shared basis to all members of the University community—students, their families, faculty and staff. Individual, couple, family and group counseling are aspects of the professional counseling services. Testing services also are part of the center’s function. The credit by exam program and the National Testing program are administered directly by the Counseling and Testing Center. The National Testing program includes certification tests for community professionals, CLEP tests and entrance exams for colleges and graduate schools.

Office of International Programs

International Programs, 303 Grace Wilkie Hall, serves the special needs of approximately 1,000 international students from more than 70 countries enrolled at Wichita State. (For international student admission requirements, see the Admission to Wichita State section of the Catalog.) An orientation program specially designed for newly arriving foreign students prepares them for entrance into the American academic system and way of life.

International Programs also sponsors the International Conversation Partners Program, the Global Classroom Program and various other activities that promote interaction between American and foreign students.

In addition, the International Program houses a Study Abroad Center which provides information to American students on study, work and travel opportunities abroad. Information concerning Fulbright-Hays grants may be obtained from this center.

Placement and Career Services

The Placement and Career Services office provides services to students and alumni seeking career advice or employment-related assistance.

Individual career counseling is available to assist students and alumni with planning and decision making. Assessment instruments, including SIGI (a computer guidance system) are offered for self-assessment. Workshops, presentations and classroom instruction are offered to enable persons to learn about the responsibilities of various career fields, to prepare job resumes and letters of application, to conduct effective employment interviews and to make informed decisions.

Occupational and career information, employer directories, information on employment trends, employer recruiting literature, annual salary survey reports and information on graduate and professional school opportunities are available in the Career Resource Center.

Degree candidate and alumni placement services include direct referral to career employment vacancies; on-campus interviews with employer representatives; and an employment listing bulletin.

Placement services also include part-time and summer employment opportunities.

Housing

Requests for housing information should be sent to:
Director of Housing
The Wichita State University
1845 Fairmount
Wichita, Kansas 67208-1595

The Wichita State University reserves the right to make policy adjustments where the situation demands and to change the residence of any student or deny or cancel residence accommodations of any student in cases where such action is deemed desirable.

WSU Child Development Center

The WSU Child Development Center is a licensed school for children of Wichita State students. Certified preschool teachers and part-time aides supervise activities which include art, language, music, science, numbers and literature.

The school is available for children six weeks to twelve years old from 7:30 a.m. to 5:30 p.m. Monday through Friday and 5 to 10 p.m. Monday through Thursday (no infant service). Each child must stay for a minimum of two hours per day. The program permits children to attend preschool while their parents are in class. It is available to the greater community as well.

Handicapped Services

The handicapped services office provides supportive services for students with impaired sensory, motor and/or speaking skills.

Student aid assistance during the 1990-91 school year has included note-takers, readers, library assistants, wheelchair pushers, test proctors, escorts, transfer assistants, transcribers and clerical services. Those interested in these services should contact the handicapped services office for updated information on such assistance.

Auxiliary aids and materials available for student use include the Perkins Braillewriter, IBM Braille typewriters, slates and styli, raised line drawing kits, the Speech Plus Calculator, Braille measuring instruments, mobility canes, print magnifiers, four track cassette tape recorder players with earphones, standard tape recorder players, phonographs, digital Braille clocks, lap boards, transcribing papers and blank tapes. Textbooks are ordered through this office for students requesting books on tape, in Braille or in large print. Tactile campus guides, Braille campus maps and manual wheelchairs for emergency use can be provided.

Student Health Services and Hospitalization Insurance

The Student Health Services in 209 Ablah Hall provides ambulatory health care for students with health concerns, medical problems, illnesses and injuries. Clinic services and health education are provided by a staff of professional nurses and community physicians. The services of registered nurses and nurse practitioners are available during office hours and physicians may be seen by appointment during their scheduled clinic hours. Physicians specializing in ear, nose and throat; dermatology; gynecology; internal medicine; orthopedics, surgery; and family practice are available.

Special services of immunizations, tuberculin skin testing, family planning information, physical examinations required by academic programs, nutrition and diet counseling and health screening are offered.

The student body has chosen to participate in a group plan for accident and sickness insurance coverage. Opportunities to enroll in the program are offered at the beginning of each regular semester. Information is available at the Student Health Services and the Office of Student Life and Services.
Research Support

Research Administration
The Office of Research Administration assists the faculty in developing sponsored research, training and other service proposals. The office collects, maintains and provides information regarding the programs, interests and needs of governments, private foundations and businesses; coordinates the preparation and submission of project proposals; and handles the general administration and reporting of sponsored grants and contracts.

Center for Economic Development and Business Research
The Center for Economic Development and Business Research, a service of the Barton School of Business, engages in business-economic research for a wide variety of clients in both private and public sectors. The center gathers, analyzes and publishes data describing economic conditions in Wichita and Kansas and is the sole source of comprehensive monthly economic data for the state. The center's staff of faculty and graduate and undergraduate students works together on policy-oriented research and publications, publishing the quarterly *Business & Economic Reports* alternately with the monthly *Kansas Economic Indicators*.

Center for Human Appraisal
The Center for Human Appraisal operates as a service of the Barton School of Business to extend research attitudes and interests in the behavioral sciences and apply that knowledge to governmental agencies and the business community. Projects undertaken by the center include management surveys, assessment programs, supervisory selection, selection for promotions, morale research, supervisory training and general research on people systems.

Center for Women's Studies
The Center for Women's Studies serves to promote research and other activities related to women and their concerns, to foster closer ties between academic and community efforts with respect to women's needs, to act as an informational referral agent and to enhance the overall awareness of campus and community to the current needs of women in the areas of education, jobs and life choices. The center is responsible for administering the BA in women's studies and supervises the work of students pursuing a concentration in women's studies in various graduate areas. The center maintains a small resource library of books and periodicals open to students, faculty and others; sponsors seminars, workshops and lectures; and provides community and campus speakers.

Hugo Wall Center for Urban Studies
The Wichita State University's role as a comprehensive urban institution was outlined by the Kansas Board of Regents in 1972: "As the Regents' urban institution, The Wichita State University's...mission includes development of programs utilizing the unique resources of the urban area..."

The Center for Urban Studies was formed in 1955 and has become a leading contributor to the urban mission articulated by the Board of Regents. The center conducts instruction, research and service programs, integrating these three essential University functions in responding to the needs of students and the urban environment. The Master of Public Administration degree is administered through the center and its faculty in public administration and urban affairs. Service programs of the center include public affairs seminars, workshops for governmental personnel, professional development seminars for governmental managers and a variety of other programs designed to link the resources of the University to urban governments. The faculty and staff of the center are engaged in a wide range of research on state and local government in Kansas, including research and analysis of boards and commissions in the City of Wichita, a history of the property tax in Kansas, a labor market analysis to guide economic development policy in the City of Wichita, a political history of Wichita and a study of and compilation of selected papers of former Kansas Governor John Carlin.

National Institute for Aviation Research
The National Institute for Aviation Research, which conducts research on topics related to aviation safety, with a focus on crashworthiness of aircraft structures, human factors, deicing, stall-spin prevention and aviation software reliability.

3. Center for Productivity Enhancement which supports research and technology transfer in computer-aided design, computer-aided manufacturing, computer-integrated manufacturing, robotics, artificial intelligence, use of composite materials and related manufacturing technologies.

Rehabilitation Engineering Center
The Kansas Board of Regents formally established the Rehabilitation Engineering Center in the WSU College of Engineering during 1978. The objective of the center is to use technology to improve the vocational prospects of the severely disabled. A qualified engineering staff, along with a rehabilitation laboratory, technicians and a well-equipped shop facility, provides the means to accomplish the center's goals. A federally sponsored rehabilitation grant allows faculty and staff to participate actively in this research.

Small Business Development Center
The Small Business Development Center, through the Barton School of Business, was established in October 1983. The SBDC provides free counseling and low-cost training to small businesses using consultants from the University as well as the community. Funding for the center is provided by the U.S. Small Business Administration, the State of Kansas and participating universities and colleges.

The center at WSU works with businesses located in the 17 counties of southcentral Kansas. Also located at WSU is the state headquarters of the Kansas Small Business Development Centers, which oversees activities of the eight regional SBDCs and 12 associate centers in Kansas. These 20 centers are located primarily at academic institutions throughout the state.

Small Business Institute
The Small Business Institute is housed within the Barton School of Business. Its purpose is to bring together the student's knowledge and the small business experience on a consultation basis. Such interaction rounds out the senior student's education with practical experience while offering assistance to small businesses in the community.

Social Science Research Laboratory
The Social Science Research Laboratory (SSR Lab) supports instruction in research methods and provides faculty,
staff, students and off-campus patrons assistance and consultation regarding research issues and questions. The SSR Lab houses the Test Grading Service for instructors who wish to use the multiple form bubble sheets as test answer sheets. The answer sheets are scanned and the instructor is provided with scores and statistical analyses consisting of the grades (in name and social security number order) and a complete item analysis of the exam. This type of service and consultation is available to individuals working on research projects also. For faculty and staff who work with microcomputers, the SSR Lab is able to up and down load files to and/or from the University’s mainframe.

The lab organizes, administers and scores the Student Perception of Teaching Effectiveness evaluations to provide the instructor a profile of their teaching skills in comparison to others in the same department, the same college and the entire University. Upon request, consultation is offered regarding the profile analysis.

The SSR Lab houses 15 terminals connected to the mainframe, an NCS Sentry 7006 scanner, several Zenith microcomputers and two IBM printers, a 3262 and a 4224.

University Gerontology Center
The University Gerontology Center develops and coordinates gerontology-related activities and programming at Wichita State, including instruction, research, service and continuing education. The center develops and manages community research in the area of aging and serves as a resource center and information clearinghouse to assist community agencies and organizations in planning and developing services for older persons.

University Press of Kansas
The University Press is operated jointly by six state Kansas universities: the University of Kansas, Kansas State University, The Wichita State University, Emporia State University, Fort Hays State University and Pittsburg State University. Founded July 1, 1967, it was the first university press in the United States to function on a state-wide level under specific sponsorship of all of the state’s universities. Offices are located on the campus of the University of Kansas in Room 303, Caruth-O’Leary Hall.

Walter H. Beech and Supersonic Wind Tunnels; Water Tunnel
Various wind tunnels are available at Wichita State for faculty and student use in aerodynamic studies. The Walter H. Beech Wind Tunnel is a 200 mph closed-return tunnel with a 7' x 10' test section. A digital data logging system and an on-line microprocessor with plotting capability are employed as part of the readout system. Two supersonic wind tunnels, capable of producing wind velocities from two to four times the speed of sound, are available.

A new 1 x 1.3 meter subsonic wind tunnel features a laser velocimetry system for flow measurement. Two smoke tunnels, a boundary layer tunnel, a water table and a new water tunnel also are available for flow-visualization studies.

The 2' x 3' water tunnel is excellent for flow visualization. Dye filaments are introduced into the flow and data are taken with cameras and videotape recordings.

WSU Center for Energy Studies
The WSU Center for Energy Studies conducts energy research with emphasis to Kansas applications. Current areas of specialization are the availability, cost, reliability and quality aspects of electric power. Research in the engineering and technical use of microcomputers is conducted also. The center is housed in the College of Engineering.

Special Academic Programs
Center for Continuing Engineering Education
The Center for Continuing Engineering Education has as its objectives:
1. Providing noncredit engineering education for professional development or occupationally/professionally related purposes.
2. Cooperating with the engineering professions and related professional associations to provide specialized courses and certificate programs.
3. Sponsoring, developing and cooperating in programs and activities that extend the resources and knowledge of the University to industry, special audiences and the general public.

Center for Entrepreneurship and Small Business Management
The Center for Entrepreneurship and Small Business Management is within the W. Frank Barton School of Business, and is housed in Devlin Hall. The center is committed to promoting an environment that encourages private enterprise and that seeks to preserve and enhance entrepreneurial activities. The center provides a comprehensive curriculum in entrepreneurial studies, as well as a major in entrepreneurship and a sequence in entrepreneurship for MBA students.

Seminars and workshops are offered for those interested in entrepreneurship. The most popular workshop, "Entrepreneurship: Your Future in Business," has received international recognition.

In addition, there is a one-week "Entrepreneurship Camp" for high school juniors and seniors. Additional programs include a visiting lecture series, a complete resource center and workshops. The Association of Collegiate Entrepreneurs, an international resource and information network for young entrepreneurs, is headquartered at the center.

The center is conducting a major research project to learn the effects of entrepreneurial education on new business start-ups and success rates, as well as a profile of individuals who start businesses.

Center for Management Development
The Center for Management Development, through the Barton School of Business, offers noncredit management development seminars to the business community.

The WSU management seminars and workshops have been acclaimed for their usefulness to practicing business people and other professionals in a wide variety of organizations. The center offers a broad range of management education and development opportunities to the growth-oriented supervisor, manager or professional specialist in business, industry, government and other public or private organizations.

Cooperative Education Program
The Cooperative Education program is a University-wide, centrally administered academic program providing students the opportunity to integrate formal course work with periods of relevant off-campus employment. More information is available in the Graduate School section of this catalog.

French Student Exchange Program
WSU is among the 100 colleges and universities in the United States that participate in the annual student exchange organized by the French Ministry of Education. One individual from WSU spends the academic year in France as a salaried assistant in English, and a student from France is attached to the WSU Department of Modern and Classical Languages and Literatures as a salaried assistant in
French. Majors and minors in French who have graduated within one year prior to departure date are eligible to apply.

Institute of Logopedics

The Institute of Logopedics is a private, nonprofit, residential and outpatient rehabilitation center located on 40 acres near the Wichita State campus. The institute is a residential facility specializing in habilitation and rehabilitation of children with speech, language and hearing disorders. The institute is University-related through its affiliation with the College of Education's Department of Communicative Disorders and Sciences, which offers academic preparation for Wichita State students desiring to work with communicatively handicapped children and adults. Observation and practicum opportunities are provided at the institute as part of the professional preparation of students in speech and language pathology and audiology.

Reading/Study Skills Center

Wichita State offers a variety of services to students through the programs of the Reading/Study Skills Center. Courses are offered to help students improve their reading and study skills. Complete descriptions of the courses offered at the center are available in University College.

In addition to formal course work, other study skills workshops are made available to students enrolled at Wichita State.

Special Facilities

Instructional facilities on the 330-acre Wichita State campus are used for educational purposes more hours per day than at any other Kansas college or university. Many of the University’s special facilities are described on the following pages.

Ablah Library

Through a wide range of materials, services and facilities, Ablah Library supports WSU teaching and research. Its growing collection of more than two million items includes not only books and periodicals, but microforms, corporate annual reports, college catalogs and audio recordings. The library also makes available study carrels, electronic carrels containing listening and viewing equipment, group-study rooms, microform reading equipment, copy machines and typewriters.

The Department of Special Collections houses a rapidly growing manuscript collection of more than 700,000 pieces including papers of the abolitionist William Lloyd Garrison and many U.S. congressmen. Other collections include original editorial cartoons by Pulitzer prize-winning cartoonists, publications of U.S. radical organizations and maps and books.

Cable Television

The Wichita State University operates Channel 13 on Wichita’s cable television system. WSU 13 broadcasts 126 hours per week of adult-oriented educational, cultural and informational programming. This programming includes 10 to 15 television courses per semester offered for academic credit by the various colleges at WSU. Channel 13 also produces programs featuring distinguished guest speakers, fine arts performances and other campus events. WSU 13 is affiliated with The Discovery Channel and BizNet, nationally delivered program services. In addition to full-time staff, 15 students are involved in the operation of the channel and the production of programs. Facilities are located in the Media Resources Center.

Campus Activities Center

The Campus Activities Center (CAC) is the community center for Wichita State University. Through its facilities and services, the center serves students, faculty, staff, alumni and guests of the University.

The CAC has several dining areas to provide a variety of atmospheres and menus as well as a catering department to meet special needs; the University Bookstore which stocks textbooks, supplies and gifts; a recreation center for leisure use that includes video games, bowling, billiards and a barber/beauty shop; a theater; and a variety of rooms that can be scheduled for meetings, special events and conferences.

The reservations office schedules the use of all facilities in the center as well as most University facilities for out-of-classroom use. Through the Student Activities Council, students are provided an opportunity to learn and develop leadership skills while planning a variety of programs for the campus.

The CAC is also home for the Student Government Association, Student Ombudsman, Ecumenical Christian Ministries and Informed Sources, a student-run campus information center.

Computer Laboratory Facilities

The Department of Electrical Engineering in the College of Engineering has a microcomputer laboratory consisting of fourteen Zenith 151 or 156-XT compatible microcomputers and eight printers. Each microcomputer has a 20MB hard disk, flexible disk drive, color display and 640KB RAM. Software packages include word processing and spread sheet with graphics, as well as systems analysis programs written by department members, which are installed and copy-protected on the hard disks and accessible for student use.

The facility is used by electrical engineering students for report writing, tabular and graphical display of laboratory data, and analysis and design of electronic and control systems.

A second laboratory is equipped with five AT compatible computers networked using a NOVELL Ethernet compatible system. These are equipped with sampling hardware and a software package for investigating the sampling process and associated digital signal processing. All laboratory machines are networked and have a multiplex gateway to the University computing system.

Computing Center

The University Computing and Telecommunications Center serves students, faculty and staff of the University by providing contemporary computing services for instruction, research and sponsored programs, administrative data processing and public service. These services include consultation, systems analysis and design, programming, interactive time-sharing, batch computer operations, an on-line administrative data base and assistance to computer users in their preparation of requests for competitive bids for the acquisition and selection of computer-related equipment.

The central processing unit is an IBM 3081-D with 16 million characters of main storage and more than 30 billion characters of on-line disk storage. Magnetic tape drives, line printers and an off-line digital plotter are available for general use. A network of more than 1,000 terminals provides interactive computing for campus classrooms, laboratories and offices. These terminals
may be used with the academic time-sharing system (CMS), interactive computer graphics, and computer-assisted instruction and the administrative terminal system (CICS). Interactive terminal facilities for students and faculty are located in Ablah Library; the Barton School of Business; the College of Engineering; the departments of chemistry, mathematics, physics, and anthropology; and in the Social Science Laboratory, where a line printer is located. More than 1,200 microcomputers are integrated into the instructional and research areas on campus. Facilities are available to permit transfer of information between the central computer and microcomputers equipped for communications.

The computing center terminal facility is located in Neff Hall. Color graphics terminals, a color graphics printer and several other CRT terminals are available in Room 114. CRT terminal facilities and hard copy terminals are located in Room 113. Both rooms are open and available 24 hours a day, seven days a week. Scientific programming and consulting services for faculty and staff instructional and research projects are located in Room 119. Student programming assistance and academic user services are located in Room 115. Batch and remote batch jobs may be submitted 24 hours a day. Printer and plotter output may be picked up from the dispatch window at Room 108 during scheduled hours.

Harvey D. Grace Memorial Chapel
Harvey D. Grace Memorial Chapel, located in the heart of the campus near Morrison Hall and the Campus Activities Center, was built in 1963 and dedicated to serve all creeds and races. The chapel is available to students for group or individual worship and meditation.

Helpem International Center
The Milton Helpem International Center for the Forensic Sciences serves as a vital resource of the Department of Administration of Justice and as an important depository of information relating to major forensic cases in the United States and abroad. Under the direction of Dr. William Eckert, the center serves as an important information source for forensic scientists and law enforcement agencies working to solve major criminal cases. The center also serves the needs of students majoring in the department. Its resources include extensive library material, tapes and other documents pertaining to major forensic cases. The center is located in the Liberal Arts and Sciences building.

Heskett Center
The multipurpose dance, physical education and recreation complex is named after H. Dene Heskett, a 1935 alumnus and benefactor of WSU. The 166,000 square foot complex contains instructional, research and recreational areas as well as the equipment necessary to support activities. Activity areas consist of a weight room, combatives room, 25-meter indoor swimming pool with separate diving well, a 200-meter indoor jogging track which surrounds five basketball courts and eight handball-racquetball courts. The outdoor area contains a six-court lighted tennis complex and four large lighted play fields. These activity areas are designed to facilitate an extensive campus recreation program.

KMUW Radio Station
KMUW Radio broadcasts at 89.1 FM. The 100,000-watt station is one of more than 300 public radio stations that make up the National Public Radio network. It serves the greater Wichita area and outlying communities within a 60-mile radius. KMUW programming includes classical and jazz music, news and public affairs, plus coverage of special events at Wichita State.

Marcus Center for Continuing Education
Many educational services are offered through the Marcus Center for Continuing Education, an adult education facility at 4201 East 21st Street. Specialized courses for business and industry, governmental agencies and the professions; special conferences for the general public; and a wide variety of personal enrichment programs are offered in the center. In addition to renting meeting areas, the Marcus Center for Continuing Education provides program development, brochure preparation, mailings, fee collection, material preparation and reproduction, registration and program evaluation.

Speech-Language-Hearing Clinic
The Wichita State University Speech-Language-Hearing Clinic, 104 Hubbard Hall, provides diagnosis and treatment of speech, language and hearing problems, including hearing aid fittings. Services are available on a cost-shared basis to University students, staff and faculty, as well as residents of surrounding communities. The clinic is open 8 a.m. to 5 p.m. Monday through Friday for scheduled appointments and also on arranged evenings for hearing testing and stuttering and other support group meetings. Senior and graduate students in the communicative disorders and sciences department provide services. All work is supervised by departmental faculty who hold appropriate national certification.

Sports and Recreation
Sports and recreation facilities for students at Wichita State include a regulation 18-hole golf course; the 10,575-seat Henry Levitt Arena which is used for intercollegiate basketball games and major entertainment events; Cessna Stadium, a 30,000-seat stadium; and Eck Stadium-Tyler Field, home to the Shockers baseball program, which ranks among the finest college baseball facilities in the country.
Wichita State is a member of the Missouri Valley and Gateway Athletic Conferences and consistently ranks nationally in basketball, baseball, tennis and bowling.

The campus recreation program, featuring the multipurpose complex, the Heskett Center, is designed to provide activities for all students, faculty and staff. In addition to intramurals and open recreation time, offerings include sport clubs; special events; excursions for children of WSU students, faculty and staff; a family program; mini-courses and workshops; outdoor recreation; and aquatics.

**Edwin A. Ulrich Museum of Art**

The Edwin A. Ulrich Museum of Art is recognized nationally for the outstanding quality of its programs. In 1984, approximately 135,000 people visited its galleries. During its first 13 years of existence, the Ulrich Museum has presented more than 400 exhibitions, ranging in scope from the poetic paintings of Joan Miro to the hyperrealist sculptures of Duane Hanson.

The museum has had one-person exhibitions of work by Joan Miro, David Hockney, Milton Avery, Kenneth Noland, Morris Louis, Isabel Bishop, Frederic Church, Childe Hassam, Alice Neel, Robert Motherwell, Alberto Giacometti, Gaston Lachaise, plus the work of many other famous artists.

Although the emphasis has been on contemporary art, there have been exhibitions as diverse as prehistoric American Indian pottery, treasures from Spanish galleons sunk in 1724, art from 16th and 17th century Antwerp, artifacts from the Civil War ironclad U.S.S. Monitor, holography, electronic art, African art and the art of New Guinea. In addition, there have been numerous photographic, print and ceramic exhibitions.

The on-campus museum is named after Edwin A. Ulrich, a retired New York businessman, who gave the University more than 300 paintings and $1,147,000 to support the collection. The Ulrich gift, valued at $4 million, is one of the largest single donations ever made to the University.

The Wichita State University Endowment Association art collection numbers more than 6,000 items. Twentieth century American art forms the core of the collection augmented by hundreds of other paintings, drawings, prints, sculptures, photographs and ceramics.

Of special note, the Ulrich Museum contains the most complete collection of paintings by the world famous American marine artist, Frederick Judd Waugh (1861-1940). The museum also houses extensive groups of work by such artists as Kathe Kollwitz, Charles Grafly, Harry Sternberg and Robert Goodnough.

Reaching beyond the traditional museum's walls, the University has an outdoor sculpture collection which is one of the best in the nation. The collection is a cross-section of 20th century sculpture, featuring works by Auguste Rodin, Henry Moore, Louise Nevelson, Joan Miro, George Rickey, Fernando Botero, Barbara Hepworth, Chaim Gross, Theodore Roszak, William Zorach, Ernest Trova, Robert Indiana, Luis Jimenez, Lynn Chadwick and many others.

The largest and most significant outdoor work is the marble and glass mosaic, *Personnages Oiseaux* created especially for the facade of the Ulrich Museum by the late Spanish artist, Joan Miro. The mosaic, the largest in the work by Miro, is constructed of one million pieces of colored Venetian glass.

Another aspect of the museum is its visiting artist program. More than 50 artists have visited WSU, including Henry Moore, Louise Nevelson, Luis Jimenez, Isabel Bishop, Duane Hanson, Gordon Parks, W. Eugene Smith, Arnold Newman, Milton Glaser, Paul Rand, Alice Neel, Theodore Stamos and Will Barnet. The museum also has organized traveling exhibitions of work by such artists as Duane Hanson, Gordon Parks and Ernest Trova.

**Wichita Radio Reading Service**

A sub-carrier of KMUW, the Wichita Radio Reading Service programs readings of printed material to more than 2,000 print-handicapped individuals. WRSS, a 24-hour daily service, also offers programming from the In-Touch Network and National Public Radio and locally produces such creative programming as poetry and radio drama.

**Wiedemann Hall**

Wiedemann Hall houses the first organ built in North America by the world-renowned firm of Marcussen and Son, Denmark. The hall, which was dedicated in 1986, is the ideal acoustical setting for the organ. In addition to the hall's main auditorium, the building has four faculty offices, an organ studio and rooms to accommodate announcing, recording and televising.

The building is named for the late community philanthropist and music lover Gladys H. G. Wiedemann who in 1983, as president of the K. T. Wiedemann Foundation, Inc., donated the great Marcussen organ.
W. Frank Barton School of Business

Offices: 100 Clinton Hall
Billy M. Jones, Interim Dean
Dennis C. Duell, Associate Dean
W. Dean Vicky, Assistant Dean
Robert H. Ross, Director of MBA program

School of Accountancy—James W. Deskins, director

Departments
Economics—Dong W. Cho, chairperson
Finance, Real Estate and Decision Sciences—Donald R. Levi, chairperson
Management—John A. Belt, chairperson
Marketing and Small Business—Robert H. Ross, chairperson

Graduate Faculty

School of Accountancy
Professors: James W. Deskins (director), Ralph W. Estes, Michael F. Foran, Bill D. Jarnig, Phillip T. May
Associate Professors: Nancy J. Foran, Linda C. Mitchusson, Douglas Sharp
Assistant Professors: LuAnn G. Bean, Sidney E. Brinkman, Linda F. Christensen

Economics
Professors: Dong W. Cho (chairperson), Randall H. Haydon, Gerald S. McDougall (associate vice president for academic affairs), Martin M. Perline, Jimmy M. Skaggs, Samuel C. Webb
Associate Professors: Dennis C. Duell (associate dean, Barton School of Business), Philip L. Hersch, David M. Kemme, Maurice Pfe nbricht, William T. Terrell, I.N. Yoon
Assistant Professors: Jen-Chi Cheng, James E. Clark, Edwin A. Sexton

Finance, Real Estate and Decision Sciences
Endowed Professor: Donald R. Levi (chairperson, Professor of Real Estate, occupies the Kansas Chair in Real Estate and Land Use Economics)
Professor: Curtis D. Terferring
Associate Professors: Morita M. Bateman, John D. McBride, Dwight D. Murphy, Carl C. Nielsen
Assistant Professors: Donald Christensen, Muhammed Dadashzadeh, Mark G. Dotzour, Manoj Gupta, George Heinrich (visiting), Richard LeCompte, Awanit P. Sethi

Management
Endowed Professor: Gerald H. Graham (R.P. Clinton Distinguished Professor of Management, occupies the R.P. Clinton Endowed Chair of Management; director, Center for Entrepreneurship)
Professor: Arthur B. Sweeney
Associate Professors: John A. Belt (chairperson), Dharma desilva, Kamal Fatehi-Sedo, Cynthia Lengnick-Hall
Assistant Professors: Nancy A. Bereman, Mark Lengnick-Hall, Linn G. Neidengard, Charles A. Pranter, W. Dean Vicky (assistant dean, Barton School of Business)

Marketing and Small Business
Endowed Professor: Billy M. Jones (WSU Endowed Professor of Entrepreneurship and Small Business Management, occupies the Endowed Chair of Entrepreneurship and Small Business; interim dean, Barton School of Business)
Associate Professors: Donald W. Hackett, Frederic B. Kraft, Robert H. Ross (chairperson; director, MBA program)
Assistant Professors: Brent D. Bowen (director, aviation management), Phillips W. Goodell, Dean E. Headley, Charles L. Martin

The mission of The Wichita State University W. Frank Barton School of Business is to offer learning opportunities which contribute to the development of professionally competent and socially responsible men and women for careers in business, government and other organizations requiring the organizational, managerial and analytical skills necessary in today’s rapidly changing environment.

This mission is influenced by the location of the college in the largest economic and cultural center in the state of Kansas. As an integral part of the state’s designated urban university, the faculty of the Barton School of Business is committed to programs and activities that will help sustain the contribution that this urban center makes to the economic, professional and cultural health of the state and nation.

Graduate degree programs in the school lead to the Master of Business Administration (MBA), Master of Professional Accountancy (MPA), Master of Science (MS) in administration and the Master of Arts (MA) in economics.

Master of Professional Accountancy
The Master of Professional Accountancy program at The Wichita State University is designed to prepare qualified candidates for careers as professional accountants in public practice, industry, government and nonprofit organizations. The program is based on strong preparation in general education courses with special emphases on communication skills, mathematics and economics, and includes a broad exposure to the different aspects of business and management.

The program requires a minimum of five years of full-time collegiate study, when beginning as a freshman. Students who decide to enter the program later in their academic careers should consult with the assistant director of the School of Accountancy to learn the approximate length of time it would take to earn the degree.

Admission Requirements
Admission to the MPA professional curriculum is available to (1) qualified students who have not yet completed a bachelor’s degree, and (2) qualified students who have completed a bachelor’s degree (not necessarily in business or accounting) from an accredited college or university.

Full admission to the MPA professional curriculum, for students who have not yet completed a bachelor’s degree, requires:
1. Completion of the preprofessional curriculum described below.
2. A minimum grade point average of 2.750 on all courses identified as Barton School of Business core courses.
3. A minimum grade point average of 3.000 on the following courses: Acct. 310, 320, 410 and 430.
4. A total of 1,100 points based on the formula of 200 times the overall grade point average on the last 60 hours plus the GMAT score.

Students who meet all the requirements above, except are lacking no more than nine hours of preprofessional curriculum, may be admitted on a conditional basis. These nine hours must be completed in the first semester following conditional admission or as soon thereafter as course scheduling permits.

Students holding a bachelor’s degree in any field (not necessarily business or accounting) from a regionally accredited institution may be admitted to the School of Accountancy if they meet the minimum scholastic requirements (a total of 1,100 points based on the formula of 200 times the overall grade point average on the last 60 hours plus the GMAT score). They will be expected to take courses covering any portion of the preprofessional curricu-
Probationary Admission—All Students
Students who do not meet the minimum GMAT and/or grade point requirements may be admitted to probationary status by the director on the basis of sufficient evidence that they can satisfactorily complete the MPA program requirements and have the potential for a successful career in professional accounting.

Degree Requirements—Students Not Possessing a Bachelor's Degree at Time of Admission

Preprofessional Curriculum
Students pursuing the Master of Professional Accountancy (MPA) are required to meet specified requirements for admission to the School of Accountancy. During the candidate's undergraduate work, the following requirements must be met:

1. The candidate must complete the general education requirements for The Wichita State University, plus additional nonbusiness courses for 56 semester hours. The following courses are specifically required by the School of Accountancy and may be counted within this 56 hours:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comm. 111, Basic Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 201Q and 202Q, Principles of Economics I and II</td>
<td>6</td>
</tr>
<tr>
<td>Eng. 210, Composition: Business, Professional and Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>Eng. 685Q, Advanced Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math. 111, College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Math. 144, Business Calculus</td>
<td>3</td>
</tr>
<tr>
<td>Phil. 144Q, Moral Issues</td>
<td>3</td>
</tr>
</tbody>
</table>

2. The candidate must complete a minimum of 28 hours of the following Barton School of Business core requirements:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct. 210, Financial Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>Acct. 220, Managerial Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>Acct. 260, Introduction to Information Systems I</td>
<td>3</td>
</tr>
<tr>
<td>DS 350, Introduction to Production Management</td>
<td>3</td>
</tr>
<tr>
<td>DS 495, Management Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 231, Introductory Business Statistics</td>
<td>4</td>
</tr>
<tr>
<td>Upper-division economics Course</td>
<td>3</td>
</tr>
<tr>
<td>Fin. 340, Finance</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt. 360, Concepts of Administration</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt. 430, Business and Society</td>
<td>3</td>
</tr>
<tr>
<td>Mkt. 300, Marketing</td>
<td>3</td>
</tr>
</tbody>
</table>

- Admission requirements for the CPA exam in Kansas specify a course in intermediate economic theory or a course emphasizing the mathematical system.

3. The candidate must complete the following courses required by the School of Accountancy:

- Preprofessional Accounting Core—12 hours
  - Acct. 310 and 410, Financial Accounting II and III | 6
  - Acct. 320, Managerial Accounting II | 3
  - Acct. 430, Taxation I | 3

During the semester in which the preprofessional curriculum will be completed, the candidate for the MPA must apply for admission to the Graduate School. The GMAT should be taken during, or just prior to, this semester. A bachelor's degree will be awarded at the time of conferring the MPA degree.

Professional Curriculum
Candidates in the professional curriculum who have completed the minimum preprofessional curriculum outlined above, must complete 59 credit hours in the following courses while maintaining an overall grade point average of 3.00 or better.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Accounting Core</td>
<td></td>
</tr>
<tr>
<td>Acct. 510, Financial Accounting IV</td>
<td>3</td>
</tr>
<tr>
<td>Acct. 560, Accounting Information Systems I</td>
<td>3</td>
</tr>
<tr>
<td>Acct. 640, Auditing I</td>
<td>4</td>
</tr>
<tr>
<td>Acct. 890, Professional Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Accounting Electives (800 level)</td>
<td>15</td>
</tr>
<tr>
<td>B. Law 435 and 436, Law of Associations I and II</td>
<td>6</td>
</tr>
<tr>
<td>DS 671, Multivariate Statistical Methods or approved equivalent</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt. 862, Organizational Behavior or approved equivalent</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt. 885, Administrative Policy</td>
<td>3</td>
</tr>
<tr>
<td>Remaining Barton School of Business core requirements</td>
<td>6</td>
</tr>
<tr>
<td>Other graduate electives</td>
<td>12</td>
</tr>
</tbody>
</table>

As a minimum, the candidate's program must include 30 graduate-level hours, including 15 hours of accounting courses numbered 800 or above and a total of 20 semester hours of courses numbered 800 or above—excluding any courses which represent business common body of knowledge.

Degree Requirements—Students Possessing a Bachelor's Degree at Time of Admission

Total degree requirements, for students granted admission after completion of a bachelor's degree, will vary and depend upon the specific course content of the undergraduate degree program. As a minimum, the candidate's program must total 30 graduate-level credit hours beyond the bachelor's degree, including 15 semester hours of accounting courses numbered 800 or above and a total of 20 semester hours in courses numbered 800 or above.

The following courses must be included in the candidate's degree program if undergraduate equivalents are not a part of the bachelor's degree:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct. 210, 310, 410, 510, Financial Accounting I, II, III and IV</td>
<td>12</td>
</tr>
<tr>
<td>Acct. 220 and 320, Managerial Accounting I and II</td>
<td>6</td>
</tr>
<tr>
<td>Acct. 260, Introduction to Information Processing Systems</td>
<td>3</td>
</tr>
<tr>
<td>Acct. 430, Taxation I</td>
<td>3</td>
</tr>
<tr>
<td>Acct. 560, Accounting Information Systems I</td>
<td>3</td>
</tr>
<tr>
<td>Acct. 640, Auditing I</td>
<td>4</td>
</tr>
<tr>
<td>B. Law 435 and 436, Law of Associations I and II</td>
<td>6</td>
</tr>
<tr>
<td>Eng. 210, Composition: Business, Professional and Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>Eng. 685, Advanced Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math. 111, College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Math. 144, Business Calculus</td>
<td>3</td>
</tr>
<tr>
<td>Phil. 144, Moral Issues</td>
<td>3</td>
</tr>
</tbody>
</table>

* Bachelor's degree holders may substitute Acct. 800 for Acct. 210 and 310 if they earn a grade of B or better in Acct. 800.

The following Barton School of Business graduate-level core courses must be completed if the candidate's undergraduate program does not include equivalent work with a grade of C or better:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS 850, Introduction to Production Management</td>
<td>3</td>
</tr>
<tr>
<td>DS 874, Management Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 800, Analysis of Economic Theory</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 830, Statistical Methods for Business</td>
<td>3</td>
</tr>
<tr>
<td>Fin. 840, Finance</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt. 830, Business and Society</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt. 860, Concepts of Administration</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt. 885, Administrative Policy</td>
<td>3</td>
</tr>
<tr>
<td>Mkt. 800, Marketing</td>
<td>3</td>
</tr>
</tbody>
</table>

The following graduate-level course work must be completed:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct. 890, Professional Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

* See list of courses under Preprofessional Curriculum. Core courses taken after admission to the MPA program must be graduate level equivalent courses.
Accounting electives (800 level) .... 15  
DS 871, Multivariate Statistical 
Methods or approved  
equivalent* ................... 3  
Mgmt. 862, Organizational Behavior or approved equivalent* ........ 3  
Other graduate electives selected 
with consent of MPA  
adviser ** .................... 9  

* These two areas may be waived and the graduate electives increased accordingly if the student has had an approved equivalent course at the upper-division level.  
** Admission requirements for the CPA exam in Kansas specify a course in intermediate economic theory or a course emphasizing the monetary system.

Master of Business Administration  
The Barton School of Business offers the Master of Business Administration (MBA) through faculty in the accounting; economics; finance, real estate and decision sciences; management; and marketing and small business departments, as well as in other colleges of the University. The MBA program is designed to prepare men and women for responsible positions of professional leadership in business, government, health-related organizations and other institutions. The program concentrates on general management, with particular attention given to developing within the student an understanding of the organization as an integrated system. Areas of emphasis may be developed in a variety of subjects as explained later.

The total hours required of students and the level at which they begin participation in the MBA program depend on their academic preparation. The total number of hours required for completion of an MBA ranges from 30 to 60 including nine hours of prerequisite algebra, calculus and Introduction to Information Processing Systems, excluding any courses required to correct deficiencies in background fundamentals that students have at the time of admission.

Most of the courses that can be taken for graduate credit and almost all of those on the 800 level are offered in the evening.

Admission Requirements  
Admission to the MBA program is granted to students who show high promise of success in postgraduate business study and who hold bachelor's degrees from regionally accredited institutions.

Previous academic training in business is not required for admission to the MBA program. Students may have backgrounds in such diverse fields as engineering, liberal arts, education and health related areas. The specific content of a student's previous education is less important than the evidence that the student has sound scholarship, strong personal motivation and the ability to develop skills necessary to assume positions of leadership.

Although various criteria are considered in granting admission, special attention is given to the applicant's grade point averages on academic work completed and to their scores on the Graduate Management Admission Test (GMAT). To be admitted, applicants must have 1,050 points based on the formula: 200 times a student's overall grade point average, plus the GMAT score; or 1,100 points based on 200 times the grade point average on the last 60 hours of graduate and undergraduate work completed, plus the GMAT score.

Foreign students are also required to have a minimum score of 550 on the Test of English as a Foreign Language.

Degree Requirements  
Advanced Standing: Students with strong backgrounds in mathematics and business administration may be granted advanced standing in the MBA program through equivalent credit for background fundamental courses for which a minimum grade of C was received in an undergraduate program. Most students entitled to such credit hold bachelor's degrees in business administration from accredited institutions. Students may be granted equivalent credit for any or all of the background fundamental courses, depending on the depth of their undergraduate or previous graduate preparation. Course work that is over six years old will not be utilized in the granting of equivalency credit on the background fundamental courses. Students who present course work over six years old, and who feel that they still have an adequate grasp of the subject matter, will be allowed to take and achieve a passing score on an equivalency exam. This exam will either be the CLEP exam, if appropriate, or another exam developed by the department and approved by the MBA program director. The MBA program may consist of as few as 30 hours for students who have no deficiencies in prerequisites and who receive equivalent credit for all of the background fundamentals.

Students Not Receiving Advanced Standing: Students with bachelor's degrees in nonbusiness fields will usually not have backgrounds warranting the granting of advanced standing through equivalency credit. There are some exceptions. Some students, for example, may have had enough work in economics or statistics to be granted credit for these courses. Determination regarding equivalency credit will be made by the Program Director following admission to the program.

MBA Course Requirements  
* Prerequisites  
  Math. 109, 111 or 112, College Algebra ........................................ 3  
  Math. 144 .................................. 3  
  Acct. 260 or equivalent, for computer literacy .................................. 3  

** Background Fundamental Courses  
  Acct. 800, Financial Accounting .................................................. 3  
  Mkt. 800, Marketing Systems ....................................................... 3  
  Mgmt. 830, Business and Society .................................................. 3  
  Fin. 840, Financial Systems ......................................................... 3  
  DS 850, Production and Operations Management .................................. 3  
  Mgmt. 860, Management of Organizations ....................................... 3  
  DS 874, Management Information Systems for Business ..................... 3  
  Econ. 830, Statistical Methods for Business .................................... 3  
  Econ. 800, Analysis of Economic Theory ......................................... 3  

Required Courses  
  Acct. 801, Managerial Accounting .................................................. 3  
  Mgmt. 862, Organizational Behavior ................................................. 3  
  Mgmt. 885, Business Policy ........................................................... 3  
  Econ. 803, Analysis of Business Conditions ....................................... 3  
  Econ. 804, Managerial Economics ................................................... 3  

*** Electives ................................................................. 15  
  Directed Electives ................................................................. 6  
  Free Electives ..................................................................... 9  

* These courses are to be taken only if a specific void exists.  
** With approval of the program director, equivalent credit may be granted for courses of equal content taken in an undergraduate program. See Advanced Standing section above.  
*** Of the 15 elective hours, six hours must be taken in one of the following three functional areas: marketing, finance and production/quantitative. The remaining nine hours are free electives, of which three may be taken at the 800 level.

Policies  
1. A candidate's individual plan of study must be approved by the director or associate director. This plan must be filed within a month of the completion of 12 hours of graduate work.

2. All candidates must complete 27 hours of 800 level courses including: 
  Acct. 801; Econ. 803; Econ. 804; Mgmt. 862; Mgmt. 885; six hours of directed electives; and six hours of free electives. The additional three hours of free electives may be at either the 800 level or the 600 level.

3. General topic interest areas offered in the Barton School of Business are accounting, business environment (including international management, business law, labor relations, environmental protection, urban economics, business economics and economic de-
students who present course work over six years old will not be utilized in the granting of equivalency credit on the background fundamental courses. Students who present course work over six years old, and who feel that they still have an adequate grasp of the subject matter, will be allowed to take an equivalency exam, if appropriate, or another exam developed by the department and approved by the MS director. Equivalency credit will be granted if a passing score is achieved. Beyond the background fundamentals, the degree program includes 33 to 36 hours of work. All course work taken for the degree must be approved by the student's adviser. (Courses identified as background fundamentals may not be included in the 33-36 hours required for the degree.)

Students obtaining the MS in administration (under either option) are required to complete the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS 871</td>
<td>Multivariate Statistical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt. 886</td>
<td>Research Methods in Business</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt. 885</td>
<td>Business Policies</td>
<td>3</td>
</tr>
</tbody>
</table>

All students must complete an evaluation of their competency in written communication during their first semester of enrollment.

Additional requirements under each option area are as follows:

**Option A:** Option A requires the completion of a minimum of 33 credit hours of work, including at least 17 hours in 800-level courses. In addition to the three required courses specified earlier, candidates must present a thesis, in their area of specialization, for a total of four semester credit hours. They must also take at least nine hours in this area of specialization.

A preliminary oral examination over the thesis proposal is required. Candidates also must present an oral defense of their thesis conducted according to the requirements of The Wichita State University Graduate School.

**Option B:** Option B requires the completion of a minimum of 36 credit hours of work, including at least 17 hours in 800-level courses. In addition, at least 15 hours must be in the area of specialization. Admission to Option B must be approved by the MS committee.

Of the 15 hours of specialization, up to four credit hours must be taken as a special project in the student's area of specialization. The special project may involve original case research or field research. This project must be approved by the MS committee and/or is directed by a group of graduate faculty members.

For Option B, a final oral examination, conducted according to requirements of the MS committee, is held over a student's entire degree program.

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**Master of Arts in Economics**

The Department of Economics offers courses of study leading to the Master of Arts (MA) degree. The curriculum for the master's program consists of theory and quantitative methodology courses and a variety of field courses in economics. Students are required either to complete a thesis or pass a comprehensive examination. The thesis option is recommended for students planning to pursue graduate work beyond the master's level. The comprehensive examination option permits students to specialize in a chosen field in economics.

A subspecialty in business economics is available in the MA program. The curriculum for this subspecialty includes business courses in addition to theory and quantitative skills courses. Students choosing this track are required either to complete an independent research project or pass a written comprehensive examination. The business economics subspecialty is designed for students seeking a career in business either as a corporate economist or as a market or industry analyst. The department strives to offer flexibility in fitting the master's program to the individual student's background and interests.

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**Admission Requirements**

Admission to the MA program in economics requires an undergraduate degree from an accredited institution. Students without proper undergraduate economics background must make up the deficiency by taking undergraduate theory courses designated by the graduate coordinator before they are allowed to take graduate-level courses. Students lacking calculus must make up this deficiency during the first semester of graduate work.

Admission to the program is based largely on the student's grade point average. For admission to full standing, students must have a grade point average of at least 2.750 for the last 60 hours of their undergraduate work and for their economics courses. The aptitude test of the Graduate Record Examination must be taken and the results submitted to the department no later than the end of the first semester of their study to retain full standing in the program.

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**Degree Requirements**

The candidate's plan of study must be approved by the graduate coordinator and the chairperson of the department. All plans of study must include at least 18 hours of graduate-level courses in economics or courses approved by the
graduate coordinator. Courses identified as background fundamentals of the MBA program and other courses designated by the economics department may not be included in the hours required for the degree.

Required courses include:
- Econ. 631, Intermediate Business Statistics .................................. 3
- Econ. 801, Macroeconomic Analysis ........................................... 3
- Econ. 802, Microeconomic Analysis ........................................... 3

Thesis. If students elect to write a thesis, they must complete 30 semester hours including thesis hours. They also must present and successfully defend their thesis before their thesis committee. Candidates are required to pass an oral examination based primarily on the defense of the thesis.

Comprehensive Examination. If students elect not to write a thesis, they must complete 34 semester hours and pass a written comprehensive examination covering economic theory and statistics.

Business Economics

In addition to the three required courses listed above, the business economics subspecialty requires the following courses:
- Econ. 831, Econometrics .......... 3
- Acct. 801, Managerial Accounting ... 3
- Fin. 841, Financial Administration ........................................... 3
- Mkt. 803, Marketing Analysis ........................................... 3

Independent Research. Students electing the independent research option are required to complete 30 graduate semester hours and 4 additional hours of independent research. Independent research is taken under the direction of a graduate faculty member of the economics department. The final product is a written paper summarizing the research submitted to the department. The research paper must be read and approved by two faculty members in addition to the faculty advisor.

Comprehensive Examination. Students electing to take the comprehensive examination option are required both to complete 34 graduate semester hours and pass a written comprehensive examination.

Accounting

School of Accountancy

Courses for Graduate/Undergraduate Credit


560. Accounting Information Systems I. (3). A study of the content, design and controls of accounting systems, with emphasis on the use of computers for processing financial data. Prerequisites: Acct. 220 and 260; Math. 109 or 111; senior standing.

640. Auditing I. (4). A study of the auditor's attest function, with emphasis on auditing standards and procedures, independence, legal responsibilities, codes of ethical conduct and evaluation of accounting systems and internal control. Prerequisites: Acct. 260, 410, 560, Math. 109 or 111; senior standing.

690. Seminar in Selected Topics. (1-3). Repeatable for credit with School of Accountancy consent.

Courses for Graduate Students Only

Where a course is indicated as a prerequisite to a second course, all prerequisites to the earlier course(s) also apply to the later course(s).

800. Financial Accounting. (3). A study of the basic structure of accounting, income determination, asset valuation, liability recognition and accounting for ownership equity. Includes the interpretation and analysis of financial statements. May not be taken for credit in the School of Accountancy. Prerequisite: no previous credit in accounting or permission of the School of Accountancy.

801. Managerial Accounting. (3). Examines the use of accounting data to analyze management problems. Covers concepts of cost analysis, return on investment analysis, and operations and capital budgeting. May not be taken for credit in the School of Accountancy. Prerequisite: Acct. 800 or equivalent.

810. Financial Accounting V. (3). A continuation of the financial accounting sequence. Emphasizes accounting for leases, pensions, foreign currency and futures contracts; segment reporting; insolvency; and calculating earnings-per-share. Prerequisites: graduate standing and Acct. 510 (or equivalent), or permission of the School of Accountancy.

815. Theoretical Foundations of Accounting. (3). A systematic treatment of the basic concepts and methodology of accounting theory and their application to problems of income determination and asset/liability valuation. Prerequisites: graduate standing and Acct. 510 (or equivalent), or permission of the School of Accountancy.

820. Managerial Accounting III. (3). Advanced study of the use of accounting information in financial policy decisions, profit planning and control, quantitative analysis of financial data and capital budgeting. Includes the application of selected quantitative methods of accounting. Prerequisites: graduate standing and Acct. 520 (or equivalent) or permission of the School of Accountancy.

825. Managerial Accounting IV. (3). Advanced study of theoretical concepts underlying cost accounting, with emphasis on the nature of business costs, establishing a conceptual framework for cost and managerial accounting and selected problem areas in cost determination and analysis. Prerequisites: graduate standing and Acct. 520 (or equivalent), or permission of the School of Accountancy.

830. Taxation II. (3). A study of the federal tax law as it applies to corporations, partnerships, estates, trusts and gifts. Prerequisites: graduate standing and Acct. 430 (or equivalent), or permission of the School of Accountancy.

835. Taxation III. (3). The application of research and planning techniques to federal tax law. Also examines selected topics in federal taxation. Prerequisites: graduate standing and Acct. 830 (or equivalent), or permission of the School of Accountancy.

840. Auditing II. (3). An advanced study of auditing with emphasis on EDP auditing statistical sampling and ethics. Prerequisites: graduate standing and Acct. 510 and 640 (or equivalent), or permission of the School of Accountancy.

860. Accounting Information Systems II. (3). A study of the concepts of information systems, their design and operation and the relationship of these concepts to the economic information requirements, information flows, decision criteria and control mechanisms in the business organization. Prerequisites: graduate standing and Acct. 560 (or equivalent) or permission of the School of Accountancy.

880. Researching Contemporary Issues in Accounting. (3). An advanced seminar offering an opportunity for oral discussion and written reports on matters of current interest in diverse areas of accounting. A major course objective is to develop the student's ability for independent research and the presentation and defense of findings. Prerequisites: graduate standing, completion of the accounting core and a course in statistics, or permission of the School of Accountancy.

890. Professional Seminar. (1). An orientation to the accounting profession with sessions covering a variety of technical and general topics. Many sessions are conducted by practitioners. MPA candidates must attend a specified number of sessions throughout their professional program but actually enroll for only one semester. Graded S/U. Prerequisite: admission to MPA program or permission of the School of Accountancy.

891. Directed Study in Accounting. (1-3). Prerequisite: School of Accountancy consent.

899. Thesis Research. (1-3).

Aviation Management

Department of Marketing and Small Business

Courses for Graduate/Undergraduate Credit

690. Seminar in Selected Topics. (1-5). Repeatable with departmental consent. Prerequisite: junior standing.

750. Workshop in Aviation Management. (1-4). Prerequisite: junior standing.
Business Law
Department of Finance, Real Estate and Decision Sciences

Courses for Graduate/Undergraduate Credit

690. Seminar in Selected Topics. (1-5). Repeatable with departmental consent. Prerequisite: junior standing.

750. Workshop in Business Law. (1-4). Prerequisite: junior standing.

Courses for Graduate Students Only

831. Legal Environment of Business. (3). An introduction to the legal environment within which the business system operates. The course considers the functions of law in relation to the business system, the interaction between business, society and government and the major frameworks of private and public law. Emphasis is placed on the realm of public law from a managerial perspective, including the ethical and social responsibility aspects of business behavior.

890. Seminar in Special Topics. (1-3). Repeatable with departmental consent.

891. Directed Studies. (1-5). Prerequisite: departmental consent.

Decision Sciences
Department of Finance, Real Estate and Decision Sciences

Courses for Graduate/Undergraduate Credit

575. Decision Making Techniques. (3). An introduction to the quantitative techniques commonly used for managerial decision making and their application to problems in such areas as production, distribution and finance. Topics include process analysis and design, production control information systems, facilities planning, materials handling system, job design, personnel planning and scheduling and current issues. Prerequisite: DS 350.

651. Design of Operations Systems. (3). Course gives an in-depth view of the long-term design aspects of operations systems. Topics include process analysis and design, production control information systems, facilities planning, materials handling system, job design, personnel planning and scheduling and current issues. Prerequisite: DS 350.

652. Operations Planning Systems. (3). Course gives an in-depth analysis of the short-term or operational aspects of goods or service-producing systems. Topics include forecasting methods, inventory control models, material requirements planning, aggregate planning and scheduling and current issues. Prerequisite: DS 350.

690. Seminar in Selected Topics. (1-5). Repeatable with departmental consent. Prerequisite: junior standing.

750. Workshop in Decision Sciences. (1-4). Prerequisite: junior standing.

Courses for Graduate Students Only

850. Production and Operations Management. (3). Concepts for planning and controlling the production of either goods or services. Topics include: linear programming, scheduling, quality control, inventory models and waiting-line models. Not open to students with credit in DS 350. Prerequisites: calculus and statistics.

851. Intermediate Production Management. (3). Theory of productive systems, decision making under uncertainty and advanced technological forecasting methods for business and industry. Application of forecasting methods and some operations research models to real-world productive systems. Prerequisite: DS 350 or 850.

871. Multivariate Statistical Methods. (3). A study of selected multivariate statistical methods used in support of modern decision making. Topics included are multivariate hypothesis testing, multiple regression, correlation, analysis of variance and covariance and discriminant analysis. Prerequisite: Econ. 870 or Econ. 231.

872. Advanced Statistical Analysis. (3). Examines topics such as sample design, chi square, variance analysis and correlation and regression analysis from the conceptual and decision-making points of view. Prerequisite: DS 871.

874. Management Information Systems for Business. (3). A study of business information systems for management decision making and control. Includes coverage of system components, control and applications. Includes an introduction to a programming language.

875. Management Science. (3). Course provides quantitative bases from which the student may develop analytical abilities for use as a decision maker. Areas of study include mathematical programming, game theory, forecasting, queuing theory and simulation. Prerequisite: calculus.

876. Advanced Management Science. (3). An in-depth examination of selected management science models. Includes advanced inventory and quality control topics, goal programming and other current decision-making techniques. Prerequisite: DS 875 or departmental consent.

884. Database Planning and Management. (3). Prepares students to deal with issues in planning and managing organization-wide integrated databases. Emphasizes logical database design and relational database implementation. Includes SQL, assuring database integrity, database conversion, database administration and data management for computer integrated manufacturing. Prerequisite: DS 874 or instructor's consent.

890. Seminar in Special Topics. (1-3). Repeatable with departmental consent.

891. Directed Studies. (1-6). Prerequisite: departmental consent.

Economics
Department of Economics

Courses for Graduate/Undergraduate Credit

602. Mathematical Methods in Economics. (3). Introduces mathematical tools that are especially useful in economics, econometrics and finance. Includes a review of differential and integral calculus, an introduction to matrix algebra and various constrained optimization and economic modeling techniques. Emphasizes economic models with both modeling. Prerequisites: Econ. 202Q and Math. 144 or equivalent and junior standing.

605. History of Economic Thought. (3). A critical analysis of economic thought, the factors that influence this thought and its impact upon the social and economic development of the modern world. Prerequisites: Econ. 202Q and junior standing.

614. Industrial Organization. (3). A study of both competitive and noncompetitive market structure, conduct and performance, with special emphasis on related public policy, such as antitrust. Prerequisites: Econ. 202Q and junior standing.

615. Economics of Transportation. (3). A study of economic characteristics of air transportation. Prerequisites: Econ. 202Q and junior standing.

617. Economics of Regulation. (3). A study of the theory and practice of regulation. Includes both the traditional regulation of public utilities and communications and the newer forms of regulation, such as safety and environmental regulations. Prerequisites: Econ. 202Q and junior standing.


625. Economic History of Europe. (3). Cross-listed as Hist. 614. An analysis of the development of economic institutions; the rise of capitalism and its influence on overseas expansion, technology, precious metals, politics and war; changes in economic ideologies; and cultural effects of economic change. Prerequisites: Econ. 201Q and junior standing.

627. Economic History of the United States. (3). Cross-listed as Hist. 515. An analysis of the basic factors in economic growth. Explores agriculture, trade and commerce; industrial development; and the changing role of the government in the economy. Prerequisites: Econ. 201Q and junior standing.


653. Public Finance. (3). An analysis of fiscal institutions and decision making in the public sector of the American economy, budget planning and execution, taxation,
600. Labor Economics. (3). An introduction to labor economics surveying both theoretical and practical research in this field. Includes labor markets, wage determination and human capital theory. Prerequisites: Econ. 202Q and junior standing.

660. Collective Bargaining and Wage Determination. (3). An examination of economic and legal aspects of collective bargaining, emphasizing the techniques and procedures used and the major issues and problems inherent in the bargaining process. Explores the manner in which wages and benefits are determined and discussed are labor-management relationships. Prerequisites: Econ. 202Q and junior standing.

662. Work and Pay. (3). Investigation of the economic aspects of work and the workplace. Deals with the demographics of the labor force, methods of rewarding those who participate in the labor force and such topics as the quality of work life, worker alienation and the nature of work under capitalism. Prerequisites: Econ. 202Q and junior standing.

684. Urban Economics. (3). A survey of the economic structure and problems of urban areas. Emphasizes the application of regional economic analysis in the study of urban areas as economic regions. Prerequisites: Econ. 201Q and 202Q, or Econ. 800, and junior standing.

692. Group Studies in Economics. (1-3). Repeatable for credit with departmental consent. Prerequisite: junior standing.

700. Workshop in Economics. (1-4). Prerequisite: junior standing.

750. Local Government Finance. (3). Cross-listed as Pol. 5. 780. An analysis of state and local government expenditures and revenue systems, with an introduction to state and local financial administration. Prerequisites: Econ. 202Q and a course in statistics or instructor's consent.

Courses for Graduate Students Only

800. Analysis of Economic Theory. (3). An intensive analysis of micro- and macroeconomic principles. Not for graduate credit in the MA program in economics. Prerequisite: departmental consent.

801. Macroeconomic Analysis. (3). An intensive analysis of contemporary literature and recent income analysis. Prerequisites: Econ. 301 and one course in calculus.

802. Microeconomic Analysis. (3). An intensive analysis of contemporary literature and problems in the areas of production, pricing and distribution. Prerequisites: Econ. 302 or 804 and one course in calculus.

803. Analysis of Business Conditions. (3). A study of economic forecasting and its relationship to macroeconomic analysis. Not for graduate credit in the MA program in economics. Prerequisites: Econ. 302 or equivalent and one semester of introductory statistics.

804. Managerial Economics. (3). A survey of theoretical and analytical tools of economics that are useful in decision making by managers. Not for graduate credit in the MA program in economics. Prerequisites: Econ. 202Q or 800 and one course in calculus.


830. Statistical Methods for Business. (3). An examination of statistical concepts and methods applicable to business decision making. Includes probability theory, point and interval estimation, hypothesis testing, regression analysis, analysis of variance and selected nonparametric techniques. Not open to students with credit in Econ. 231 or equivalent. Not for graduate credit in the MA program in economics. Prerequisite: calculus.

831. Introduction to Econometrics. (3). Analysis of time series, multiple regression, multiple and partial correlation, analysis of variance and introduction to econometric techniques. Prerequisites: Econ. 631 and one course in calculus.


841. Money and Capital Markets. (3). Theoretical and empirical studies of rate of return on financial assets available in credit, currency, futures and options, equity capital, and international capital markets. An examination of concepts and techniques for measuring and managing financial risk. Prerequisite: Econ. 340 or equivalent.

847. Speculative Markets. (3). Cross-listed as Fin. 847. Analysis of the markets for speculative securities such as futures, options and commodities. Evaluates underlying theories explaining speculative markets in which such securities are traded. Discusses trading strategies such as hedging and arbitrage. Prerequisite: Fin. 840 or equivalent.


861. Seminar in Contemporary Labor Issues. (3). An intensive analysis of contemporary labor problems in the field of labor. The specific nature of the problems is determined by the interest of those enrolled in the course. Repeatable for credit with departmental consent. Prerequisite: instructor's consent.

870. Seminar in International Trade and Finance. (3). Cross-listed as Fin. 820. A seminar in theoretical concepts and contemporary selected issues of international economics and finance. Selected issues include such areas as foreign exchange markets, the Eurodollar market, Arab oil dollars in the international monetary system, transference of inflation between countries, developments in the common markets, etc. Prerequisite: Econ. 674, Fin. 690 or instructor's consent.

885. Seminar in Environmental Quality Control. (3). Examination of actual problems, projects and/or current approaches to environmental quality control. Takes a critical look at current happenings and trends. Prerequisite: instructor's consent.

891. Directed Study. (1-3). Individual study of various aspects and problems of economics. Repeatable for credit with departmental consent. Prerequisites: graduate standing and departmental consent.

892. Group Studies in Economics. (1-3). Repeatable for credit. Prerequisite: departmental consent.


896. Thesis. (1-2).

Entrepreneurship

Department of Marketing and Small Business

Courses for Graduate/Undergraduate Credit

560. Consulting with Small Enterprise. (3). Course gives hands-on experience consult-
ing with an existing small business. Students work with the owner in teams under the guidance of the instructor to identify the problem, gather information relevant to the problem, propose solutions to the problem and help the owner implement agreed upon solutions. The student gains a personal knowledge of the lifestyle of an entrepreneur, both pros and cons, as well as experienced-based knowledge about various aspects of managing a small business. Prerequisites: Mkt. 300, Fin. 340, Mgmt. 360, senior standing. Preferred: Ent. 465 also be taken.

668. Feasibility Analysis. (3). Course explores such advanced subjects as leveraged buyouts, R&D limited partnerships, private placements of stock, role of the entrepreneur in economic development, marketing strategy for smaller businesses and strategic planning during early growth stages. The student prepares a business plan and is required to present the plan for evaluation by a panel of academics from various business disciplines. Prerequisites: Ent. 361 or consent of instructor.

690. Special Topics in Entrepreneurship. (3). Advanced course with in-depth discussion of emerging topics within the field of entrepreneurship. Topics will rotate, allowing the student the opportunity to work on advanced topics. Prerequisites: Entre. 668, 465, senior standing.

750. Workshop in Entrepreneurship. (1-4). Prerequisite: junior standing.

Courses for Graduate Students Only

868. New Venture Feasibility Seminar. (3). Course focuses on directing students in the appropriate methods of selecting financial sources and in raising seed capital through the preparation of a comprehensive feasibility study. Covers (1) sources of capital, such as venture capitalists, investment bankers, banks and creative forms of financing; (2) marketing opportunity analyses; (3) pro forma development; (4) feasibility criteria; (5) actual preparation of the loan package. Prerequisites: Acct. 800 or its equivalent, or approval of the instructor. Not open to students with credit in Ent. 668.

889. Entrepreneurship and Innovation within Organizations. (3). Course addresses trends, current status and success factors in the area of innovation and entrepreneurship within organizations. Principles examined are applicable to any organization, large or small, private or public, by those persons who wish to create change and innovate within the existing structure. Covers (1) foundations of entrepreneurship; (2) barriers to change, such as environmental characteristics of individuals; (4) creative thinking and forced idea generation methods; (5) "intrapreneurship"—the need for it, definition, methods, favorable environment and rewards; (6) examples of intrapreneurship; (7) entrepreneurial strategies, policies and practices for organizations; and (8) the entrepreneurial society, a growing way of life. Prerequisites: open to students fully admitted to graduate programs in the Barton School of Business and instructor's approval.

890. Seminar in Special Topics. (1-3). Repeatable with departmental consent.

891. Directed Studies. (1-5). Prerequisite: departmental consent.

892. Special Project in Entrepreneurship. (1-4). A special project including original case research supervised internships or field research. Prerequisites: open to all students fully admitted to graduate programs in the Barton School of Business and instructor's approval.

Finance

Department of Finance, Real Estate and Decision Sciences

Courses for Graduate/Undergraduate Credit

640. Financial Management. (3). An exploration of the problems and operations for which the financial officer is responsible, emphasizing controversial aspects of financial analysis. Prerequisites: Fin. 340, six hours of accounting or departmental consent and junior standing.

641. Investments. (3). An analysis of investment risks, financial information and industry characteristics. Examines corporate, government, municipal and financial institution securities and other investment types. Prerequisites: Fin. 340 and junior standing. Credit in Econ. 340 is strongly recommended.

642. Capital Markets and Financial Institutions. (3). An introduction to the capital markets system. Studies the management and operations of financial institutions. Each major type of financial institution is viewed in the context of its competitive environment with respect to both asset and liability management. Prerequisites: Fin. 340 and junior standing. Credit in Econ. 340 is strongly recommended.

644. Commercial Bank Management. (3). A study of bank asset and liability management. Also explores the internal organization of commercial banks, current problems and recent innovations in commercial banking. Prerequisites: Fin. 643 and junior standing.

645. Security Analysis and Valuation. (3). Comprehensive treatment of methods of analyzing major types of securities. Market behavior analysis also is made. Explores the formulation of investment objectives, the design of portfolios for classes of institutional and individual investors and portfolio theory. Prerequisites: Fin. 641 and junior standing.

648. International Finance. (3). Cross-listed as Econ. 674. The study of foreign exchange, balance of payments, the international monetary system and the world's money and capital markets and their relationships with the financial operations of multinational firms. Also explores relevant aspects of international financial management through a series of case studies. Prerequisites: Fin. 340, Econ. 202Q and junior standing.

690. Seminar in Selected Topics. (1-6). Repeatable with departmental consent. Prerequisite: junior standing.

750. Workshop in Finance. (1-4). Prerequisite: junior standing.

Courses for Graduate Students Only

820. Seminar in International Trade and Finance. (3). Cross-listed as Econ 870. A seminar in theoretical concepts and contemporary selected issues of international economics and finance. Includes such areas as foreign exchange markets, the Eurodollar market, Arab oil dollars in the international monetary system, transference of inflation between countries, developments in the common markets. Prerequisites: Fin. 648 or Econ. 674 or instructor's consent.

840. Financial Systems. (3). An intensive analytical introduction to finance from the management viewpoint, including the theory of financial management, the financial institutional structure and an analysis of a variety of practical problems of business finance. Prerequisite: Acct. 800 or equivalent.

841. Financial Administration. (3). An integrated treatment of basic business finance, financial management, financial statement analysis and financial institutions. Prerequisite: Fin. 840 or equivalent.

842. Structure and Policies of Financial Institutions. (3). The development, management and impact of policies of financial institutions, including planning, measuring and achieving financial goals. Prerequisites: Fin. 840 or equivalent.

843. Investment Analysis and Portfolio Management. (3). Study of the basic theory and practice of security valuation and investment management. Includes security and portfolio analysis, selection of investment media and measurement of performance. Not available to students with credit in Fin. 641 or equivalent. Prerequisites: Fin. 540 or 840 and Econ. 830.


845. Security Analysis. (3). An analysis and valuation of investment securities issued by corporations and governmental agencies. Prerequisites: Fin. 641 and 843 or departmental consent.

846. Capital Budgeting. (3). A study of the organization and operation of the capital budgeting system. Explores problems of partial decentralization and in comparability of estimates of funds flow. Includes contemporary methods of treating uncertainties and constraints and the application of programming techniques. The determination of appropriate discount rates also is explained. Prerequisite: Fin. 840 or equivalent.

847. Speculative Markets. (3). Cross-listed as Econ 847. Analysis of the markets for speculative securities such as futures, options and commodities. Emphasis is on understanding theories explaining speculative markets in which such securities are traded and discusses trading strategies such as hedging and arbitrage. Prerequisite: Fin. 840 or equivalent.

890. Seminar in Special Topics. (1-3). Repeatable with departmental consent.

891. Directed Studies. (1-6). Prerequisite: departmental consent.

892. Special Project in Finance. (1-4). A special project including original case research supervised internship or field research. Prerequisite: approval of the MS committee. Open only to MS in administration degree candidates.

Management
Department of Management

Courses for Graduate/Undergraduate Credit

561. Introduction to International Economics and Business. (3). Cross-listed as Econ. 672. A survey of the economic foundations of international trade and investment. After a study of international trade, theory and policy (the international economy), it explores the operations of the multinational firm within that environment. Prerequisite: Econ. 207Q and junior standing.

663. Organizational Interactions. (3). A study of interpersonal, intrapersonal, and interorganizational interactions. Prerequisites: Mgmt. 360 or concurrent enrollment and junior standing.

665. Organizational Development. (3). An introduction to the study of organizational change. Emphasizes team building and bureaucratic integration. Includes individual, group and structural developments. Prerequisites: Mgmt. 360 or concurrent enrollment and junior standing.

667. Organizational Structure and Design. (3). An introduction to the study of organizational structure and design of top management. Emphasizes the role of the multinational firm within that environment. Prerequisite: Econ. 207Q and junior standing.

863. International Business Administration. (3). An introduction to international business administration with particular attention given to the development of multinational business strategies in light of the diverse economic, political, social and cultural dimensions of the environments that exist in both developed and developing areas of the world.

866. Organizational Conflict and Stress. (3). A study of individual behavior in an organizational setting. Human variables in business are analyzed from the standpoint of job placement, performance and individual development. Topics include behavioral development, motivation and learning in human relations. Prerequisite: Mgmt. 860 or departmental consent.

867. Organizational Behavior. (3). A study of individual behavior in an organizational setting. Human variables in business are analyzed from the standpoint of job placement, performance and individual development. Topics include behavioral development, motivation and learning in human relations. Prerequisite: Mgmt. 860 or departmental consent.

868. Organizational Conflict and Stress. (3). Studies in flexibility and rigidity. Recent research on thinking in the areas of innovation, conflict, resolution, stress and anxiety as relevant to organizational structures and behaviors. Prerequisite: Mgmt. 860 or departmental consent.

690. Seminar in Selected Topics. (1-5). Repeatable with departmental consent. Prerequisite: junior standing.

750. Workshop in Management. (1-4). Prerequisite: junior standing.

Courses for Graduate Students Only

830. Socio-Legal Environment of Business. (3). An examination of the economic, political, social and legal environment in which business operates. Gives consideration to the role of the multinational firm within that environment. Prerequisite: Econ. 207Q and junior standing.

883. Special Project in Management. (1-4). A special project including original case research, supervised internships or field research. Prerequisite: approval of the MS Committee. Open only to MS in administration degree candidates.


Marketing
Department of Marketing and Small Business

Courses for Graduate/Undergraduate Credit

561. International Marketing. (3). Problems and procedures of marketing in foreign countries. Includes the effects of foreign cultures and marketing systems on the design of marketing programs. Prerequisites: Mkt. 300 and junior standing.

604. Distribution Management. (3). A study of distribution channels and their relationships with wholesalers and retailers. Emphasizes the role of the firm's stored facilities, inventory control, procedures and shipping facilities. Prerequisites: Mkt. 300 and junior standing.

606. New Product Marketing. (3). Discusses the issues of identifying, evaluating, developing and commercializing new products within both smaller and larger firms. Explores the role of the product/brand manager and the person who often acts as an internal entrepreneur. Prerequisites: Mkt. 300, 403 and 405.

607. Promotion Management. (3). An analysis of all issues involved with the promotion of an organization and its products or services. Deals with the development of advertising campaigns, management of the personal sales force, development of special promotional activities and management of public relations. Prerequisites: Mkt. 300 and junior standing.

608. Selling and Sales Force Management. (3). An analysis of all issues involved with the promotion of an organization and its products or services. Deals with the development of advertising campaigns, management of the personal sales force, development of special promotional activities and management of public relations. Prerequisites: Mkt. 300 and junior standing.

690. Marketing Program. (3). A study of all aspects of the marketing mix that are integrated to make an effective and coordinated marketing program. Prerequisites: Mkt. 300 and six additional hours of marketing.

750. Workshop in Marketing. (1-4). Repeatable with departmental consent. Prerequisite: junior standing.

Courses for Graduate Students Only

800. Marketing Systems. (3). An intensive analytical introduction to the combination of institutions that comprise the overall marketing system. Also presents the marketing function as a major subsystem within the individual business firm.

802. Marketing Strategy. (3). Integration of long-range marketing and corporate policies. Includes budgetary control and the
evaluation of the effectiveness of marketing systems. Also probes the organization of the marketing department and its relation to the total organization. Prerequisite: Mkt. 800 or departmental consent.

803. Marketing Analysis. (3). The application of the scientific method to the solution of marketing problems. Prerequisite: Mkt. 800 or equivalent.

805. Consumer Decision Processes. (3). An examination of different aspects of the behavior of consumers and of the factors that help explain their behavior. Includes an analysis of current concepts and models. Prerequisite: Mkt. 800 or departmental consent.


Courses for Graduate Students Only

893. Special Project in Marketing. (1-4). A special project including original case research, supervised internships or field research. Prerequisite: approval of the MS Committee. Open only to MS in administration degree candidates.


Personnel

Department of Management

Courses for Graduate/Undergraduate Credit

664. Labor Relations. (3). Presents the philosophy underlying labor legislation and the function of collective bargaining in labor-management relationships. Prerequisite: junior standing.

666. Selection, Training and Placement. (3). Analysis of advanced programs of employee selection, training and placement. Explores testing, interviewing, counseling, appraisal, job analysis and job design. Prerequisite: Pers. 466 or departmental consent and junior standing.

690. Seminar in Selected Topics. (1-5). Repeatable with departmental consent. Prerequisite: Pers. 466 or departmental consent.

750. Workshop in Personnel. (1-4). Prerequisite: junior standing.

Courses for Graduate Students Only

867. Seminar in Personnel Administration. (3). An in-depth study and analysis of several critical and/or major current problems in personnel and a review of significant literature. The direction of the course could be determined by the interests of the class. Prerequisite: Pers. 466.

868. Wage and Salary Administration. (3). A study of job evaluation and other procedures that lead to the development of a sound wage and salary structure. Prerequisite: Pers. 466 or instructor's consent.

890. Seminar in Selected Topics. (1-3). Repeatable with departmental consent.

891. Directed Studies. (1-5). Prerequisite: departmental consent.

893. Special Project in Marketing. (1-4). A special project including original case research, supervised internships or field research. Prerequisite: approval of the MS Committee. Open only to MS in administration degree candidates.


Real Estate

Department of Finance, Real Estate and Decision Sciences

Courses for Graduate/Undergraduate Credit

611. Real Estate Finance. (3). Real estate financing instruments, institutions, traditional and creative financing techniques. Risk analysis, mortgage financing and underwriting, primary and secondary mortgage markets. Prerequisite: Fin. 340. RE majors should have completed RE 310.


618. Real Estate Investment Analysis. (3). Equity investor decision criteria, institutional and ownership entity investment constraints, financial leverage opportunities, cash flow analysis and creative income tax strategies. Prerequisite: Fin. 340. RE majors should have completed RE 310.

619. Urban Land Development. (3). A hands-on course designed to familiarize students with all aspects of land development, including supply and demand analysis, site selection, feasibility analysis, development financing, cash-flow budgeting and marketing strategies. Prerequisite: RE 310 or 611 or 618.

690. Seminar in Selected Topics. (1-5). Repeatable with departmental consent. Prerequisite: junior standing.

750. Workshop in Real Estate. (1-4). Prerequisite: junior standing.

Courses for Graduate Students Only

810. Real Estate Feasibility Analysis. (3). Theory and practice of analyzing the feasibility of both new construction and redevelopment of income-producing projects. Approaches detailed comprehensive case studies with contemporary analytical techniques. Prerequisite: RE 310, 614 and 618.

890. Seminar in Special Topics. (1-3). Repeatable with departmental consent.

891. Directed Studies. (1-5). Prerequisite: departmental consent.

College of Education

Offices: 104 Corbin Education Center
Maurine A. Fry, Dean
James L. Carroll, Associate Dean for Academic Programs
Marcus T. Ballenger, Associate Dean for Students

Departments
Communicative Disorders and Sciences—Kenneth W. Burk, interim chairperson
Counseling, Educational and School Psychology—Randolph A. Ellsworth, chairperson
Curriculum and Instruction—Dennis J. Kear, chairperson
Educational Administration and Supervision—Rodney Muth, chairperson
Health, Physical Education, and Recreation—Natasha M. Fife, interim chairperson
Industrial Technology—Sidney G. Connor, chairperson

The College of Education offers programs leading to the Master of Arts (MA) in communicative disorders and sciences; the Master of Education (MEd) in educational administration, educational psychology, elementary education, physical education, secondary education, special education and counseling; the Master of Science Education (MSE) for secondary teachers in biological sciences, chemistry, geology and physics; the Specialist in Education (EdS) in educational administration, school psychology and counseling; and the Doctor of Philosophy (PhD) in communicative disorders and sciences. A transfer program in educational administration leading to the EdD or PhD is available in cooperation with the University of Kansas.

Graduate offerings include courses which help students meet requirements for state certification as principals, supervisory personnel, district school administrators, school counselors, early childhood teachers, special education teachers, reading specialists, school psychologists, speech and language pathologists and audiologists. Other programs are available to support the continued academic and professional development of teachers.

Admission Requirements
Specific admission requirements for each degree specialization are described in the department’s section of the Graduate Bulletin. Applicants for admission should review admission criteria well in advance of intended enrollment dates since some programs admissions are determined by a faculty committee once each year or once each semester. Several programs require submission of scores from examinations (e.g., Graduate Record Examination), as well as transcripts and letters of reference.

Minimum admission requirements for full standing are a bachelor’s degree from a regionally accredited institution and a grade point average of at least 2.750 based upon the last sixty (60) credit hours of course work (including any post-bachelor’s graduate work). The student should have no more than nine hours of background deficiencies in the major field of graduate study desired. For most degree programs, admission requirements exceed these minimums.

Degree Requirements
Each advanced program of study specifies the number of semester hours of graduate course work required, elective courses, practica, comprehensive examinations and thesis requirements. Specific degree requirements are listed on program sheets available from the departmental offices. A thesis option in the MA or MEd programs may be elected. Appropriate topics range from basic to applied action research, and approaches vary from historical to descriptive to experimental. The thesis program requires a minimum of thirty (30) credit hours, approval of the thesis proposal by the student’s graduate adviser and thesis committee, and an oral examination over the thesis topic. The committee is appointed by the graduate dean from nominees submitted by the student’s adviser.

Candidates for the nonthesis MA, MEd and MSE are usually required to pass a written comprehensive examination in their major area. Within the first three weeks of the semester in which students take the exam, an Application for Comprehensive Examination should be filed with the department office. Applications will not be accepted if submitted less than two weeks prior to the scheduled examination date. Thesis students must pass an oral examination over their research. Specific examination requirements are described under the appropriate department’s section of the Graduate Bulletin. The written comprehensive examination is scheduled the first Saturday in November for the fall semester, the second Saturday in April for the spring semester and the first or second Saturday in July for the Summer Session.

Financial Assistance
Some financial assistance to support graduate study is available, including federal traineeships, assistantships and The Wichita State University fellowships.

Communicative Disorders and Sciences
Graduate Faculty
Professors: Kenneth W. Burk (interim chairperson), Barbara W. Hodson, Roger N. Kasten
Associate Professors: Jerry L. Cranford, Harold T. Edwards, Wesley L. Faires
Assistant Professors: Ronald D. Chambers, Thomas R. Knell, Rosalind R. Scudder, Michael K. Wynne

Degrees and Areas of Specialization
The Department of Communicative Disorders and Sciences offers courses of study leading to the Master of Arts (MA) and the Doctor of Philosophy (PhD). Academic and clinical training are provided for students who wish to become professionally qualified to work with communicatively handicapped children and adults. Instructional areas include communication sciences, speech and language pathology, and clinical and rehabilitative audiology. A graduate program culminating in a master’s degree is required for professional certification as a speech-language pathologist or audiologist in the public schools and for work in hospital clinics, rehabilitation centers or private practice. With an undergraduate preprofessional major, students normally can complete the master’s program in two years and be eligible for certification by the Kansas State Department of Education and by the American Speech-Language-Hearing Association.

Admission Requirements
Admission to the master’s degree program is granted to students who have completed an undergraduate major of at least 30 credit hours in the area of speech, language and hearing disor-
Doctor of Philosophy Requirements

Doctoral students, in conjunction with their advisory committee, develop a Plan of Study which normally consists of at least 90 credit hours, 60 percent of which must be taken at The Wichita State University. Students normally take the qualifying examination in the semester in which they complete the Plan of Study requirements, exclusive of dissertation hours. A minimum of 9 hours of Advanced Practicum will be included in the Plan of Study. The final requirements in the PhD program are the completion of original research and an oral defense thereof.

Communication Sciences

Courses for Graduate/Undergraduate Credit

610. The Neurology of Speech and Language. (4). A consideration of basic neuropsychology necessary for acquiring an understanding of the representation of speech and language in the human central nervous system and conditions resulting from neurological impairment. Prerequisite: at least senior standing.

Courses for Graduate Students Only

828. Advanced Speech and Hearing Science. (3). 1L. Advanced study of speech and hearing processes, primarily in their normal aspects. Attention to current understanding of speech generation, the speech signal, and the normal function of hearing.

380. Laboratory Instrumentation. (3). 2L; 3L. An introduction to clinical and research instrumentation used in the field of communicative disorders and sciences. Experience with instrumentation is gained through practical projects and applications within the laboratory. Prerequisite: CDS 829.

900. Speech Acoustics. (3). A detailed analysis of the acoustics of speech. Studies the various theories of speech sound production along with the instrumental analysis of speech sounds and ends with an examination of various speech disorders from the point of view of acoustics. Prerequisite: CDS 828.

903. Speech Perception. (3). A critical review of the theories and empirical research addressing the perception of speech, species-specific communication and speech recognition systems through artificial intelligence. Discusses both unimodal and bimodal models of perception. Prerequisite: CDS 900.

910. Speech Physiology. (3). A critical review of pertinent research concerning the physiological bases of speech. Emphasis on understanding the instrumental techniques utilized in such studies. Prerequisite: CDS 828.

920. Neurophysiology of Communication. (2). Special lectures, seminars, clinical demonstrations and independent study. Admission to courses is possible with a minimum grade of C in each stated prerequisite or its judged equivalent, or with departmental consent, unless otherwise specified in the course description.

Speech-Language Pathology

Courses for Graduate/Undergraduate Credit

520. Language Disabilities in Children and Adolescents. (3). Evaluates disorders cognitive approaches to language disabilities in children and adolescents. Covers practical application of language assessment procedures, interpretation of results and methods for developing intervention. CDS 111Q or 705, 220 or departmental consent.


705. Communicative Disorders. (3). Cross-listed as Comm. 665. A survey of speech, language and hearing disorders; their identification and treatment; and consideration of the roles of health and educational specialists in the total habilitative process. Provides background in normal communicative structures, processes and acquisition for understanding of communicative disorders. Introduces language disabilities in children, adult aphasia, articulation disorders, voice disorders, cleft palate, laryngectomy, stuttering, cerebral palsy and hearing impairment. Exception: such an opening in CDS. Credit in both CDS 111Q and 705 is not allowed.


720. Stuttering: Diagnosis and Clinical Management. (3). A review of current theories on the etiology and development of the disorder. Covers behaviorally based diagnostic procedures for children and adults, as well as methods for clinical management and real-life generalization, including procedures for parent and client interviewing and counseling. Provides opportunities for observation and demonstration therapy.

721. Intervention with the Severely-Multiply Handicapped. (2). Discusses current techniques in assessment of communication skills and the development of communication programs for the severely-multiply handicapped person. Addresses other issues important to the speech-language professional, including medical problems, ethical concerns, behavior control, feeding techniques and augmentative communication.

726. Voice Disorders: Diagnosis and Clinical Management. (3). Review of current knowledge on the symptomatology and etiology of commonly encountered voice disorders in children and adults. Presenta-
tion of procedures for differential diagnosis and clinical management, based on a working knowledge of the anatomy and physiology of normal voice production. Prerequisites: at least senior standing and CDS 214.

727. Teaching English as a Second Language. (2-3). Cross-listed as Eng. 727 and LING 727. Discusses current methods of teaching English to nonnative speakers. Students learn to analyze interlanguage patterns and to design appropriate units for small- and language laboratory use.


Courses for Graduate Students Only

805. Adult Aphasia: Evaluation and Clinical Management. (3). Review of historical and contemporary literature, standard tests for evaluation of communicative disorders in aphasia, and procedures for planning rehabilitation regimens for adults. Prerequisite: prior or concurrent enrollment in CDS 610.

810. Neurogenics. (3). Studies speech disorders resulting from upper motor neuron lesions in the central nervous system. Discusses evaluation and management approaches for selected disorders. Prerequisite: prior or concurrent enrollment in CDS 610.

815. Interviewing and Parent Counseling. (3). Presentation of current techniques of case history taking and interviewing as they apply to speech, language, hearing, learning, and behavior disorders in handicapped children and adults. Considers procedures employed in ongoing and terminal counseling.

820. Examination Methods in Speech and Language Pathology. (3). 3R; 3L. Appraisal and differential diagnostic techniques in speech and language pathology. A weekly diagnostic practicum in communicative disorders; provides experiences in report writing and follow-up procedures. Prerequisites: medical clearance and terminal semester of graduate program.

824. Language Remediation Strategies—Birth to 3. (3). Discussion of current language intervention strategies and programs for infants, toddlers and preschoolers, birth to 5 years. Also examines assessment procedures leading to the development of individualized and family programs.

825. Seminar in Communicative Disorders. (2-3). Review of recent developments and a study of methods of integrating research findings and newer clinical methods and concepts into a rehabilitative procedure.

834. Beginning Graduate Methods in Communicative Disorders. (1). Repeatable. Introduction to clinical and practicum methods for beginning graduate students in speech and language. Prerequisites: CDS 417 and 418 or equivalent and departmental consent.

835. Advanced Graduate Methods in Communicative Disorders. (1). Repeatable. Lecture and class discussions covering various types of communicative disorders. relates theories and methods to students' clinical work. Prerequisites: CDS 834 or equivalent and departmental consent.

836. Graduate Practicum in Communicative Disorders. (1-2). Repeatable. Supervised application of diagnostic and/or clinical management techniques with children and adults presenting communicative disorders. Requires 50 hours practical for each hour of credit. Prerequisites: departmental consent and medical clearance.

Audiology

Courses for Graduate/Undergraduate Credit

751. Clinical Audiology I. (3). 3R; 1L. Techniques and procedures for administering the basic auditory test battery and the interpretation of audiommetric results. Prerequisite: graduate student status.

752. Clinical Audiology II. (3). 3R; 1L. Diagnostic and rehabilitative procedures in the audiology clinic. Techniques and procedures for the administration and interpretation of special auditory tests including tests for speech perception, predictive acoustic reflexes, tests for central auditory pathology, and calibration. Prerequisite: CDS 751.


Courses for Graduate Students Only

826. Anatomy and Physiology of the Auditory System. (2). Reviews the anatomy and physiology of the auditory system in the light of current research knowledge. Studies normal system as a basis for understanding the pathological system. Prerequisites: CDS 231, 316.

827. Introduction to Psychacoustics. (2). 2L; 1D. Basic principles underlying the perceptual hearing process, with emphasis on the interdependencies between sound stimuli and subjective auditory experience as related to communication behavior. Prerequisite: CDS 540.

850. Graduate Practicum in Audiology. (1). Repeatable. Introduction to clinical and practicum methods for the beginning graduate student in audiology. Prerequisite: departmental consent.

851. Medical Audiology. (2). Many hearing disorders require evaluation/treatment by both the audiology and medical professions. Course reviews the audiological and physiological/medical aspects of the more common of these conditions found in children and adults. Prerequisites: CDS 231, 540, 826 or instructor's consent.

854. Community and Industrial Audiology. (2). Review of recent developments and research with attention to industrial audiology, federal and state regulations and environmental noise problems. Prerequisite: CDS 751.


858. Physiological Measures of the Auditory and Vestibular Systems. (3). 3R; 2L. Techniques and procedures for administration and interpretation of physiologic tests of the auditory and vestibular systems, including electrocochleography (ECOG), auditory brain stem response (ABR), electrogustomraphy (ENG) and acoustic reflex. Includes test administration practicum. Prerequisites: CDS 540, 610, 826, 851.

860. Amplification I. (3). 3R; 2L. The history and function of hearing aids, auditory trainers and assistive listening devices. The measurement and significance of the electroacoustic characteristics. The principles and procedures for the selection and recommendation of specific amplification systems for individual hearing losses. Prerequisite: CDS 751.


864. Habilitation of the Hearing-Impaired Child. (2). Psychological, social and educational impact of congenital and adventitious hearing loss in children and adolescents. Emphasis on development and educational characteristics. Studies the acquisition of speech and language skills of hearing-impaired children, current assessment and intervention strategies to develop functional and effective communication, and the techniques and programs to assist hearing-impaired children and their parents overcome the barriers posed by hearing impairment. Prerequisites: graduate standing, CDS 231, 458.

886. Graduate Practicum in Audiology. (1-2). Repeatable. Application of audiometric techniques in clinical situations. Experience in complete patient management, counseling and rehabilitation follow-up, when appropriate. Requires 3-4 hours of practicum per week for each hour of credit. Prerequisite: departmental consent and medical clearance.

General

Courses for Graduate/Undergraduate Credit

715. Selected Topics in Communicative Disorders and Sciences. (1-3). Individual or group project in specialized areas of communicative sciences and disorders. Repeatable.

750. Workshop in Communicative Disorders and Sciences. (1-4). Offered periodically on selected aspects of speech and hearing habilitation.
Courses for Graduate Students Only

890. Research Methods. (3). A survey of the different research methods utilized in the fields of communication sciences and communication pathology. Students acquire the fundamental motivation, knowledge and skills for conducting clinical and basic science research and in reading and critically evaluating the clinical research literature. Prerequisite: graduate student status.

880. Presentation of Research. (1-3). A directed research project culminating in a manuscript appropriate for publication. Repeatable, but total credit hours may not exceed three. Prerequisites: CDS 800 and instructor's consent prior to enrollment.

890. Independent Study in Speech and Language Pathology or Audiology. (1-3). Arranged individual, directed study in specialized content areas in speech and language pathology or audiology. Repeatable. Prerequisite: instructor's consent prior to enrollment.

895. Thesis Research. (1-2). Repeatable, but total credit hours counted toward degree requirements must not exceed two.

899. Thesis. (1-2). Repeatable, but total credit hours counted toward degree requirements shall not exceed two.

915. Advanced Selected Topics in Communicative Disorders and Sciences. (1-4). Advanced individual or group study in specialized areas of communicative sciences and disorders. Intended for doctoral students or advanced master's-level students. Repeatable.

925. Clinic and Program Administration. (2). Approaches to clinical administration and rehabilitation program planning and development. Gives attention to community analysis and utilization, personnel management, evaluation of program effectiveness, standards for accountability and fiscal procedures.

930. Seminar in Clinical Research. (3). Presentation of advanced models in research design applicable to the investigation of communicative disorders in a clinical setting. Prerequisites: CDS 800 and competency in statistics.

932. Research Proseminar. (1). A weekly seminar of informal discussion and formal presentation of ongoing or planned research by the CDS faculty and doctoral graduate students. Goal is to provide CDS doctoral students with new and valuable knowledge and insights regarding how real world research is performed. Prerequisite: doctoral student standing.

935. Advanced Practicum in Communicative Disorders and Sciences. (1-4). 1R; 3-12L. Supervised internship in one or more of the following sections: Advanced Practicum in Client Management, Advanced Practicum in Clinical Supervision, Advanced Practicum in Academic Instruction, Advanced Practicum in Research and Advanced Practicum in Clinical and Program Administration. Intended for doctoral students or advanced master's-level students. Repeatable; more than one section may be taken concurrently.

990. Advanced Independent Study in Speech and Language Pathology, Audiology or Speech Science. (1-3). Arranged individual, directed study in specialized content areas in speech and language pathology, audiology or speech sciences. Repeatable. Prerequisites: advanced standing and instructor's consent.


Counseling, Educational and School Psychology

Graduate Faculty

Professors: James L. Carroll (associate dean), Glen R. Dey, Maurine A. Fry (dean), James J. Rathigan (dean, Student Affairs), John H. Schub (associate vice president, Student Affairs)

Assistant Professors: Orpha K. Duell, Randolph A. Ellsworth (chairperson), James L. Tramil, David L. Meabon (associate vice president, Academic Affairs)

Graduate Faculty

Deans: Maurine A. Fry (dean), Glen K. Hitchcock, Nancy A. McKellar, Charles A. Romig, Marlene Schommer, Brian J. Stone

Degrees and Areas of Specialization

The Department of Counseling, Educational and School Psychology offers programs leading to the Master of Education (MEd) in counseling and in educational psychology. The department offers the Specialist in Education (EdS) in counseling and in school psychology.

Master of Education Requirements

The Master of Education (MEd) in counseling and in educational psychology may be earned under a thesis or nonthesis option. The nonthesis option in counseling requires 36 credit hours of course work and a written comprehensive examination. The thesis option in counseling requires 39 credit hours of course work plus an oral examination over the thesis. For state certification examination in elementary or secondary counseling, 39 credit hours are required under the nonthesis plan and 44 credit hours are required under the thesis plan. The MEd in educational psychology requires 36 credit hours of course work and a written comprehensive examination. The thesis option requires 32 credit hours of course work plus an oral examination over the thesis.

Admission Requirements—Counseling

In addition to the general requirements, students seeking admission to the counseling program are required to have a 3.000 grade point average based upon the last 60 credit hours of course work (including any post-bachelor's graduate work), completion of nine credit hours of undergraduate psychology, plus six additional undergraduate hours in the behavioral sciences.

Admission to the MEd program in counseling does not require the teaching certificate; however, students whose career goals include Kansas school counseling certification must hold a Kansas teaching certificate and have two years of teaching experience prior to recommendation for school counselor certification. Only persons who have been admitted to and have completed the MEd counseling program at the 39 credit hour nonthesis level or at the 44 credit hour thesis level, hold a Kansas teaching certificate and have two years teaching experience may be recommended for certification as a school counselor.

Applications for admission will be reviewed twice a year, in the fall and spring. Deadlines for submitting applications to the Graduate School will be the first Monday in October for consideration for spring admission and the last Monday in March for consideration for fall admission. There will be no summer admissions. All completed applications will be considered for admission within four weeks after the application deadline. In the event that all available openings are not filled from the pool of completed applications, candidates who applied to the Graduate School by the deadline but whose departmental application materials were not complete prior to the deadline will be considered in the order in which their applications were completed.

Admission Requirements—Educational Psychology

To be considered for admission to the MEd in educational psychology, students must provide their grade point average for the most recent 60 credit hours of course work; Graduate Record Examination scores (verbal and quantitative); names, addresses and phone numbers of three persons to provide letters of reference; and a statement of professional goals and research interests. The Graduate Record Examination (GRE) and grade point average (GPA) will be evaluated using the following index:

\[
\text{GPA} + \left( \frac{\text{GRE Verbal} + \text{GRE Quantitative}}{400} \right)
\]

Ordinarily, applicant's scores on this index will equal or exceed 5.5. This index of 5.5 could be achieved by a student who attained a combined verbal and quantitative score on the GRE of 1,000 and a 5 average over the last 60 credit hours of undergraduate course work.

Applications for admission will be reviewed twice a year, in the fall and spring. Deadlines for submitting ap-
Applications to the Graduate School will be the first Monday in October for consideration for spring admission and the last Monday in March for consideration for fall admission. There will be no summer admissions. All completed applications will be considered for admission within four weeks after the application deadline. In the event that all available openings are not filled from the pool of completed applications, candidates who applied to the Graduate School by the deadline but whose departmental application materials were not complete prior to the deadline will be considered in the order in which their applications were completed.

Specialist in Education Requirements

The Specialist in Education (EdS) in counseling requires 30 credit hours of course work beyond the MEd. The school psychology EdS requires 39 credit hours of course work beyond the MEd. The degree is awarded upon completion of course work and practica. For certification in school psychology, students must apply for a one year provisional certificate, register for a four credit hour post-specialist internship, and complete the full-time, one year internship in a public school.

Admission Requirements—Counseling

To be considered for admission to the Specialist in Education program in counseling, students must have a master's degree with appropriate course work from a regionally accredited institution with a major in counseling or related profession outside of education (persons in these related professions may be required to complete course work or other prerequisites for full admission). Have a graduate grade point average of 3.250 (4.000 system), submit a Miller Analogies score, submit evidence of professional knowledge and skills (previous graduate work, practicum, field experience and placements), provide indications of personal attributes and experience (vocational experiences in the field of helping services; recommendations from instructors, employers, practicum supervisors; and on-campus interviews with at least one member of the counseling faculty).

Applications for admission will be reviewed twice a year, in the fall and spring. Deadlines for submitting applications to the Graduate School will be the first Monday in October for consideration for spring admission and the last Monday in March for consideration for fall admission. There will be no summer admissions. All completed applications will be considered for admission within four weeks after the application deadline. In the event that all available openings are not filled from the pool of completed applications, candidates who applied to the Graduate School by the deadline but whose departmental application materials were not complete prior to the deadline will be considered in the order in which their applications were completed.

Admission Requirements—School Psychology

Students who have completed a master's degree in educational psychology, counseling or a directly related area may apply for admission. Students must provide graduate degree transcripts, undergraduate grade point averages for the last 60 credit hours; Graduate Record Examination scores (verbal and quantitative); names, addresses and phone numbers of three persons to provide letters of reference; and a statement of professional goals and research interests. Undergraduate grade point average (GPA) and Graduate Record Examination (GRE) scores will be evaluated using the following index:

\[
\text{GPA} + \left( \frac{\text{GRE Verbal} + \text{GRE Quantitative}}{400} \right)
\]

Ordinarily, applicant's scores on this index will equal or exceed 5.5 and master's degree grade point averages will equal or exceed 3.500. The GPA and GRE index of 5.5 could be achieved by a student who attained a combined verbal and quantitative score on the GRE of 1,000 and a B average over the last 60 credit hours of undergraduate course work.

Following admission to the EdS program, each student will meet with a faculty adviser to determine whether prerequisite requirements have been met or how remaining prerequisites can best be met. All students must complete the introductory professional courses issue course at WSU, and all students must have either completed a thesis as part of their master's program or prepared a thesis equivalent as part of the EdS program. A thesis equivalent differs from a thesis only in procedures for enrollment and in form of recognition. Faculty will apply all thesis criteria for advisement, proposal review, human subjects review and final oral examination.

Applications for admission will be reviewed twice a year, in the fall and spring. Deadlines for submitting applications to the Graduate School will be the first Monday in October for consideration for spring admission and the last Monday in March for consideration for fall admission. There will be no summer admissions. All completed applications will be considered for admission within four weeks after the application deadline. In the event that all available openings are not filled from the pool of completed applications, candidates who applied to the Graduate School by the deadline but whose departmental application materials were not complete prior to the deadline will be considered in the order in which their applications were completed.

Courses for Graduate/Undergraduate Credit

652. Student Development. (3). Training for students involved as small-group leaders. Prerequisite: DARE student leader.

653. Studies in Student Development. (1-2). Designed as a supervised experience for students participating as peer advisers and leaders in developing activities for students entering or attending College. Emphasizes peer counseling and consulting skills. Prerequisites: CESP 652 and DARE student leader.

655. Studies in Student Services. (1-6). Provides students with training in basic helping skills for paraprofessional counseling. Involves training and periodic seminars. May be repeated for a maximum of six hours. Prerequisite: departmental consent.

704. Introduction to Educational Statistics. (3). An introduction to statistics, including measures of central tendency, measures of variability, correlation, chi square, median test, t test, correlated t test and one way and two way analysis of variance.

716. Principles of Learning and Evaluation for Teachers. (3). A study of the learning process and principles related to learning in the classroom. Gives consideration and study to evaluation of the products of learning. Students extend their knowledge by a thorough review of research. May be substituted for CESP 433 but is not open to students with credit in CESP 433. Prerequisite: CESP 332 or 333.

728. Theories of Human Development. (3). Describes what developmental theories are, what they do, where they come from, how they work and how they are used to explain human nature. Uses theoretical assumptions and related research to systematically evaluate developmental theories in terms of their scientific worthiness and their ability to address characteristics of human development. Focuses on those theories which help shape the way we currently view human development as well as significant new perspectives which may shape the way we view it in the future. Prerequisites: CESP 332 or 333, Psy. 334, or equivalent.

729A, B, C and D. Applications in Development: (A) Infants/Toddlers—prenatal to three; (B) Early Childhood—three through eight; (C) Late Childhood/Early Adolescence—nine through fourteen; (D) Adolescence—fifteen to young adulthood. (1). An in-depth study of the physical, cognitive, emotional and social development of the child in the contexts of family and social environments. Focuses on the integration of a conceptual framework with the basic ele-
Courses for Graduate Students Only

800. Principles and Applications of Educational Psychology. (3). A critical examination of the major topic areas traditionally defined as educational psychology. After examination of basic paradigms and strategies of the discipline, students apply them to such areas as instructional practices and design, classroom management and discipline. Prerequisite: CESP 312, 333 or 433 or instructor's consent.

801. Introduction to Educational Research. (3). An introduction to research in education. Includes (1) a survey of current educational research, (2) the nature of research design, (3) understanding the design of a single study, (4) an understanding of the statistical analysis and interpretation of data relevant to research. Applications of research to school-related issues and problems. Required of students enrolled in thesis programs.

802. Research Methods. (3). Statistical techniques for the appraisal of data and their applications in educational research. Practical experiences are conducted. Prerequisite: CESP 301 or concurrent enrollment or admission to school psychology program.

803. Counseling Theory. (3). A study of selected theories of counseling. Prerequisite: CESP 804 or concurrent enrollment or admission to school psychology program.

804. Principles and Philosophy of Counseling. (3). The development of a guidance philosophy, including a study of the helping relationship and the services that are part of school, agency and other institutional settings. Prerequisite: admission to counseling program.

805. Counseling: The Poorly Adjusted Individual. (3). Perceptual approach to the problems of emotionally disturbed or delinquent children and youth in both elementary and secondary schools.

806. Children of Poverty. (3). A perceptual approach to children and youth whose adjustment problems appear to be related to poverty in the affluent society.

807. Counseling: Child Abuse and Neglect. (2). The etiology, symptoms and indicators, treatment and prevention issues of physical abuse and neglect, emotional abuse and neglect and sexual abuse. Prerequisites: CESP 704, 801, 802, 803, 804.

808. Elementary School Counseling. (3). The role of the elementary counselor in providing individual and group counseling, group guidance and consultation in the school setting. Prerequisites: CESP 704, 801, 802, 803, 804.


815. Individual Intelligence Assessment. (3). Study of the conceptual and theoretical formulations, empirical evidence and research concerning behavioral characteristics of exceptional children.


820. Learning Theory and Instruction. (3). Applications of some major learning theories to instruction. Prerequisite: CESP 801 or departmental consent.


822. Psychometric Procedures in Counseling. (3). Survey and study of standardized tests and their application in counseling, emphasizing their selection, use and interpretation. Studies the basic concepts pertaining to the interpretation of psychological tests as inventories, including basic measurement theory and the factors involved in the selection of tests. Prerequisites: CESP 704 and 801; counseling students must also have CESP 802, 803, 804 or instructor's consent.

823. Experimental Design in Educational Research. (3). A consideration of sampling theory, designing hypotheses about populations from samples, testing correlation coefficients, means and difference between means, simple factorial designs, designs involving matched groups, designs involving repeated measures of the same group and analysis of covariance. Prerequisite: CESP 704.

824. Techniques of Counseling. (3). Examines and practices techniques of counseling through simulated counseling situations and extensive examination of counseling case studies. Prerequisites: CESP 728, 821, 822 and Psy. 845.

825. Group Counseling Techniques. (2). Examination of different types of groups, group selection, communication patterns in groups and issues to be addressed in group settings. Prerequisites: CESP 821 and 822.

830. Introduction to Marriage and Family Counseling. (3). A survey course on marriage and family counseling including theory, techniques and research in the field. Prerequisite: CESP 803.

832. Secondary School Counseling. (3). Designed to provide information and skills needed for counseling in secondary schools. Prerequisites: CESP 704, 801, 802, 803, 804.

840. Psychology of Exceptional Children. (3). Study of the conceptual and theoretical formulations, empirical evidence and research concerning behavioral characteristics of exceptional children.

852. Special Studies. (1-4). Covers specific topics identified by the department in consultation with institutions or groups of graduate students. Course procedures vary according to topic. Repeatable. Prerequisite: instructor's or departmental consent.

855. Individual Intelligence Assessment. (3). Use of individual tests for appraisal of intelligence, adaptive behavior and learning styles. Prerequisites: CESP 704, 801, 802, 803, 804.

858. Diagnostic Testing. (3). Use of individual tests, rating procedures and behavioral techniques for the appraisal of perceptual development, linguistic development, classroom behavior and academic skills. Consider assessment theory and research relevant to these areas in a lecture-discussion format which includes some case simulation activities. Prerequisites: CESP 822 and instructor's consent.

859. Counseling Practicum. (3). Supervised practice in individual counseling. Required of students who have completed CESP 824 and 825 and coordinator's consent. Must be taken within one year of completion of CESP 824.

857. Professional and Ethical Issues. (2). Study of major ethical, legal and professional issues with conclusions in the area of educational psychology. Prerequisites: CESP 824 and 825.


862. Presentation of Research. (1-2). A project submitted in thesis manuscript form. Repeatable for a maximum of two hours of credit. Prerequisite: CESP 860.

866. Practicum in Guidance Services. (2-3). Supervised practice in administration, test interpretation, group counseling and other activities of the guidance department. Prerequisites: CESP 833 and instructor's consent.

867. Practicum in Group Guidance and Counseling Methods. (3). Supervised practice in group guidance and counseling. Repeatable for three hours of additional credit. The second practicum must be in a different
Courses are selected in (1) the disciplines (e.g., sciences, mathematics, social sciences, humanities, fine arts); (2) curriculum and instruction including foundations, reading, technology, middle school education, special education, etc.; and (3) complementary and supporting fields including gerontology, women's studies, nursing, communication and health care administration.

Master of Science Education Requirements

The Master of Science Education is a nonthesis, 36 credit hour program with 12 hours of approved courses in professional education and a minimum of 18 credit hours in the scientific disciplines. A maximum of six credit hours of upper-division, undergraduate course work in the scientific disciplines may
be allowed. Students must successfully complete written comprehensive examinations or prepare a video-tape demonstration of science teaching and pass a two-hour final oral examination.

Curriculum and Instruction—General

Courses for Graduate/Undergraduate Credit

615. Learning and Reading Strategies. (3). Designed to provide prospective teachers and current teachers with the understanding of the development of learning and reading skills and to explore instructional approaches for guiding secondary students in those skills and their use in content areas.

616. Literature for Adolescents. (3). Extensive reading of literature in all genres consistent with studies of adolescents' reading interests, abilities and responses to literature. Prerequisite: junior standing.

703. Learning Centers. (3). Considers a variety of alternative approaches to the teaching of students at all grade levels and subject matter areas via learning centers.

705. Introduction to the Reading Process. (3). Designed to acquaint students and teachers with all aspects of current reading theory and pertinent reading research to point out the possibilities of applying this theory and research to the actual teaching of children.

714. Activities for Human Relations I. (3). Covers values, communications and creativity. Activities in the above areas can be used by individuals and groups in instructional settings to explain, teach and enhance human relationships.

715. Activities for Human Relations II. (3). Covers introductory activities, cooperation and sharing in instructional areas. The above areas can be used by individuals and groups in instructional settings to explain, teach and enhance human relationships.

718. Group Dynamics for Educators. (3). A laboratory course in human relations and group dynamics based upon involvement in various group activities.

720. Microcomputers in the Classroom. (2). Designed to familiarize students with the various areas of computer application in education. No computer experience is necessary. Develops a working knowledge of computer functions, applications, software and languages that is relevant to ordinary classroom use. Prerequisite: upper-division standing.

721. Beginning Applesoft BASIC. (1). Introduces classroom programming applications. Develops a practical and working level of skills in programming Applesoft BASIC and how to plan, write, debug and modify simple programs for classroom use. Prerequisite: CI 720 or equivalent.

722. LOGO Implementation. (3). Designed to acquaint students with the philosophy of LOGO. Teach the LOGO language in its classroom application and develop curricular activities which stress problem solving and programming techniques. Prerequisite: CI 720 or equivalent.

734. Literature-Based Reading Program. (3). Develops specific methods for developing a literature program with children (preschool-elementary years). Specifically, this course emphasizes extending literature and media through the reading environment, language arts, the arts and creative expression. Prerequisite: junior, senior or graduate standing.

745. Utilizing the Print Media in Classrooms. (3). Explores various ways the print media may be utilized. Activities in the above areas include the research of the print media, propaganda analysis, communicative skills through word study and writing practice and improved reading through speed and comprehension practice. Stresses the utilization of the daily newspaper as a supplement to other materials in teaching the various school subjects. Also emphasizes preparation of teaching materials for the school classroom.

750. Workshops in Education. (1-4). Prerequisite: CI 705 and 846 or equivalent.

821. Classroom Reading Practicum. (3). Designed to provide practicum experience in delivering developmental and corrective reading instruction in the classroom setting. Prerequisites: CI 705 and 846 or equivalent.

831. Evaluation Techniques in an Effective Classroom. (3). Designed to create an awareness of classroom management and evaluation systems which include a variety of evaluation and management tools and formats.

835. The Instructional Process. (3). Focuses on a process of instruction in order to develop skill in systematic instructional planning. Includes instructional theory, systems approach and other recent approaches to instruction.

838. Curriculum Alternatives. (3). Examines curriculum models that are alternatives to the traditional curriculum and the socio-economic, political and psychological factors that may affect curriculum development. Covers attention to a comparison of historical and contemporary models for the curriculum.

842. Remedial Reading Practicum. (3). Emphasizes corrective treatment of diagnosed reading difficulties. Requires a laboratory practicum in remedial reading instruction. Prerequisites: CI 705 and 846 or equivalent.

845. Curriculum Models. (3). Study of the elementary school curriculum includes all of the experiences of children for which the school will assume responsibility. Explores the potential of this broad concept of the curriculum. Emphasizes development in teaching and attention to a comparison of historical and contemporary models for the curriculum.

846. Remedial Reading Diagnosis. (3). Emphasizes individual diagnosis. The use of standardized instruments, teacher-made instruments, corrective treatment of reading difficulties: including case study. Prerequisites: CI 705 or equivalent.

849. Seminar in Reading Organization. (3). Examines the organization and administration of reading programs. Also investigates pertinent research in the area of reading instruction. Prerequisite: CI 705 or equivalent.

852. Improvement of Instruction in Language Arts. (3). Recent developments in the teaching of language arts in elementary and/or middle school grades; problems, concerns, methods, materials and research related to listening and to oral, written and visual communication including "school" writing and creative writing. Students select particular concepts and related skills for special attention. Prerequisite: CI 319.

854. Improvement of Instruction in Social Studies. (3). A study of recent changes in social studies curriculum and instruction designed to investigate strengths and limitations of various approaches. Stresses competency in teaching for concept development, dealing with value-laden issues and teaching for inquiry. An inquiry-centered learning environment emphasizes personalizing the social studies curriculum for children. Alternative teaching strategies and complementary evaluative techniques are reviewed and practiced. Prerequisite: CI 406 or equivalent.

856. Improvement of Instruction in Mathematics. (3). For teachers in service. Considers recent trends in subject matter curriculum and teaching guides to improve understanding of meanings, vocabulary and mathematical concepts. Includes instructional methods and materials. Prerequisite: CI 444 or equivalent.

858. Improvement of Instruction in Science. (3). For teachers in service. Identifies and explores the principles of science that teachers should recognize, understand and consider from kindergarten through grade eight. Prerequisite: CI 321 or equivalent.

859. Seminar in Education. (3). Prerequisite: CI 806.


862. Presentation of Research. (1-2). A project submitted in thesis manuscript form. Repeatable for a maximum total of two hours of credit. Prerequisite: CI 860.


890. Special Problems in Education. (1-4). Directed reading and research under supervision of a graduate instructor. Prerequisite: departmental consent.

Curriculum and Instruction—Early Childhood

Courses for Graduate/Undergraduate Credit

518. Methods for Kindergarten Education. (3). Acquaints students with all aspects of the kindergarten program and introduces the wide variety of materials available and use. Prerequisites: CI 301 and CESP 332.

760. Parent Education. (3). An introduction to ways of working with parents of elementary and preschool children and an analysis of formal and informal approaches with emphasis on the teacher's role in developing these procedures. Prerequisite: CI 301 or instructor's consent.

761. Early Childhood Education. (3). An introduction to the programs, problems and philosophy of educating children in the preschool years.
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762. Methods and Materials in Preschool Education. (3). The study of teaching methods for the teacher of preschool children and the preparation of materials to enhance the learning experiences of these children. Prerequisite: CI 761 or instructor's consent.

763. Teacher/Child Relations. (3). Assists the student in developing the necessary skills for effective communication with children from birth to age eight. Emphasizes helping the child build a positive self-image and a positive relationship with others.

764. Day-Care Services. (3). Instructional methods and operational procedures for day-care center workers.

Course for Graduate Students Only

870. Research and Contemporary Influences in Early Childhood Education. (3). Analysis of current early childhood education research with an in-depth study of contemporary programs influencing the education of young children.

Curriculum and Instruction—Elementary Education

Course for Graduate Students Only

806. Introduction to Graduate Study in Elementary Education. (3). Explores the field of elementary education; delineates its history and trends, reasons for teaching, criteria of professionalism, program orientation and requirements and options for the student pursuing a degree.

Curriculum and Instruction—Foundations of Education

Course for Graduate/Undergraduate Credit

701. Foundations of Education. (3). A survey of the various foundations areas, including philosophical, historical, social and comparative. This course is prerequisite to subsequent foundations courses.

Courses for Graduate Students Only

807. Philosophy, History and Psychology of Secondary and Elementary Education. (3). An introductory survey of concepts of mind, learning, experience and knowledge, and philosophical, historical and psychological systems and theories as they relate to current educational problems and practices. Prerequisite: CI 701 or instructor's consent.

808. Sociology of Education. (3). An exploration of the relationship between education and society. Prerequisite: CI 701 or instructor's consent.

Curriculum and Instruction—Middle Level Education

Courses for Graduate/Undergraduate Students

620. Introduction to Middle Level Education. (3). An overview of the historical, philosophical, social and psychological factors affecting the movement toward better educational opportunities for learners from ages 10 to 14.

621. Curriculum/Instruction Alternatives for Middle Level Education. (3). An exploration into the development of alternative curricular organizations and instructional strategies for better meeting the needs of preadolescents in grades five through nine.

Curriculum and Instruction—Special Education

Courses for Graduate/Undergraduate Credit

601. Introduction to Exceptional Children. (3). A survey of the characteristics of exceptional learners, including the handicapped and the gifted. Service delivery models and current practices are presented. This course fulfills recertification requirements for teachers and serves as an introductory course in exceptionality for special education majors, administrators and school psychologists. Prerequisite: CESP 332 or 333.

735. Introduction to the Gifted. (3). Historical and socio-educational perspectives germane to gifted education, and an overview of the characteristics and learning needs of high ability students. Designed for administrators, teachers or anyone interested in gifted education. Prerequisites: graduate standing and CI 601.

740. Introduction to Early Childhood Handicapped. (3). A basic introduction to the emerging field of early intervention for handicapped children and their families. Prerequisites: CESP 728, 840 (or CI 601), CI 761 or permission of instructor.

741. Introduction to Mildly Handicapped. (3). A study of the incidence, classification, etiology and intellectual, personal, social and developmental characteristics of the learning disordered child. Examines current research, parental concerns and historical development of the educational approaches to learning and behavioral disorders. Prerequisite: instructor's consent.

Courses for Graduate Students Only

841. Program Organization and Delivery Systems. (3). Examination of factors in classroom organization and management that affect the establishment and operation of programs for exceptional children. Prerequisite: CI 601 or CESP 840.

847E. Practicum: Learning Disabilities. (3-6). Prerequisite: instructor's consent.

847F. Practicum: Educable Mentally Handicapped. (3-6). Prerequisite: instructor's consent.

847K. Practicum: Behavior Disorders. (3-6). Full-time participation in a class for emotionally handicapped children/adolescents supervised by the professor. Emphasizes applied teaching methods for the mildly and severely disturbed, formal-informal psycho-educational assessment devices, curriculum strategies, behavior management and prescriptive remediation for academic deficits. Prerequisites: instructor's consent, CI 749 and 888.

847M. Practicum: Gifted. (3). Supervised teaching experiences with gifted learners. Stresses applied teaching approaches. Provides opportunities to apply various theoretical, structural and technological methodologies related to the education of the gifted learner. Repeatable for a total of six hours. Prerequisites: instructor's consent and CI 735.

847R. Practicum: Regular Early Childhood. (3). The practicum in early childhood in a traditional setting provides opportunities for the student to develop competencies with young children by working in a classroom setting with a trained professional. Prerequisites: CESP 728, CI 761 and 762 and departmental consent.

847T. Practicum: Home Based Early Childhood Handicapped. (2). The practicum in home-based education for early childhood handicapped provides opportunities for the student to develop clinical competencies with handicapped young children and their parents under the supervision of trained professional in the field. Prerequisites: CI 740, 891 and CDS 815 or CI 760 and departmental consent.

847U. Practicum Seminar in Learning Disabilities. (3). Explores trends and issues related to the learning disabled individual, adaptation of materials for specific needs and critical examination of incidents related to the practicum experience.

847V. Practicum Seminar in Educable Mentally Handicapped. (1). Examines trends and issues related to the educable mentally handicapped individual, adaptation of materials for specific needs and critical examination of incidents related to the practicum experience.

847W. Practicum Seminar in Behavior Disorders. (1). Examines trends and issues related to the emotionally disturbed individual, adaptation of materials for specific needs and critical examination of incidents related to the practicum experience. Prerequisite: concurrent enrollment in CI 847K.

883. Methods: Gifted Education. (3). Stresses planning for a qualitatively differentiated curriculum to meet the unique needs of the gifted learner. Explores a variety of suitable program models including grouping, acceleration, guidance and combinations of these. Prerequisite: CI 735 or instructor's consent.

887. Assessment and Analysis of the Learner. (3). The application of standardized and informal evaluation techniques including critical evaluation of standardized tests and their appropriateness for special populations, alternative methods of assessment and intervention techniques based on diagnostic profiles.

888. Methods: Mildly Handicapped. (3). Mastery of specified competencies in teaching special students including use of data based instruction; strategies for reading assessment; techniques to improve reading, math and written language skills; and strategies for working with other teachers to facilitate mainstreaming of special students.
Assessment for Early Childhood Handicapped. (3). Studies emerging and traditional models, procedures and materials in the early identification, screening and assessment of infants and preschoolers with suspected special needs. Concurrent enrollment in an early childhood special education practicum is strongly recommended.

Methods: Early Childhood Handicapped. (3). Demonstrates and discusses current procedural strategies and materials used cross-categorically with specific categorical groups and across domains in early intervention. Concurrent enrollment in an early childhood special education practicum is strongly recommended.

Advanced Topics in Early Childhood Handicapped. (1-4). Special topical seminars in early intervention are offered periodically to facilitate opportunities for the in-depth study of critical issues or topical research in this rapidly developing field. Prerequisites: CESP 728, 732, 840 (or CI 601), CI 761, 762, 740, 847R, 891, 892 or permission of instructor. Repeatable for credit.

Educational Administration and Supervision

Graduate Faculty

Professors: Robert E. Anderson, Willis J. Furtwengler, Rodney Muth (chairperson)

Associate Professors: Ronald G. Davison, Carol B. Furtwengler, M. Claradine Johnson

Assistant Professors: Charles F. Adams, Sharol Little, Vicky L. Triponey (associate dean, Student Life)

Degrees and Areas of Specialization

The Department of Educational Administration and Supervision offers courses of study leading to the Master of Education (MEd) in educational administration and supervision for students pursuing certification endorsement at the building level and the Specialist in Education (EdS) in educational administration and supervision for students pursuing certification endorsement as district level administrators.

Master of Education Requirements

The Master of Education (MEd) in educational administration and supervision is a 33 credit hour nonthesis program. Students pursuing certification endorsement as building administrators must complete this program in its entirety.

Admission Requirements

Individuals seeking admission and who meet all Graduate School admission requirements enter with nondegree status and must have a 3.00 GPA based upon the last 60 credit hours of course work (including any post-bachelor's grade work), and a cumulative score of 1,250 or higher on the Graduate Record Examination (general test). Students meeting these requirements will be admitted to nondegree A status and must complete CI 701 and CESP 801. Upon completion of these prerequisites, students will be transferred from nondegree to degree status.

Specialist in Education Requirements

The Department of Administration and Supervision offers a 30 credit hour post-master's program leading to the Specialist in Education (EdS). Candidates must complete a residency requirement consisting of one semester of full-time study (nine credit hours) or one summer session (six credit hours) and maintain a grade point average of 3.250 (4.000 scale) throughout their program of study. No comprehensive final examination is required.

Admission Requirements

Individuals seeking admission and who meet all Graduate School admission requirements enter with nondegree A status and must have completed the following prerequisites: 2 years of teaching experience; a graduate degree from an accredited institution; a cumulative GPA of 3.250 (4.000 scale) or higher in prior graduate studies; and a cumulative score of 1,350 or higher on the Graduate Record Examination (general test). When these prerequisites are satisfied and standards are met, students will be transferred from nondegree to degree standing.

Doctor of Philosophy and Doctor of Education

A transfer program in educational administration, leading to the Doctor of Philosophy (PhD) or Doctor of Education (EdD), is available in cooperation with the University of Kansas.

Certification Programs

The Department of Educational Administration and Supervision provides degree programs and course work that lead to State of Kansas certification endorsement in the following areas:

- 91-1-33 Director of Special Education
- 91-34 Coordinator of Special Education
- 91-1-127a Supervisor
- 91-1-128 Building Administrator
- 91-1-129a District Administrator

Courses for Graduate/Undergraduate Credit

- 750. Experienced Administrator's Workshop. (1-2). Offers a variety of administrative topics.

Special Studies in Educational Administration and Supervision. (1-3). Group studies in new materials, new research or innovations in advanced educational administration and supervision areas for practicing administrators or advanced students. Repeatable for credit with departmental consent. Prerequisite: departmental consent.

A Survey of School Administration Today. (3). An introductory experience for students interested in learning more about school administration at the K-12 level. Emphasizes the role of the administrator as applied theoretician, problem finder, problem solver, legal/financial expert, instructional supervisor and human resource developer. Students are familiarized with the skills, understandings and career commitments essential to success in school administration. Not applicable to EAS graduate degree program requirements. Prerequisite: admission to Graduate School.

Courses for Graduate Students Only

- 801. Educational Administration Theory. (3). An examination of the major theories of administration and application to specific problems. Provides an overview of the administration of the school district, especially problems involving the community and staff. Includes data gathering for self-evaluation of supervisory potential. Prerequisite: CESP 801 and instructor's consent.

- 804. Clinical Supervision for Administrators/Supervisors. (3). An examination of clinically-oriented supervisory models, explicit teaching approaches and their practice applications. Emphasizes the use of formative supervision strategies that focus on performance issues coming from actual teaching situations and the teacher's guided analysis of these issues. Also considers related responsibilities of the supervisor for planning and organizing staff development activities. Prerequisite: EAS 801.

- 836. Curriculum Management. (3). A study of curriculum philosophies, theories and developmental processes. Includes examination of recent programs and proposals, curriculum development at the building and school system levels and techniques of program evaluation.


- 842. School Law. (3). General concepts of law; interpretations of statutes and court decisions affecting education, and legal responsibilities of school personnel.

- 852. Special Studies in Educational Administration and Supervision. (1-3). Group studies in new materials, new research or innovations in advanced educational administration and supervision areas for practicing administrators or advanced students. Repeatable for credit with departmental consent. Prerequisite: departmental consent.

- 854. School Facilities and Resource Management. (3). Designed for those preparing to become administrators at the school building level. Focuses upon the knowledge and skills necessary to plan and organize work groups, projects and the resources necessary to carry out day-to-day functional activities of schools. Prerequisites: EAS 801.

- 860. Research Seminar in Educational Administration and Supervision. (3). De-
signed for students in advanced study. Emphasizes development of research proposals and studies. Prerequisite: completion of master's degree or adviser's consent.

862. Presentation of Research. (1-2). A project submitted in thesis manuscript form. Repeatable for a maximum two hours of credit. Prerequisite: EAS 860.

873. Interpersonal Skills for Administrators. (3). Designed as a laboratory approach to interpersonal skills development. Students employ role-play exercises to acquire skills in dealing with groups. Prerequisites: EAS 801, 804.


878. Strategies for School Improvement. (3). An examination of organizational/instructional characteristics of schools as determinants of their effectiveness (e.g., pupil academic achievement). Considers various school improvement models, including programs designed specifically for elementary and secondary schools. Research studies are examined to establish correlates for school effectiveness, as well as related teacher effectiveness variables. Prerequisites: EAS 801 and 804.

884. School Plant and Facilities. (3). Planning new educational facilities based upon educational programs. Includes the evaluation of existing schools, remodeling and operation and maintenance of present school plant. Prerequisite: master's degree or instructor's consent.

890. Special Problems in Administration. (1-4). Directed problems in research for master's students primarily under supervision of a graduate instructor. Prerequisite: instructor's consent.

892. Principalship/PRACTICUM. (6). Two-semester course includes building-level field experiences designed to emphasize the acquisition of knowledge and skill in administrative practices and procedures of administration. Prerequisites: all program course work and departmental consent.

904. Supervisory Strategies for Successful Schools. (3). An examination of supervisory strategies designed to enhance school climate and student learning. Focuses on planning the reports to practice supervision, curriculum and instructional leadership requirements, measurement and evaluation issues, staff development and school restructuring, and related school climate issues. Prerequisite: EAS 804.

953. Financial Support of Education. (3). Focuses on the financial support of education at local, state and national levels. Emphasizes methods of taxation, budget preparation and efficient expenditures. Prerequisite: master's degree or instructor's consent.

955. Field Project in Administration and Supervision. (2-6). Field projects are planned to meet a legitimate need in an educational setting in which the student, under the supervision, may become directly involved. The project may fulfill a community need, a departmental concern or a needed investigation or inquiry. Acceptable projects are developmental or must include an appropriate research design. A useful, well-documented report of the project is required, with the plan, format and style approved by the student's committee. Prerequisite: completion of master's degree.

963. Politics and Power in Education. (3). An examination of the interaction of social and power in the school as it relates to administrative processes. Studies systems of control, social class, power structure, human relations and group dynamics. Prerequisite: instructor's consent.

990. Special Problems in Administration. (1-4). Directed problems in research for specialist and doctoral degree students under supervision of a graduate instructor. Prerequisite: instructor's consent.

991. Practicum in Educational Administration and Supervision. (1-2). Designed for persons who have been employed in their first administrative position and are seeking certification in Kansas. Course of study is individually designed by an EAS faculty member with the student and his/her school district supervisor. Addresses the needs of the student and of the district. Thrust is to assist the student to extend basic skills relevant to a particular administrative assignment. The student must register for three hours of credit in EAS 991 to meet certification requirements. S/U grading only. Prerequisites: completion of master's degree and departmental consent.

992. Superintendency/Internship. (6). Two-semester course designed primarily for individuals who are completing an educational specialist program in Educational Administration and Supervision. Focuses on the role expectations of district-level administrators, and includes field experiences designed to emphasize knowledge and skill in administrative practices and procedures. Work is designed for each student's projected administrative interest. Students must file an application for this terminal course. Prerequisites: building-level administrator certification, all program course work and departmental consent.

Other Courses

The following courses are still available for students enrolled prior to June 1, 1990, and may be taken only by permission.

810. The Principalship. (3).
853. School Business Administration. (3).
871. Group Processes for Administrators and Supervisors. (3).
872. Conflict Management. (3).
888. Data Management for School Administrators. (3).
891. Preserve Building Administrator Practicum. (3).
909. Planning in Educational Administration. (3).
946, 947, 948, 949. The Internship. (2, 3, 4, 5).
960. Seminar in the Process of Administration. (1-3).

Health, Physical Education and Recreation

Graduate Faculty
Associate Professor: John F. Hansan
Assistant Professors: Kathy D. Campbell, Natasha M. Fife (interim chairperson), Richard E. Laptad, Dave C. Pizzaro, F. Yvonne Slingerland, Nancy B. Stubbs, Larry Thye

Degrees and Areas of Specialization

The Department of Health, Physical Education and Recreation offers courses of study leading to the Master of Education (MEd). Academic training is provided for students who wish to prepare for careers in physical education programs in public schools and universities, for careers in exercise science/wellness, and for careers in sports administration.

Admission Requirements

Admission to the master's degree program requires students to have completed an undergraduate degree from a regionally accredited institution and have a grade point average of at least 2.750 (4.000 system) on the last 60 credit hours of undergraduate course work including any post-bachelor's graduate work. In addition to the above requirements, students selecting the sports administration option must submit a letter of application and three letters of recommendation and have an interview with the sports administration committee.

Master of Education Requirements

The Master of Education (MEd) in Physical Education may be earned under a 30 credit hour thesis option or a 36 credit hour nonthesis option. The exercise/wellness program offers a 36 hour thesis option and a 36 hour nonthesis option. The thesis option requires an oral examination on the research; the nonthesis option requires a written comprehensive examination. The sports administration program is a 36 hour nonthesis option and requires a final oral examination.

Courses for Graduate/Undergraduate Credit

500. Health Education. (3). Goal is to provide practical applications of theoretical models of change for the health field. Discusses health problems, strategies for affecting change and outcome assessment. Develops selected instructional materials. Two field trips are taken to preselected local health agencies. Additional projects are required for graduate students.

502. Applied Health 1, (2). Introduction to public health problems and practices. Field excursions are arranged. Prerequisite: departmental consent.

504. Applied Health II. (2). Intensive study of selected health problems with regard to illness prevention and the present state of the world health. Prerequisite: PE 502 or departmental consent.

515. Rhythmic Activities in the Elementary School. (2). Designed to teach methodology
and curricular content of rhythmic activities appropriate for elementary school children.

530. Physiology of Exercise. (3). 3R; IL. Provides the student with a working knowledge of human physiology as it relates to exercise.

533. Measurement and Evaluation in Physical Education. (3). A study of the modern practices utilized in the total evaluation of physical education programs including (1) basic statistical procedures, (2) evaluating students, (3) evaluating teaching, and (4) a survey of measurement tools.

544. Organization and Administration of Physical Education Programs. (3). The organizational and administrative problems of physical education programs and the management of the physical plant.

547. Internship in Sport Business. (8). Cumulating activity for students in the field option. Prerequisite: approval of enrollment. Students spend the equivalent of full-time employment in the appropriate agency for a total of at least 520 hours. Prerequisites: senior standing and departmental consent.

557. Internship in Fitness/Wellness. (8). Cumulating activity for students in the fitness field option specialization. Students spend the equivalent of full-time employment in the appropriate agency for one full semester. Prerequisites: senior standing, departmental consent, PE 450, 2.500 minimum GPA overall and for major.

590. Independent Study. (1-3). Prerequisite: departmental consent.

750. Workshop in Education. (1-4).

752. Special Studies in Health, Physical Education and Recreation. (1-3). Group study in a preselected area of health, physical education or recreation. Repeatable for credit with departmental consent. Prerequisite: departmental consent.


781. Cooperative Education Field Study. (1-8). Goal: to acquaint students with a field placement which integrates theory with a planned and supervised professional experience designed to complement and enhance the student's academic program. Individualized programs must be formulated in consultation with appropriate graduate faculty. The plan of study for a graduate degree-bound student must be filed before approval of enrollment for cooperative education graduate credit. May be repeatable for credit with a limit of eight hours counting toward the graduate degree. Offered Cr/NC only.

Courses for Graduate Students Only

800. Recent Literature in Health, Physical Education and Recreation. (3). Survey and critical analysis of research and other pertinent materials in the field.

801. Seminar in Sports Administration. (3). Designed to provide a comprehensive overview of the factors involved in sports administration programs. Sample of topics: public relations, promotion, personnel management, finance, accounting, contest management and travel.

810. Adapted Physical Education. (3). Philosophy, principles and methods of adapting physical education and recreational activities to the needs of the handicapped and the exceptional individual. Provides laboratory experience. Prerequisite: PE 328 or departmental consent.

812. Advanced Techniques in Physical Education. (3). Comprehensive coverage of selected physical activities, with special emphasis on teaching procedures. Includes laboratory experiences.

815. Fitness Assessment and Exercise Prescription. (3). Introduces techniques appropriate for screening, health appraisal and fitness assessment as required for prescribing exercise programs for individuals with or without disease or with controlled disease. Requires out of class laboratory experiences. Prerequisites: PE 530 or equivalent and graduate standing.

830. Advanced Physiology of Exercise. (3). In-depth study into the physiological basis of exercise. Includes energy metabolism, respiratory dynamics, cardiovascular functions and regulation during rest, steady state and exhaustive physical activity. Special emphasis given to the immediate and long term adaptation to exercise and training. Prerequisite: PE 530.

847. Internship. (6-12). Internship in selected areas of specialization in exercise science or sports administration. Prerequisite: departmental consent.

857. Internship in Exercise Science/Wellness. (6). Internship in selected area of specialization within the exercise science/wellness program. Students spend the equivalent of full-time employment in the appropriate agency for one full semester. Prerequisite: departmental consent.

860. Research Methods in Health, Physical Education and Recreation. (3). Examination of research methodology as related to topics in health, physical education, recreation, sports studies and exercise science/wellness. In-depth study of the scientific method and evaluation of the literature, research design and statistical processes, methodology, data collection techniques, computer-based analysis of data and the student report writing. Students design and complete a mini research project. Prerequisite: departmental consent.

875. Thesis Research. (1-2). Development of a research problem and proposal with the direction of a graduate faculty member. Repeatable but total credit hours counted toward degree requirements must not exceed two. Prerequisites: admission to graduate school in good standing, PE 860 and departmental consent.

876. Thesis. (1-2). Repeatable but total credit hours counted toward degree requirements must not exceed two. Students must be enrolled in this course during the semester in which all requirements for the thesis are met. Prerequisites: PE 875 and consent of the student's committee chair.

880. Analysis of Motor Skills. (3). Movement and sport skills analyzed in terms of mechanical principles by means of films and experimentation.

890. Problems in Health, Physical Education and Recreation. (1-4). Directed reading and research under supervision of a graduate instructor.

Industrial Technology

Graduate Faculty

Associate Professor: Sterling B. Leavallen

Assistant Professors: Alan A. Aagaard, Sidney G. Connor (chairperson)

Degrees and Areas of Specialization

The College of Education offers courses of study leading to the Master of Education (MEd) with a specialization in secondary education. The secondary specialization provides for an option in the field of industrial technology.

Graduate courses in the Department of Industrial Technology provide the opportunity for study in selected areas of professional interest and may be used to satisfy specific requirements in the Master of Education degree and to satisfy requirements for certification.

Courses for Graduate/Undergraduate Credit

500. Industrial Field Studies. (1-4). An in-depth analysis of industrial concepts from the perspective of an industrial employee. Requires a comprehensive written paper conceptualizing research and development, finance, marketing, production and industrial relations. The paper involves a comparison of the theoretical to the state-of-the-art in a local industrial firm. A one-hour group conference is held on campus weekly for purposes of directing student perceptivity. Course may be repeated by selecting specific areas from the industrial principles listed above.

501. Preparation of Instructional Materials. (3). The selection, development and organization of instructional materials for effective teaching of industrial technology.

519. Shop Planning and Organization. (3). Selection, purchase and organization of shop equipment and supplies. Also includes developing and maintaining necessary records and reports and the planning of shop facilities.

570. Directed Studies in Materials and Processes. (3). Provides an opportunity for the advanced student to pursue an area of emphasis other than the major area of study in a synthesis level. The method of study for research, basic and applied, or a combination thereof, in consultation with the professor; culminating in a research project and/or report. Prerequisite: departmental consent.

572. Basic N/C Programming. (3). Lecture/laboratory course provides instruction in numerically controlled machine tool design, utilization programming, tooling and operation. Prerequisite: 8 hours machine tool operations or equivalent.

575. Composite Material Applications. (3). An introduction to the description and application of composite materials. Prerequisite: postsecondary course in lastics or equivalent industrial experience.

580. Directed Studies in Power and Energy. (3). Provides an opportunity for the advanced student to pursue an area of emphasis within the realm of power and energy on a synthesis level. The method of study is research, basic and applied, or a combination thereof, in consultation with the professor; culminating in a research project and/or report. Prerequisites: departmental consent.
590. Directed Studies in Visual Communications. (3). Provides an opportunity for the advanced student to pursue an area of emphasis within the realm of visual communications on a synthesis level. The method of study is research, basic and applied, or a combination thereof, in consultation with the professor; culminating in a research project and/or report. Prerequisite: departmental consent.

592. Desktop Publishing. (3). Desktop publishers control the entire publishing process, from creation and typesetting to printing and distribution, with equipment from the desktop. Word processing on the personal computer and laser printing are the two technological achievements that make possible a desktop publishing revolution. Stresses type design, harmony, legibility, copy fitting and layout fundamentals.

594. Offset Lithography. (3). Principles and techniques of preparing computer-generated and other original copy, processing lithographic negatives and plates, as well as operating offset printing presses. Includes laboratory. Prerequisite: departmental consent.

596. Introduction to Computer Aided Drafting (CAD). (3). Interactive computer graphics course that provides hands-on experience and basic information necessary for students to implement, modify and use a computer graphics system. Enables students to learn methods of input and output and teaches the fundamentals of CAD using various microcomputer based CAD system applications. Demonstrates mainframe CAD system applications.

597. VersaCAD. (3). Introduction to CAD is designed to give an individual with no previous CAD background an exploratory experience in Computer Aided Drafting. Introduces VersaCAD software to the students who complete a workbook of sample drawings designed to cover the major operations of the software. After the sample drawings are completed, a major project using the computer is required. Each student receives 64 hours of computer time.

598. AutoCAD. (3). A basic Computer Aided Drafting course utilizing AutoCAD software to produce mechanical and assembly type drawings.

750. Workshop in Industrial Technology. (1-4). Offered from time to time on various aspects of industrial technology.

751. Institute in Industrial Technology. (1-4). Designed to develop knowledge and competence related to curricular and methodological innovations in industrial education. Content is designed to satisfy those competencies that are identified as essential for teaching a defined subject area. Prerequisite: departmental consent.

785. Instructional Media. (3). Selection, use and production of educational media. Includes instructional design, media planning skills, visual literacy, slide show production, design and production of transparencies, basic photography, audio recording and mixing, video tape recording and the operation of instructional audio-visual equipment. Assignments involve the design and production of materials for teaching.

790. Special Problems in Industrial Technology. (1-4). Directed reading and research under the supervision of a graduate instructor. Prerequisite: departmental consent.

792. Explorations in Technology. (3). Participants experience the modular curriculum approach for the middle level student, including technical materials demonstration equipment and specific laboratory equipment. Teachers gain insight into methodologies for proper delivery of the curriculum and gain familiarity with the presentation format and laboratory equipment.

796. Principles of Technology 1. (3). Prepares teachers to teach Principles of Technology Units 1-7 through experiential familiarity with technical materials, equipment, videos and laboratory manuals. Emphasizes presentation format and laboratory equipment. Prerequisite: departmental consent.

797. Principles of Technology 2. (3). Prepares teachers to teach Principles of Technology Units 8-14 through experiential familiarity with technical materials, equipment, videos and laboratory manuals. Emphasizes presentation format and laboratory equipment. Prerequisite: departmental consent.

799. Principles of Technology 3. (3). Evaluation and synthesis of previous course work, remediation and enrichment of areas of assessed weaknesses regarding the principles of applied physics. Prerequisite: I. Tec. 797.

Courses for Graduate Students Only


821. Curriculum Construction in Industrial Technology. (3). Selection and construction of curriculum content for general and specialized areas of study in industrial technology. Prerequisite: I. Tec. 820.

840. Instructional Technology in Industrial Technology. (3). Designed to acquaint graduate students with the emerging technology of instruction. Includes a study of programmed instruction, systems approach to instruction, instructional television, projected media, motion films, computer-assisted instruction, learning resource centers and other pertinent topics. Students are involved in planning and preparing instructional material using systematic procedures. Prerequisite: departmental consent.


Music Education

See School of Music section, College of Fine Arts.
College of Engineering

Offices: 100 Wallace Hall
William J. Wilhelm, Dean
Mark M. Jong, Associate Dean

Departments
Aerospace—Bert L. Smith, chairperson and master's graduate coordinator; Glen W. Zumwalt, doctoral graduate coordinator
Electrical—Roy H. Norris, chairperson; Lloyd M. Benningfield, graduate coordinator
Industrial—Donali L. Hommerzheim, chairperson; Abu Masud, graduate coordinator
Mechanical—Richard T. Johnson, chairperson; Albert L. Gosman, graduate coordinator

Master of Science
The College of Engineering offers graduate programs leading to a Master of Science (MS) in aerospace engineering, electrical engineering, industrial engineering and mechanical engineering, and a Doctor of Philosophy (PhD) in aerospace engineering, electrical engineering, industrial engineering and mechanical engineering. The graduate programs are enhanced by the presence of the industrial complex and the National Institute for Aviation Research on the Wichita State campus. Details of the MS programs can be found in the individual departmental sections.

Doctor of Philosophy
PhD programs are offered by the four departments of engineering at WSU. Typical fields of specialization can be found in the individual departmental sections. These fields will be used in determining testing areas for the qualifying examination in the major and minor fields.

Admission Requirements
Admission to any PhD program in engineering requires that the student has completed (or nearly completed) a master's degree in engineering or physical science. Some students may find it necessary to take prerequisite courses to be able to meet the course breadth requirements. The student is recommended to the graduate dean for admission by the department chairperson in consultation with the graduate coordinator of the department where the graduate student will be housed.

Plan of Study and Advisory Committee
Within the first 12 hours of PhD course work, the department chairperson, in consultation with the graduate coordinator and the student, recommend to the Engineering Graduate Committee an advisory committee for each student, consisting of a minimum of four engineering faculty members with at least one from an engineering department other than the student's major department, and one graduate faculty member from outside the College of Engineering. The chairperson of the advisory committee should be the student's dissertation adviser. The student and advisory committee chairperson will formulate a plan of study and a tentative dissertation topic for approval by the advisory committee, the department chairperson, the engineering graduate committee and the graduate dean. The plan of study will include designation of major and minor fields and all graduate-level course work which is applicable to the degree.

Course Breadth Requirements: To ensure proper breadth of course work, the Plan of Study must include at least 12 hours of mathematics, at least 15 hours in the student's major field and a minor field of study as defined by the student's advisory committee. A Plan of Study normally contains about 60 semester hours of courses, including courses from the master's degree and should have a minimum of 60 percent of the hours (approximately 54 hours) beyond the master's level at the 800-900 level or equivalent.

Foreign Language or Research Tools Requirement (FLORT): The Plan of Study must include either (1) proof of translating ability in one foreign language in which a significant amount of printed material in the student's field exists, or (2) six hours of course work (not necessarily at the graduate level) in advanced computing skills, statistics or experimental methods.

Qualifying Examination
Before 18 post-master's graduate hours are completed, after admission to the PhD program, the student under the direction of his/her advisory committee must take written examinations in (1) mathematics, (2) the major field of study, and (3) the minor field of study. The qualifying examinations are two hours each and are offered as requested. The schedule for the exams will be established by the graduate coordinator in the department where the student is housed and the exams will be established and graded by members of the student's advisory committee or the appropriate departments of members of the student's advisory committee. On the first attempt, the student must take at least two parts of the exam. No part may be attempted more than twice. This examination tests students' breadth of knowledge and determines their ability to formulate mathematical representations of real physical situations. Upon passing, a student is known as an Aspirant for the PhD.

Time Limits and Residency Requirement
From the time the student is admitted to the program, no more than six years may elapse until requirements for the degree have been completed. However, the student may petition the advisory committee for a leave of absence to pursue full-time professional activities related to his/her doctoral program and long-range professional goals. At least two semesters shall be spent in residency on the WSU campus involved in full-time academic pursuits. This may include up to half-time teaching and research. Well-designed plans for obtaining dissertation research experience under the supervision of the student’s adviser will be considered in lieu of the residency requirement.

Dissertation Approval Examination (DAE)
When the PhD aspirant has completed the major portion of the course work and FLORT requirement, the advisory committee can petition for permission to administer the DAE. The aspirant will submit a written dissertation proposal to the advisory committee. After reading the proposal and receiving permission of the graduate dean, the advisory committee will conduct an oral examination to determine the aspirant's ability to carry out the proposed research and whether or not this research qualifies as a PhD dissertation. Any essential change in the project requires committee approval.

After passing the DAE, the student is known as a Candidate for the PhD Degree. A candidate must be continuously enrolled in PhD Dissertation for a minimum of six hours each semester and two hours in the Summer Session until completion of the dissertation or 24 hours of PhD Dissertation have been
taken. After this, two hours per semester and one hour per summer are required. In any case, no less than 24 hours of enrollment for PhD dissertation will be required. The dissertation may be performed in absentia with the approval of the advisory committee.

Final Dissertation Examination
The student must defend the dissertation before the advisory committee. At least five months must elapse between the DAE and the final examination. The final examination will be open to the public. Invited guests or external examiners may be invited if the committee desires.

General Engineering

Courses for Graduate/Undergraduate Credit

510. Topics in Engineering. (1-3). New or special courses of general engineering interest are presented on sufficient demand. Repeatable for credit when subject material warrants.

565. Computer Graphics. (3). 2R; 2L. Forms of computer graphics, input-output devices, generation of points, vectors, etc. Included are interactive versus passive graphics and the mathematics of three dimensions, projections and the hidden line problem. Animated movies, computer-designed instruction and interactive and applications. Prerequisites: Math. 344, EE 199 or AE 327 or equivalent.

600. Integration of Engineering Concepts. (3). Designed for seniors to integrate their classwork into a coherent concept of the major principles, tools and techniques of engineering. Prerequisites: senior standing, preferably taken last semester of undergraduate work.

Aerospace Engineering

Graduate Faculty
Distinguished Professors: William H. Wentz, Jr., Glen W. Zumwalt (doctoral graduate coordinator)
Professors: Walter D. Bernhart, Andrew J. Craig, Bert L. Smith (chairperson and master's graduate coordinator), Melvin H. Snyder
Associate Professors: Klaus A. Hoffmann, Walter J. Horn, M. Gawad Nagati
Assistant Professors: Steven J. Hooper, L. Scott Miller, Michael Papadakis

The Department of Aerospace Engineering offers programs leading to Master of Science (MS) and Doctor of Philosophy (PhD) degrees. Faculty research provides valuable educational opportunities for graduate students. Current research topics include high angle of attack aerodynamics, stall and spin aerodynamics, mechanics of composite materials and structures, aircraft design, rocket exhaust plumes, computational and experimental aerodynamics and aerodynamics of aircraft in dust and water droplet clouds.

The department's facilities, which are among the finest of any university worldwide, include six wind tunnels, a water tunnel and a structural testing lab. Graduate students have opportunities to use equipment in all laboratories for their research projects. Students also may use the research facilities in the University's National Institute for Aviation Research, including a composites lab, a crash dynamics lab and a flight simulation lab.

The department's programs are enhanced by Wichita's aviation heritage and the presence of leading aerospace and aviation companies, including Beech, Boeing, Cessna and Learjet.

Graduate course work is scheduled so that engineers employed in local industry may pursue graduate degrees.

Master of Science

A course of study leading to the MS degree may be taken with specialization in any of the following fields: (1) aerodynamics—fluid mechanics and propulsion, (2) structures—solid mechanics and composites, and (3) dynamics and control. Two options are available: (1) the option requires a minimum of 30 credit hours, including six hours of thesis, and (2) the non-thesis option requires a minimum of 33 credit hours of course work. At least 60 percent of the course work in either option must be 700-level or above. The plan of study must be filed within the first twelve credit hours of course work, and must be approved by the student's adviser and the graduate coordinator. Additional details of the MS degree may be obtained from the department chairperson or the graduate coordinator.

Before the MS degree is granted, candidates must pass an examination. Candidates pursuing the thesis option must pass an oral examination over their thesis research. Candidates pursuing the non-thesis option must pass an examination over core graduate course work in their major.

To be admitted to MS program, students must have completed the equivalent of an undergraduate major in an engineering or related field. For admission with full standing, a minimum grade point average of 2.750 is required for (1) the last two years of undergraduate work, (2) all engineering courses and (3) mathematics and physical sciences courses.

Doctor of Philosophy

Courses of study leading to the Doctor of Philosophy (PhD) degree are available with specializations in the same fields as listed for the MS degree. Details of the PhD program can be found under the College of Engineering heading.

Graduate Courses

All graduate courses must be approved in advance of enrollment by a student's graduate adviser.

Courses for Graduate/Undergraduate Credit

508. Systems Dynamics. (3). Lump parameter modeling; classical, numerical, transform and state model methods of solution; introduction to systems with feedback; analogies of some basic physical systems. Prerequisites: AE 373 and Math. 550.


615. Introduction to Space Dynamics. (3). Orbital mechanics, orbit determination, orbital maneuvers, attitude dynamics and maneuver. Prerequisite: AE 573.

625. Flight Structures II. (3). Study of aeroelastic effects of flight vehicle components. Introduction to energy methods and variational principles. Application of finite element method to the analysis of flight vehicle structures. Special
projects in structural analysis and design. Prerequisite: AE 525.


653. Basic Composite Material Technologies. (3). An introduction to the basic composite material technologies including mechanical behavior, material classification, testing for mechanical properties, manufacturing methods, nondestructive inspection and design. Prerequisite: AE 333.


660. Selected Topics. (1-3). Prerequisite: instructor's consent.

709. Structural Dynamics I. (2). Matrix methods for the analysis of continuous systems. Prerequisite: AE 512 or equivalent.

711. Intermediate Aerodynamics. (4). A study of the equations of motion, potential flow, conformal transformations, finite wing theory, nonsteady airfoil theory and advanced numerical techniques in aerodynamics. Prerequisite: AE 424 or 420 or ME 621.

712. Advanced Aerodynamics Laboratory. (3). 1R 3L. Advanced topics in wind tunnel testing including analysis and sensitivity, modeling techniques, flexure design and calibration, control surface loads and moments, laser velocimetry, dynamic signal processing, flow visualization using smoke tunnels and water tunnel. Prerequisite: AE 512 or instructor's consent.

713. Advanced Aerodynamics. (3). Detailed examination of vortex development, boundary layers, lift and drag theory. Prerequisite: AE 424 or 420 or ME 621.


716. Aerodynamics of Compressible Fluids I. (3). Analysis of compressible fluid flow for one- and two-dimensional cases, moving shock waves, one-dimensional flow with friction and heat addition, linearized potential flow, method of characteristics, conical shocks and subsonic similarity laws. Prerequisite: AE 424, AE 420, ME 621 or equivalent.


733. Mechanics of Fiber Composites. (3). Classical laminate theory, failure theories, hygrothermal behavior. Other topics include fatigue, fracture toughness, damage tolerance, inter laminar stresses, flexure, buckling and vibration. Prerequisite: AE 653 or equivalent.


801. Structural Dynamics II. (2). Advanced topics in structural dynamics including analysis and sensitivity, modeling techniques, flexure design and calibration, control surface loads and moments, laser velocimetry, dynamic signal processing, flow visualization using smoke tunnels and water tunnel. Prerequisite: AE 512 or instructor's consent.

802. Rocket Propulsion. (2). Propulsion by solid and liquid chemical rockets: performance parameters and design components. Brief introduction to nuclear and electric propulsion. Prerequisites: AE 702 and 716.

803. Rotor Aerodynamics. (3). Aerodynamics of rotors, including propellers, wind turbines and helicopters; momentum, blade element and potential flow analysis methods; Reynolds number effects; helicopter dynamics, control and performance. Prerequisite: AE 711.


812. Aerodynamics of Viscous Fluids. (3). Viscous fluids flow theory and boundary layers. Prerequisite: AE 424 or 420 or ME 621.

813. Advanced Flight Dynamics II. (3). Sensitivity analyses of flight parameters; control surface sizing; handling qualities; pilot-in-the-loop analysis; trajectory optimization. Prerequisite: AE 714.

815. Space Dynamics II. (2). Missile and interplanetary trajectories, orbital perturbations, attitude control methods and atmospheric reentry. Prerequisite: AE 715 or equivalent.

817. Transonic Aerodynamics. (2). Experimental and analytical studies in supersonic and transonic flow and flight near Mach one. Basic equations and solution methods: linearized potential equation; shock occurrence criteria on wings; Transonic Area Rule; nozzle throat design; detached shock wave computations; computational methods. Prerequisites: AE 424, 420 or equivalent; and AE 711 or 716.


822. Finite Element Analysis of Structures. (3). Formulation of the finite element equations for variational problems. Use of isoparametric and higher order elements for analyzing two- and three-dimensional problems in solid mechanics; introduction to solutions of nonlinear problems. Prerequisites: AE 722 and 731.

831. Analysis of Elastic Solids II. (3). Advanced topics in the theory of elasticity such as the analysis of nonlinear elastic bodies and anisotropic bodies. Prerequisite: AE 731.

832. Theory of Plates and Shells. (3). Small deflections of thin elastic plates; classical solutions for rectangular and circular plates; approximate solutions for plates of various shapes; introduction to the analysis of thin shells. Prerequisite: AE 731.


838. Random Vibration. (3). Includes characterization, transmission and failure of mechanical systems subjected to random vibration. Includes analysis and measurement methods for random data. Prerequisite: instructor's consent.

860. Selected Topics. (1-3). Prerequisite: instructor's consent.

876. MS Thesis. (1-6). Graded S/U only.

878. Directed Studies. (1-3). Involves directed study under the supervision of a graduate faculty member. Requires a written report. Repeatable toward an MS directed study project up to three hours. Graded S/U only. Prerequisite: graduate standing.

911. Airfoil Design. (3). Historical development of airfoils, underlying theories and experimental and modern aircraft design philosophies and techniques; topics used in modern airfoil computations; application of computer programs for practical airfoil design problems including high lift
and control devices. Prerequisites: AE 711, Math. 757.

913. Aerodynamics of Aeroelasticity. (3). A study of thin airfoils and finite wings in steady flow and thin airfoils oscillating in incompressible flow. Includes extension to compressible and three-dimensional airfoils and modern methods for low aspect ratio lining surfaces. Prerequisites: AE 711 and 677 or instructor's consent.

916. Aerodynamics of Compressible Fluids II. (2). An exploration of perfect gas flows past bodies of revolution. Also includes an axisymmetric method of characteristics, high temperature gases in equilibrium and frozen flows and one- and two-dimensional moving shock waves. Introduces separated flows and jet mixing. Prerequisite: AE 715.


936. Theory of Plasticity. (3). Includes criteria of yielding, including plastic stress-strain relationships and stress deformation in thick-walled shells, rotating discs and cylinders, bending and torsion of prismatic bars for ideally plastic and strain-hardening materials. Includes two-dimensional and axially symmetric problems of finite deformation and variational and extremum principles. Prerequisite: AE 731.

960. Advanced Selected Topics. (1-3). Prerequisite: instructor's consent.


990. Advanced Independent Studies. (1-3). Prerequisite: instructor's consent.

Electrical Engineering
Graduate Faculty
Associate Professors: Robert I. Egbert, John B. O'Loughlin, Larry Paarman
Assistant Professors: Ward T. Jewell, William R. Parkhurst, Mohammad Sarmadi, Asrat Teshome

The Department of Electrical Engineering offers courses of study leading to the Master of Science (MS) and Doctor of Philosophy (PhD) degrees.

Master of Science
Courses of study leading to the MS degree are available with specializations in control systems, communications, signal processing, computers and digital systems, energy and power systems.

Admission Requirements
Admission to the MS program in electrical engineering requires the completion of an undergraduate major, or the equivalent, in electrical engineering or related areas with a grade point average of 2.750 for (1) the last two years of undergraduate work, (2) all engineering courses and (3) mathematics and physical sciences courses.

Degree Requirements
The MS in electrical engineering requires the completion of a plan of study approved by a student's advisor and the department's chairperson. Two options are available with separate requirements: (1) the thesis option requires a minimum total of 30 hours, including four to six hours of thesis (EE 876) and (2) the non-thesis option requires a minimum of 34 total hours, including two to four hours of directed studies (EE 878).

Programs in either option must have at least 60 percent of the course work numbered at the 700 level or above and must include at least six hours outside the department. Students must have a 3.000 grade point average in electrical engineering courses for graduation as well as in all work on the plan of study. Specific course requirement information will be supplied by a student's graduate advisor.

Examinations
Before the degree is granted, all candidates must pass an oral examination over their course work. Thesis option candidates must also pass an oral defense of their thesis.

Doctor of Philosophy
Courses of study leading to the Doctor of Philosophy (PhD) degree are available with specializations in control theory, computer-aided analysis and design, the student's interest.

Examinations
Before the degree is granted, all candidates must pass an oral examination over their course work. Thesis option candidates must also pass an oral defense of their thesis.

Doctor of Philosophy
Couses of study leading to the Doctor of Philosophy (PhD) degree are available with specializations in control theory, computer-aided analysis and design, the student's interest.

Facilities
Modern electrical engineering laboratories contain facilities for experimental work in areas of instrumentation, control systems, computers and digital systems, electronics, circuits, energy conversion, power electronics and power quality.

Courses for Graduate/Undergraduate Credit

585. Electrical Design Project I. (2). 3L. A design project under faculty supervision of one or more hours. Prerequisite: separate arrangements. May not be counted toward a graduate electrical major.


595. Electrical Design Project II. (2). 3L. May not be counted toward a graduate electrical major. A continuation of EE 585. Prerequisite: EE 585 or departmental consent.

598. Electric Energy Systems. (3). 3R. Concepts of electric energy systems, high-energy transmission lines, system representation, load-flow analysis, load-flow control, economic operation, symmetrical and unsymmetrical faults and system stability. Stresses computer applications. Prerequisite: EE 382.

638. Microprocessor Systems and Applications. (3). A detailed study of microprocessor architectures and addressing, assembly language programming, interrupt processing, interfacing to input/output devices and numeric coprocessors. Assembly language programs and tested to illustrate the major concepts. Prerequisites: EE 228 and at least one EE course at 400 level or above.

663. Waves, Waveguides and Antennas. (3). A study of radiation and transmission of electromagnetic waves. Topics include plane wave propagation in various media, normal and oblique reflections, dielectric windows, transmission through waveguides and introduction to antennas. Prerequisites: EE 363 and 682.

681. Electronic Circuits II. (4). 3R. 3L. An investigation of the theory and application of discrete and integrated circuits. Topics include but are not limited to, feedback, active and switched capacitor filters, nonlinear circuits, analog and digital phase locked loops, switched-mode power conversion and RF circuits. Prerequisites: EE 492 and 480 or departmental consent. May not be counted for credit toward a graduate electrical major.

682. Energy and Information Transmission. (2). 2R. A study of the theory and application of transmission lines. Treats both pulsed and steady state sinusoidal signals. Topics include line parameter and equations, signal propagation, effects of terminations and resonant lines and stubs. Prerequisite or corequisite: EE 480. May not be counted for credit toward a graduate electrical major.


686. Information Processing. (4). 3R. 3L. Properties of signals and noise; introduction to information theory; and AM, FM and pulse modulation and detection. Includes principles of sampling, coding and multipling and the organization of analog and digital systems for information processing. May not be counted toward a graduate elec-
trical major. Prerequisite: EE 480 and either Stat. 471 or IE 354.

688. Power Electronics. (4). 3R; 3L. Deals with the applications of solid-state electronics for the control and conversion of electric power. Gives an overview of the role of the thyristor in power electronics application and establishes the theory, characteristics and protection of the thyristor. Presents controlled rectification, static frequency conversion by means of the DC link-converter and the cyclo converter, emphasizing frequency, and voltage control and harmonic reduction techniques. Also presents requirements of four-quadrant commutation methods as applied to DC-DC control and firing circuit requirement and methods. Introduces applications of power electronics to control AC and DC motors using new methods such as microprocessors. Prerequisites: EE 492 and 681.

689. Electrical Laboratory. (2). 4L. Provides training in laboratory methods and in experimental design methods. Consists of selected experiments related to EE 682 and several of the other prerequisites, depending on the background of the student enrolled. May not be counted for credit toward a graduate electrical major. Prerequisites or corequisites: EE 682 and any two of EE 494, 598, 599, 636, 665 and 684.

691. Introduction to VLSI Circuit and System Design. (3). Fundamentals of integrated circuits, circuits of current VLSI design, NMOS and CMOS integrated circuit design, design rules and layout; and structured design examples. Prerequisites: EE 492, 494.

692. Digital Computer Design Fundamentals. (3). An introductory but reasonably detailed study of stored program digital computers from an integrated hardware-software approach. Gives consideration to computer logic design, arithmetic units and operation, large capacity storage systems, input-output units and systems integration. Prerequisite: EE494 or departmental consent.

696. Principles of Power Distribution. (3). The distribution of electric power is one of the most important functions provided by the electric utility industry. This course provides an overview of the engineering fundamentals of distribution of system. Discusses methods for system planning and subdivision, primary and secondary distribution networks. Presents voltage regulation, protection and reliability. Prerequisite: EE 488.

726. Embedded Systems Programming. (3). A study of the requirements and design of embedded software systems. Application of the C programming language in the implementation of embedded systems with emphasis on real-time operating systems, interfacing and assembly and high-level languages, control of external devices, task control and interrupt processing. Prerequisite: EE 638.

754. Probabilistic Methods in Systems. (3). A course in random processes designed to prepare the student for work in communication and control systems. Computer systems information technology, algorithms. Probability and basic concepts and useful analytical tools for engineering problems involving discrete and continuous-time random processes Discusses applications to system simulation, analog and digital signal processing, data compression parameter estimation and related disciplines. Prerequisites: EE 480 and Stat. 471 or IE 354 or departmental consent.

781. Analog Filters. (3). A detailed study of analog filter design methods. Includes both passive and active filters. Discusses analog transfer functions, filter approximations, frequency response and noise analyses. Prerequisite: EE 681.


786. Digital Communication Systems. (3). Presents the theoretical and practical aspects of digital and data communication systems. Topics include the modeling and analysis of information sources as discrete processes; basic source and channel coding; multiplexing and framing; spectral and time domain considerations related to ASK, FSK, DPSK, QPSK, FSK, MSK and other techniques appropriate for sampled information in both base-band and band-pass systems; intersymbol interference; effects of noise on system performance; optimum systems; and general models in signal-space. Prerequisites: EE 754 and 686.

790. Independent Study in Electrical Engineering. (3-9). Arranged individual, independent study in specialized content areas in electrical engineering under the supervision of a faculty member. Repeatable for credit. Prerequisite: departmental consent.

792. State-Variable Techniques in Systems L. (3). Reviews of mathematics fundamental to state-space concepts. Formulation of state-variable models for linear and nonlinear continuous and discrete systems and correspondences of time and frequency domains. Studies adjoint systems in addition to Ljapunov and Lagrange stability and computational approximation techniques. Prerequisite: EE 490 or departmental consent.

794. Advanced Digital Systems. (3). Covers primarily two topics: (1) microprocessors and (2) microprogramming. Presents the operation and application of microprocessors and reviews a survey of digital devices. Covers the characteristics of microprogrammable architecture and presents the techniques of microprogramming. The techniques are applied on the department microprogrammable minicomputer. Prerequisites: EE 694 and 228 or equivalent.

797. Computer Application to Power Systems Analysis. (3). Describes the use of power system component models and efficient computational techniques in the development of a new generation of computer programs representing the steady and dynamic states of electric power systems and integrates of methods currently employed in the electric utility industry. Emphasis on algorithms suitable for computer solution of power systems problems such as power flows and system voltages during normal and emergency conditions and transient behavior and the results from fault conditions and switching operations. Prerequisites: EE 218, 598.

798. Advanced Energy Systems. (3). A continuation of EE 598 with the topics treated in greater depth. Stresses computer applications. Prerequisite: EE 598 or departmental consent.

Courses for Graduate Students Only

854. Stochastic Control Systems. (3). Reviews the pertinent aspects of deterministic system models; stochastic processes and linear dynamic system models with emphasis on linear systems driven by white Gaussian noises; linear estimation and optimal control design; and mean square analysis of Kalman filters. Prerequisites: EE 684 and 754.

876. MS Thesis. (1-3). Graded S/U only. Repeatable for credit toward the MS thesis option up to six hours. Prerequisite: prior consent of MS thesis advisor.

877. Special Topics in Electrical Engineering. (3). New or special courses are presented under this listing on sufficient demand. Repeatable for credit. Prerequisite: departmental consent.

878. Directed Studies in Electrical Engineering. (1-4). Graded S/U only. Repeatable toward the MS directed study option for up to four hours. The student writes a paper and gives an oral presentation on the study made. Prerequisite: departmental consent.

883. Digital Filters. (3). A study of digital filter design methods. Includes both IIR and FIR filters. Discusses software and hardware implementations; two-dimensional, two-dimensional digital filters. Prerequisite: EE 782 or departmental consent.

884. Discrete-Time Control Systems. (3). Fundamentals of input-output and state-space analysis, difference equations and state space representations; pole placement and observer design; dynamic programming and discrete minimum principle; linear state regulator design; equality-constrained control problems. Prerequisites: EE 684 and 782.

886. Error Control Coding. (3). Presents fundamental topics from information theory which underlie source and error control coding. Reviews topics from finite field theory and vector spaces essential for the study of coding. Presents the concepts of code-space, sphere packing and perfect codes. Considers linear (n,k) block codes in some detail including topics such as error detection and correction concepts, parity check matrices and syndromes. Hamming codes, cyclic codes, error trapping decoding, BCH codes, burst-error-correcting codes, interleaving and product codes. Presents convolutional codes and topics such as the Viterbi algorithm for decoding. Prerequisites: EE 685 and 754.

888. Selected Topics in Antennas and Propagation. (3). Determination of characteristics of practical antenna systems; radiation patterns and vector space; insolation for the study of antennas and electromagnetic waves; horn, slots, etc.; wave propagation in the earth's environment, including tropospheric and ionospheric phenomena. Prerequisite: EE 663.

889. Advanced Electrical Laboratory. (2). 6L. Training in fundamental experimental techniques in some field of electrical specialization. Consists of selected experiments in various areas of electrical engineering. The general subject area is announced each semester the course is offered. Repeatable for credit. Prerequisite: departmental consent.
980. Topics in Control Systems. (3). A study of various concepts such as multi-loop systems, multivariable systems and decoupling; nonlinear systems; and sampled-data systems. Repeatable for credit. Prerequisite: EE 684 or departmental consent.

983. State-Variable Techniques in Systems II. (3). A continuation of the study of state-space concepts in the areas of nonlinear systems and optimal and suboptimal control systems with wide classes of performance measures. Prerequisite: EE 792 or departmental consent.

985. Nonlinear Control Theory. (3). An introduction to the analysis and design of nonlinear control systems with emphasis on control nonlinearity, control output disturbances, and model uncertainties. Prerequisite: EE 684 and 792 or instructor's consent.

987. Operation and Control of Power Systems. (3). Acquaints electric power engineering students with power generation systems, their operation in economic mode and their control. Introduces mathematical optimization methods and applies them to practical power systems problems. Introduces methods used in modern control systems for power generation systems. Prerequisite: EE 598.

990. Advanced Selected Topics in Electrical Engineering. (1-3). Presents new or specialized advanced topics in engineering. Repeatable for credit. Prerequisite: instructor's consent.


990. Advanced Independent Study. (1-3). Arranged individual, independent study in specialized content areas in engineering under the supervision of a faculty adviser. Repeatable toward the PhD degree. Prerequisites: advanced standing and departmental consent.

993. Sensitivity Methods in Control Systems Design. (3). Sensitivity analysis of deterministic and stochastic systems; sources of sensitivity in control systems, e.g. plant parameter variation, time delays, small nonlinearities, noise disturbances and model reduction; quantitative study of the effects of uncertainties on system performance; low-sensitivity design methods, state and output feedback design; sensitivity function approach, singular perturbation and model education techniques; adaptive systems and near-optimal control. Prerequisites: EE 893.

Industrial Engineering
Graduate Faculty
Distinguished Professor: Randall Chambers
Professors: Brian Lambert, Don Malzahn
Associate Professors: Don Hommerzheim (chairperson), Abu Masud (graduate coordinator)
Assistant Professors: In-Chan Choi, Jeffrey Fernandez, Ming Liu, Saed Motavalli, Subramanian Prakash

The Department of Industrial Engineering offers graduate programs leading to Master of Science (MS) and Doctor of Philosophy (PhD) degrees with specializations in ergonomics/human factors, manufacturing systems, and operations research/systems engineering.

Master of Science
Admission Requirements
To be admitted to a graduate program in industrial engineering, students must have completed the equivalent of an undergraduate major in engineering or other quantitatively oriented fields. Applicants' records are examined individually prior to admission to evaluate their potential for graduate study. For full admission, a grade point average of 3.00 is normally required for (1) the last two years of undergraduate work and (2) all mathematics, engineering and physical sciences coursework.

Degree Requirements
The MS in industrial engineering requires the completion of a plan of courses that is approved by the student's graduate advisor and the department's graduate coordinator. To be awarded the degree, a student must complete the following requirements: (1) the thesis option requires a minimum total of 30 hours, including six hours of thesis through IE 876, and (2) the nonthesis option requires a minimum total of 34 hours, including three hours of project through IE 849. At least 60 percent of the course work in either option must be 800-level or above.

Examinations
Before a degree is granted, candidates in both options must pass an oral examination of their thesis/project work. Details of the examinations can be obtained from the department's graduate coordinator.

Doctor of Philosophy
For admission and degree requirements, see the Graduate Programs in Engineering section.

Courses for Graduate/Undergraduate Credit

549. Human Factors Engineering. (3). A systematic approach to the optimization of human-environment interaction. Includes human information processing and limitations, work space design and environmental factors. Prerequisites: IE 452 and 524 or departmental consent.

553. Production and Inventory Control. (3). Quantitative techniques used in the analysis and control of production systems. Includes forecasting, inventory policies, and statistical process control and total quality management. Prerequisite: IE 524.

556. Information Systems. (3). A study of the design, implementation, and economic analysis of computer-based information systems. Prerequisite: IE 655 and EE 218 or AE 227.


563. Facilities Planning and Design. (3). Quantitative and qualitative approaches to problems in facilities planning and design, emphasizing activity relationships, space requirements, material handling, storage layout, and facilities location. Prerequisite: IE 429, 533 and 558.

565. Systems Simulation. (3). The design of simulation methods and techniques for use in designing and evaluating discrete systems, including manufacturing systems too complex to be solved analytically. Emphasizes general purpose computer simulation languages. Prerequisites: IE 550 or equivalent and EE 220 or AE 227.


590. Industrial Engineering Design I. (3). A design project utilizing industrial engineering principles, performed under faculty supervision, for solving practical problems. Prerequisites: IE 563, 565 and departmental consent. May not be counted toward a graduate industrial engineering major.

664. Engineering Management. (3). An introduction to the design and control of tech-
nationally based projects. Considers both the theoretical and practical aspects of system models, data processing and planning, project planning and control, resource allocation, team development, and personal skill assessment. Prerequisite: IE 254 or Stat 471.


690. Industrial Engineering Design II. (3). Continuation of the design project initiated in IE 590. Prerequisites: IE 590 and departmental consent. May not be counted toward graduate industrial engineering major.

720. Urban Systems. (3). Cross-listed as P. Adm. 720. Develops the principles of systems analysis and the tools by which these principles can be applied. Example applications include taking urban problems. Emphasizes the formulation of realistic models and solutions. Develops computer techniques in class as necessary. Prerequisite: departmental consent.

730. Analysis of Decision Processes. (3). Decision analysis as it applies to capital equipment selection and replacement. Explores decision theory, risk, uncertainty and multiple attributes in the development of and solutions. Presented as a self-contained analysis of decision algorithms. Prerequisites: IE 254 and 255.

743. Operations Research. (4). A study of various operations research techniques including linear programming, transportation and assignment algorithms, dynamic programming, queuing models and inventory models. Prerequisites: IE 254 or Stat 471, Math 511 or 555 and EE 218 or AE 227. May not be taken by students who have credit in IE 450.


749. Advanced Human Factors. (3). A continuation of IE 549. Includes principles and application of human factors to the design of the workplace, displays, control systems, hand tools and video display terminals. Prerequisite: IE 549.

750. Industrial Engineering Workshops. (1-4). Various topics in industrial engineering. Prerequisite: departmental consent.

754. Reliability and Maintainability Engineering. (3). Studies problems of quantifying, assessing and verifying reliability. Presents various factors that determine the capabilities of components emphasizing practical applications. Examples and problems cover a broad range of engineering fields. Prerequisite: IE 524.

756. Decision Support Systems. (3). A study of various decision support system techniques including relational database, spreadsheets and expert systems. Prereq-uisites: IE 556 or departmental consent.


764. Systems Engineering and Analysis. (3). Presentation of system design process from the identification of a need through conceptual design, functional design, detail design and development, and system test and evaluation. Studies operational feasibility, reliability, maintainability, supportability and cost feasibility. Prerequisites: IE 254 and 255.

775. Computer Integrated Manufacturing. (3). A study of the concepts, components and technologies of CIM systems, enterprise modeling for CIM, local area networks, CAD/CAD interfaces, information flow for CIM, shop floor control and justification of CIM systems. Prerequisites: IE 553 or instructor's consent.

780. Topics in Industrial Engineering. (3). New or special courses are presented under this listing. Repeatable for credit when subject matter warrants.

Courses for Graduate Students Only


830. Advanced Linear Programming. (3). A study of the mathematical developments of the simplex methods, revised simplex methods, decomposition, bounded variables, parametric programming and other advanced topics in LP. Prerequisite: IE 450 or 743.

831. Nonlinear Programming. (3). An extensive treatment of constrained and unconstrained search techniques and nonlinear optimization algorithms. Prerequisite: IE 450 or 743 or departmental consent.

832. Inventory Systems. (3). A study of deterministic and stochastic inventory models and algorithms for inventory systems and their applications. Prerequisite: IE 553 or 743.

835. Applied Forecasting Methods. (3). A study of the forecasting methods, including smoothing techniques, time series analysis and Box-Jenkins models. Prerequisite: IE 524.

842. Advanced Simulation. (3). A study of advanced techniques and methods for statistically selecting input distributions for and analyzing output from simulation models. Also studies variance reduction and model validation techniques. Prerequisites: IE 565 and 524.


849. Industrial Engineering Graduate Project. (3). An independent study performed under the supervision of academic adviser for students in MSIE nonthesis option. Requi-res a report and oral examination based on the study. Prerequisite: consent of student adviser.

857. Environmental Hygiene Engineering. (3). Evaluation and control of mechanical, physical and chemical environments. Environmental factors considered include heat, cold, noise, vibration, light, pressure, accelerated, radiation and air contaminants. Prerequisite: IE 549.

860. Engineering Management Communications. (3). A study of the design of technical communications for specific audiences, the writing process, the editing of your own and others' technical writing, formal presentation of technical material and the design of visual aids.


880. Topics in Industrial Engineering. (3). New or special courses are presented under this listing on sufficient demand. Repeatable for credit when subject matter warrants.

890. Independent Study in Industrial Engineering. (3). Analysis, research and solution of a selected problem. Prerequisite: instructor's consent.

930. Multiple Criteria Decision Making. (3). An extensive treatment of techniques for decision making where the multiple criteria nature of the problem must be recognized explicitly. Prerequisites: IE 450 or 743.

949. Work Physiology. (3). The study of cardiovascular, pulmonary and muscular responses to industrial work including aspects of endurance, strength, fatigue, recovery and the energy cost of work. Utilization of physical work capacity and job demand for task design, personnel assignment and assessment of work-rest scheduling. Prerequisite: IE 549.

950. Occupational Biomechanics. (3). Theoretical fundamentals of the link system of the body and kinetic aspects of body movement. Includes application of biomechanics to work systems. Prerequisites: IE 549 and AE 223.

956. Knowledge-Based Systems. (3). Introduction to the concepts and techniques in knowledge-based systems or expert systems. Includes design and development of knowledge-based systems using microcomputer-based software. Prerequisite: IE 218 or AE 227 or departmental consent.

960. Advanced Selected Topics. (1-3). Prerequisite: instructor's consent.

970. Robotic Sensors. (3). A study of robotic sensors, contact and noncontact. Emphasizes the application of machine vision in robotics and automated inspection. Prerequisite: IE 670.


990. Advanced Independent Study. (1-3). Arranged individual, independent study in specialized content areas. Repeatable toward the PhD degree. Prerequisites: advanced standing and departmental consent.
Mechanical Engineering
Graduate Faculty
Professors: Albert L. Cosman (graduate coordinator), A. Richard Graham, Mahesh S. Greywall, Richard T. Johnson (chairperson), Ashutosh Mishra (visiting)
Associate Professors: Jharna Chaudhuri, George E. Talli
Assistant Professors: Behnam Bahr, Hamid M. Lankaran, Julie A. Mathis, James E. Steck (visiting), Paul O. Steranka
Adjunct: Francis W. Cooke, Dan E. Olson

The Department of Mechanical Engineering offers courses of study leading to the Master of Science (MS) and Doctor of Philosophy (PhD) degrees. Departmental faculty have developed research activities in several areas of specialization, including engineering materials properties and failure modes; controls, robotics and automation; multibody and impact dynamics; mechanical engineering design and manufacturing; and thermodynamics and transport processes.

Several departmental faculty members are associates of Wichita State's National Institute for Aviation Research (NIAR). This association makes facilities of the NIAR available for research activities of these faculty and their graduate students. These facilities include scanning and transmission electron microscopes (SEM and TEM) located in the materials laboratory, the crash dynamics laboratory, the shock and vibration laboratory, the propulsion laboratory, and the computer integrated manufacturing laboratory.

The department's programs and efforts are influenced by the concentration of technology-oriented industries in the Wichita area. Particular attention is given to scheduling course work so that engineers employed by local industries may pursue a graduate degree in mechanical engineering.

Master of Science
Course work leading to the MS degree can allow specialization in any of the major research areas of the department faculty. Both thesis and nonthesis degree options are available. Generally, the thesis option provides more in-depth study in a specialty area.

Admission Requirements
Full admission to the MS program requires the equivalent of an undergraduate major in mechanical engineering or related areas with a grade point average of 3.00 for (1) the last two years of undergraduate work, (2) all engineering courses and (3) mathematics and physical science courses. Each applicant's academic record is evaluated prior to admission to the program to determine their potential for success in the graduate study.

Degree Requirements
The MS in mechanical engineering requires the completion of one of two options: (1) the thesis option requires a minimum of 30 credit hours, including four hours of thesis through ME 876 or (2) the nonthesis option requires a minimum of 34 credit hours, including two hours of directed study through ME 878. In the nonthesis option, an ad hoc faculty committee gives an oral examination to students in relation to their project.

Students must have the Plan of Study in either option approved by their graduate adviser and graduate coordinator or department chairperson and must have their plan meet the department's requirements.

Course work in either option must include (1) a minimum of 60 percent of the courses at the 700-level or above and (2) a minimum of six hours outside of the department.

Examinations
Before a degree is granted, candidates must pass an oral examination over the thesis of directed study and/or course work.

Doctor of Philosophy
Areas of research specialization for the Doctor of Philosophy (PhD) program are within those stated previously for the MS degree. Exact specialties will depend upon the student's dissertation adviser and graduate committee. Other details of the Doctor of Philosophy (PhD) program can be found under the College of Engineering heading.

Courses for Graduate/Undergraduate Credit
The courses numbered 502 through 760 are not automatically applicable toward an advanced degree in engineering. They must be approved by the student's adviser, the graduate coordinator and the chairperson of the department. Courses required for the BS degree normally are not permitted for use toward the graduate degree in mechanical engineering.

502. Thermodynamics II. (3) Continuation of ME 396, emphasizing availability, irreversibility, Maxwell's equations and thermodynamic property relations. Prerequisites: ME 396, with a grade of C or better.

503. Mechanical Engineering Laboratory. (2, 4L) Selected experiments designed to illustrate the methodology of experimentation as applied to mechanical and thermal systems. Experiments include the measurement of performance of typical systems and evaluation of physical properties and parameters of systems. Prerequisites: ME 402, 541, 622.

541. Mechanical Engineering Design II. (3). 2R, 3L. Applications of engineering design principles to the creative design of mechanical equipment. Problem definition, conceptual design, feasibility studies, design calculations to obtain creative solutions of current mechanical engineering problems. Introduction to human factors, economics and reliability theory. Group and individual design projects. Prerequisites: ME 350 and 439 with a grade of C or above in both.


550. Selected Topics in Mechanical Engineering. (1-3). New or special topics are presented on sufficient demand. Repeatable for credit when subject material warrants. Prerequisites: departmental consent.

621. Fluid Mechanics. (3). Continuation of fluid mechanics stem of ME 400. Analysis of steady and unsteady, incompressible and compressible, multidimensional flow fields emphasizing continuity, momentum and energy equations. Includes potential flow, boundary layer theory and fluid machinery. Prerequisites: ME 400.

622. Heat Transfer. (3). Continuation of heat transfer stem of ME 400. Study of steady and transient, onedimensional and multidimensional conduction, forced and free convection, radiation and combined heat transfer. Discusses various analytical methods, analogies, numerical methods and approximate solutions. Prerequisites: ME 400 and 621 (ME 621 may be taken concurrently).

630. Biomechanical Engineering. (3). Study of the physiology and biomechanics of the living body from the viewpoint of basic mechanical engineering principles. Introduces and discusses various artificial organs and life support systems. Prerequisites: ME 400 and Math. 550.

641. Thermal Systems Design. (3). Modeling, simulation and optimization used as tools in the design of thermal systems. Discusses engineering design principles, characteristics of thermal equipment and economic considerations. Studies open-ended problems, including work on design projects in small groups. Prerequisites: ME 400 and 502, both with a grade of C or better.

650. Selected Topics in Mechanical Engineering. (1-3). New or special topics are presented on sufficient demand. Repeatable for credit when subject material warrants. Prerequisites: departmental consent.


662. Mechanical Engineering Practice. (2, 4L). An exercise in the practice of mechanical engineering; students engage in a comprehensive design project requiring the integration of knowledge gained in prereq-
usitise engineering science and design courses. Opportunities to specialize in mechanical engineering or industrial engineering are available to students in their last semester of study. Prerequisite: ME 541.

670. Senior Thesis I. (1). A design, analysis or research project performed under faculty direction. Enrollment limited to mechanical engineering students who are in the last two semesters of their study. requires recommendation by a member of the department faculty and approval of the department chairperson. Prerequisite: ME 541 which may be taken concurrently, and departmental consent.

671. Senior Thesis II. (1). Continuation of ME 670. Prerequisite: ME 670.

678. Studies in Mechanical Engineering. (1-3). Arranged individual, independent study in specialized content areas in mechanical engineering under the supervision of a faculty member. Requires written report or other suitable documentation of work for departmental records. Prerequisite: departmental consent. Three hours credit for technical elective credit. Not for graduate credit.

725. Computer-Aided Analysis of Mechanical Systems. (3). Modeling and analysis of planar motion for multi-body mechanical systems including automatic generation of governing equations for kinematic and dynamic analysis, as well as computational methods and numerical solutions of governing equations. Open-ended student projects on engineering applications such as vehicle ride stability simulations for different terrains. Prerequisites: ME 339, AE 373 and Math. 350.

734. Solar Engineering. (3). A study of solar energy with methods of collection conversion system analysis and economics. Emphasizes solar space and water heating systems. Prerequisite: ME 400 or departmental consent.


744. Advanced Environmental Engineering. (3). A continuation of ME 544 emphasizing computer-based energy systems related to the design and selection of heating, ventilating and air conditioning equipment and distribution sub-systems. Prerequisite: ME 544 or departmental consent.

747. Microcomputer-Based Mechanical Systems. (3). 2R; 1L. Microcomputer-based real-time control of mechanical systems. Familiarizes students with design and methodology of software for real-time control. Includes an introduction to the C programming language which is most relevant to interfacing and implementation of control theory in computer-based systems. Laboratory sessions involve interfacing microcomputers to mechanical systems and software development for control methods such as PID. Prerequisite: ME 659 or instructor's consent.


750. Special Topics in Mechanical Engineering. (1-3). New or special topics are presented under this listing on sufficient demand. Repeatable for credit with subject matter warrants. Prerequisite: departmental consent.

755. Intermediate Thermodynamics. (3). Laws of thermodynamics, introduction to statistical concepts of thermodynamics, thermodynamic properties, chemical thermodynamics, Maxwell's relations. Prerequisite: ME 502 or departmental consent.

758. Computational Fluid Dynamics and Heat Transfer I. (3). Basic finite difference methods for wave equation, Navier-Stokes equations, and conservation laws. Stability, boundary layer theory, and the Navier-Stokes equations. Prerequisites: ME 621 and 622 or equivalent.

760. Fatigue and Fracture. (3). Covers fracture mechanics in metals, ceramics, polymers and composites. Suitable for graduate and undergraduate study in metallurgy and materials science, as well as other engineering disciplines. Prerequisite: ME 350 or instructor's consent.

* Normally not permitted for use toward the graduate degree in mechanical engineering.

Courses for Graduate Students Only

801. Boundary Layer Theory. (3). Development of the Navier-Stokes equations, laminar boundary layers, transition to turbulence, turbulent boundary layers and an introduction to homogeneous turbulence. Prerequisite: Math. 651 or departmental consent.

829. Advanced Computer-Aided Analysis of Mechanical Systems. (3). Computational methods in modeling and analysis of spatial multi-body mechanical systems. Includes Euler parameters, automatic generation of governing equations of kinematics and dynamics, numerical techniques and computational methods; computer-oriented projects on ground vehicles with suspension and steering mechanisms, crashworthiness and biodynamics. Prerequisite: ME 729 or instructor's consent.

845. Fracture. (3). Ductile and brittle fracture: phenomena and mechanisms, linear elastic fracture mechanics, transition temperature approaches, tests for fracture resistance and design methods. Prerequisite: departmental consent.

846. Fatigue and Wear. (3). Fatigue of metals and nonmetals: phenomena, fatigue testing procedures and design methods; Survey of wear problems in engineering. Prerequisite: departmental consent.

850. Special Topics in Mechanical Engineering. (3). New or special topics are presented on sufficient demand. Repeatable for credit with subject matter warrants. Prerequisite: departmental consent.

851. Heat Transfer-Conduction. (3). Theory and measurement, Fourier's equation, steady and unsteady state with and without heat sources and sinks and numerical methods. Prerequisites: ME 622, Math. 757 or departmental consent.

852. Heat Transfer-Convection. (3). Free and forced convection in laminar and turbulent flow. Includes analysis and synthesis of heat transfer equipment. Prerequisite: ME 622 or departmental consent.

853. Heat Transfer-Radiation. (3). Radiative properties of real surfaces, configuration factor analysis, radiative transfer in participating media, exchange factor analysis, Monte Carlo methods. Prerequisite: ME 622 or departmental consent.

856. Advanced Thermodynamics. (3). Statistical thermodynamics, Boltzmann Bose-Einstein and Fermi Dirac statistics, calculation of thermodynamics properties, elementary kinetic theory, introduction to irreversible thermodynamics. Prerequisite: ME 502 or departmental consent.

858. Computational Fluid Dynamics and Heat Transfer II. (3). Vector form of the Navier-Stokes and the energy equation. Generalized transformation of the flow equations to the computational domain. Numerical methods for inviscid flow equations, boundary layer type equations, "parabolized" Navier-Stokes equations and the Navier-Stokes equations. Prerequisite: ME 758 or equivalent.

860. Electromechanical Control Systems. (3). Description analysis and design of electromechanical control systems emphasizing actual devices. Prerequisite: ME 659 or departmental consent.

861. Similitude in Engineering. (2). Critical analysis of models and analogies as aids to engineering design. Prerequisite: departmental consent.

866. Rational Design Methods. (3). The principles of creativity, decision theory, analogies, optimization and reliability as applied to problems of engineering design. Prerequisite: departmental consent.


878. Directed Studies. (1-4). Graded S/U only. Repeatable for credit. Student must write a paper. Students selecting the directed study option to fulfill the degree requirement need also to take an oral examination on the study made. Prerequisite: departmental consent.

901. Advanced X-Ray Diffraction Theory. (3). First part concentrates on the fundamental X-ray diffractions theories including dynamical theory of X-ray and anomalous absorption, with which a serious student in this field must be thoroughly familiar. Second part emphasizes the general theory of X-ray diffraction in a concise and elegant form using Fourier transforms. The general theory is then applied to various atomic structures, ideal crystals, imperfect crystals and amorphous bodies. Prerequisites: ME 750, Math. 757.

960. Advanced Selected Topics. (1-3). New or specialized advanced topics in mechanical engineering. Prerequisite: instructor's consent.


990. Advanced Independent Study. (1-16). Arranged individual, independent study in specialized content areas. Repeatable toward the PhD degree. Prerequisites: advanced standing and instructor's consent.

The following abbreviations are used in the course descriptions: R stands for lecture and L for laboratory. For example, 4R; 2L means four hours of lecture and two hours of lab.
College of Fine Arts

Offices: 415 Jardine Hall
Rhoda-Gale Pollack, Dean
Walter J. Myers, Associate Dean
Raymond D. Oliveri, Coordinator for graduate studies in music
Donald L. Corbett, Coordinator for graduate studies in music

School of Art and Design—Walter J. Myers, interim chair
Art Education—Mary Sue Foster, director
Art History—Stockton H. Garver, Jr., senior faculty
Graphic Design—Clark V. Britton, director
Studio Arts—John D. Boyd, director
School of Music—William E. Mathis, chair
Music Education—James L. Hardy, director
Musicology-Composition—J. William Thomson, director
Keyboard Performance—Paul E. Reed, director
Strings Performance—Jay C. Decker, director
Voice/Choral Performance—Harrison C. Boughton, director
Winds/Percussion Performance—Victor A. Markovich, director
School of Performing Arts—Leroy Clark, chair

School of Art and Design
Walter J. Myers, Interim chair

The School of Art and Design offers programs leading to both the Master of Arts and Master of Fine Arts degrees. Students seeking the Master of Arts degree take a concentration in art education. Students seeking the Master of Fine Arts degree may take a concentration in ceramics, painting, printmaking or sculpture. The specific requirements for each major are described under the appropriate program listing.

Art Education
Graduate Faculty
Associate Professor: Mary Sue Foster, Diane C. Gregory

Master of Arts in Art Education
The Master of Arts (MA) degree in art education meets the needs for advanced study in the field. The program is designed for students pursuing a career in public school art teaching, supervision, college teaching, museum education or art research.

Admission Requirements
To be admitted without deficiencies, students must have completed a bachelor's program in art education and meet requirements for Kansas state certification in this field. Also required are a 2.750 overall grade point average during the last two years of undergraduate study and a 3.000 grade point average in art, with a minimum of 12 hours in graduate credit or equivalent, 15 hours in studio area and nine hours in art education curriculum. Degree applicants are expected to schedule an interview with the art education faculty prior to the first semester of enrollment. During the interview applicants are required to present for evaluation the following: (1) a personal and professional resume reflecting accomplishments; (2) a brief statement outlining professional goals; (3) written examples of professional and scholarly work; and (4) six examples of their art work in either portfolio or slide form with an accompanying list identifying media, size, etc. Up to half of the portfolio may be work produced by students of the applicant. All work should be identified with name, title, size and media. When deemed necessary, undergraduate courses determined by the major professor may be added before students are admitted to the MA program. All correspondence should be addressed to the graduate coordinator of art and design.

Degree Requirements
Two major plans may be followed in meeting the requirements for the MA degree.

Plan A. The minimum requirements through Plan A are summarized below. Of the 33 hours required, 15 must be in courses numbered 700 or above.

Art education including 3 hour thesis .......................... 18 hours
Major art areas and related fields .................................. 12 hours
Total ............................................................. 30 hours

Plan B. The minimum requirements through Plan B are summarized below. Of the 33 hours required, 15 must be in courses numbered 700 or above.

Art education (includes 6 hours of research problems) ........ 18 hours
Major art areas and related fields .................................. 15 hours
Total ............................................................. 33 hours
* May include courses in studio arts and art history.

All candidates must pass a written comprehensive examination before enrolling in thesis or terminal project. This examination is scheduled the first Saturday in November, the second Saturday in April, and the first or second Saturday in July. Candidates must pass an oral defense of their thesis if following Plan A. If following Plan B, they must make a verbal and/or visual presentation of their terminal project.

Plan of Study
In order to define a program of study for the graduate degree, students must submit in triplicate the Plan of Study form leading to admission to candidacy for the degree no later than one month following the completion of 12 semester hours of graduate credit.

Transfer of Credit and Extension Work
A maximum of six semester hours of graduate work may be transferred from another graduate school with the approval of the major adviser and the dean of the Graduate School, preferably before the work is taken. Correspondence courses are not accepted for credit, and extension credit is accepted only if the major department and the dean of the Graduate School give their approval and if the course is taught by The Wichita State University graduate faculty. Only six hours of such work will be accepted. Six hours of graduate-level courses in one department taken on a nondegree student basis will be accepted. Courses taken outside of one department before acceptance into the art education master's program may or may not apply toward the degree.

Courses for Graduate/Undergraduate Credit

510Q. Stimulating Creative Behavior. (3.) Includes theories of creativity; strategies for problem finding and problem solving; iden-
517. Student Teaching Seminar in Art. (1). Analyzes problems encountered in the art classroom during student teaching. Requires concurrent enrollment in seven hours of student teaching courses. Prerequisites: Art E. 516 and departmental approval for student teaching.

702. Metal Processes for Jewelry Construction. (3). Emphasizes fabrication techniques, design analysis and function of jewelry designed for jewelry students and acknowledged craftsmen. Repeatable once for credit. Prerequisite: Art E. 212, 302 or instructor's consent.

710. Creative Behavior and Visual Thinking. (3). Identification and application of theories for creative and critical thinking. Emphasizes strategies for problem solving and visual thinking and procedures to implement those strategies. Student identifies an area for individual investigation. Repeatable once for credit.

711. Seminar in Art Education: Topic to be Announced. (1-3). Supervised study and research of selected topics in art education. Prerequisite: instructor's consent.

712. Development of Art Understanding in the Educational Program. (3). Readings, observation and evaluative techniques in the development of concepts and materials for art understanding. Repeatable once for credit. Prerequisite: instructor's consent.

713. Fiber and Fabric Processes. (2-3). Fiber processes utilizing traditional and experimental techniques in woven forms and other structural techniques using natural and manmade fibers. Repeatable once for credit. Prerequisite: instructor's consent.

715. Research Problems in Art Education. (3). Orientation in research methods, findings and applications. Student to enroll in six hours of research studies and current problems in art education. Repeatable once for credit. Prerequisite: instructor's consent.

719. Electronic Imaging. (3). Emphasizes personal and group research and computer processing and their application to art and art education. Students generate sequential images with a variety of software and hardware. The student makes application of this new technology to problems of design, art history and art criticism, and develops curriculum materials for art instruction that employ computer graphics procedures. The graduate student prepares a research paper on selected topics related to computer graphics and art learning.

720. Art and Early Childhood. (1-3). Emphasizes the cognitive and aesthetic domains of young children and develops the potential for creative and visually expressive behavior as a natural means of a child responding to environmental stimuli.

750. Art Workshop. (1-3). Repeatable for credit. Area to be covered is determined at the time course is offered.

Courses for Graduate Students Only

815. Individual Research Problems in Art Education. (1-4). Directed independent study in art education not normally covered in other graduate course work. Repeatable for credit. Prerequisite: instructor's consent.

816-817. Thesis—Art Education. (1-3; 1-3).

818-819. Terminal Project—Art Education. (1-3; 1-3).

Art History

Graduate Faculty
Professor: Mira P. Merriman
Assistant Professor: Stockton H. Garver

Although there is no graduate degree in art history, the following courses are available for graduate credit.

Courses for Graduate/Undergraduate Credit

520. Seminar in Art History. (3). Systematic study in selected areas of art history. Course content varies but individual areas are not repeatable for credit.

521Q. Italian Renaissance. (3). A study of the architecture, sculpture and painting from the 14th to the 16th century. Emphasizes early developments in Florence and Siena and late developments in Rome.

522. Italian Baroque. (3). A study of Baroque painting, sculpture and architecture in Rome, Venice and Bologna from 1600 to 1750 emphasizing the Caravaggio, Caravaggio, Bernini and Tiepolo.

523. 18th and 19th Century European Art. (3). A history of European art from Watteau through post-Impressionism.

524. 18th and 19th Century American Art. (3). A history of American art from the colonial period through the 19th century.


528. Museum Techniques I. (3). Designed primarily for the graduate student interested in museum work. Includes specialized research related to administrative responsibilities of a museum: collection, exhibition, recording, preservation and financial activities.

529. Modern Architecture. (3). An overall view of the development of modern architecture from its inception in the early 20th century until today. Stresses theoretical connections between architecture and the arts of painting and sculpture as they developed in the United States and Europe.

530. The Art of Classical Greece. (3). A study of the painting, sculpture and architecture of Greece during the 5th and 4th centuries B.C.

531. The Art of Hellenistic Greece. (3). A study of the painting, sculpture and architecture of Greece during the Hellenistic period, 4th to 1st centuries B.C.

532. Independent Study in Art History. (1-3). Work in a specialized area of the study of art history. Directed readings and projects. Prerequisite: instructor's consent.

533. Seminar: Topics in Modern Art. (3). Selected readings and problems in art of the modern era. Course content varies but individual areas are not repeatable for credit.

721. Introduction to Art History for Teachers I. (3). A historic and stylistic overview of the development of art from prehistoric through medieval times. Emphasizes how art history can be integrated into art and non-art classroom curricula. Specifically designed for early childhood, elementary and secondary teachers. Approved for recertification credit for elementary and secondary teachers by KSBOE.

722. Introduction to Art History for Teachers II. (3). A historic and stylistic overview of the development of art from the Renaissance to the present. Emphasizes how art history can be integrated into art and non-art classroom curricula. Specifically designed for early childhood, elementary and secondary teachers. Approved for recertification credit for elementary and secondary teachers by KSBOE.

732. Independent Study in Art History. (3). Work in specialized area of the study of art history. Directed readings and projects for graduate students in all disciplines. Prerequisite: instructor's consent.

Courses for Graduate Students Only


829. Thesis. (2).

832. Independent Study. (1-3). Individually supervised work in a specialized area of the study of art history. Directed readings and projects for graduate students in all disciplines. Prerequisite: instructor's consent.

Graphic Design

Graduate Faculty
Professor: Clark V. Britton, Jr.
Assistant Professor: Kirsten S. Johnson

Although there is no graduate degree in graphic design, the following course is available for graduate study.

Course for Graduate/Undergraduate Credit

530. Seminar in Graphic Design. (3). Supervised study and research. Requires
weekly consultation and reports. Repeatable for credit. Prerequisite: departmental consent.

**Studio Arts**

**Graduate Faculty**

Professors: Richard St. John, John Boyd

Associate Professors: Raymond Olivero, Ronald Christ, Kathleen Shanahan

Assistant Professors: David Detrich

**Master of Fine Arts**

The Master of Fine Arts (MFA) degree is offered for qualified students planning careers as professional artists, either working independently or as artist-teachers on the college or art school level. The program is designed for a concentration in ceramics, painting, printmaking or sculpture.

**Admission Requirements**

Admission without deficiencies requires a 2.750 grade point average during the last two years of undergraduate study and a 3.250 overall grade point average in the major field of study: ceramics, painting, printmaking, and sculpture. Also required is a Bachelor of Fine Arts (BFA) degree, or the equivalent, that includes a minimum of 12 hours of art history, 15 hours in the major field and 20 hours of related work. Applicants should present examples of work for evaluation. They should submit 15 color slides (2" x 2") in their major area. All work should be identified with name, title, size and media. Applicants should also include a short statement of their artistic philosophy. Also list all honors, awards, scholarships, exhibitions, special recognition for work in art or services rendered through art. Three letters of recommendation should be forwarded. No application is considered until an application to Graduate School, transcripts and the materials listed above are received. A stamped return envelope for all materials should be included.

Students holding degrees from institutions where requirements differ from those at Wichita State may be required to take undergraduate courses to make up deficiencies as determined by the major professor and the graduate art coordinator. Applicants should address all correspondence to the graduate art coordinator.

**Degree Requirements**

Minimum course requirements for completion of the MFA degree are summarized below. In addition, 45 of the 60 hours must be taken in courses numbered 800 or above.

Studio courses in the major area..............................................23 hours

* Studio courses in a minor option area .......................... 5 hours

** Courses in art history.......................... 9 hours

Terminal project in the major area...........................................10 hours

Course in art seminar or directed readings ...............................3 hours

Total .............................................. 60 hours

* Minor option can be taken in one studio area, a variety of studio areas or in the major area, with approval of area adviser and graduate coordinator.

** These nine hours are mandatory.

The terminal project consists of an exhibition of original studio art work, accompanied by (1) a written report in thesis form and (2) the MFA terminal project report, which is a photographic documentation of the candidate's studio work (submitted in duplicate).

**Plan of Study**

In order to define a program of study for the graduate degree, students must submit in triplicate the Plan of Study form leading to admission to candidacy for the degree no later than one month following the completion of 24 semester hours of graduate credit.

**Graduate Review**

MFA degree students must satisfactorily complete four graduate reviews conducted in their major MFA area at the end of each fall and spring semester. At this time, the graduate faculty makes observations and recommendations regarding the quality of the students' works and their standing in the program. No graduate review is held during Summer Session.

**Transfer of Credit**

All graduate credit for transfer will be at the discretion of the departmental adviser and graduate coordinator. A maximum of 12 semester hours from prior graduate study may be considered for transfer to the MFA program. However, no transfer work will be considered until the students have successfully completed 24 semester hours and their first graduate reviews and no hours can be applied to a major field of study. If a transfer of credit is allowed, it may reduce course requirements but not entrance requirements. A ruling on hours converted to the MFA program by the degree of the Graduate School, graduate art coordinator and the major professor is final. Graduate nondegree work obtained before admission to a planned degree program will not be accepted.

**Required Prerequisites**

Students who have not been accepted to degree standing in the MFA Studio or MA Art Education programs may enroll in 800-level courses only with written consent of the art graduate coordinator.

**Examinations**

At the beginning of and during the semester in which the degree is to be conferred, two interviews between candidates and their committees are conducted. The proposed content of the MFA exhibition is discussed and evaluated. The graduate committee's findings, upon final review and the MFA terminal exhibition, are filed by the major professor with the graduate dean at least two weeks before the end of the final semester. This procedure constitutes the terminal examination for MFA candidates.

**Policy Toward Student Art**

The School of Art and Design reserves the right to select and retain a maximum of three pieces from the graduate exhibition. MFA printmaking candidates may be required to deposit one print from any edition for the University Collection.

**General**

**Courses for Graduate/Undergraduate Credit**

500. Topics in Visual Arts and Design. (3). Covers topics of special interest and significance to faculty and students in Studio Art and Design. Content varies in subject matter from one semester to another. Repeatable for credit with departmental consent.

750. Art Studio Workshop. (1-3). Area covered is determined at time course is offered. Repeatable for credit.

**Course for Graduate Students Only**

800. Seminar in Art Topics. (3). Designed to explore areas of common interest in the arts. Supervised study, research and discussion. Repeatable for credit.

**Ceramics**

**Courses for Graduate/Undergraduate Credit**

570. Advanced Ceramics Studio. (3). Lab fee. Advanced studio problems involving forming methods, glaze formulation and firing procedures. Lecture periods involve advanced studies of ceramic materials and glaze formulation. Repeatable for credit. Prerequisites: Art S. 370 and instructor's consent.

574. Advanced Study of Kiln Methods. (3). Advanced study of kiln design and construction with research in the area of refractory materials. Requires reading assignments, notebook and laboratory work. Prerequisite: Art S. 374.

575. Study of Ceramic Materials II. (3). Lab fee. Lectures and research covering clays, glazes and refractory materials. Reading assignments concerning physical and chemical characteristics of pottery materials. Prerequisites: Art S. 275 and 370.
576. Study of Ceramic Glazes II. (3). Lab.
   The study of glaze formulation and the color and crystalline effects of oxides on base glazes. Requires notebook, formulation records and laboratory work. Prerequisite: Art S. 375.

578. Independent Study in Ceramics (1-3).
   A professional emphasis on technical or aesthetic research in the ceramics field. Available only for the advanced ceramics student with instructor's consent. Statement of intent must be submitted for faculty approval before registration. Prerequisite: departmental consent.

Courses for Graduate Students Only

800. Seminar in Art Topics. (3). Designed to explore areas of common interest in the arts. Supervised study, research and discussion. Repeatable for credit.

870. Special Problems in Ceramics. (1-5).
   Research in advanced problems in ceramics. Repeatable for credit.

875. Advanced Research of Ceramic Materials. (3). Lectures and advanced research covering clays, glazes and refractory materials. Reading assignments concerning physical and chemical characteristics of pottery materials. Requires notebook and outside lab work.

876. Advanced Study of Ceramic Glazes. (3).
   The study of glaze formulation and the color and crystalline effects of oxides on base glazes. Requires notebook, advanced formulation records and laboratory work. Prerequisite: Art S. 875.

878-879. Terminal Project—Ceramics. (2, 3 or 5; 3 or 5).

Drawing

Courses for Graduate/Undergraduate Credit

545. Advanced Drawing Studio. (1-3).
   Drawing with a variety of media. Uses graphic problems relative to individual technical and aesthetic development. Critiques are given. Repeatable for credit. Prerequisites: Art S. 340 and 345.

549. Independent Study in Drawing. (3).
   A professional emphasis on technical or aesthetic research in the drawing area. Available only for the advanced drawing student with instructor's consent. Statement of intent must be submitted for faculty approval before registration. Prerequisites: Art S. 340, 345 and instructor's consent.

Courses for Graduate Students Only

840. Special Problems in Life Drawing. (1 or 3).
   Drawing from life. Requires sketchbooks and/or portfolio. Repeatable for credit.

845. Special Problems in Drawing. (1-3).
   Advanced drawing in various media with emphasis on independent work and the development of personal expression. Repeatable for credit.

Painting

Courses for Graduate/Undergraduate Credit

550. Advanced Painting Studio. (1-3-6).
   Designed for the professionally oriented student. Emphasizes independent study. Repeatable for credit. Prerequisites: four semesters of Art S. 350 and interview with instructor.

551. Advanced Watercolor Studio. (3).
   Requires sketchbooks and/or portfolio. Prerequisites: completion of foundation program and Art S. 251.

553. Independent Study in Painting. (3).
   A professional emphasis on technical or aesthetic research in the painting area. Available only for the advanced painting student with instructor's consent. Statement of intent must be submitted for faculty approval before registration. Prerequisite: departmental consent.

Courses for Graduate Students Only

800. Seminar in Art Topics. (3). Designed to explore areas of common interest in the arts. Supervised study, research and discussion. Repeatable for credit.

850. Special Problems in Painting. (1-5).
   Professional and experimental painting emphasizing the development of maturity, ideas, independent thinking and personal expression. Mediums include oil, watercolor and synthetic media. Repeatable for credit with the consent of the drawing/painting faculty.

858-859. Terminal Project—Painting. (3 or 5; 3 or 5).

Printmaking

Courses for Graduate/Undergraduate Credit

560. Advanced Printmaking Studio—Intaglio. (1-3). Intaglio, collagraph and mixed techniques. For students interested in professional printmaking, course offers specialization in color printing or black and white. Repeatable for credit. Prerequisites: Art S. 260, 262 and 364.

561. Advanced Printmaking Studio—Lithography. (1-3). Lithography, black and white or color. For students interested in professional printmaking, course offers specialization in color printing. Repeatable for credit. Prerequisites: Art S. 260, 262 and 364.

565. Independent Study in Printmaking. (3).
   A professional emphasis on technical and aesthetic research in the printmaking area. Available only for the advanced printmaking student with instructor's consent. Statement of intent must be submitted for faculty approval before registration. Prerequisite: departmental consent.

Courses for Graduate Students Only

860. Special Problems in Printmaking—Intaglio. (1, 3 or 5).
   Advanced printmaking on an individual basis. Gives encouragement to investigation combined with a craftsman-like approach. Techniques include all intaglio, relief and combined methods, black and white and color. Repeatable for credit.

862 & 863. Special Problems in Printmaking—Lithography, (1, 3 or 5).
   Advanced printmaking on an individual basis. Gives encouragement to investigation, combined with a craftsman-like approach. Includes lithography and allied techniques, black and white and color. Repeatable for credit.

868-869. Terminal Project—Printmaking. (3 or 5; 3 or 5).

Sculpture

Courses for Graduate/Undergraduate Credit

580. Advanced Sculpture Studio. (1-3).
   Sculpture in any medium, emphasizing individual development and creativity. Repeatable for credit. Prerequisite: Art S. 380.


585. Independent Study in Sculpture. (3).
   A professional emphasis on technical or aesthetic research in the sculpture area. Available only for the advanced sculpture student with instructor's consent. Statement of intent must be submitted for faculty approval before registration. Prerequisite: departmental consent.

Courses for Graduate Students Only

880. Special Problems in Sculpture. (3 or 5).
   Advanced sculpture emphasizing experimentation and high quality work on an individual basis. Stresses special projects in casting architectural sculpture, mixed media or new materials and techniques. Repeatable for credit.

888-889. Terminal Project—Sculpture. (3 or 5; 3 or 5).

School of Music

William E. Mathis, Chair

Graduate degree programs in the College of Fine Arts, School of Music, are designed to extend and broaden the professional competency of men and women desiring careers in music. Students may pursue graduate studies in history-literature, theory-composition, music education, performance, and pedagogy. While providing for advanced training in the specific skills of music, these graduate programs help to cultivate the student's capacity to think—to consider impersonally, dispassionately and without prejudice any problem related to the art of music.

Master of Music

The Master of Music (MM) degree allows for specialization in history-literature, piano pedagogy, theory-composition and performance. The general requirements for the degree are outlined below, while the specific information about the requirements for each specialization is given in the section concerning courses offered in the area of specialization.

Admission Requirements

Admission to the MM program requires the completion of an accredited
music bachelor's program that includes a minimum of 42 semester hours in music, with at least 24 hours in a major field and 15 hours in a minor field. Approval of the MM specialization must be acquired during the first semester of enrollment.

Degree Requirements
The MM degree requires the completion of a minimum of 32 graduate hours, including a thesis or recital as indicated for the respective specializations. Of those hours, 60 percent must be in courses numbered 700 and 800 or above. Each Plan of Study must include 852, Introduction to Bibliography and Research; 830, Seminar in Music Theory; and six hours elected from graduate courses in music history and literature, including 791-792, Seminar in Music History, or any of the period courses from 893, Music of Antiquity through the Renaissance, through 897, Music of the 20th Century. A minimum of eight semester hours in the applicant's specialization must also be selected with the advisor's approval.

Master of Music Education
The School of Music offers the Master of Music Education (MME) degree through its music education department. The requirements for this degree are explained in detail under the section of the Graduate Bulletin concerning the music education program.

Examinations
All degree candidates in the School of Music must pass an oral comprehensive examination. The oral comprehensive examination for thesis candidates includes a defense of the thesis.

Music Education
Graduate Faculty
Professors: James L. Hardy, Donald Corbett, Betty T. Welsbacher
Assistant Professors: Thomas Fowler, Nancy L. Scriven

Master of Music Education
The Master of Music Education (MME) program allows for concentration in elementary music, choral music, instrumental music (with recital option), music in special education and voice. Conducting options may be elected on the choral and instrumental programs.

Admission Requirements
Admission to the degree program in music education requires the completion of a Bachelor of Music Education degree, or its equivalent, from an accredited institution. Students holding bachelor's degrees in music other than the Bachelor of Music Education must satisfy public school certification requirements to qualify for full admission. Applicants without such certification are admitted on a conditional basis pending their attainment of public school teaching credentials. Approval of the MME specialization must be acquired.

Degree Requirements
MME programs range from 32 to 36 hours. The required core is 13 hours; 17 field specialty hours must be decided in consultation with an advisor and terminal options. Of these hours, 12 must be in courses numbered 700 or 800. Each Plan of Study must include 852, Introduction to Graduate Study; 851, Psychology of Music; 871, History and Philosophy of Contemporary Music Education; and 830, Seminar in Music Theory. Three hours are also required in graduate music history.

Qualified students requesting permission to present a formal graduate recital should obtain approval from the appropriate performance area before completing 12 hours of graduate enrollment. A recital is not a terminal requirement option for the MME in special education.

Courses for Graduate/Undergraduate Credit

606. Music Methods for Early Childhood Education. (3). Methods and materials for teaching music in the preschool and kindergarten classroom. Includes the development of the child's musical growth through singing, listening, rhythmic and creative activities; a survey of available materials and development of playing, singing and conducting skills.

611. Music for Special Education. (3). Open to upper-division or graduate students; designed for the potential practicing music teacher, classroom teacher or special education teacher. Includes identification of dysfunctional children and their problems and current theory and practices in special music education. Satisfies the requirement, effective September 1, 1981, that applicants for initial certification or renewal of secondary or/elementary certification shall present a survey course, or equivalent content from other courses, in the subject area of exceptional children. This provision applies to initial certification and recertification of music teachers only. Grades K-12.

686. Marching Band Techniques. (2). A systematic approach to the marching band with regard to organization, show development, instrumentation, music adaptation, drill construction and script development. Teaches both traditional drill and corps style marching utilizing manual methods and computer generated graphics. Field observations, films, photographs and live performances by marching bands supplement the class syllabus. Required for all instrumental majors.

732. Music in the Junior High School. (3). Includes administrative structures, the curriculum, adolescent development, teaching as behavior management, competencies needed for successful teaching of general and choral music in grades 6-9.

737A. Advanced Woodwind Techniques. (2). Special problems and techniques in the teaching of woodwind instruments. Surveys current materials. Prerequisites: Mus. E. 257 and 238 or equivalent.

739A. Advanced Brass Techniques. (2). Special problems and techniques in the teaching of brass instruments. Surveys current materials. Prerequisite: Mus. E. 239 or equivalent.

740A. Advanced Percussion Techniques. (2). Special problems and techniques in the teaching of percussion instruments. Surveys current materials. Prerequisite: Mus. E. 240 or equivalent.

750. Music Education Workshop. (1-4). Repeatable for credit.

781. Cooperative Education. (1-8). A field placement which integrates course work with a planned and supervised professional experience designed to complement and enhance the student's academic program. Individualized programs must be formulated in consultation with and approved by appropriate faculty sponsors and cooperative education coordinators. Students enrolled in Coop 781 may follow one of two scheduling patterns: full time one semester in a field study and returning to full school enrollment the following semester. Such students need not be concurrently enrolled in any other course. Prerequisites: successful completion of the freshman year and satisfactory academic standing prior to the first job assignment. May be repeated for credit. Offered Cr/Ncr only.


790. Special Topics in Music. (1-4). For individual or group instruction. Repeatable with departmental consent.

Courses for Graduate Students Only


822. Advanced Techniques in Special Music Education. (3). For the music education special emphasis MME candidates only. Studies research literature and trends in special music education. Includes an examination of materials and techniques and special projects exploring the development of musical understanding in the dysfunctional child. Course satisfies the requirement, effective September 1, 1981, that applicants for initial certification or renewal of second-
ary and/or elementary certification shall present a survey course, or equivalent content from other courses, in the subject area of exceptional children. This provision applies to initial certification and recertification of music teachers only. Prerequisite: Mus. E. 403 or 404.

823. Special Music Education Practicum. (3). For the music special education emphasis MME candidate only. Supervised teaching in special education classrooms. A companion course to Mus. E. 822; gives the music special education emphasis MME candidate experience in teaching in special education classrooms. Prerequisite: Mus. E. 822 or concurrent enrollment.

831. Developing the Child's Musical Understanding, (3). Definition of understandings necessary for the attainment of musical awareness in the child. Directs the exploration of classroom experiences toward the successful development of understanding through the application of basic learning principles. Prerequisite: Mus. E. 403.


841. Special Project in Music, (1-3). Individually supervised study or research emphasizing the student's personal needs. Repeatable for credit. Prerequisite: Instructor's consent.

842. Special Project in Music, (1-3). Individually supervised study or research emphasizing the personal needs of the student. Repeatable for credit. Prerequisite: Instructor's consent.

844. Terminal Conducting Project, (2). Individually supervised project for those entering the conducting option on the instrumental or choral emphasis under the MME degree. Prerequisite: Instructor and departmental consent.


851. Psychology of Music, (2). An overview of music behaviors from a psychological perspective. Relates recent literature concerning human psychoacoustics; melodic, rhythmic and harmonic perception; and major learning theories to current trends in music education.

852. Introduction to Bibliography and Research, (3). See course listing under musicology-composition department.

854. Research Seminar in Music Education, (3). Continued application of techniques of research. Requires the completion of a major research project. Prerequisite: Mus. C. 852.


Music Performance
Graduate Faculty
Professors: Harrison C. Boughton, Joseph C. Combs, Jay C. Decker, George H. Gibson, James Jones, Walter J. Myers
Associate Professors: Dorothy Crum, Victor A. Markovich, Paul E. Reed, Frances K. Shelly, Nicholas E. Smith, Robert Town, Vernon L. Yenne, Won Bin Yim
Assistant Professors: Julie Bees, Sylvia Coats, Catherine Consiglio, Robert Clasman, David Schepps, Russell D. Widener

Master of Music with Emphasis in Performance
Admission to the Master of Music (MM) program with emphasis in music performance requires a performance background with a Bachelor of Music degree in the performance area of specialization or the equivalent. Background deficiencies must be satisfied before admission to candidacy is granted. All performance degree candidates must complete a satisfactory audition in their performance area of specialization. The audition should be completed as early as possible—but no later than the end of the first semester of enrollment. Final acceptance in a performance specialty is dependent on approval of the respective performance faculty.

A formal graduate recital, in lieu of a thesis, must be presented in partial fulfillment of the requirements for the MM degree with emphasis in performance.

In order to receive permission to schedule a degree recital, students must satisfy the performance degree expectations of the respective performance area. Permission to schedule the recital must be obtained no later than the semester before the semester in which the recital is to be performed. The student's performance repertoire and the recital program must be in accordance with the guidelines and expectations established by the respective performance area.

Students studying for the MM degree with emphasis in performance should plan to be in residence during at least one fall or spring semester, since continuous study opportunities may not exist in Summer Session.

Master of Music with Emphasis in Piano Pedagogy
The Master of Music (MM) degree with emphasis in piano pedagogy gives primary emphasis to the development of tutorial concepts specific to keyboard skills and artistry; secondary, but significant, emphasis is placed on an acceptable demonstration of keyboard performance at the master's degree level. The pedagogy option includes extensive preparation in the area of keyboard literature and stresses the relationship of performance to selected repertoire and teaching-skill development.

Admission Requirements
Students must have completed a Bachelor of Music in piano performance degree or its equivalent. All candidates must complete a satisfactory audition as early in the program as possible—in no event later than the close of the first semester of enrollment. Permission to pursue the degree is tentative pending approval of the audition. Deficiencies, if noted, must be satisfied before admission to candidacy for the degree.

Degree Requirements
The MM degree with emphasis in piano pedagogy requires the completion (minimum) of 32 graduate hours, including a graduate degree recital. Of these hours, 20 must be in courses numbered 700-800 or above. The degree must include the following courses:

1. 852, Introduction to Bibliography and Research, 3 hours
2. 830, Seminar in Music Theory, 3 hours
3. Election of a minimum of two courses (6 hours) in graduate music history-literature from 893, Music of Antiquity through the Renaissance, through 897, Music of the 20th Century
4. Pedagogy and literature courses as specified in the pertinent MM (piano pedagogy) curriculum guide.

Applied Music Private Study
712. Applied Music Instruction for Non-majors, (2). Basic applied instruction for persons who are not active in a music degree program. May not be used to fulfill music degree requirements. Repeatable for credit.

731. (1). For majors only; study on secondary instruments. Repeatable for credit. Graduate.

732. (2). For majors only. Repeatable for credit. Graduate.

734. (4). For performance and pedagogy majors or students preparing for master's degree recitals only. Repeatable for credit.

Applied Music Classes
717W. Violin Class for Adult Beginners, (2). Beginning violin class: fundamentals of learning to play violin emphasizing tone and intonation development, basic techniques for reading (notes and rhythm). May not be applied to music major requirements. Repeatable for credit.

717Y. Popular Vocal Styles, (2). Class voice instruction for adults emphasizing basic vo-
General Performance

Courses for Graduate/Undergraduate Credit

580. Piano Pedagogy. (2). Primarily concerned with the art and science of teaching. Includes observations of master teachers in the University and community.


620. String Pedagogy: Violin and Viola. (2). Required for violin and viola performance majors. A study of techniques for violin and viola, including the teaching of mini-lessons for instructor and class critique. Prerequisite: violin or viola performance capability or instructor's consent.

625. Voice Pedagogy. (2). Required for voice performance majors. Designed to acquaint the voice major with vocal techniques, concepts and materials of private and class instruction.

651. Advanced Conducting and Score Reading. (2). Baton technique, score reading and musicianship. Prerequisite: Mus. P. 217 or 218 or equivalent.

680. Woodwind Pedagogy. (2). Required for woodwind performance majors. A comprehensive study of woodwind instrument techniques, concepts and materials of studio instruction for the advanced student, including the teaching of mini-lessons for instructor and class critique. Prerequisite: performance capability on a woodwind instrument or instructor's consent.

681. Brass Pedagogy. (2). Required for brass performance majors. A comprehensive study of brass instrument techniques, concepts and materials of studio instruction for the advanced student, including the teaching of mini-lessons for instructor and class critique. Prerequisite: performance capability on a brass instrument or instructor's consent.

682. Percussion Pedagogy. (2). Required for percussion performance majors. A comprehensive study of percussion instrument techniques, concepts and materials of studio instruction for the advanced student, including the teaching of mini-lessons for instructor and class critique. Prerequisite: performance capability on percussion instruments or instructor's consent.

691. Advanced Choral Conducting. (2). A comprehensive study of conducting and rehearsal techniques, analysis and ear training and types of choral composition for the advanced student. Prerequisite: Mus. P. 217 or 218 or equivalent.

707. Piano Repertoire. (1). Designed to give performing and listening experience to piano performance majors. Repeatable for credit.

Musicology-Composition

Graduate Faculty

Professors: William E. Mathis, Walter A. Mays, John W. Thomson, Bertil van Boer
Assistant Professors: Katherine Murdock, Dean Roush

Master of Music

Emphasis in Music History-Literature

Completion of a Master of Music (MM) degree with emphasis in history-literature requires a demonstrated reading proficiency in one of three languages: German, French or Italian. Students may demonstrate proficiency by satisfactorily completing the Graduate School Foreign Language Test designed by the Educational Testing Service or by completing equivalent language courses, such as French 100 or German 101, at Wichita State. A thesis is also required for the degree.

The general requirements for the MM degree are summarized at the beginning of the School of Music section of the Graduate Bulletin.

Emphasis in Music Theory-Composition

Admission to the MM program with emphasis in theory-composition requires a Bachelor of Music degree with a major in theory-composition or the demonstrated equivalent. Background deficiencies must be satisfied before students may enroll in graduate composition courses. Applicants must also submit representative compositions for examination by the composition faculty; approval for admission to candidacy is contingent upon the candidate's demonstrated ability to complete a final project in composition.

Completion of the MM degree with emphasis in theory-composition requires at least one quarter of 840A-C. Seminar in the Techniques of Composition. In addition, students must complete a terminal project which must consist of one of the following: (1) a composition of major proportions, (2) a body of works in various media or (3) a written thesis in the area of music theory. Composition majors may be required by the thesis committee to have a work or works performed publicly. The composition or compositions must be submitted in a minimum of two ink copies and bound in keeping with the procedures established through the Graduate School of The Wichita State University. These ink copies represent high quality of musical manuscript and must be completed in the candidate's own hand.

The general requirements for the MM degree are summarized at the be-
ginning of the School of Music section of the Graduate Bulletin.

Courses for Graduate/Undergraduate Credit

523. Form and Analysis. (2). Extensive analysis of the forms and formal processes of musical literature. Prerequisite: Mus. C. 227.

531. Introduction to Electronic Music. (2). Basic techniques of electronic music. Directed toward composers who wish to use the electronic medium in teaching, performing or communicating in any way with their constituency.


561. 18th Century Counterpoint. (2). Contrapuntal devices of the 18th century as found in the works of J.S. Bach. Prerequisite: Mus. C. 228.

597-598. Organ Literature and Practice. (1-3). Performance and discussion of works for the instrument of all periods; study of organ design and construction; and practice in aspects of service playing, such as hymn playing, accompaniment, accompanying and improvisation. Required of all organ majors. Repeatable. Prerequisite: Mus. C. 228 or departmental consent.

623. Opera Literature. (3). A comprehensive survey of Italian, German, French, Russian, English and American opera literature from the 17th century to the present. Mus. C. 113 is strongly recommended before taking the course. Should be only upperclassmen. Not limited to music majors.

624. Oratorio and Cantata Literature. (2). A study of the solo vocal literature of the larger sacred and secular forms from the 17th century to the present. Not limited to music majors.

641. Orchestration. (2). The study of instrumental and choral harmonic materials of all periods for various instrumental combinations with an approach to the problems of full orchestra and band scores. Prerequisite: Mus. C. 227.


659-660. Applied Composition. (2-2). Individual study in musical composition emphasizing writing for both small ensembles and large groups in the larger forms. Repeatable. Prerequisite: Mus. C. 560 and instructor's consent.


672. Contemporary Techniques. (2). Advanced study of music from impressionism to the present emphasizing related literature and creative writing. Prerequisite: Mus. C. 228.

685. String Literature and Materials. (2). A survey and stylistic analysis of music for solo strings and chamber combinations, beginning with the early baroque period.

726. Voice Literature. (3). A comprehensive survey of early Italian arias, French chansons, German lieder, contemporary English songs and Russian and Spanish literature.

750. Musicology-Composition Workshop (1-4). Repeatable for credit. Prerequisite: instructor's consent.

753. Choral Literature I. (2). A historical and stylistic survey of choral literature of the Renaissance and Baroque eras.

754. Choral Literature II. (2). A historical and stylistic survey of choral literature of the classical romantic and contemporary eras.

758. Teaching of Theory in the Community Junior College. (2). Designed to prepare the junior college theory teacher. Gives attention to contemporary trends in music theory and their application to planning courses of study, evaluation of texts and pedagogical techniques.

781. Cooperative Education. (1-8). See Mus. E. 781. Offered Cr/NCR only.


790. Special Topics in Music. (1-4). For individual or group instruction. Repeatable with departmental consent.

791-792. Seminar in Music History. (3-3). Develops areas of interest in music history as time permits. Makes no effort at a chronological survey. Includes ideas evoking the most interest and considered by the instructor to be of the greatest professional benefit when interest warrants.

Courses for Graduate Students Only

830. Seminar in Music Theory. (3). An analytic study of the materials used in musical composition from antiquity to the present, employing analytical approaches such as Schenker, Hindemith and serial techniques. Designed to develop analytic perspective rather than compositional skills.

840A-C. Seminar in the Techniques of Composition. (2). Examines the nature of compositional techniques through selected works in different media: (A) large ensembles, (B) small ensembles and (C) solo literature. Prerequisites: Mus. C. 671, 672 and 641, or departmental consent.

841-842. Special Project in Music. (1-3; 1-3). Individually supervised study or research. Emphasizes professional needs of the student. Repeatable for credit. Prerequisite: instructor's consent.

852. Introduction to Bibliography and Research. (3). Techniques of research and development of bibliography in music and music education. Course must be elected the first available semester of enrollment.

859-860. Advanced Composition. (2-2). Original work in the large forms and a continuation and expansion of Mus. C. 659-660. Prerequisite: Mus. C. 660 or equivalent.


876. Thesis. (2).

892. Music of Antiquity Through the Renaissance. (3).

894. Music of the Baroque Era. (3).

895. Music of the 18th Century. (3).

896. Music of the 19th Century. (3).

897. Music of the 20th Century. (3).

School of Performing Arts

Leroy W. Clark, Chairperson

Dance

While a formal major in dance at the graduate level is not offered, the following courses are available for graduate credit.

Courses for Graduate/Undergraduate Credit

501. Modern Dance IV. (3). Continuation of Dance 401. Advanced level. Emphasizes professional technique and performance quality. Repeatable for credit. Prerequisite: instructor's consent or by audition.

505. Choreography III. (3). Focuses on the choreographic process. Students create choreographic studies for more than one dancer utilizing elements studied in Choreography I and II and exploring different choreographic approaches. Further exploration may include environmental, chance, and collaborative choreographies and multimedia approaches. Students are encouraged to explore new approaches to accomplishment, such as live music, self-produced music, unusual or innovative sources. Prerequisites: Dance 405 and concurrent enrollment in appropriate-level modern dance or ballet technique class.


545. Methods of Teaching Dance. (3). Develops teaching skills for elementary school, high school, recreation centers, private and professional schools and universities through lesson planning and in-class teaching practice. Prerequisite: Dance 401 or 410.

605. Choreography IV. (3). Further work on the choreographic process begun in Choreography III. Class produces a concert of the students' works at the end of the semester. Prerequisites: Dance 505 and concurrent enrollment in appropriate-level modern dance or ballet technique class.

635. Mid-America Dance Theatre. (1-6). The student company performs on campus and in the community and tours as the occasion arises. Prerequisites: members accepted by audition, which is open to community and University dancers.
current enrollment in appropriate-level modern and ballet technique class is required. Repeatable for credit.

645. Practice in Teaching Dance. (3). Actual placement in teaching situation with responsibilities of teaching ballet, modern and/ or jazz in private studios, elementary, high schools, Ys or recreation centers. Prerequisite: Dance 542.

690. Special Topics in Dance. (1-6). For individual or group instruction. Repeatable for credit with departmental consent.

750. Dance Workshop. (1-4). Repeatable for credit.

**Theatre**

Graduate Faculty

Professors: Leroy W. Clark (chairperson), Bela Kiralyfalvi, Richard Welsbacher

Associate Professors: Judith Babnich, Joyce Cavarozzi

Assistant Professors: Jerald D. Blatt

A Master of Arts degree in communication with an emphasis in theatre is available through Wichita State. The following courses may apply for graduate credit.

**Courses for Graduate/Undergraduate Credit**

510. Design Project. (1). Advanced work in the problems of stage lighting design, costume design or scenic design. With the permission and supervision of the appropriate faculty member, the student designs for specific productions for either Mainstage or Experimental Theatre. Repeatable twice for credit if taken in different design areas. Prerequisite: Instructor's consent.

516 & 517. Playwriting I and II. (3 & 3). Cross-listed as Eng. 517 and 518. The writing of scripts for performance. Emphasizes both verbal and visual aspects of playwriting. If possible, the scripts are performed. Prerequisite: Instructor's consent.

542. Advanced Acting. (3). Continued development of methods established in Thea. 244. Prerequisite: Thea. 244Q and sophomore standing.

544. Advanced Stagecraft. (3); R; L arr. Explores advanced construction techniques for the fabrication of stage scenery and stage properties. Such operations may include welding, vacuum forming, carpentry and working with a variety of new materials. Students complete practical studio work in design for a variety of productions in dance and theatre. Prerequisite: Thea. 244.

546. Scene Painting. (3). Presented with a lecture-demonstration-studio arrangement. Explores various theatre painting materials and techniques enabling the student to develop some skill as a scenic artist. Prerequisite: Thea. 244.

559. Directing II. (3); R; L arr. Staging and rehearsal techniques emphasizing the problems of the period and stylized play. Prerequisites: Thea. 259 or departmental consent and junior standing.

610. Directing the Musical. (3). An interdisciplinary course utilizing interdepartmental expertise (theatre, dance, music) to teach the student how to produce a musical. Prerequisite: Instructor's consent.

621. Advanced Oral Interpretation. (3). Intensive study and analysis of various forms of literature, the techniques of effective oral communication and the building of the individual or group concert recital. Arranged workshops and festivals. Prerequisites: Thea. 221Q and junior standing.

622. Academic Theatre Practicum. (2). The investigation and exploration of the theatrical act in the classroom situation within the University community. Designed to reinforce the researching, writing, directing and performing skills. Enrolled students, functioning as a company, produce and perform for various disciplines on campus. Repeatable once for credit.

623Q. Development of the Theatre I. (3). The history of theatrical activity as a social institution and an art form from its beginnings to the 17th century. Includes representative plays, methods of staging and theatrical architecture of various periods.

624Q. Development of the Theatre II. (3). From the 17th century to the present.

643. Styles in Acting. (3). Training in, and development of, the special techniques required for period or stylized plays with special emphasis on Greek, Shakespearean, Restoration and modern nonrealistic styles. Prerequisites: Thea. 243Q, 542 and junior standing.

647. Scene Design I. (3). Continuation of Scene Design I with more advanced work in designing settings for the stage and including studies in scenicographic techniques and exercises in model building. Student designs settings for a production having a single set, a production requiring a simultaneous setting and a production requiring multiple settings. Requires no laboratory work in theatre production. Prerequisites: Thea. 344 and 345.

649. Stage Lighting II and Theatre Sound. (3). Continues the study and application of the theories and techniques of Stage Lighting I, emphasizing advanced concepts of design, and provides an introduction to theatre sound production. Prerequisite: Thea. 345.

651. Scene Study. (3). Designed as the synthesis of all previous acting courses. Studies scenes in depth as preparation for performance. Course goal is the presentation of fully realized characterizations in those scenes studied, integrating the elements of the actor's craft learned in the prerequisite courses. Prerequisites: Thea. 643 and junior standing.

653. History of Costume. (3); R; L arr. Historical survey and individual research of dress from ancient Egypt to present day with emphasis on social, political, economic and religious influence and practice of adapting period styles to the stage. Prerequisite: Thea. 253 or departmental consent.

657. Costume Design I. (3). Covers the techniques of costume design for the stage. Students strengthen and expand their knowledge of techniques in costume design for the stage, film and television. Prerequisites: Thea. 653; Art H. 121G, 122G or 124; and Art F. 240.

675. Directed Study. (2-4). Cross-listed as Comm. 675. Individual study or projects. Repeatable for credit with departmental consent. Prerequisite: departmental consent.

725. Dramatic Theory. (3). Critical examination of selected aesthetic theories of the theatrical arts and the relationship of the theories to major dramatic works and theatrical periods. Prerequisite: Thea. 623Q, 624Q or departmental consent.

728. Playwriting Analysis. (3). Designed to develop student's abilities to analyze play scripts from the point of view of those who write the task of staging them. Focus is on studying and testing practical methods of analysis developed by outstanding theatre directors, teachers and critics. Collective analysis and student projects, if any, are part of the course work. Prerequisite: Thea. 623Q or 624Q.

**Courses for Graduate Students Only**

820. Investigation and Conference. (2-3). Cross-listed as Comm. 820. Directed research and experimentation for graduate students in some phase of (a) public address, (b) theatre history and production, (c) radio-television or (d) the teaching of speech. Repeatable for credit up to a total of six hours.

823. History of Dramatic Criticism. (3). A survey and analysis of major critical theories from Aristotle to the present.

824. Development of Modern Theatre Styles. (3). An examination of the major movements in the modern theatre since 1870. Emphasizes both literary and physical elements of styles.
College of Health Professions

Offices: 400 Ahlberg Hall
M. Diane Roberts, Dean

Departments
Clinical Science—James Jackson, chairperson
Dental Hygiene—Denise Maseman, director
Health, Administration and Gerontology—Stephen C. Gladhurt, chairperson
Nursing—Susan Kruger, interim chairperson
Physical Therapy—Martha Shawver, interim director
Physician Assistant—Marvis Lary, director

The College of Health Professions offers graduate programs leading to a Master of Arts in Gerontology, Master of Health Science, Master of Science in Nursing and Master of Physical Therapy. Admission to these programs requires a bachelor’s degree and the fulfillment of requirements listed for each program and elsewhere in the Graduate Bulletin.

Gerontology

Department of Health, Administration and Gerontology

Graduate Faculty
Professors: Lowell Holmes (anthropology), Roger Kasten (communicative disorders and sciences)

Associate Professors: William Hays (gerontology), Ellen Holmes (health, administration and gerontology), Gregory Meissen (psychology), Ram P. Singhal (chemistry), James Snyder (psychology), James Trammill (curriculum and instruction), Samuel Yeager (public administration)

Assistant Professors: Elwin Barrett (social work), Nancy Brooks (sociology), Helen Halstead (nursing), Jean Jordan (health, administration and gerontology), Carla Lee (health, administration and gerontology), Nancy Snyder (public administration)

The gerontology program offers courses of study leading to the Master of Arts (MA) degree in gerontology. Because gerontology is concerned with gaining and applying knowledge about all aspects of aging in a wide range of professional settings, it is by nature, multidisciplinary. The graduate degree program in gerontology at Wichita State draws upon the biological sciences, psychology, economics, sociology, the health professions and anthropology.

Master of Arts

The gerontology program offers two options leading to the MA degree, the generalist option and the specialist option. Both options require a minimum of 30 hours for the thesis track and 36 hours for the nonthesis track.

The generalist option is designed for students with little or no previous training in gerontology, among them professionals in such areas as logopedics, recreation, physical or occupational therapy, the ministry, counseling, social work, adult education and mental health, where older people make up a significant and increasing proportion of the client population and where professionals with gerontological training are presently scarce.

The specialist option is designed for students who have undergraduate course work in gerontology. Since employment in the area of aging often demands the combination of knowledge and skills found in a particular discipline such as public administration, social work or mental health, the specialist option combines graduate course work in gerontology with an emphasis (12 hours) in another department or discipline.

Admission Requirements

In addition to the Graduate School admission requirements, applicants must have a grade point average in their bachelor's major of 3.000 (on a 4.000 scale) and must submit names of three references. Students desiring to pursue the generalist option must have an undergraduate degree in an applied or professional area or have work experience with older persons. Those who wish to pursue the specialist option must have completed course work in each of the following four areas: biology or physiology of aging, psychology of aging, economics of aging and sociology of aging. They must have maintained a 3.000 average in these courses. These students must also meet the admission requirements of the department in which the area of specialization is being taken.

Degree Requirements

Students must take certain required core courses, as well as courses in the generalist or specialist option, with a minimum total of 30 hours for the thesis and 36 hours for the nonthesis track.

Core (Required) Courses. All students enrolled in the MA program in gerontology must take the following courses:

Geron. 800, Seminar in Gerontology .......................... 3 hours
Geron. 801, Field Research in Gerontology .......................... 3 hours
Geron. 802, Policy Making for Gerontologists .......................... 3 hours
Geron. 810, Advanced Gerontology Internship ............ 6 hours
Thesis (if option selected) .................. 3 hours

Written comprehensive exams are required of all students who pursue the nonthesis program option.

Generalist Option. In addition to the core courses, students pursuing the generalist option must take the following courses:

Geron. 731, Growth and Development IV: Adults and Aging .......................... 3 hours
Geron. 663, Economic Insecurity .......................... 3 hours
Two of the following three courses: .......................... 6 hours
Geron. 513, Sociology of Aging
Geron. 514, Anthropological Perspectives on Aging
Geron. 518Q, Biology of Aging

Elective gerontology courses .................. 3-9 hours

Specialist Option. In addition to the core courses, students pursuing the specialist option are required to take a minimum of 12 hours offered by the department in the area of specialization. These courses must meet the approval of the graduate coordinator or department chairperson in the department of specialization.

The internship and thesis, if the specialist option is selected, must be related both to gerontology and to the area of specialization. The Plan of Study required by the Graduate School must also be approved by the gerontology program and the outside department.

Gerontology Emphasis

The gerontology emphasis is a 12- to 15-hour concentrated core in gerontology taken as part of a master's degree program in another department. Students who wish to pursue the gerontology emphasis must fulfill the requirements in the degree granting program along with the additional emphasis courses.
department as well as the designated gerontology core.

Courses for Graduate/Undergraduate Credit

501. Internship in Gerontology. (3-6). A specially designed field experience for students who need or desire training to enhance their professional abilities and skills in gerontology and for whom academic credit is inappropriate. As part of the internship, students collectively meet one hour a week with the field placement supervisor. Repeatable for credit to a total of six hours. Prerequisite: 12 hours of gerontology credit and instructor's consent. 506. Politics of Aging. (3). Cross-listed as Pol. S. 506.

512. Issues in Minority Aging. (3). Cross-listed as Min. S. 512. Prerequisites: Min. S. 100Q, Geront. 100Q, Soc. 111Q or instructor's consent.


514. Anthropological Perspectives in Gerontology. (3). Cross-listed as Anthr 514.

518Q. Biology of Aging. (3). Cross-listed as Biol. 518Q.


537. The Social Consequences of Disability. (3). Cross-listed as Soc. 537.

550. Selected Topics in Gerontology. (1-6). Study in a specialized area of gerontology with the focus upon preprofessional programs and current issues in the field of aging. Emphasizing knowledge and skills in applied areas of gerontology as they relate to an emerging area of research and application. Repeatable up to six hours. Prerequisite: instructor's consent.

590. Legal Aspects of Health Care Administration. (3). Cross-listed as HAE 590.


663. Economic Insecurity. (3). Cross-listed as Econ. 663.

700. Grant Proposal Preparation. (3). Concerned with the process of research and project proposal development, including response to published guidelines, project planning and proposal development and submission. Examines grant funding, including types of funding sources and their purposes and methods and processes of proposal evaluation. Students write and evaluate proposals.

720. Independent Readings in Gerontology. (1-3). Directed study in a specialized topic in gerontology. Repeatable up to six hours. Prerequisite: 12 hours of gerontology credit and departmental consent.


750. Workshop in Gerontology. (1-3). Designed to provide specialized instruction, using a variable format in a gerontologically relevant subject. Repeatable for credit.

751. Cooperative Education. (3-6). Same as Geront. 810 and part of the Co-operative Education program. See Geront. 810 for description and prerequisites.

798. Multidisciplinary Perspectives on Aging. (3). Introduction to the advanced study of the process of aging from a multidisciplinary point of view. Does not count for degree in gerontology. Prerequisite: admission to graduate school. Open only to students with an undergraduate major or minor in gerontology.

Courses for Graduate Students Only

800. Seminar in Gerontology I (3). Advanced study of the theories of aging from a multidisciplinary perspective emphasizing social gerontology. Prerequisite: Geront. 794 or 12 hours of gerontology or instructor's consent.

801. Field Research in Gerontology. (3). An examination of the methods of participant observation and interview as approaches to understanding aging and the aged. Students gain practical experience in these methods through individual fieldwork projects. Prerequisite: Geront 794, 12 hours of gerontology credit or instructor's consent.

802. Policy-making for Gerontologists. (3). The making of policy by gerontologists through planning and implementation. Assumes knowledge of aging programs. Prerequisite: Geront 794, 12 hours of gerontology or instructor's consent.

810. Advanced Gerontology Internship. (3-6). Designed to integrate academic gerontology and practical experience emphasizing application of research findings. Students are assigned to an agency or organization engaged in planning, administering or providing direct services to older people. Includes the intern submitting and being examined upon a comprehensive internship paper. Prerequisites: 12 hours of gerontology credit and instructor's consent prior to registration.

820. Thesis. (1-3). Repeatable, but total credit hours counted toward degree shall not exceed four hours.

Health Care Administration

Department of Health, Administration and Gerontology

Although there is no graduate degree in health care administration, the following courses are available for graduate credit.

Courses for Graduate/Undergraduate Credit

503. Organization and Administration of the Health Care System. (3). Analysis of the nature of health and the input to health and health services delivery. Discusses general systems theory and systems analysis in relation to health care. Emphasizes the interrelatedness of economic, political and social aspects of the health services system. Considers current trends and the role of planning and exposes students to guest lecturers with professional expertise in relevant areas. Prerequisite: departmental consent.

504. Health Economics. (3). Cross-listed as Econ. 665. An analysis of health care systems in the United States including the demand for and supply of health care services, the quantity, quality and pricing of health services, the need for insurance, and the role of the government in the health sector. Prerequisite: HAE 503 or Econ. 202.

505. The Politics of Health. (3). Cross-listed as Pol. S. 505. Designed to show how government in the United States makes decisions in the health field, to describe the political forces shaping governmental policy in health care, and to analyze the arguments for and against an increased governmental role in health. Prerequisite: HAE 503, Pol. S. 121 or departmental consent.

507. Health Planning. (3). Designed to discuss strategic business planning in health services management. Includes a strategic management scheme that will accommodate change and encourage innovation and enhanced productivity. Presents an identification and adaptation of strategies and options and an anticipatory time frame that provides the organization with protection against the perils of crisis decision-making in traditional entrepreneurial organizations. Prerequisites: junior standing and instructor's consent.

509. Health Care Operations Analysis. (3). An examination of methods for measuring the operational efficiency and effectiveness of health care and medical care programs. Includes methods to analyze current operations and approaches to plan better manpower, technology, financial planning and management control systems in a health setting. Prerequisites: HAE 503, Math. 111 or equivalent, Mgmt. 360 and junior standing.

510. Health Finance. (3). An examination of the principles of financial analysis and management for health care institutions. Emphasizes understanding and applying general financial concepts to the health setting. Considers financial organization, sources of operating revenues, management of working capital, methods of utilizing examples for hospitals and other health organizations. Prerequisites: HAE 503 and Acc. 210 or equivalent.

565. Concepts of Quality Assurance in Health Care. (3). For health care personnel; focuses upon current social concerns with assessing quality of health care and appropriate utilization of activities and resources. Prerequisite: departmental consent.

590. Legal Aspects of Health Care Administration. (3). Cross-listed as Geront. 590. A study of the principles of law as applied to the health fields. Considers such issues as release of information, subpoena, records and the right to consent to treatment (insurance); doctor-patient-nursing home relationship and legal consent; and other topics. Prerequisite: junior standing or departmental consent.

605. Health Services Research. (3). Deals with intermediate statistical procedures and research design; assigns health professionals must understand in order to intelligently analyze research in the health care field and to conduct research themselves. Covers the designs of experimental, survey and other post facto research plus statistical techniques, including correlation coefficients, the t-test, chi square and two-way analysis of variance. Prerequisite: departmental consent.
Health Science

Department of Health, Administration and Gerontology

Graduate Faculty
Associate Professors: Diane Huntley, James Jackson (chairperson, clinical sciences department), Diane Roberts (dean, College of Health Professions)
Assistant Professors: Jo-Lynne Campbell, Mary Conrad, Marc Dicker, Stephen Gladhart (chairperson, health, administration and gerontology department), Linda Hogan, Carla Lee, Kenneth Pitetti, Barbara Smith, Haris Zafar

Master of Health Science (MHS)
This graduate program for health professionals is organized to meet the needs of practicing health care practitioners who hold the bachelor’s degree. The programs in dental hygiene; health, administration and gerontology; medical technology; physical therapy; physician assistant; and respiratory therapy participate in the MHS program through faculty and curricular involvement and many health professionals in these disciplines will find the MHS program applicable to their interests. The major roles within the health care system for which graduates will be prepared are those of educators, administrators and practitioners.

Although opportunity for full-time study is available, the program has been developed especially for the employed part-time student. All courses are available in the evening. The program must be completed within six years.

Admission Requirements
Admission to the MHS program requires that candidates be appropriately credentialed in a health field; however, students may request admission based on the applicability of the MHS degree to their goals and objectives. Admission requests based on professional necessity and background of health experience may be made to the director of the graduate program. Certain prerequisite courses and the advanced clinical studies emphasis have special requirements.

1. An applicant must have a bachelor’s degree from a regionally accredited educational institution and credentials (if available) in a health area. The basis on which credit is awarded for the bachelor’s degree must be consistent with the policies and procedures for the award of such credit at The Wichita State University. Non-health credentials will be considered on an individual basis.

2. A student must have participated in the health field. A new bachelor’s student may enter the program, but will be declared a candidate for the degree only after completion of the equivalent of one year of full-time professional experience in the health care field. No more than nine hours of courses may be taken before acceptance as a candidate. Exceptions to this requirement must be approved by the MHS graduate coordinator.

3. A personal interview is necessary with the master of health science director and a designated department coordinator, or, in the absence of an appropriate department, a designated adviser.

4. The student must complete an MHS application and statement of interest.

5. The student must have earned a minimum GPA of 3.000 in the last 60 credit hours of undergraduate coursework for full standing. Probationary status will be granted according to Graduate School guidelines.

6. Students may be required to meet additional requirements established by their departments.

Degree Requirements
The award of the MHS degree requires a minimum of 34 credit hours of graduate work with a thesis. At least 22 hours must be in courses numbered 700 and above. The nonthesis option requires a minimum of 37 credit hours.

The curricula are planned with study directed toward analysis, synthesis and evaluation of the health care delivery system. Courses of study can provide comprehensive, in-depth review of the various forces acting upon the health care delivery system and the health care provider in their various roles. The director of the MHS should be contacted for detailed information on the curriculum.

A core of 9 hours is required of all students in the MHS program. The foundation courses address concerns common to all health professions and include current issues, research and quality assurance in the health professions. Students then continue in an area of emphasis to achieve a greater understanding of the issues and research problems facing the health field.

Areas of Concentration. The MHS director must be contacted for planning sheets which list all requirements for available concentration areas of administration, education and clinical studies. Specific courses are required within each concentration, and electives are identified to meet the individual’s specific needs and career goals. Each student is assigned an adviser designated for each area of concentration. These advisers work with the students in developing individual plans of study and in selecting and evaluating learning in light of career interests and goals. Supportive courses are drawn from many disciplines in the University, including business, education, psychology, biology and chemistry.

Academic Standards. Students enrolled in the MHS program are expected to maintain grades of B or better in all required courses and a B average in all
other course work attempted. Students in the clinical concentration are required to complete an acceptable thesis. The student must gain approval of the thesis proposal by the graduate advisor(s) and thesis committee and must pass a final oral examination covering the thesis topic.

In lieu of a thesis, the student may choose the practicum/project option in the education or administration concentration. Seminars, reports and independent study assignments may be required for completion of the practicum/project, resulting in a major written report.

Nondegree Students. Students not seeking degrees may take some graduate courses listed under the MHS program as long as all prerequisites are satisfied. Each student must have the approval of the graduate coordinator. Refer to the Graduate School criteria for nondegree students.

Courses for Graduate/Undergraduate Credit

501. Instructional Design in Health Education. (3). Designed to assist health professionals construct health science curriculum. Emphasizes identifying various curriculum models and applying educational principles, writing behavioral objectives and the acquisition of supplementary materials. Special emphasis to program development in school, community and patient education settings. Prerequisite: junior, senior or graduate standing in one of the professional programs or instructor's consent.

510. Clinical Departmental Management. (3). Presents concepts and methods of clinical department management through lecture and group interaction and individual problem solving and situational analysis projects. Provides information pertinent to management majors, department directors, shift supervisors and staff personnel who need an understanding of departmental management of clinical revenue generating departments. Prerequisites: senior standing or greater in health professions and Mgmt. 360 or instructor's consent.

511. Neuroanatomy and Neurophysiology. (3). Study of the structure, physiology and functions of the central and peripheral nervous systems. Prerequisite: HS 310 or CDS 214.

521. Independent Study. (1-6). Offers reading and conference experience to complete a course requirement or provide enrichment in a specific area. Prerequisite: upper-division or graduate standing or department chairperson's consent.

531. Applied Principles of Nutritional Support Therapy. (3). A study of the principles of nutritional support and diet therapy. Investigates the dietary concerns of a variety of clinical disorders including gastrointestinal disorders, diabetes mellitus, cancer, burns, obesity and weight loss, kidney and cardiovascular disease, parenteral and enteral nutrition and surgical conditions. Discusses nutritional assessment, data interpretation, case plan development, record keeping and client communications.

533Q. Independent Study. (1-6).

550. Advanced Perinatal Cardiorespiratory Care. (3). Cross-listed as RT 550. Focuses on diagnostic and therapeutic modalities used in the care of high risk mothers and infants. Includes equipment and techniques used in tertiary care perinatal centers: high frequency ventilation, ECMO, air transport, and so on. Emphasizes respiratory care and medical management of critically ill and difficult-to-treat patient. Prerequisites: RT 450 and 203 or instructor's consent.

570. Interpreting of Sexuality for Health Professions. (3). Cross-listed as Nurm 570. Elicits strategies to assist clients and families coping with sexual problems and disorders. Discusses models and applying educational principles, the interpretations of the biological, psychological and cultural aspects of sexuality to the helping professions. Open to nonnursing majors.

575. Special Topics or Selected Topics. (1-4). Lecture/discussion; focuses on a discrete area of the health professions. Refer to schedule. In-depth study of particular topic or concept, including didactic and current research findings and technological advances relevant to the topic. Open to nonmajors. Repeatable up to six credit hours with departmental consent.

700. Gross Anatomy. (6). 3R; 9L. Designed for students in the physical therapy program. Study of the structure of the human body including embryology; emphasizes integration of embryological and anatomical information with human functional abilities. Prerequisites: four semesters of biological sciences or departmental consent.

701. Issues in Health Care. (3). An in-depth look at current issues facing health professionals. Topics may be presented in lecture, small groups, simulation and with guest speakers. Presents trends in health care, ethics, consumerism and current research findings; includes disease prevention and health promotion, ethics, consumerism and current research findings. Topics relate to current trends in the health professions. Prerequisite: graduate standing.

703. Evaluation of the Health Professions. (3). Presents the background and methods for evaluating performance in the health professions. Emphasizes the planning, development and implementation of the clinical setting as well as the planning and use of evaluation tools in educational and professional settings.

704. Continuing Education in the Health Professions. (3). Planning, implementation and evaluation of continuing education programs and the quality of those programs. Emphasis on existing continuing education models and consideration of alternative systems.

705. Health Services Research. (3). An examination of statistical research methods used by health care professionals and organizations. Includes presentation of information, selection and evaluation of population and variable probability, expectation, sampling distributions, hypothesis testing, analysis of variance and simple research designs. Prerequisite: upper-division statistics course or consent of MHS graduate coordinator.

706. Characteristics of the Adult in Professional Education. (3). Designed to help students understand the process of accomplishing professional development throughout the lifespan of the individual. Students explore the concept of professionalization and study the processes of health education, the demands of practice and the learners themselves. There are opportunities to apply knowledge, skills and abilities to real life situations through discussions, readings and in class. Prerequisites: HS 501 and 708.

708. Teaching and Learning Strategies in Health Science. (3). Examines the various means of presenting health knowledge and couples these teaching strategies with the audiences and types of student bodies that will receive this knowledge. Examines the nature of health care curriculum in depth, and procedures for developing and improving them. Explores health education curriculum. Prerequisite: departmental consent.

710. Research Methods in Health Professions. (3). Examination of research methodology as related to the health professions. Includes identification of significant health care research problems, development of relevant hypotheses, review and critical evaluation of methodologies of research, and critique of methodology pertinent to the hypotheses developed. This methodology addresses the selection of sample, measurement instrument and research design.

712. Administration of Hospital-Based Education. (3). 2R; 2L. Historical perspective of educational programs and requirements for providing institution-wide educational services, identification and analysis of educational needs, hospital's role in community health planning and program evaluation.

714. Quality Assessment and Assurance for Health Care Institutions. (3). Introduction to the concepts, processes, and requirements for developing and implementing quality assurance from both inside and outside the institution—roles and problems. Introduction to quality assurance problem-solving and decision making process. Prerequisites: instructor's consent.

720. Neurosciences. (3) 3R; 2L. Integration of embryology, anatomical structure, physiological and functions of the central and peripheral nervous systems with human functional abilities. Prerequisite: HS 700 or departmental consent.

725. Workshop in Health Related Professions. (1-4). An examination of relevant topics in health care organizations. Students carry out the delivery of health care service.

800A. Seminar in Health Science. (1). Recent developments and issues affecting the financing, organization and management of health care resources in the public and private sector of our nation's medical care system. Prerequisite: HS 701 or departmental consent.

800B. Seminar in Health Education. (1). Covers current trends and directions in allied health education in both patient care and academic settings. Prerequisite: HS 701 or departmental consent.

810. Practicum/Project. (3). Designed to enhance and complement the academic experience of students pursuing the Master of Health Science degree. Provides an opportunity to link the student's academic studies with practical work in direct observation and supervised participation in the administrative/educational process in a selected health care organization. Students carry out their assigned tasks under the guidance and
Students will be admitted conditionally until all requirements for admission are completed. Items 5 and 6 must be completed before a student begins any clinical course and prior to filing the plan of study. Approval of the plan of study will clear the admission status from conditional to full standing.

Prerequisites: A course in statistics accepted by the Department of Nursing and an undergraduate research course are required. Prerequisite courses are not credited to the degree.

Degree Requirements

Satisfactory completion of the following courses is the minimum requirement for the MSN degree:

A. Phase I (Core)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Nurs. 703, Foundations of Nursing</td>
<td>3</td>
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<tr>
<td>Nurs. 705, Nursing Research</td>
<td>3</td>
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<tr>
<td>Nurs. 711, Issues in Nursing</td>
<td>3</td>
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<tr>
<td>Nurs. 839, Adult Nursing I</td>
<td>3</td>
</tr>
<tr>
<td>Nurs. 834, Adult Nursing Practicum (may be divided into two 3-hour courses)</td>
<td>6</td>
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<tr>
<td>Nurs. 839, Adult Nursing II</td>
<td>3</td>
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<tr>
<td>Nurs. 833, Adult Nursing I</td>
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</tr>
<tr>
<td>Nurs. 834, Adult Nursing Practicum (may be divided into two 3-hour courses)</td>
<td>6</td>
</tr>
<tr>
<td>Nurs. 841, Community Health Nursing</td>
<td>3</td>
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<tr>
<td>Nurs. 833, Adult Nursing I</td>
<td>3</td>
</tr>
<tr>
<td>Nurs. 834, Adult Nursing Practicum (may be divided into two 3-hour courses)</td>
<td>6</td>
</tr>
<tr>
<td>Nurs. 837, Perspectives in Gerontological Nursing</td>
<td>3</td>
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<tr>
<td>Nurs. 829, Foundations of Maternal-Child Nursing</td>
<td>3</td>
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<tr>
<td>Nurs. 832, Maternal-Child Nursing: Practicum I</td>
<td>3</td>
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<tr>
<td>Nurs. 835, Perspectives in Maternal-Child Nursing</td>
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<tr>
<td>Nurs. 836, Maternal-Child Nursing: Practicum II</td>
<td>3</td>
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<tr>
<td>Nurs. 819, Foundations of Psychiatric/Mental Health Nursing</td>
<td>3</td>
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<tr>
<td>Nurs. 822, Psychiatric/Mental Health Nursing: Practicum I</td>
<td>3</td>
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<tr>
<td>Nurs. 843, Perspectives in Psychiatric/Mental Health Nursing</td>
<td>3</td>
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<tr>
<td>Nurs. 844, Psychiatric/Mental Health Nursing: Practicum II</td>
<td>3</td>
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<tr>
<td>Nurs. 811, Foundations of Administration</td>
<td>3</td>
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</tbody>
</table>
Nurs. 827, Resource Management in Nursing 3
Nurs. 812, Nursing Administration Practicum 3 3

2. Functional Role: Student selects one
Nurs. 845, Seminar in Nursing Administration 3
Nurs. 812, Nursing Administration Practicum 3
or
Nurs. 813, Foundations of Nursing Education 3
Nurs. 814, Nursing Education Practicum 3-6
or
Nurs. 745K, Problems in Education 1
Nurs. 757, Clinical Teaching Strategies 3
Nurs. 813, Foundations of Nursing Education 3-6
or
Nurs. 807, Clinical Nurse Specialist: Role 3
Nurs. 808, Clinical Nurse Specialist: Practicum 3

3. Electives or selected courses 3-6
4. Options
Nurs. 821, Thesis 6

Nurs. 823, Project 3

Supporting hours option: These hours must support the student’s clinical concentration or functional role. Students electing not to do a thesis or project complete 42 hours rather than 36 hours.

Electives 3-6
Total hours required 36-42

Phase I courses must be completed before beginning Phase II courses. The student, with an academic advisor, will determine the subsequent sequencing of the course work. Prerequisite courses are completed prior to enrollment in nursing courses; elective courses may be taken, with department approval, prior to enrollment in nursing courses.

Courses for Graduate/Undergraduate Credit

505. Directed Study in Nursing. (1-4). Elective. Individual study of the various aspects and/or problems of professional nursing. Repeatable. Prerequisite: departmental consent.


543. Women and Health Care. (3). Cross-listed as Wom. S. 543. Examines the historical development of the women’s health movement, focuses on current issues relevant to women and health care and explores the roles of women in the health care system and as consumers of health care. Examines self-care practices of women and studies ways to promote positive health practices. Open to non-nursing majors.

700. Assessment of Pediatric and Adolescent Clients. (3). 2R; 3L. A theoretical and clinical laboratory experience; students focus on the assessment of pediatric and adolescent clients. Open admission to RN and graduate students.

703. Foundations of Nursing. (3). Focuses on the nature of theory and the process of theory development. Traces the historical development of nursing theory and explores possibilities for the development of selected conceptual models of nursing in terms of implications for nursing practice, nursing research and nursing education. Prerequisites: admission to Graduate School.

704. Health Maintenance of the School Age Child. (3). 2R; 3L. Examines and applies major theories, clinical concepts and research studies related to school health nursing. Open to RN and graduate students.

705. Nursing Research. (3). Building on an initial research experience, course is designed to assist the student in understanding premises which govern research design, implications of statistical and research considerations. Open admission to RN and graduate students.

706. Organization and Management of the School-Health Program. (3). 2R; 3L. Examines and applies concepts of organization and management in the school-health delivery system. Focuses on economic and social factors which influence the school-health delivery system. Open to RN and graduate students.

708. School Nurse Practicum. (2). 6L. An intensive clinical experience in which students analyze, design, implement and evaluate nursing systems to promote the health of individuals in the school-health delivery system and the broader community system. Open to RN and graduate students.

711. Issues in Nursing. (3). Analyzes various issues in professional nursing. Focuses on issues ranging from concerns within the local practice setting to national policy issues. Examines the roles of nurses in the political and economic system. Prerequisite: admission to Graduate School.

721. Epidemiology: A Data-Based Method for Decision-Makers. (3). Introduces the basic epidemiologic approach used to assess and make decisions about the health of the community. Prepares students to use this method in the evaluation of health and public services in the community. Prerequisite: graduate standing or instructor’s consent.

734. Diabetes Mellitus Nursing Practicum. (3). An intensive clinical experience in which the student studies, designs, and implements nursing systems for individuals or groups in the area of diabetes mellitus nursing management. A 150-hour semester accompanies the practicum.

750. Workshops in Nursing. (1-4). An opportunity for intensive study of special topics related to nursing practice, education or research. Open to non-nursing majors.

757. Clinical Teaching Strategies. (3). An exploratory development of alternative teaching strategies for the clinical educator to accommodate changes in the health care scene. Discusses clinical teaching methods. A clinical rotation provides experience in the construction of an evaluation tool is constructed after the student, subject and setting are delineated. Investigates roles of the educator in teaching clinically.

791. Special Studies in Nursing. (1-6). Students engage in extensive study of particular areas in nursing related to the nursing profession and directly related to nursing practice. Repeatable. Prerequisites: admission to Graduate School and departmental consent.

796. Nursing Practicum in Special Settings. (1-6). Directed practice in various settings, including clinical specialties, nursing administration, nursing education and consultation. Student plans, in collaboration with major area and preceptor, a weekly schedule of evaluative criteria for the experience. Prerequisites: admission to Graduate School and departmental consent.

799. Directed Readings in Nursing. (1-2). Student engages in critical search of the literature in areas related to the profession and practice of nursing. Prerequisites: admission to Graduate School and departmental consent.

Courses for Graduate Students Only

807. Clinical Nurse Specialist: Role. (3). First of a two-course series designed for the student preparing for the clinical specialist role. Discusses the historical development of the clinical nurse specialist role: the ethical, legal, political and economic issues affecting such a role, and the current trends and future directions for the role. Identifies components of the clinical nurse specialist role and examines approaches for implementation. Prerequisite: completion of at least 6 hours of clinical concentration.

808. Clinical Nurse Specialist: Practicum. (3). Second of a two-course series designed for the student preparing for the clinical specialist role. An intensive practicum experience; the student works with a clinical nurse specialist preceptor in a selected clinical setting. Emphasizes role development and analysis of strategies to improve nursing practice. Prerequisites: completion of 6 hours of clinical concentration and NURS. 807 (or concurrent enrollment).

811. Foundations of Nursing Administration. (3). Designed to assist the student in acquiring theoretical knowledge of organizational theory and the delivery of patient care and in the development of management skills. Prerequisite: departmental consent prior to registration. Prerequisites or corequisites: NURS. 703, 705 and 711.
812. Nursing Administration Practicum. (3). Practicum in a nursing administration setting; student under professional guidance becomes directly involved. A seminar accompanies the field experience. Types of experience may include roles in nursing education or administrative unit-level nursing administration, staff development or community health. May be repeated twice. Prerequisites: Nurs. 811 or 827 or concurrent enrollment.

813. Foundations of Nursing Education. (3). Designed to assist the student explore theoretical and practical aspects of curriculum development and teaching of nursing in higher education and continuing education. Prerequisite: departmental consent. Prerequisites or corequisites: Nurs. 703, 705 and 711.

814. Nursing Education Practicum. (3 or 6). Student, under professional guidance becomes directly involved in clinical and classroom teaching, curriculum development and participation in other faculty functions in higher education and continuing education. A seminar accompanies the field experience. Prerequisites: departmental consent and Nurs. 813.

819. Foundations of Psychiatric Mental Health Nursing. (3). Evaluates major theories, clinical concepts and current research in psychiatric/mental health in relation to formulating a model approach for graduate education. Prerequisites: Nurs. 703, 705 and 711.

821. Thesis. (1-6). Graded S/U only. Student, in conjunction with the academic adviser and a three-member thesis committee, designs and conducts a formal research project. Permission of the Graduate School and departmental consent prior to registration.

822. Psychiatric/Mental Health Nursing: Practicum I. (3). Intensive clinical experience; student plans, implements and evaluates nurse-therapist strategies with individual clients. Seminar accompanies the practicum. Prerequisite or corequisite: Nurs. 819.

823. Graduate Project: Alternative to Thesis. (1-3). Graded S/U only. An opportunity to develop and pursue a scholarly project rather than a thesis. This may take the form of a position paper, historical study, a philosophical paper or other type project developed in conjunction with the student's faculty adviser. Prerequisites: admission to Graduate School and departmental consent.

825. Independent Study. (1-6). Provides opportunity for the student to develop, in collaboration with a faculty member, objectives and protocol for independent work related to the practice of nursing. Prerequisites: admission to Graduate School and departmental consent.

827. Resource Management in Nursing. (3). Focuses on the assessment of human and material resources and informational systems needed to manage nursing care delivery. Emphasizes Nursing Personnel Management, patient classification systems, cost out of nursing services, strategic planning and marketing. Prerequisites: Nurs. 703, 705 and 711.

829. Foundations of Maternal-Child Nursing. (3). Provides the foundation for all courses in the maternal-child clinical concentration. Seminars enable students to investigate major theories, clinical concepts and research studies related to maternal-child nursing. Prerequisites: Nurs. 703, 705 and 711.

832. Maternal-Child Nursing: Practicum I. (3). An intensive clinical experience; student focuses on the process of systematic assessment of individuals and groups within a family system. A seminar accompanies the practicum. Prerequisite or corequisite: Nurs. 829.

833. Adult Nursing I. (3). Examines clinical concepts and issues related to the maintenance of optimal health states of adults. Emphasizes assessment, measurement and nursing interventions related to these concepts. Prerequisites: Nurs. 703, 705 and 711.

834. Adult Nursing Practicum. (3 or 6). An intensive clinical experience; student designs, implements and evaluates nursing care for adults. Selects specialized areas of study; may include health maintenance or illness care of acutely or chronically ill adults. Practicum sites may include hospitals, extended care facilities, rehabilitation centers, community health agencies. A seminar is part of the practicum. Prerequisites: Nurs. 703, 705, 711 or instructor's consent; Nurs. 833 or 839 may be concurrent.

835. Perspectives in Maternal-Child Nursing. (3). Critically examines health care delivery systems for maternal and child health. Analyzes the effects of political, economic and social factors on maternal and child health. Examines nursing roles in the delivery of maternal and child health care. Prerequisites: Nurs. 703, 705, 711 and 829.

836. Maternal-Child Nursing: Practicum II. (3). An intensive clinical experience; student analyzes, designs, implements and evaluates nursing systems for individuals and groups within a family system. Prerequisites: Nurs. 703, 705, 711, 829 and 832; Nurs. 835 may be concurrent.

837. Perspectives in Gerontological Nursing. (3). Emphasizes the synthesis of concepts and theories into a functional theoretical framework of gerontological nursing. This basis is utilized to identify health problems of older adults and to plan appropriate preventive, rehabilitative or restorative approaches to those problems. Attention is on social, economic, political, ethical and legal aspects as they impact upon the well-being of older adults. Prerequisites: Nurs. 833 and 834 or instructor's consent.

839. Adult Nursing II. (3). Examines clinical concepts and issues related to major disruptions in the health status of adults. Emphasizes assessment, measurement and interventions related to these concepts. Prerequisites: Nurs. 703, 705 and 711.

841. Foundation of Community Health Nursing. (3). As the health care system broadens its base to community settings, an appraisal of historical development, trends and issues related to community health nursing is investigated. Analyzes conceptual models and rapid changes in scope, practice and research in the community. Prerequisite: Nurs. 703, 705, 711.

843. Perspectives in Psychiatric/Mental Health Nursing. (3). A critical examination of the delivery of mental health nursing. Emphasizes practitioner roles and therapeutic nursing modalities. Analyzes the effects of historical, social, political, economic and ethical-legal factors. Prerequisite: Nurs. 819.


845. Seminar in Nursing Administration. (3). An in-depth study and analysis of the roles of nurse managers in various health care settings. Discusses special problems, current topics and issues in nursing administration. Prerequisites: Nurs. 811 or 827 and at least 3 hours of Nurs. 812.

Physical Therapy

Department of Physical Therapy

Graduate Faculty

Assistant Professors: Ken Pitetti, Martha Shawver (interim director), Barbara Smith

Teaching Fellow: Susan Hanahan

Laboratory Coordinator: Susan Tork

Master of Physical Therapy

The program prepares individuals to enter beginning practice as a physical therapist. The graduates are prepared to evaluate neuromuscular, musculoskeletal, sensorimotor and related functions to determine the degree of muscle strength, motor development, motion, respiratory ventilation or peripheral circulatory efficiency of individuals. Following referrals from physicians or dentists, the physical therapist plans and implements appropriate treatment programs for disabled individuals. Graduates are prepared to work in preventive health care as well as maintenance or restorative care. The program requires full-time study for a period of twenty-four consecutive months. Students enter the program in the fall semester only.

Admission Requirements

Admission to the program requires that the student:
1. Have a bachelor's degree from an accredited four-year institution acceptable to the Graduate School;
2. Have a cumulative grade point average of 3.00 in all college courses, in prerequisite courses and in all health and science courses;
3. Show evidence of completing the following:
   - Biology—two semesters of introductory biology (which would lead to a biology major) with a laboratory
   - Anatomy and Physiology—with a focus on human or vertebrate anatomy and human or mammalian physiology
   - College Chemistry—two semesters with laboratory
   - College Physics—two semesters
with laboratory
Basic Skills area:
English Composition—two semesters
Computers—one semester computer application courses or the equivalent
Speech—one semester
Mathematics—precalculus or equivalent
Statistics—one semester
Social Sciences—psychology, sociology, plus four more courses in any social science area
Humanities—ethics, plus four more courses in any humanities area

To be reviewed for admission, applicants should do the following:
1. Seek an application packet from the Department of Physical Therapy.
2. Submit the designated Application for Admission and supporting transcripts to the Graduate School.
3. Submit the designated Physical Therapy Application, along with three references to the Department of Physical Therapy after September 1 and before March 1, for the following fall admission.

Applications will be reviewed any time after September 1 for the next fall admission. Applicants will be notified of their admission status by the Graduate School. Applicants should be aware that their records can only be reviewed when all materials have been submitted. Once an applicant has been admitted, he or she will be asked to submit a $100 nonrefundable tuition deposit to reserve a space for the fall admission. Once the student enrolls, this money will be counted toward payment of tuition.

Degree Requirements
The student must maintain a 3.00 grade point average and a C or better in each of the following courses:

<table>
<thead>
<tr>
<th>First Year</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>HS 700, Gross Anatomy</td>
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<td>PT 705, Clinical Medicine I</td>
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<td>PT 710, Principles of Physical Therapy I</td>
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<td>PT 715, Seminar I</td>
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<td>Spring</td>
<td>HS 720, Neurosciences</td>
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<td>PT 715, Research II</td>
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<td>PT 722, Seminar I</td>
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<td>PT 726, Clinical Medicine II</td>
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<td>PT 730 Principles of Physical Therapy II</td>
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<td>PT 735, Physical Therapy Theory Procedures I</td>
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Summer
PT 800, Clinical Education I | 6
PT 825, Education in Physical Therapy (title to be changed in Spring 1992 to Seminar II) | 1
Second Year
Fall
PT 810, Principles of Physical Therapy III | 4
PT 815, Physical Therapy Management I | 3
PT 826, Clinical Medicine III | 2
PT 835, Physical Therapy Theory and Procedures II | 4
PT 840, Independent Study | 1-2

Spring
PT 820, Physical Therapy Management II | 2
PT 830, Principles of Physical Therapy IV | 3
PT 840, Independent Study | 1-2
PT 845, Seminar III | 1
PT 850, Clinical Education II | 6

13-14

Summer
PT 860, Clinical Education III | 6
PT 870, Clinical Education IV | 6

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Special Requirements
Students will be required to purchase uniforms and other clinical apparel, professional liability insurance and health insurance coverage, and submit evidence of an annual physical examination while in the program. Students must also become certified in cardiopulmonary resuscitation (CPR) prior to entering the clinical rotations.

Students are expected to provide their own transportation to and from the health care facilities used for clinical experiences. During clinical assignments outside Wichita, students may be required to pay all living and travel expenses.

Students are referred to the Department of Physical Therapy Student Handbook for more details on special departmental policies and procedures.

Courses for Graduate/Undergraduate Credit
705. Clinical Medicine I (4). 2R; 4L. Survey of medical conditions seen by physical therapists emphasizing causes, effects and treatment. Emphasizes the medical model. Prerequisite: departmental consent.

710. Principles of Physical Therapy I (5). 3R; 6L. Development of ability to differentiate causes of musculoskeletal problems and development of basic treatment programs using scientific rationale for treatment selection. Prerequisite: departmental consent.

712. Research I (1). Discussion and application of principles of critiquing scientific literature. Prerequisite: departmental consent.

715. Seminar I (1). 1R. Discussion of information from readings and other sources regarding the profession, settings for health care delivery, professionalism and psychosocial aspects of health care. Prerequisite: departmental consent.

722. Research II (1). Continuation of PT 712; development of the research proposal. Prerequisite: PT 712.

726. Clinical Medicine II (2). Survey of medical conditions seen by physical therapists emphasizing causes, effects and treatments. Emphasizes medical model. Coordinated by department. Prerequisite: PT 705.

730. Principles of Physical Therapy II (5). 3R; 6L. Continuation of PT 710, adding advanced concepts and techniques to differentiate causes of musculoskeletal problems and to develop treatment programs using scientific rationale for selection of programs. Prerequisite: departmental consent.

735. Physical Therapy Theory and Procedures I (4). 2R; 4L. Utilization of physical modalities related to sound, light, electricity, water, paraffin, traction and massage, to achieve physiological and mechanical results. Evaluation, treatment and documentation methods of both modalities, analysis of relevant scientific literature. Prerequisite: departmental consent.

Courses for Graduate Students Only
800. Clinical Education I (6) 40P. Introduction to physical therapy care in varied settings requiring communication and interpersonal relationship skills; application of basic physical therapy procedures; beginning professional socialization; beginning development of a generalist in physical therapy. Prerequisite: departmental consent.

810. Principles of Physical Therapy III (4). 2R; 4L. Correlation of previous course materials and the use of scientific rationale to develop physical therapy evaluations and treatments for patients with specific orthopedic medical diagnoses. Also discusses prevention of musculoskeletal problems and utilization of appliances. Prerequisite: departmental consent.

815. Physical Therapy Management I (3). 3R. Study of payment systems, legal aspects of physical therapy, assurance of quality physical therapy care. Includes peer review, documentation, legal and ethical aspects, fiscal consideration, marketing, communication with the public, private sector and government officials. Prerequisite: departmental consent.

820. Physical Therapy Management II (2). 2R. Study of management systems including assessment, planning, organization, control and evaluation methods. Includes personnel management, fiscal considerations, electronic device utilization and management styles. Prerequisite: departmental consent.

825. Education in Physical Therapy (1). 1R. Discussion of teaching and learning the-
ologies as they apply to physical therapy education of patients, students, health professionals and community. Includes methods of evaluating instruction, content, strategies and learners. Prerequisite: departmental consent.

826. Clinical Medicine III. (2). Continuation of PT 726. Prerequisite: PT 726.

830. Principles of Physical Therapy IV. (3). 2R; 2L. Integration of evaluations, treatment modalities and program planning previously presented in the curriculum to develop and to evaluate specialty services in physical therapy including arthritis, diabetes, burns and obstetrics-gynecology; developmental investigation of clinical protocols to screen well babies, work situations for injury prevention and children for scoliosis. Prerequisite: departmental consent.

835. Physical Therapy Theory and Procedures II. (4) 3R; 2L. Development of physical therapy evaluations and treatment programs for cardiopulmonary, neurologic and other long-term rehabilitation patients. Assistive devices, home evaluations and problems with architectural barriers are incorporated into discharge planning. Prerequisite: departmental consent.

840. Independent Study. (1-2). Individual study with objectives developed in collaboration with a departmental faculty member. Repeatable for credit with departmental consent. Prerequisite: departmental consent.

845. Seminar III. (1). 1R. Discussion of information from readings and other sources regarding employment, psychosocial and international aspects of physical therapy. Prerequisite: departmental consent.

850. Clinical Education II.* (6). 40P. First in a series of three courses offering continued development of clinical management of patients in varied clinical settings. Includes managerial aspects of care, teaching and some opportunities for clinical research. Prerequisite: departmental consent.


890. Thesis. (1-6). Repeatable to a maximum of six hours. Prerequisites: enrollment in graduate studies and consent of thesis adviser.

855. Advanced Perinatal Cardiorespiratory Care. (3). Cross-listed as HS 550. Focuses on diagnostic and therapeutic modalities used in the care of high risk mothers and infants. Includes equipment and techniques used in tertiary care perinatal centers: high frequency ventilation, ECMO, air transport, and so on. Emphasizes the respiratory care and medical management of critically ill and difficult-to-treat patient. Prerequisites: RT 450 and 203 or instructor's consent.

In the series of three clinical courses, students experience three different settings including general and rehabilitation practices and a selected area of specialization—pediatrics, geriatrics, orthopedics, home health. The order of the settings is flexible. There is a gradual increase in the level of expectations in performance which is guided by the evaluation process.

Respiratory Therapy

Department of Clinical Sciences

Although there is no graduate degree in respiratory therapy, the following course is available for graduate study.

Course for Graduate/Undergraduate Credit

550. Advanced Perinatal Cardiorespiratory Care. (3). Cross-listed as HS 550. Focuses on diagnostic and therapeutic modalities used in the care of high risk mothers and infants. Includes equipment and techniques used in tertiary care perinatal centers: high frequency ventilation, ECMO, air transport, and so on. Emphasizes the respiratory care and medical management of critically ill and difficult-to-treat patient. Prerequisites: RT 450 and 203 or instructor's consent.
Fairmount College of Liberal Arts and Sciences

Offices: 200 LAS
Phillip Drennon Thomas, Dean

Departments
Administration of Justice—Galan Janekseka, chairperson; Stephen Doeren, graduate coordinator

Anthropology—Donald Blakeslee, chairperson; Karl Schlesier, graduate coordinator

Biological Sciences—Wendell Leavitt, chairperson; George Sweet, graduate coordinator

Chemistry—B. Jack McCormick, chairperson; Ram Singhal, graduate coordinator

Elliott School of Communication—Vernon Keel, director; Richard N. Armstrong, graduate coordinator

Computer Science—Mary Edgington, chairperson; Mahesh Rathi, graduate coordinator

English—Don Wineke, chairperson; Sarah Daughtery, graduate coordinator

Geology—John C. Gries, chairperson and graduate coordinator

History—John Dreifort, chairperson; John D. Born, graduate coordinator

Mathematics—Buma L. Fridman, chairperson; Kenneth G. Miller, graduate coordinator

Minority Studies—John Gaston, chairperson and graduate coordinator

Modern and Classical Languages and Literatures—Ginette Adamson, chairperson; Eunice Myers, graduate coordinator

Philosophy—Robert Feleppa, chairperson

Physics—David Alexander, chairperson; Hussein Hamdeh, graduate coordinator

Political Science—John E. Stanga, chairperson; Kenneth N. Ciboski, graduate coordinator

Psychology—Charles Burdul, chairperson; Gary Greenberg, graduate coordinator

Sociology/Social Work—John J. Hartman, chairperson and graduate coordinator

Women's Studies—Sally L. Kitch, director

Administration of Justice
Graduate Faculty
Associate Professor: Ronald G. Iacovetta (assistant dean, Graduate School), Galan M. Janekseka (chairperson)
Assistant Professors: Fred W. Benson, Donald L. Blazieck, Stephen E. Doeren (graduate coordinator), Wayne W. Dunning

Master of Administration of Justice
The Master of Administration of Justice (MAJ) degree requires a minimum of 36 semester hours.

Admission Requirements
It is recommended that applications for admission be filed with the dean of the Graduate School by March 1 for consideration in the fall semester. Evaluation for admission is based upon the applicant's undergraduate record and academic background. A minimum of 15 hours of work in administration of justice or approved equivalent is required (otherwise, deficiency requirements will be assessed). Limitations on the number of students admitted to the MAJ degree program each academic year may be established because of constraints imposed by the department's graduate teaching/advising capacity.

Degree Requirements
The MAJ degree requires a minimum of 36 hours, including 21 hours taken in courses numbered 800 or above. All students are required to take AJ 891, 893, 894, 895, 896 and 897. Students must complete a thesis or a 36-hour course work option and a comprehensive examination.

It is recommended that MAJ students complete the core requirements prior to enrollment in elective classes. Each core requirement course will be offered once each academic year. Elective courses will be selected in consultation with the student's graduate adviser. Note the restrictions on the following elective hours: there is a maximum of nine hours total in AJ 781, 782, 783, 881 and 882; there is a maximum of six hours total in AJ 781, 881 and 882; and there is a maximum of six hours total in AJ 782 and 783.

Examinations
Thesis candidates are required to defend orally both their prospectus and their final project. Students electing the 36-hour straight course work track are required to pass a written comprehensive examination.

Facilities
Students in the Wichita State MAJ degree program have access to excellent computer and research facilities, as well as a criminalistics laboratory. Students also may use local, state and federal criminal justice agencies for field research or internship placements.

The Milton Helpern International Center for the Forensic Sciences serves as a vital resource of the Department of Administration of Justice and as an important depository of information relating to major forensic cases in the United States and abroad. The center serves as an important information center for forensic scientists and law enforcement agencies working to solve major criminal cases. In addition, it serves the needs of students majoring in the department. Located in the Liberal Arts and Sciences Building, the center contains extensive library material, tapes and other documents pertaining to major forensic cases.

Courses for Graduate/Undergraduate Credit

595. Research Methods. (3). An introduction to experimental design, the process of designing experiments, statistical methods, and related procedures. Emphasizes the general methodology of research as it pertains to the administration of justice.

600. Forensic Anthropology. (3). Cross-listed as Anthr. 600. A study of the area of criminal investigation involving biological evidence: blood, hair, fingerprint, dentition and skeletal system. The course covers the procedures of collection, preservation, marking, transportation, referral, laboratory analysis, classification and identification emphasizing anthropological interpretation.

621. Environmental Law. (3). A study of the legal and administrative problems of the federal, state and local government relating to environmental protection. Includes federal and state laws and regulations, as well as judicial decisions.
and nongovernmental protective agencies as related to prevention, investigation and enforcement processes of environmental protection. Special emphasis on the contribution administration of justice agencies can make toward development and implementation of effective environmental public education and assistance programs.

650. Security, Theory and Practice. (3). Advanced course emphasizing the interrelationships between theories underlying contemporary security practice. Prerequisite: AJ 231 or departmental consent.

641. Forensic Psychiatry. (3). Analysis of the role of psychiatry in the administration of justice process. Introduces the student to concepts and procedures of forensic psychiatry.

643. Forensic Science. (3). Analysis of the medical role of prevention, detection and treatment as related to the administration of justice. Emphasizes medical specialty areas, such as pathology and psychiatry which have a significant effect on segments of the administration of justice process.

651. Dispute Resolution in Administration of Justice. (3). Analysis of community and individual reaction to agency policy and services. Emphasizes the agency's role as mediator between offenders and victims of crime and between other groups and individuals in conflict.

781. Cooperative Education. (1-6). Provides the student with a paid field placement that integrates theory with a planned and supervised professional experience designed to complement the student's academic program. Students work with a faculty member in the formulation and completion of an academic project related to the field experience. The cooperative education experience must be an integral part of the student's graduate program. Individualized programs must be formulated in consultation with and approved by the department cooperative education coordinator. Open only to AJ graduate students. Offered Cr/NC only.

782. Workshop in Administration of Justice. (3).

783. Advanced Special Topics in Administration of Justice. (1-4). Detailed study of topics in administration of justice with particular emphasis established according to the expertise of the various instructors. Prerequisite: departmental consent.

Courses for Graduate Students Only

816. Correctional Administration. (3). Analyzes basic methods utilized in the organization and administration of the various facets of correctional institutions. Reviews methods utilized in traditional correctional institutions, diagnostic centers, halfway houses and other treatment models.

885. Seminar on Juvenile Justice. (3). An analysis of the criminal justice process as related to the juvenile offender. Emphasizes functional components, such as training of corrections personnel, community coordination for delinquency prevention and control, police-school relations and ethical administrative and operational aspects of juvenile justice agencies.

856. Agency-Community Relations. (3). In-depth analysis of the role of agency administrators in community relations and related public officials in existing community programs. Special emphasis on a multiplicity of approaches for developing new lines of communications between the agency and its community.

861. Police Administration. (3). A comparative survey and analysis of administrative philosophy, problems, procedures, organizations and functions of effective agency organization. Considers administrative skills related to operations and personnel.

881. Internship. (3-6). Supervised field placement in a criminal justice agency. For three credits, the student works 192 hours and completes an academic project under the direction of a faculty member. Prerequisite: consent of internship coordinator.

882. Individual Directed Study in the Administration of Justice. (1-6). Faculty directed readings and/or research in special areas of interest in the field of administration of justice. Prerequisite: departmental consent.

891. Judicial Process. (3). The review and analysis of local, state and federal criminal statutes and court decisions as they apply to the administration of justice process.

893. Seminar on the Application of Criminal THEOLOGY AND CRIMINOLOGY: Analysis of the major theories of criminology and of their importance to the administration of justice process. Emphasizes the student's development of a consistent and valid frame of reference.

894. Critical Issues. (3). Investigates emerging phenomena in the overall system of criminal justice to demonstrate the pertinence of theory to practice. Examples of issues include role conflicts in law enforcement and corrections; police professionalism; the offender as a client for services; and corrections as a setting for research.

895. Policing in America. (3). A study of law enforcement topics including the historical development of policing, the police role, occupational socialization and problems of police work in the United States.

896. Corrections in America. (3). Focuses on analysis and formulation of contemporary correctional systems in America including both institutional programs, such as prisons and jails and noninstitutional programs which focus on alternatives to incarceration in community settings, such as diversion, probation, parole, halfway houses, work releases and restitution.

897. Advanced Research Methods in Administration of Justice. (3). Advanced research course; studies the selection and formulation of research problems, research design, hypotheses generation, scale construction, sampling procedures and data analysis and interpretation. Prerequisite: AJ 595 or equivalent.

899. Thesis. (3-6). Prerequisite: consent of departmental graduate committee.

American Studies
Graduate Faculty

Associate Professor: James H. Thomas
Assistant Professor: Jacqueline J. Snyder

Although a complete graduate program is not currently available in American Studies, the following courses may apply toward a master's degree, if approved in advance of enrollment by the student's advisor, the chairperson of the American Studies department and the dean of the Graduate School. Students working toward the Master of Arts in Liberal Studies (MAL) degree may use American Studies as one of their three fields of study.

Courses for Graduate/Undergraduate Credit


520. American Studies Through the Media. (1-3). Courses created or coordinated by the Department of American Studies; offered through radio, television, newspapers and telnet. Areas of American studies emphasis vary from course to course.

701. Directed Readings in American Studies. (1-3). Prerequisites: six hours of American studies course work or equivalent and instructor's consent.

702. Directed Readings in American Studies. (1-3). Prerequisites: six hours of American studies course work or equivalent and instructor's consent.

750. Workshop in American Studies. (1). Designed to provide specialized instruction using a variable format in a subject relevant to American studies. Repeatable for credit.

798. Introduction to Research. (3). Bibliography, methodology and the philosophy of research. Repeatable for a total of six hours of credit. Prerequisites: six hours of American studies course work or equivalent and instructor's consent.

799. Seminar in American Studies. (3). Individual conferences organized around a problem or problems presented by a representative figure, theme or period, i.e., the Industrial Revolution, Reconstruction, westward migration or Mark Twain and the Mississippi. Repeatable for a total of six hours of credit. Prerequisites: six hours of American studies course work or equivalent and instructor's consent.

Anthropology
Graduate Faculty

Professors: Lowell D. Holmes, Arthur H. Rohn, Karl Schlesier (graduate coordinator)

Associate Professors: Donald Blakeslee (chairperson), Clayton Robarchek, Kim Schneider

Assistant Professors: Dorothy Billings, David Hughes, Peer Moore-Jansen

The anthropology department offers a course of study leading to the Master of Arts (MA) degree.

Admission Requirements

Admission to the MA program in anthropology requires the completion of
Degree Requirements

The MA degree in anthropology requires the completion of 30 semester hours, including the presentation of a thesis. At least 18 of these hours must be in courses numbered 700 or above. The 30 hours must include a core course in archaeology (501 or 736), cultural anthropology (503 or 746), physical anthropology (505 or 756), and two seminars. Students may substitute other appropriate courses if they can show proof of having taken one or more as undergraduates.

Examinations

All students must pass a written proficiency examination in the fundamentals of anthropology. Students must complete a minimum of 15 semester hours of graduate work in anthropology before taking the examination. Before a degree is granted, candidates must pass an oral defense of their thesis. A foreign language examination is contingent upon the nature of the thesis topic.

Courses for Graduate/Undergraduate Credit

501. Approach to Archaeology. (3). Lab fee. An introduction to the problems of studying past cultures. Focuses special attention on methodology and techniques available to archaeologists and the theoretical rationale leading to sound interpretations of the structure of extinct cultures. Prerequisite: Anthr. 305Q or 124Q.

502. Introduction to Archaeological Laboratory Techniques. (3-9). Maximum of three hours. An introduction to the laboratory processing of archaeological materials. Direct experience in all phases of preparing excavated materials for analysis, including cleaning, restoring, preserving, numbering and cataloging of ceramic and lithic artifacts and other remains. Prerequisite: Anthr. 124Q or 305Q.

503. Approach to Cultural Anthropology. (3). Fall semester only. An overview of major current directions in the study of culture and of cultures: symbol systems which structure social, political, economic and religious institutions, personality, the arts and bodies of knowledge. Explores controversies that presently animate discussions of the role, methods and content of modern anthropology. Prerequisites: Anthr. 102Q or 124Q.

504. Approaches to Biological Anthropology. (3). Spring semester only. An intensive study of three central topics in biological anthropology: evolutionary theory, paleoanthropology and modern human variation.

505. Emphasizes current theories, methods and issues. Required of all graduate students in anthropology. Prerequisite: Anthr. 101Q or equivalent.


508Q. Ancient Civilizations of the Americas. (3). A cultural survey of the Aztec, Maya and Inca. Prerequisite: Anthr. 124Q or instructor's consent.

511. The Indians of North America. (3). A survey of tribal societies and native confederations north of Mexico from the protohistoric to the historic period. Prerequisite: Anthr. 102Q or 124Q.

514. Anthropological Perspectives in Geology. (3). Cross-listed as Geol. 514. An anthropological analysis of the latter stages of the life cycle with historical and cross-cultural perspectives. Prerequisite: Anthr. 102Q, 106Q or 124Q or Soc. 111Q.

515Q. Chinese People and Culture. (3). An introduction to the peoples of China and aspects of their culture: economy, government, society, religion and the arts. Historical attention on the many adjustments the Chinese have made during the twentieth century, including political revolutions, industrialization and expanding trade relations.

516Q. Japan: People and Culture. (3). An introduction to the culture of Japan including its history and prehistory, aspects of traditional culture and 20th century Japan, its economy, politics and social organization.

519. Applying Anthropology. (3). The application of anthropological knowledge in the solution of social problems in industry, public health and public administration. Prerequisite: Anthr. 102Q or 124Q.

522Q. Art and Culture. (3). A survey of the visual and performing arts of nonwestern peoples with special attention to their relation to social, political and economic living. Prerequisite: Anthr. 102Q or 124Q.

526. Social Organization. (3). A survey of the varieties of social organization among nonindustrialized peoples throughout the world. Deals with family systems, kinship, residence patterns and lineage, clan and tribal organizations. Prerequisite: six hours of anthropology.

538. Early Man in the New World. (3). A critical examination of facts and theories concerning early man in the New World from the peopling of the continent to the beginning of the Archaic Tradition, and of the role of cultural contacts between peoples in Asia and North America. Prerequisite: Anthr. 102Q or 124Q.

540. The Indians of the United States: Conquest and Survival. (3). An anthropological inquiry into four centuries of cultural contact, conflict, resistance and change. Prerequisite: Anthr. 102Q or 124Q or instructor's consent.

542. Women in Other Cultures. (3). Cross-listed as Wom. S. 542. Deals with the place of women in primitive and other non-Western societies, in various aspects of culture: political, economic, social, religious, domestic, intellectual, psychological and aesthetic. Compares and contrasts societies in order to see how different kinds of roles for women are related to different kinds of societies.

555. Fossil Evidence for Human Evolution. (3). A detailed examination of human evolutionary history as evidenced by fossil remains and an interpretive analysis of the fossil record. Prerequisite: Anthr. 101Q or Biol. 203Q or equivalent.

556. Human Variability. (3). A critical examination of the biological aspects of contemporary human variation, stressing human adaptation. Prerequisite: Anthr. 101Q or Biol. 203Q or equivalent.

557. Human Osteology. (3). Deals with human skeletal and dental materials with applications to both physical anthropology and archaeology. Lecture and laboratory sessions; includes bone and tooth identifications, measurement and analysis and skeletal preservation and reconstruction. Individual projects are undertaken. Prerequisite: Anthr. 101Q or equivalent.

559. Topics in Anthropology. (3). Detailed study of topics in anthropology with particular emphasis being established according to the expertise of the various instructors.

600. Forensic Anthropology. (3). Cross-listed as Anthr. 600. An introduction to forensic anthropology, the role of archaeologists and anthropologists in criminal investigation involving biological evidence: blood, hair, fingerprint, dentition and skeletal system. Covers procedures of collection, preservation, marking, transportation and identification emphasizing anthropological interpretation.

602. Archaeological Laboratory Analysis. (1-3). Students analyze archaeological materials, including ceramic, lithic, faunal and vegetal remains according to accepted methods. Students learn to apply standard methods of identification and modes of interpretation to the materials to produce an acceptable archaeological report. Prerequisites: Anthr. 502 and instructor's consent.

604. Museum Methods. (3). An introduction to museum techniques relating to the acquisition of collections and related procedures, such as accessioning, cataloging, documentation, presentation and storage. Emphasizes current trends in museological philosophy concerning purpose, function and relevance of museums, as well as career opportunities. Prerequisite: instructor's consent.

607. Museum Exhibition. (3). Contemporary philosophy of exhibition design and the application of recent concepts to the planning and installation of an exhibit. Prerequisite: Anthr. 606 or instructor's consent.

611. Southwestern Archaeology. (3). A comprehensive survey of the prehistoric, historic and living cultures of the American Southwest particularly emphasizing the cultural continuities and changes covering 11,000 years. Prerequisites: one introductory course in anthropology or departmental consent.

612. Indians of the Great Plains. (3). An investigation of the cultural dynamics of the
Great Plains area from the protohistoric period to the present. Prerequisites: six hours of anthropology and departmental consent.

613. Archaeology of the Great Plains. (3). The archaeology of the Great Plains area from earliest evidence to the historic period. Prerequisite: one introductory course in anthropology or departmental consent.

647. Theories of Culture. (3). A survey of the main theoretical movements in cultural anthropology, including both historical and contemporary schools of thought. Prerequisite: six hours of anthropology.

651. Language and Culture. (3). Cross-listed as Ling. 651. An introduction to historical and descriptive linguistics. Deals with the ethnography of communications, lexicostatistics and linguistic determinism. Prerequisite: six hours of anthropology.

667. English Syntax. (3). Cross-listed as Engl. 667 and Ling. 667. Examination of aspects of English and their relation to linguistic theory. Prerequisite: Engl. 315 or Ling. 577 or Anthr. 577 or instructor's consent.

690. Field Methods in Anthropology. (3-6). A maximum of six hours can be counted as anthropology hours toward either degree. Instructor (subject). Prerequisite: six hours of anthropology and departmental consent.

746. Advanced Cultural Anthropology. (3). Entails an in-depth coverage of selected topics in cultural anthropology, including social structure, economic and political organization, religion, personality, arts and knowledge systems, and current research methods. Prerequisite: six hours of anthropology.

756. Advanced Physical Anthropology. (3). In-depth coverage of selected topics in physical anthropology, including population dynamics, primatology, growth and development and current research methods. Prerequisite: Anthr. 501 or instructor's consent.

760. Workshop. (1-4). Short-term courses focusing on anthropological problems. Prerequisite: instructor's consent.

764. Seminar in Archaeology and Ethnology. (3). Specifying advanced theory problems in a historical approach to culture. Prerequisites: six hours of anthropology and departmental consent.

765. Field Methods in Anthropology. (3-6). A maximum of six hours can be counted as anthropology hours toward either degree. Instructor (subject). Prerequisite: six hours of anthropology and departmental consent.

661. Introduction to Anthropology. (3). An introduction to the methods and techniques of the science of man. Course work includes the study of the human being as a social animal, his development, and his cultural complexity. Prerequisite: departmental consent.

837. Seminar in Cultural Anthropology. (3). Intensive study of advanced theoretical questions in cultural anthropology. Repeatable up to six hours. Prerequisite: five hours of anthropology.

847. Colloquium in Anthropology. (1-2). S/U grade only. Repeatable for a maximum of three hours. Seminar-style experience in recent research in all of the subfields of anthropology. Allows those students preparing their first papers for presentation at professional conferences to present them before a critical but friendly audience. Students presenting colloquium papers receive two credits. Prerequisite: graduate standing in anthropology.

848. Recent Developments in Anthropology. (3). A review of the latest discoveries and interpretations in the science of human beings. Repeatable up to six hours. Prerequisite: five hours of anthropology.

870. Independent Reading. (2-3). Repeatable up to six hours. Prerequisite: departmental consent.

875-876. Thesis. (2-2). Repeatable for a maximum of six hours. Prerequisite: five hours of anthropology.

**Biological Sciences**

Graduate Faculty

**Distinguished Professor:** Alvin Sarachek (Distinguished Professor of Natural Sciences)

**Professors:** L. Raymond Fox (associate chairperson and coordinator), Wendell W. Leavitt (chairperson), George H. Sweet (graduate coordinator)

**Associate Professors:** Karen L. Brown, Donald A. Distler

**Assistant Professors:** Stephen D. Helmer, Brett A. Larson, Joseph S. Murray, Kyle W. Seker, Arthur L. Youngman

**Master of Science and Areas of Specialization**

The Master of Science (MS) degree offered by the Department of Biological Sciences allows for specialization in a variety of subdisciplines within the broad areas of molecular, cellular, organismic, populational and environmental biology.

**Admission Requirements**

Admission as a full standing student to the MS degree program in biological sciences requires: (1) the completion of 24 undergraduate semester hours in biological sciences and 15 semester hours of course work in chemistry; (2) an overall grade point average of at least 2.750 (4.000 scale) for the most recent 60 semester hours completed; (3) a grade point average of at least 3.000 (4.000 scale) for all undergraduate biological sciences course work; (4) three letters of reference from science faculty; (5) receipt of GRE general aptitude and advanced test in biology scores; and (6) conditional acceptance by a member of the graduate faculty, based on the availability of research space and the student's academic background. Students who do not meet these requirements but who wish to begin graduate course work may qualify for conditional acceptance into a nondegree category.

**Degree Requirements**

Students may pursue a Master of Science degree in biology under either a research thesis option or nonthesis option. The more traditional thesis option, which includes a minimum of 30 semester hours in graduate course work, requires the successful completion and defense of a research project. Each student pursuing this option works individually with a graduate faculty member who directs the research activity of the student. The nonthesis option requires a minimum of 36 semester hours in graduate course work and successful completion of written comprehensive examinations in two areas of biology. The nonthesis option is primarily designed for, but not limited to, students employed in professional areas, such as the medical community and secondary education, who wish to expand or update their knowledge of biological principles.

**Nonmajor Courses**

(May not be used to satisfy the requirements for the major)

**Courses for Graduate/Undergraduate Credit**

509G. Foundations of Human Heredity. (4). Introduction to the mechanisms and societal significances of developmental, transmission and population genetics of humans. Gives attention to inborn errors of metabolism and development and the roles of genetic counseling and genetic engineering in their management. Intended for students majoring outside of the natural sciences and does not carry credit toward a biological sciences major or minor. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisite: junior standing.

518G. Biology of Aging. (3). Cross-listed as Ger. 518G. An introduction to the phenomenon of aging, including a survey of age-related processes and mechanisms of senescence emphasizing humans. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisite: basic course in biological sciences that satisfies general education requirements.

**Major Courses**

(Used to satisfy the requirements for the major)
Courses for Graduate/Undergraduate Credit

500. Cell Physiology. (3). Designed to bridge the gap between molecules and organisms by focusing on the function and the structure as it relates to function, of the basic units of life, cells. Includes a detailed treatment of cellular components and processes, the cyto-skeleton, membrane transport control of gene expression, cell-cell communication and a consideration of cellular evolution. Also discusses the controversies now used in the field of cell biology. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisites: Biol. 204 and Chem. 531.

502. Vascular Plants. (4). 2R; 6L. An introduction to the structure, reproduction and evolution of the major groups of living and extinct vascular plants. Includes an introduction to flowering plant systematics. Students earning graduate credit are expected to perform a primary laboratory survey on a topic selected in consultation with the instructor and deliver a 30-minute oral presentation to the class. Prerequisite: Biol. 204.

503. Taxonomy and Geography of Flowering Plants. (4). An introduction to the principles and methods of plant taxonomy and to the study of the patterns of plant distribution and the origin of these patterns. Class time is divided among lectures, laboratories and field work. Field trips throughout Sedgwick County and to the Flint Hills provide an opportunity to collect specimens and to observe ecology and distribution of native species of flowering plants. Prerequisite: Biol. 204 or instructor’s consent.

524. Vertebrate Zoology. (4). 2R; 4L. Emphasizes the experimental approach to plant physiology. Students seeking graduate credit are expected to complete additional assignments chosen in consultation with the instructor. Prerequisite: Biol. 204. Biol. 527 also is recommended.

527. Comparative Anatomy. (5). 3R; 4L. An intensive study of representative chordates emphasizing vertebrate anatomy. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisite: Biol. 204.

528. Parasitology. (3). 2R; 4L. The parasites of man and other vertebrate hosts. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisite: Biol. 204.

531. Food Microbiology. (4). 2R; 4L. Examines the role and significance of microorganisms in foods. Includes factors that affect microbial growth; detection of microbial contaminants; food preservation by use of chemicals, radiation, high and low temperature, drying and fermentation; food-borne microbial infections and intoxications; and the microbial basis of food sanitation, control and inspection. Students earning graduate credit are expected to prepare a term paper based on the technical literature on a topic chosen in consultation with the instructor. In addition, graduate student responses on essay examinations are read with greater expectations with respect to clarity, quantity and quality of information presented. Prerequisite: Biol. 330.

532. Entomology. (5). 3R; 4L. An introduction to the morphology, physiology, behavior, ecology and economic significance of insects. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor or develop proficiency in a specific taxon by performing an individual systematic project. Prerequisite: Biol. 204.

534. Mammalian Physiology. (3). An organic systems approach to mammalian—primarily expected to produce a term paper based on and endocrine control systems and the co-ordination of body functions. Students earning graduate credit are expected to submit an additional laboratory report relating the results of a laboratory experiment to those found in the current technical literature. Prerequisite: concurrent or prior enrollment in Biol. 534.

540. Comparative Embryology. (4). 2R; 4L. Emphasizes the experimental approach to plant physiology. Students seeking graduate credit are expected to complete additional assignments chosen in consultation with the instructor. Prerequisite: Biol. 204. Biol. 527 also is recommended.

544. Histology. (4). 2R; 4L. The microscopic anatomy of vertebrate tissues emphasizing mammals. Students earning graduate credit are expected to complete additional assignments chosen in consultation with the instructor. Prerequisite: Biol. 204.

552. Mycology. (4). 2R; 4L. The structure, reproduction and development of fungi emphasizing the cytokology and physiology of forms of scientific and economic importance. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisite: Biol. 204.

560. Plant Ecology. (4). 2R; 6L. Principles and patterns of plant distribution and of adaptation of plants to particular habitats. Emphasizes the experimental approach to plant ecology. Field trips are an integral part of the laboratory. Prerequisite: Biol. 204.

573. Statistical Applications in Biology. (3). Designed to supplement Stat. 370 by providing experience with practical applications of statistical theory to biological data. Includes statistical methods derived from both the primary literature and independently designed research projects. Emphasizes the design of experiments to answer specific hypotheses, the treatment of non-normally distributed data sets and nonhomogeneous experimental unit sizes and the use of packaged computer programs for certain statistical tests. Access to calculators with at least two memory banks is strongly encouraged. Students earning graduate credit are expected to complete an additional statistical analysis assignment involving the use of the computing facilities. Prerequisites: Stat. 370.

575. Field Ecology. (5). 3R; 4L. Techniques for analysis of systems consisting of living organisms and their environment. Field trips are required. Students earning graduate credit are expected to perform an individual project on comparative community structure and report the results of this investigation as a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisite: instructor’s consent.

590. Immunology Laboratory. (3). 61. Methods of immunization and techniques for qualitative and quantitative determinations of antibody production and antigen-antibody reactions. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisites: Biol. 204 and Chem. 531.

591. Immunobiology Laboratory. (3). 61. Methods of immunization and techniques for qualitative and quantitative determinations of antibody production and antigen-antibody reactions. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisites: Biol. 590, Chem. 531 or instructor’s consent.

610. Topics in Botany. (2-4). No more than a total of six credit hours earned from among Biol. 610, 640 and 660 may be applied toward major and graduation requirements. Students must complete a Directed Independent Study Abstract form and obtain departmental approval prior to enrollment. Prerequisite: Instructor consent.

620. Animal Behavior. (3). A survey of animal behavior, including human; major emphasis on the analysis of behavior as a concert of physiological processes. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisite: Biol. 204 or departmental consent.

630. Sociobiology. (3). A systematic study of the biological basis of social behavior. Focuses on animal societies, their population, structure, casts and communication and the evolution of these patterns. Students earning graduate credit are expected to produce
a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisite: Biol. 204 or departmental consent.

640. Topics in Zoology. (2-4). No more than a total of six credit hours earned from among Biol. 610, 640 and 660 may be applied toward major and graduation requirements. Students must complete a Directed Independent Study Abstract Form and obtain departmental approval prior to enrollment. Prerequisite: Biol. 204.

654. Pathogenic Microbiology. (4). 2R; 4L. An introduction to the important pathogenic microorganisms and their relationships to health and disease in man. Students earning graduate credit are expected to prepare a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisite: Biol. 330.

656. Microbial Physiology. (3). The physiology and metabolism of microorganisms. All students are expected to prepare a term paper based on the technical literature on a topic chosen in consultation with the instructor, and those earning graduate credit are expected also to present oral presentations on this topic to the class. Prerequisites: Biol. 330 and Chem. 531.

659. Microbial Physiology Laboratory. (3). 6L. An introduction to the basic techniques involved in the study of microbial physiology. Students earning graduate credit are expected to design and perform an additional experiment in consultation with the instructor and present the results in written form using the format of a scientific journal chosen in consultation with the instructor. Prerequisites: Biol. 330 and Chem. 531.

660. Topics in Microbiology. (2-4). Lab fee. No more than a total of six credit hours earned from among Biol. 610, 640 and 660 may be applied toward major and graduation requirements. Students must complete a Directed Independent Study Abstract Form and obtain departmental approval prior to enrollment. Prerequisite: Biol. 330.

666. Special Topics in Biochemistry. (3). Designed primarily for students who choose the biochemistry field major. Discusses a small number of current problems in biochemistry in depth. Requires reading published research papers in the field. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisites: Biol. 204, Chem. 662 and 663.

669. Research in Biochemistry. (2). Cross-listed as Chem. 669. S/U grade only. Designed primarily for students who choose the biochemistry field major. Requires participation in a biochemistry research project under the direction of a faculty member and a written report summarizing the results. May be repeated once for credit. Prerequisites: Biol. 300, Chem. 662 or 663 and Chem. 666.

671. Evolutionary Ecology. (4). 3R; 2L. Presents basic principles of population genetics and ecology as a framework for the study of topics in evolutionary ecology. Emphasizes (1) the maintenance and structure of population level genetic variation; (2) the maintenance and evolutionary advantages of sex; (3) individual, kin, group selection; (4) population demographic structure; (5) population regulation and dispersal; (6) life history strategies in heterogeneous environments; and (7) demographic and genetic covariance. Teaches basic techniques in population ecology on several short field trips throughout the semester. Students earning graduate credit are expected to participate in a weekly seminar in addition to class hours. Prerequisite: Biol. 584. Biol. 418 also is recommended.

750. Biology Workshop. (1-3).

756. Microbial Genetics. (4). The relationship between development, metabolism and genetics in microorganisms. Students earning graduate credit are expected to prepare a term paper on the technical literature on a topic chosen in consultation with the instructor. Prerequisites: Biol. 330 and 584 or departmental consent.

780. Molecular Genetics. (3). Studies of the physicochemical nature of genetic material and the mechanisms of genetic regulation of metabolism. Students earning graduate credit are expected to produce a term paper and deliver a seminar based on the technical literature on a topic chosen in consultation with the instructor. Prerequisite: Biol. 584 or instructor's consent.

790. Advanced Immunology. (3). Contemporary problems in immunologic research. Includes lectures, assigned readings and reports. Students earning graduate credit are expected to produce a term paper based on the technical literature on a topic chosen in consultation with the instructor. Prerequisites: Biol. 590 and instructor's consent.

798. Biology Seminar. (2). Reviews of current research in biological sciences. Repeatable once for credit.

Courses for Graduate Students Only

890. Research. (2-5). S/U grade only. Students performing research on their thesis projects should enroll for an appropriate number of hours. Students who use the results of the research results must be presented to the student's thesis committee before a grade is assigned.

891. Thesis. (2). S/U grade only. Students must be enrolled in this course during the semester in which the thesis is defended.

Chemistry

Graduate Faculty


Associate Professors: Anneke S. Allen, William T.K. Stevenson, Melvin E. Zandl

Assistant Professors: Dennis L. Burns, R. Carolyn Drury, John B. McCarten, Kanatage Wimalasena

The Department of Chemistry at Wichita State offers courses of study leading to the Master of Science (MS) and the Doctor of Philosophy (PhD) degrees.

Admission Requirements

To enroll in the graduate program in chemistry, students must meet admission requirements of the Graduate School and hold an undergraduate degree with a major in chemistry. International students must have a minimum TOEFL score of 570. Students whose preparation is equivalent to the BS program recommended by the American Chemical Society Committee on Professional Training are considered well prepared for graduate study.

When admitted to the graduate program in chemistry, students are required to take orientation examinations. The results are used by an advising committee of the department to counsel graduate students about which courses are appropriate.

Students must select a faculty member to be their research adviser by the beginning of their second semester in the graduate program. The research adviser guides the students in their research.

Degree Requirements (Master's)

The MS degree in chemistry requires the completion of 30 credit hours, including the presentation of a thesis. The program requires at least six credit hours in research, Chem. 790. Also, at least 15 credit hours in chemistry courses numbered above 701 must be taken, including at least one 700-level course from four of the following five areas: analytical chemistry, inorganic chemistry, organic chemistry, physical chemistry, and biochemistry. Students must successfully complete Chem. 700 at least twice, and full-time students must register each semester in Chem. 701. Additional courses, which may be outside the major field, are selected by students in consultation with their adviser and the department's advising committee.

Chemical Physics Option. Students who have a particular interest in chemical physics may follow a special option. They must take at least one 700-level course from four of six areas, including physics as the sixth area. Physics courses that may be taken include Phys. 631, 712, 714, 811, 881 or other approved courses. It is recommended that students in this option take Chem. 642. Additional information is available in the chemistry department office.

Examinations. Master's students must pass qualifying examinations, which are the same as orientation examinations, in four areas of chemistry. An examination must also be passed in one research skill, including the areas of German, French, Russian (or the equivalent of one academic year of language with a grade of B or better); computer science; or electronic techniques.

Thesis. The thesis is reviewed by a committee from the department, and an oral examination given by a faculty
committee appointed by the Graduate School must be passed.

Degree Requirements (Doctorate)

All PhD students are required to take 24 course hours, 12 of which must be in the area of major interest. Students are required to begin cumulative examinations at the beginning of their second year. These examinations follow the proficiency exams in the areas of analytical, inorganic, organic, physical, and biochemical, four of which the student must take and pass (three attempts permitted) during the first year. Students must pass six cumulative examinations out of 16 attempts to remain in the program. After completion of the cumulative examinations, students are encouraged to develop and orally defend an original research proposal. Two enrollments in departmental seminar and continuous enrollment in departmental colloquia are required. The final requirement for the degree is the defense of a thesis based on original research. Well-prepared entering students should be able to complete the requirements within four years.

Courses for Graduate/Undergraduate Credit


505. Chemical Literature. (1). A survey of chemical publications and the publication process. Designed to give the student the ability to conduct a proper search of the literature for information. Also covers aspects of technical writing. Prerequisite: Chem. 531.

514. Inorganic Chemistry. (3). Basic inorganic chemistry emphasizing molecular symmetry and structure, fundamental bonding concepts, ionic interactions, periodicity of the elements, systemsatics of the chemistry of the elements, acid-base chemistry and non-aqueous solvents, classical coordination chemistry and introductory bioinorganic chemistry. Prerequisite: Chem. 112Q with a grade of C or better.

523. Analytical Chemistry. (4). 2R; 6L. Lab fee. Evaluation of data, theory and application of gravimetric analysis and precipitation, neutralization and oxidation-reduction volumetric analysis. Prerequisite: Chem. 112Q with a grade of C or better.

524. Instrumental Methods of Chemical Analysis. (4). 2R; 6L. Lab fee. Introduction to the theory and application of physical methods of analysis and analysis and separation of complex mixtures, both inorganic and organic. Also discusses basic computer programming as it applies to analytical chemistry. Prerequisite: Chem. 523 or 124Q.

531. Organic Chemistry. (5). 3R; 6L. Lab fee. Survey of the chemistry of the major classes of organic compounds emphasizing reaction mechanisms, stereochemistry, and spectrographic analysis. Prerequisite: Chem. 112Q or 124Q with a grade of C or better.


533. Elementary Organic Chemistry. (3). Basic organic chemistry emphasizing topics of importance to health professions and education majors. Gives special emphasis to carbohydrates, proteins, drugs, pesticides and energy production. Students should enroll in Chem. 534 simultaneously. Credit is not allowed for both Chem. 533-534 and 531. This course does not meet the needs of the chemistry majors or premed students. Prerequisite: Chem. 112Q or equivalent.

534. Elementary Organic Chemistry Laboratory. (2). Lab fee. A basic laboratory course to provide pertinent experiences in the laboratory to fortify the survey lecture course Chem. 533. Prerequisite or corequisite: Chem. 533.

545. Physical Chemistry. (3). Thermodynamics. Studies gases, first law, thermochemistry, second and third laws, phase equilibrium, solutions, chemical equilibrium, electrochemistry, and surface chemistry. Prerequisite: Chem. 112Q, Math. 344 or equivalent and one semester of college physics.

546. Physical Chemistry. (3). Kinetic theory, kinetics, transport phenomena, quantum mechanics, spectroscopy and statistical thermodynamics. Prerequisites: one year of college physics and Math. 344.

547. Physical Chemistry Laboratory. (2). 6L. Lab fee. Experimental methods that illustrate principles learned in Chem. 545 and 546. Prerequisite: Chem. 545 or 546.

561. Introduction to Biochemistry. (3). A brief history of biochemistry, emphasizing the development of the molecular biology, chemistry of biomolecules—proteins, carbohydrates, lipids, nucleic acids and vitamins, molecular basis of bioenergetics and metabolism and storage, transfer and control of genetic information. Course meets the needs of majors from health programs and science education curriculum. Prerequisite: Chem. 531 or 533 or one semester of organic chemistry.

603. Industrial Chemistry. (3). Designed to bridge the industrial-academic gap. Includes petroleum chemistry and major processes in industrial chemistry. Also discusses some aspects of environmental chemistry such as hazardous and nuclear waste disposal and air pollution. Topics in polymer chemistry include major synthetic routes to high polymers and resins and techniques of polymer characterization, structure properties correlations and methodology in plastics and composites processing. Prerequisite: Chem. 523 or concurrent enrollment.

605. Medicinal Chemistry. (3). For students interested in chemistry related to the design, development and mode of action of drugs. The primary purpose of the course is to describe those organic substances that are used as medicinal agents and to explain the mode of action and chemical reactions of drugs in the body; to illustrate the importance and relevance of chemical reactions as a basis of pharmacological activity, drug toxicity, allergic reactions, carcinogenicity, etc. and to bring about a better understanding of drugs. Includes transport, basic receptor theory, metabolic transformation of drugs, discussion of physical and chemical properties in relation to biological activity, drug design, structure-activity relationships and discussion of a selected number of organic medicinal agents. Prerequisites: Chem. 532 or 533 or concurrent enrollment in biochemistry (Chem. 561 or 662) and a year of biology are strongly recommended.

613. Inorganic Chemistry Laboratory. (2). 6L. Lab fee. Experimental methods of inorganic chemistry. Prerequisite: Chem. 514 or concurrent enrollment.

615. Advanced Inorganic Chemistry. (3). Includes modern bonding theories, structure and spectra of inorganic compounds, coordination compounds, organic inorganic chemistry, organoanion, organoion ring systems and polymers, inorganic environmental chemistry, mechanisms of inorganic reactions and solid state chemistry. Prerequisite: Chem. 514 and 546.

625. Electronics. (2). 1R; 4L Lab fee. Provides a working knowledge of electronic devices and circuits for the student or researcher who has a background in electronics. Prerequisite: instructor's consent.

641. Advanced Physical Chemistry. (3). Introduction to quantum chemistry, atomic and molecular spectra, static and dynamic behavior of molecules. Prerequisites: Chem. 546.

642. Chemical Physics. (3). Topics in areas of overlapping interest for students of chemistry and physics, such as thermodynamics, quantum mechanics, solids and various types of spectroscopy. A team of chemists and physicists discusses standard experimental and theoretical techniques used in research in chemical physics. Prerequisite: Chem. 641 or instructor's consent.

662. Biochemistry of Cell Constituents, Catalysis, Oxidation, Photosynthesis. (3). Study of major constituents of the cell: proteins, carbohydrate, glycoprotein, lipid, nucleic acid, nucleoprotein; enzyme catalysis; biological oxidations; photosynthesis; and introduction to intermediary metabolism. A fundamental background of biology or microbiology is recommended but not essential. Biomedicine students may enroll concurrently in Chem. 664. Prerequisites: Chem. 523 and 532 or equivalents.

663. Biochemistry of Cell Metabolism, Bio-synthesis, Structure, Function and Regulation of Proteins and Nucleic Acids. (3). Study of metabolism and control of carbohydrates, lipids, phosphoglycans, spinolipids, steroids, and proteins; synthesis of porphyrins, amides and polypeptides; synthesis and metabolism of purines, pyrimidines and nucleotides; synthesis and structure of DNAs, RNAs and proteins; organization and functioning of genes; evolution of proteins and nucleic acids; hereditary disorders of metabolism; biochemistry of endocrine glands; major nutrients and vitamins; body fluids and generalized tissues. A fundamental background of biology or microbiology is recommended but not essential. Prerequisite: Chem. 662.
and the hydrogen atom, variation and perturbation techniques, electron spin, Hartree-Fock and configuration-interaction methods, molecular-orbital and valence-bond frameworks. Includes postulates of quantum mechanics and the Born-Oppenheimer theorems. Prerequisite: Math. 344 or equivalent. Corequisite: Chem. 705 or equivalent.

751. Chain Growth Polymerization. (3). Mechanisms, kinetics and thermodynamic aspects of polymerization processes which proceed by a chain growth mechanism, free radical, anionic, cationic and Zeigler Natta and group transfer polymerization. Prerequisites: Chem. 531 and 545.

752. Step Growth Polymerization. (3). Polymerization process which proceed by a step growth or ring-opening mechanism. Preparation of thermoplastics, including relations between molecular weight and reaction condition. Conversion of monomers into polymers. Prequisites: Chem. 531 and 545.

756. Physical Biochemistry I: Principles. (3). An examination of the physical principles that form the basis for the structure and activity of biological macromolecules. Includes the conformational analysis of molecular building blocks and its relation to the higher order structures of proteins, nucleic acids, lipids and carbohydrates, energetic and bonding interactions, solution thermodynamics, chemisorption, conformational analysis of chain statistics and macromolecular flexibility, transport processes and multiple binding equilibria. Prerequisites: Chem. 545, 546 and 662 or equivalent.

Courses for Graduate Students Only

809. Special Studies in Chemistry. (2-3). Systematic study in selected areas of chemistry. Repeatable for credit. Course content differs from one offering to the next.

814. Organometallic Chemistry. (3). A study of the synthesis, structure, bonding, reactivity and industrial applications of organometallic and nontransition metal compounds. Prerequisite: Chem. 615 or equivalent.

815. Bioinorganic Chemistry. (3). The study of the role of inorganic chemistry in biological systems. Includes electron transport, biological catalysis mediated by metal ions, metal storage and transport, ion transport and the role of transition metals in metabolism. Prerequisites: Chem. 615 and 663 or equivalent.

821. Equilibrium and Statistics in Analytical Chemistry. (3). Covers homogeneous and heterogeneous solution equilibrium calculations and statistical methods used in experiment design and data analysis. Prerequisite: Chem. 524 or equivalent.

822. Analytical Separations. (3). The theory and practice of analytical separation methods including gas and liquid chromatography, ion exchange and electrophoresis. Prerequisite: Chem. 524 or equivalent.

823. Analytical Spectroscopy. (3). Absorption (UV visible, IR and atomic); emission; flame emission and atomic absorption spectrophotometry, molecular fluorescence; phosphorescence; Raman, nuclear magnetic resonance and electron spin resonance spectroscopy; X-ray methods. Lectures and discussions on theory and practice. Particular emphasis on instrumentation and the acquisition of artifact-free data. Prerequisite: Chem. 524 or equivalent.

824. Electroanalytical Chemistry. (3). Includes voltammetry, polarography, chronomperometry and coulometry; reversible and irreversible diffusion controlled processes; CE (chemical reaction before electrical reaction), EC (electrical reaction before chemical reaction) and catalytic reaction; and organic polarography and voltammetry. Prerequisite: Chem. 524 or equivalent.

831. Advanced Physical Organic Chemistry. (3). Includes molecular orbital theory, sigma transition state rearrangements, electrolytic reactions, cycloadditions, reactive intermediates and photochemistry. Prerequisite: Chem. 731.

832. Modern Synthetic Methods. (3). Discussion of retrosynthetic analysis, applications, asymmetric syntheses and stereochemistry. Prerequisite: Chem. 732.

833. Natural Products Chemistry. (3). Discussion of the structure, chemistry and bio-synthesis of the alkaloids, steroids, terpenoids, carbohydrates and aromatic and aliphatic natural products. Prerequisite: Chem. 732.

834. Heterocyclic Chemistry. (3). An account of the physical and chemical properties of the main classes of heterocyclic compounds. Prerequisite: Chem. 732.

835. Bioorganic Chemistry. (3). Includes the chemistry of amino acids and peptides, enzyme structure and function and inhibitor design. Prerequisites: Chem. 662, 663 and 662 and concurrent enrollment in 663 and 732.

841. Advanced Quantum Chemistry. (3). Considers advanced applications of quantum mechanics to atomic and molecular problems. Includes determinant wave-functions, angular momentum coupling, time-dependent perturbation theory, relativity corrections, integral equations, integral equations, and organic polarography and voltammetry. Prerequisites: Chem. 705 and 741 or equivalents.

842. Chemical Kinetics. (3). A description of reacting systems, including the mathematical and experimental characteristics of simple and complex kinetic systems. Discusses the theories of chemical kinetics, as well as the kinetics of homogeneous reactions in the gas phase, the kinetic aspects of solution reactions, heterogeneous reactions and selected topics of current interest. Prerequisite: Chem. 546 or equivalent.

843. Statistical Thermodynamics. (3). Develops Boltzmann, Fermi-Dirac and Bose-Einstein statistical mechanics with applications made to gaseous-state and solid-state chemical problems. Emphasizes the relationship of statistical mechanics and thermodynamics. Considers applications of statistical thermodynamics to polymers. Prerequisites: Chem. 546, 745 or equivalents.

845. Chemical Thermodynamics. (3). A presentation of the basic three laws of thermodynamics in a classical framework discussing their application to real physical systems. Emphasizes theory and its application to chemical systems. Prerequisites: Chem. 545, 546 and Math. 344 or equivalents.

846. Molecular Spectroscopy. (3). The theoretical basis for spectroscopy and spectroscopic determinations of molecular
structure. Includes polyelectronic atoms, time-dependent perturbation theory, vibration and rotation of diatomic molecules, vibration and rotation of polyatomic molecules, electronic spectra and magnetic resonance spectroscopy. Prerequisites: Chem. 741 or its equivalent and Chem. 705 or its equivalent.

847. Chemistry of Condensed Matter. (3). Includes thermodynamics, statistical mechanics, quantum chemistry and structural determinations of condensed phase matters. Emphasizes metals, alloys, intermetallic compounds, composite materials and advanced materials. Prerequisites: Chem. 741 and 745 or equivalents.

852. Techniques of Polymer Characterization. (3). A study of physical, spectroscopic and diffraction techniques to determine the size, structure and morphology of polymers.

853. Polymer Properties. (3). Kinetics and thermodynamics of the crystallization process and the influence of sample history on the gross morphology of the crystallites. Structural features which preclude the development of polymer crystals and encourage amorphous character, relationships between structure, Tm and Tg, theoretical strengths of materials, the time dependent mechanical behavior of polymers and the Maxwell and Voigt models of viscoelasticity. The Boltzmann superposition principle and how it can be used to predict creep behavior, strain aging, yielding and fracture in polymers. Prerequisite: degree in chemistry or related subject.

861. Enzyme Mechanisms. (3). An introduction to the study of enzyme mechanisms. Modern approaches include steady-state, relaxation and chemical modification methods. Prerequisite: Chem. 662 or 663 or equivalent.

862. Biotechnology: Principles and Applications. (3). Presents a broad informed view of contemporary biotechnology including its role in the production of premium products from biological raw materials. Biotechnology involvement for the production of products include energy, food, drink, flavors, chemicals, biopolymers, medicines and agricultural materials. Prerequisites: Biol. 203 and 204 and Chem. 662 or 663 or equivalents.

863. Analytical Biochemistry. (3). A review of modern analytical methods used in biochemistry and molecular biology including absorbance and fluorescence spectroscopy chromatography (affinity, gel-filtration, HPLC, ion-exchange, ion-pair), gel electrophoresis, radioactive tracer methods; cloning, sequencing and recombinant DNA procedures. Prerequisites: Biol. 203 and 204 and Chem. 662 or 663 or equivalents.

864. Physical Biochemistry II: Techniques. (3). An examination of the physical techniques used in the study of the structure, properties and reactions of biological molecules and macromolecules. Includes vibrational and electronic molecular spectroscopy scattering of radiation, nuclear and electron magnetic resonance, sedimentation and electric field techniques. Uses examples from the research literature throughout to illustrate specific applications.

900. Research in Chemistry. (2-12). S/U grade only. Research for the student planning to receive an MS. Research is directed by a faculty member. Repeatable for credit.

990. Research in Chemistry. (2-16). S/U grade only. Research for the student planning to receive the PhD. Research is directed by a faculty member. Repeatable for credit.

Communication, Elliott School of
Graduate Faculty
Professor: Vernon Keel (director, Elliott School)
Associate Professors: Philip Gaunt, Dennis Smith
Assistant Professors: Les Anderson, Richard Armstrong (graduate coordinator), John Freeman, James Hallmark, Susan Huxman, Sharon Iorio, Frank Kelly, Keith Williamson

Master of Arts in Communication
The Elliott School of Communication coordinates a multidisciplinary Master of Arts in Communication (MAC) program in cooperation with other departments and disciplines throughout the University. The general communication program includes five areas of emphasis: 1) communication theory; 2) cross-cultural communication; 3) mass communication; 4) theatre and drama; and 5) general communication. The graduate coordinator in the Elliott School is also the program coordinator for the MAC program. (See requirements for the MAC program in General Programs, Communication section of the Graduate Bulletin.)

Master of Education
The following courses may apply toward a Master of Education (MEd) degree with intensive study in secondary education and content specialization in speech and drama, offered by the Department of Curriculum and Instruction, College of Education. Prospective candidates are advised jointly by representatives of the Department of Curriculum and Instruction and the Elliott School of Communication. (See requirements for the MEd degree in the College of Education section of the Graduate Bulletin.)

These courses may also apply toward other master's degree programs or may be taken by students in nondegree status if approved by the faculty advisers, the director of the Elliott School of Communication and the dean of the Graduate School.

Courses for Graduate/Undergraduate Credit

500. Advanced Reporting I. (3). 1R, 4L. A course for juniors and seniors on the techniques of reporting and writing the more complex and important types of news stories. Covers police beat stories, sports and economic reporting and includes the study and practice of journalistic interviewing. Prerequisites: junior standing. Comm. 230 and either 300 or 322.

502. Public Information Writing. (3). Uses basic journalistic skills of clear, precise writing to communicate effectively with various audiences. Students write press releases, speeches and popularizations of complex documents. Techniques learned in this course are valuable in writing grant proposals, committee reports, pamphlets and journal articles. Prerequisite: junior standing or departmental consent.

509. Directed Projects in Instructional Television. (2). Practical assignments in instructional television and cablecasting. Activities include six hours per week in campus television exercises. Prerequisites: Comm. 304 and instructor's consent.

510. Editing. (3). 1R, 4L. Selection, evaluation and preparation of copy and pictures for publication. Covers copy editing, rewriting, headline and caption writing and page layout. Prerequisites: junior standing and Comm 230.

520. Seminar in Journalism. (3). Exploration of problems and controversies involving the press, the nature of news and consumers of news. Prerequisite: departmental consent.


525. Advertising Copywriting. (3). Detailed practice at writing various kinds of advertising copy, including print and broadcast forms. Emphasizes terse, precise writing that evokes response sought by advertiser. Prerequisite: Comm. 324 or departmental consent.

530. Media Performance: Radio. (3). Provides experiments in various areas of radio performance from newscasts to radio drama, commercials to PSAs. Designed to extend, through simulated experiences as well as on-air work, student performance skills, capabilities and knowledge in this public communication medium. Prerequisites: Comm. 111 or 112 and 221Q, 222 or Thea. 243.

531. Media Performance: Television. (3). Provides experiences in various areas of television performance, from newscasts to interviews, special features and commercials. Designed through simulated experiences to extend student performance skills, capabilities and knowledge in this public communication medium. Prerequisites: Comm. 111 or 112 and 221Q, 222 or Thea. 243.

580. Editorial Writing. (3). A study of editorial judgment, including practice in the writing of editorials and editorial page features and a study of research materials available to editorial writers. Prerequisites: junior standing and Comm. 230.

570. Magazine Journalism. (3). Magazine production, including the choosing of subjects, story structure, and illustrations; the shooting and editing of photographic stories; layout; the handling of production and management concerns. Prerequisite: Comm. 230 or departmental consent.
635. Leadership Techniques for Women. (3). Designed to provide the woman student experience in decision making and to improve skills in leadership through role playing and exercise in group dynamics.

636. Advanced Public Speaking. (3). Theory and practice in the various forms of platform speaking for the academically mature student. Includes such special forms as the after-dinner speech and speeches of goodwill, tribute, keynote and courtesy.

650. Instructional Communication. (3). The study and practice of communication concepts, processes, technologies and strategies related to formal instruction and learning outcomes. By means of structured experiments, students develop competencies in (1) determining appropriate instructional goals, (2) designing instructional strategies to achieve learning outcomes, (3) utilizing visual, vocal and verbal communication skills to implement instructional strategies and (4) assessing the proficiency of communication skills used for instruction. Course flexibility in planning and emphasis provides for the utilization of instructional communication across disciplines and educational levels as well as in most professional and training settings.

660. Seminar in Communication. (2-3). Special seminars designed to treat one area of interest or problems in: (a) speech communication, (b) electronic media or (c) speech education. Repeatable for credit in different topics only.

661. Directing the Forensics Program. (3). A study of the methods and procedures in coaching and directing high school and collegiate forensic programs (debate and individual events). The future teacher is made aware of the literature and professional organizations in the field.

665. Communicative Disorders. (3). Cross-listed as CDS 705. A survey of speech, language and hearing impairments, including identification and treatment; and consideration of the roles of health and educational specialists in the total habilitative process. Provides background in normal communicative structures, processes and acquisition for understanding communicative disorders. Areas introduced include language disabilities in children, adult aphasia, articulation disorders, voice disorders, dysarthria, expectation, stuttering, cerebral palsy and hearing impairment.

675. Directed Study. (2-4). Cross-listed as Thea. 675. Individual study or projects. Repeatable for credit with departmental consent. Prerequisite: departmental consent.

680. Introduction to Communications Research. (2). An integrative approach to an understanding of the nature and scope of communication research as it applies to communication theory, mass communication, cross-cultural communication and theater/drama. Provides an overview of the current status of research in these areas. Emphasis is placed on (a) the basic steps of research; (b) the development of library and other resources; (c) bibliographic search; (d) computer accessing of source materials; (e) organization, style and format of a research report and citation of sources in footnotes and bibliographies in accordance with standard style guides. Course should be taken at the beginning of the graduate program.

682. Advanced Interpersonal Communication. (3). A comprehensive study of the nature and scope of interpersonal communication as related to verbal and nonverbal communication, group and leadership. Prerequisite: Comm. 112 or instructor's consent.

672. The Art of Conversation. (3). Conversation is the form of communication people engage in most naturally and frequently, but about which they seldom think seriously. Course is designed to help participants enhance their understanding and appreciation of, as well as their skill in, the art of conversation. Possible topics include the nature of conversation, principles of conversation, conversation in the media and conversation analysis. Prerequisites: Comm. 112 and junior standing or departmental consent.

737. Processes and Effects of Mass Communication. (3). An exploration into the effects of mass communication at the individual social and cultural levels.

745. Special Topics in Journalism. (1-3). Directed study on selected aspects of journalism and mass communication or related topics: communications theory, news, editorials, advertising and broadcasting. Repeatable for credit when topics differ substantially. Prerequisites: senior standing and departmental consent.

750A. Journalism Workshop. (1-3). Designed to provide specialized instruction using a variable format, in a journalistically relevant subject.

750B. Workshops in Communication. (2-4).

770. The Audience. (3). Application of research techniques to the measurement of audience behavior with particular emphasis on mass media audiences. Includes focus group interviews, survey research and radio and television ratings.

Courses for Graduate Students Only

781. Communication Law and Responsibility. (3). Emphasizes both oral and written aspects of communication law and responsibility. Addresses general functions of the law including the right to communicate, broadcast law and law of the press. More specific topics include discussion of the first amendment rights, libel, privacy, copyright, advertising, obscenity, pornography and corporate communication concerns. Prerequisites: junior standing and Comm. 130, or departmental assessment.

752. Directed Study. (2-4). Cross-listed as Thea. 675. Individual study or projects. Repeatable for credit with departmental consent. Prerequisite: departmental consent.

782. Investigation and Conference. (2-3). Cross-listed as Thea. 820. Directed research and experimentation for graduate students in some phase of (a) speech communication, (b) electronic media or (c) speech education. Repeatable for credit up to a total of six hours.

750. Introduction to Communications Research. (2). An introduction to historical, critical and observational methodologies in communication research. Emphasizes historical, critical and observational research with particular emphasis on those forms of research common to communication studies. Prerequisite: Comm. 801.

803. Empirical/Quantitative Research Methodologies in Communication. (2). An introduction to empirical research methods in communication. Emphasizes both experimental and nonexperimental research with particular emphasis on the research common to communication studies. Studies research design, methods and reporting techniques. Prerequisite: Comm. 801.
830. Theories of Rhetoric Classical. (3).
Cross-listed as Engl. 825. An intensive study of the rhetorical theories of classical writers from 466 B.C. to the decline of Roman oratory. Principal emphasis on Isocrates, Plato, Aristotle, Quintilian, Cicero and Longinus.

831. Theories of Rhetoric Renaissance to Early Modern. (3). Cross-listed as Engl. 826. A study of the emerging patterns of rhetoric from the Second Sophistic to modern times. Analyzes the rhetorical systems associated with such figures as Augustine, Felenon, Butler, Sheridan, Steale, Rush, John Quincy Adams, Blair, Campbell and Whately.

860. Seminars in Communication. (2-3).
Special seminars designed to treat problems in: (a) speech communication, (b) electronic media or (c) speech education. Repeatable for credit.

865. Organizational Communication. (3). Cross-listed as Mgmt. 665. An analysis of communication models with emphasis on their applications to communication problems in organizations. Explores social psychological processes underlying persuasion in interpersonal and public relations through the mass media. Critically analyzes communication systems and techniques within formal organizations.

870. Directed Research. (2-3). Directed research culminating in a written research paper on a specific investigation, project or production. Supervised by a committee of three graduate faculty members with the committee chair acting as “instructor of record” and awarding the grade. Required of all Master of Arts in Communication (MAC) degree students who select the nonthesis option. Study should be in the student’s area of emphasis. Course should be taken after completion of 24 hours of graduate work approved in the plan of study. Not renewable for credit nor available to students taking Comm. 875-876. Prerequisites: Comm. 801 and 802 or 803.

875-876. Thesis. (2-2).

Computer Science
Graduate Faculty
Professor: Jan Zytkowski
Associate Professor: Mary Edgington (chairperson)
Assistant Professors: Rajiv Bagai, Ashvin Radhiya, Mahesh Rathi (graduate coordinator), Vasant Shanbhogue, Rajshekhar Sunderraman

The Department of Computer Science offers two graduate degree programs, the Master of Computer Science (MCS) and the Master of Science (MS).

Master of Computer Science (MCS)
The MCS is a profession-oriented degree aimed at candidates with substantial background in the computing profession but not necessarily a degree in computer science. Through a wide range of electives outside the computer science department and a sizable graduate project called Practicum, the MCS program seeks to emphasize the impact of computers in application areas. The MCS with software engineering emphasis is an option available for MCS candidates.

Master of Science (MS)
This program offers the more traditional graduate degree intended primarily for candidates with an undergraduate degree in computer science. Through a combination of coherent electives and a research/thesis segment, the MS program seeks to provide a level of concentration suitable for advanced professional work and/or further graduate study in computer science.

Admission Requirements
Candidates seeking to pursue graduate study in computer science are expected to meet the usual requirements for admission to the Graduate School, including the completion of a bachelor’s degree with a minimum GPA of 2.750 in the last 60 hours of course work. All candidates must earn a satisfactory score on both the GRE aptitude test and the GRE subject test in computer science. English language competency must be established by earning a minimum score of 550 on the TOEFL (Test of English as a Foreign Language) Examination. Although neither the MCS nor the MS program requires that the prior bachelor’s degree be in computer science, both programs require the following minimum background in the computer science area.

Background Course Work
The equivalent WSU course work is given in parentheses.
(a) Mathematics
   (1) Two semesters of calculus (Math. 242-243).
   (2) Introductory knowledge of linear algebra and discrete mathematics (Math. 211 and Math. 331).
(b) Programming
   Introductory knowledge of computer programming including documentation practices (CS 200Q) and the knowledge of a programming language, such as Pascal (CS 212), Ada (CS 215), or Modula-2.
   (c) Assembly Language Programming
   One semester of programming in an assembly language (CS 216).
   (d) Basic Data Structures
   Introductory knowledge of computer algorithms and elementary data structures (CS 300).
   (e) Computer Organization
   Introductory knowledge of the functions and interplay of the components of a digital computer (CS 340).
(f) Basic File Structures
   Introductory knowledge of computer file organization and processing techniques (CS 405).

Requirements (b)-(f) are prerequisites to graduate-level course work in computer science. They may be met by (1) completing the equivalent WSU courses, (2) equivalent course work from another accredited institution, (3) passing proficiency tests administered by the department or (4) satisfactory score on the GRE advanced test in computer science.

(g) Foundation Courses
In addition to the prerequisite course work, all master’s candidates must complete four foundation courses:
- Programming Languages (CS 510)
- Operating Systems and Architecture I (CS 540)
- Data Structures (CS 560)
- Software Engineering (CS 580)

For admission to candidacy, MCS candidates must have completed two of these courses and MS candidates must have completed all four.

If taken for graduate credit, MCS candidates may count two of these courses toward the graduate degree. MS candidates cannot apply any credit from these courses toward the graduate degree.

Full or partial waiver is given to those students earning above-median scores in the GRE subject test.

Requirements by Category
Admission to graduate study in the Department of Computer Science may be recommended in one of three categories depending upon the candidate’s interests and background.

I. Degree Category
   All candidates seeking the MCS or MS degree must be admitted to this category. The extent of deficiency in the basic requirements determines the initial status, as follows:
   A. Full-standing
      Must meet all the requirements with no more than six hours of deficiency in the background course work, (a)-(g), with a minimum GPA of 3.000 in all CS-related courses.
   B. Conditional
      Must meet all the requirements with no more than 12 hours of deficiency in the background course work, (a)-(g), and with a minimum GPA of 3.000 in all CS-related courses. The conditional status normally must be removed within one year of admission.
C. Probationary
Candidates fulfilling the requirements for full-standing or conditional status except for the minimum GPA requirements may be recommended for admission in this status. Each applicant's case is evaluated on the basis of other merits which may justify admission.

II. Nondegree A Category
Applicants not seeking a graduate degree may be admitted to this category provided they meet the same requirements as set forth for the Degree Category. The admission criteria for the two statuses in this category—full-standing and probationary—are the same as those of the corresponding statuses in the Degree Category, with the exception that the GRE aptitude and the GRE subject tests are not required for the category.

III. Nondegree B Category
Applicants with substantial deficiencies for the Degree or the Nondegree A categories may be recommended for admission to this category provided they meet the Graduate School requirements for admission and there is reasonable evidence of interest and ability to pursue graduate-level course work. Students in this category are restricted from taking courses numbered 800 or above.

Denial of Admission
Individuals with substantial deficiencies in their background and/or a low GPA in previous course work usually can remedy their deficiencies by enrolling in the College of Liberal Arts and Sciences and satisfactorily completing required background course work. The departmental adviser in computer science will help plan a course of study toward this end.

Degree Requirements—MCS
Candidates for the MCS degree must complete a minimum of 30-32 credit hours of graduate-level course work, as follows:

A. Foundation courses (0-6 credit hours)—All foundation courses (see (g) above) are required. No credit hours from this group may be applied toward the MCS degree.

B. Computer theory (3 credit hours)—CS 720, Theoretical Foundations of Computer Science. No computer science graduate students will be admitted to 800-level courses until they have completed CS 720.

C. Core courses (12 credit hours)—All candidates must complete at least four 800-level courses below 890. For the MCS with software engineering emphasis, two of these courses must be CS 881, Requirements Specification and Design, and CS 882, Testing and Reliability.

D. Electives (6-12 credit hours)—A coherent block of graduate-level electives approved by the candidate's graduate adviser must be taken from a related field such as engineering, business, mathematics or computer science itself. Computer science electives must be selected from courses numbered 600 or above. Candidates for the MCS with software engineering emphasis must take 9 of these credit hours in software engineering-related courses.

Practicum (3 credit hours)—A required part of each MCS candidate's program is a practicum (CS 891) involving a significant project which may be job-related. This project will be supervised by a member of the computer science graduate faculty and, if applicable, by the candidate's supervisor on the job. Candidates for the MCS with software engineering emphasis will complete a practicum related to software engineering.

F. Final examination—Each MCS candidate must pass a final examination by an ad hoc faculty committee. This examination will involve (but not necessarily be limited to) the work done on the practicum.

Degree Requirements—MS
Candidates for the MS degree must complete a minimum of 30-32 credit hours of graduate-level work, as follows:

A. Foundation courses (0 credit hours)—All foundation courses (see (g) above) are required. No credit hours from this group may be applied toward the MS degree.

B. Computer theory (3 credit hours)—CS 720, Theoretical Foundations of Computer Science. No computer science graduate students will be admitted to 800-level courses until they have completed CS 720.

C. Core courses (12 credit hours)—All candidates must complete at least four 800-level computer science courses below 890.

D. Electives (9 credit hours)—Each MS candidate must complete a coherent block of technical electives from computer science or a closely related field, as approved by the candidate's graduate adviser. Computer science electives must be at the 600 level or above.

E. Research/Thesis (6-8 credit hours)—All MS candidates must complete six hours of additional graduate-level coursework, including two credit hours of CS 890 (Graduate Seminar), specifically approved for this purpose.

F. Final Examination—(1) Each MS candidate writing a thesis must pass a final examination by an ad hoc faculty committee. This examination will pertain to, but is not limited to, the subject matter of the thesis. (2) MS candidates opting for additional course work in place of thesis must pass a final comprehensive written examination. This examination will cover a variety of topics which are normally addressed in the foundation, theory and core course work or in the background course work.

Examinations
See "Admission Requirements" above for entry examinations. See the category marked "Final Examination" under each degree for exit examinations.

Courses for
Graduate/Undergraduate Credit

501. Numerical Programming Techniques. (3). 2R; 2L. A study of the programming techniques used to solve nonlinear equations, interpolate, integrate and solve systems of linear equations. Discusses the implications of finite precision floating point arithmetic. Also covers techniques for initial and boundary value problems in ordinary differential equations. Selected algorithms are implemented on the computer. Prerequisites: Math. 243 and CS 300 with grades of C or better.

510. Programming Language Concepts. (3). 2R; 2L. An introduction to the concepts of different styles of languages— imperative languages, logic languages, object-oriented languages, etc. Prerequisites: CS 410 with a grade of C or better.


540. Operating Systems. (3). 3R; 1L. Covers the fundamental principles of operating systems: process synchronization, scheduling,
resource allocation, deadlocks, memory management, file systems. Studies a specific programming language in depth. Programming assignments consist of modifications and enhancements to the operating system studied. Prerequisite: CS 440 with a grade of C or better.

560. Data Structures and Algorithms II. (3). 3R; 1L. Design and analysis of algorithms. Studies specific data structures, e.g., trees, graphs, etc. Emphasizes algorithm design techniques such as greedy, divide and conquer, dynamic programming. Analyzes time and space efficiency of various algorithms. Prerequisites: CS 300 and 320 with a grade of C or better in each.

588. Software Design and Testing. (2), 2R; 1L. Program design tools and techniques and program testing. Includes top-down and bottom-up design, various design paradigms, bottom-up and top-down testing techniques. Emphasizes large program design systems, illustrated by several programming projects. Prerequisite: CS 410 with a grade of C or better.

611. Ada and Software Engineering. (3). 2R; 1L. An in-depth study of the programming language and emphasis on understanding the software engineering principles on which its design is based. Focuses on the novel features the language has to offer such as structured design and development of small and large systems. Laboratory sessions provide hands-on programming experience to reinforce textbook knowledge of the language. Prerequisite: CS 510.

612. Systems Programming. (3). 2R; 1L. A study of system software including assemblers, disassemblers, macroprocessors, link editors, loaders, language translators and debuggers. Practical experience in building system software through programming laboratory exercises. Prerequisite: CS 405 or equivalent with a grade of C or better.

615. Compiler/Interpreter Techniques. (3). 2R; 2L. Review of programming language structures, translation and implementation. Compilation of simple expressions and statements, control structures and hierarchical organization of compilers and interpreters, including lexical and syntactic scan, construction of symbol tables, object code generation, diagnostic error messages and optimization techniques. Prerequisite: CS 405 or equivalent with a grade of C or better.

640. VLSI Systems Design. (3). 2R; 2L. Includes an introduction to VLSI system, MOS switch, integrated system fabrication, data and control flow in systematic structures, implementing integrated system design, overcoming problem in yield and reliability, and system architecture and system timing and highly concurrent systems. Prerequisite: CS 540 or equivalent.

641. Small Systems Architecture. (3). A course on minicomputers and microcomputers and on how small computers are used in today's business environments. Includes general concepts of computer architecture particularly the differences between large computers and small computers and the special operating systems and architectures used. Prerequisite: CS 405 or equivalent. Use of display terminals, cassettes, tapes and disks; networks of small computers; and trends in small computer use and design. Prerequisite: CS 340 or EE 594.

665. Data Base Design. (3). Principles of data base design and management for computer information systems. Examines several logical organization and design techniques. Also discusses problems of security and integrity of data. Prerequisite: CS 405 or equivalent with a grade of C or better.

674. Artificial Intelligence and Philosophy. (3). CS 320 or CS 440. Transfer of ideas between artificial intelligence and philosophy; concepts and techniques of artificial intelligence and their application in philosophy. Prerequisites: CS 405, CS 510 with grades of C or better.

680. Introduction to Software Engineering. (3). 2R; 2L. An introduction to the body of knowledge, presently available tools and current theories and trends regarding the process of program development. Studies these topics from several different viewpoints, ranging from the individual programmer's statement to a large programming project. Prerequisite: CS 585 with a grade of C or better.

684. Applications Systems Analysis. (3). A study of the methods for analyzing business systems problems and other large-scale applications of the computer. At the crossroads of computer technology, management sciences and systems analysis. Prerequisite: CS 340 or equivalent.


705. Workshop in Computer Science. (1-5). Short-term courses with special focus on introducing computer science concepts. Repeatable for credit. Prerequisite: departmental consent.

771. Artificial Intelligence. (3). Heuristic and algorithmic methods, principles of heuristic approach and cognitive processes. A study of the objectives of artificial intelligence research and simulation of cognitive behavior. Includes a survey of appropriate examples from various areas of artificial intelligence research. Prerequisite: CS 300.

773. Pattern Recognition. (3). An introduction to pattern recognition, including clustering algorithms, model selection, feature extraction, classifier design, Bayes decision theory, parameter estimation, image enhancement, computer vision, and applications in various fields. Prerequisites: CS 212 and Math. 211 or 511, 243 and 3140 with grades of C or better. Stat. 370 recommended but not required.

777. Expert Systems. (3). Planning, construction and application of expert systems. Discusses major aspects of expert systems, illustrates with various examples, including data representation, knowledge bases, inference engines, user interfaces, explanation facilities, metarules and dealing with uncertainty. Introduces basics of a production system language. Prerequisite: CS 580 or instructor's consent.

798. Individual Projects. (1-3). Allows beginning graduate students and mature undergraduates to pursue individual projects of interest in computer science. Graded S/U only. Prerequisite: departmental consent.

Courses for Graduate Students Only

No computer science graduate students will be admitted to 800-level courses until they have completed CS 720.


821. Analysis of Algorithms. (3). Introduction to the techniques used to analyze both specific algorithms and classes of algorithms. Covers popular models, including Knuth's M/M/1 queueing networks. Studies specific techniques, including: divide-and-conquer, recurrence equations and dynamic programming. Analyzes applications to set operations, hashing and sorting. Transitive closure and partitioning. Prerequisites: CS 560 and either 420 or graduate standing.
A study of advanced topics in computer architecture, like parallel processing and network architectures, computer performance evaluation and reliability of computing systems. Studies architecures of typical systems like those of the IBM, CDC and Burroughs families of computers. Prerequisite: CS 540.

A comprehensive treatment of the design of executive softwares for systems ranging from simple multiprogramming to multiprocessor and networked systems. Includes concepts of concurrent and parallel processes, related problems of intra- and inter-system communication, synchronization and integrity. Presents general principles of resource management as related single-processor and multiprocessor environments. Prerequisite: CS 540 or EE 694.

A study of hardware and software features of on-line multiple computer systems emphasizing network design and telecommunication. Includes network protocols, interprocessor communication and centralization versus distribution. Also includes study of the use of microcomputers in representative operating systems. Prerequisite: CS 540 or 641 or EE 694.

884. Principles of Data Base Design. (3).
An advanced treatment of the principles of data base design. Addresses logical design, including relational models; physical design, including new technological advances in implementing very large data bases; security and integrity of data; and distributed data base networks. Prerequisite: CS 560.

885. Machine Learning and Discovery. (3).
An advanced study of computer programs that learn, improve performance and make discoveries. Includes objectives, methods and research paradigms for such systems, a survey of existing methods and applications, including the most recent developments; theoretical principles for learning and discovering; and computational theories of learning processes and cognitive models of human learning; concept and the theory, formation and use of analogy in learning. Includes computing and programming a project such as developing a computing learning system. Prerequisite: CS 771 or 776 or 214 and 574, or CS 214 and 773.

886. Computer Vision. (3).
An introduction to computer vision, a rapidly growing subfield of artificial intelligence. The basic topic is the understanding or description of images by a computer or robot. Covers two-dimensional Fourier analysis, scene matching and understanding, texture, motion, shape recognition, relational image structure and human perception. Prerequisite or CS 773 or instructor's consent.

887. Simulation and Modeling. (3).
An up-to-date treatment of the important aspects of a simulation study, including data generation and testing, construction and verification of models, simulation with high-level programming languages and simulation with GPS. Prerequisites: CS 300 or AE 327, Math. 344 and Stat. 571 or IE 354.

888. Software Specification and Design. (3).
A detailed presentation of the techniques and tools available for the specification of software requirements and their translation into a design. Includes formal specification and design methods such as structured analysis, object-oriented design and JSD. Prerequisite: CS 580.

889. Topics in Software Engineering. (3).
An in-depth study of one or more topics in software engineering, such as Configuration Management, Quality Assurance, Formal Specification, or Real-time Software Development. Actual topics vary with instructor’s area of expertise and need for credit with different topics, but topics taken under prior course numbers may not be repeated. Prerequisite: CS 580.

890. Graduate Seminar. (1).
A series of seminars on topics of current research interest in computer science. Participants are required to present one or two seminars on topic(s) to be selected with the approval of their graduate advisers. Repeatable up to four credit hours. Graded S/U only. Prerequisite: departmental consent.

892. Thesis. (1).
A year-long study of advanced topics in computer science. Includes opportunities for research, conference attendance, and the writing of an advanced research project. Prerequisite: departmental consent.

893. Individual Reading. (1-5).
Graded S/U only. Prerequisite: departmental consent.

899. Special Topics. (2-3).
Topics of current interest to advanced students of computer science. Repeatable for credit with departmental consent. Prerequisite: departmental consent.

**English**

Graduate Faculty

Distinguishing Professor: Albert Goldbarth
(Adele M. Davis Distinguished Professor of Humanities)

Professors: James Lee Burke, Frank S. Kastor, James D. Merriman, Philip H. Schneider, Helen J. Throckmorton

Associate Professors: Tina Bennett-Kastor, Sarah B. Daugherty (graduate coordinator), James P. Erickson, Anthony P. Gyles, W. Stephen Hathaway, Gerald B. Hoag, James A. Sember, John A. Stephens, Donald Wineke (chairperson), William F. Woods, Peter T. Zoller

Assistant Professors: Elizabeth E. Adams, Roger Berger, Jeanine M. Hathaway, Diane Quantic, Harold Veeseer

Both the Master of Arts (MA) degree in English and the Master of Fine Arts (MFA) degree in creative writing are offered by the English department at the Wichita State University.

**Master of Arts**

The Master of Arts (MA) program in English is designed to equip graduate students with the knowledge and skills necessary both to the outstanding teacher and to the well-prepared candidate for further graduate study. The graduate committee of the department accordingly requires its master's candidates to follow a course of advanced study that leads to a comprehensive knowledge of English and American literature rather than a course that develops specialization in one or two areas. Candidates also are given training in the principles of literary criticism and in the use of bibliographical tools so that they will have a general competence in criticism and research, although they may not be professional critics or research experts.

**Admission Requirements**

Applicants must meet the general requirements of the Graduate School, with the additional requirement that they have a 3.000 grade point average in their previous work in English courses. The coordinator of graduate studies in English will then evaluate the applicant's transcript, prescribing additional undergraduate hours for those who have fewer than 24 credit hours in English and American literature or in other work acceptable to the Department of English. Courses in freshman composition, grammar, teaching methods, journalism, speech, etc., may not be included in the required 24 hours. Exceptions may be made for outstanding students who have majored in related fields.

Applicants who earned their undergraduate degrees more than ten years before the time of application for admission must be interviewed by the graduate coordinator before admission to the degree program.

Applicants who have earned degrees at institutions in countries in which English is not the native language must score at least 600 on the TOEFL (Test of English as a Foreign Language) Examination before being admitted to the MA degree program in English.

**Counseling**

All MA candidates in English are advised by the coordinator of graduate studies in English. The coordinator and the student establish a Plan of Study that takes into account the student's interests and future vocational plans.
Transfer of Credit

Students must complete 24 hours of credit at Wichita State within the English department. Students may transfer up to nine hours of credit on the Plan A program and up to six hours of credit on plans B and C. If the credit to be transferred comes from a program in which the student took a graduate degree, the time limits imposed by the Graduate School on other transfer of credits will not apply.

Language Requirement

Master’s degree candidates in English may fulfill the department’s foreign language requirements in any one of the following ways:

1. By submitting a transcript showing the successful completion of at least 15 hours of undergraduate work in a single foreign language or the equivalent as defined by Fairmount College of Liberal Arts and Sciences

2. By completing the required 15 hours of undergraduate work in a single foreign language

3. By taking the Graduate School Foreign Language Test (GSFLT) in the elected foreign language, with a successful score determined by the English department

4. By submitting a transcript showing successful completion of six hours of linguistics.

Master’s candidates with a creative writing emphasis (Plan C) have the additional choice of successfully completing six semester hours of foreign literature in translation in courses approved by the department’s graduate committee as a substitute for the language requirement.

Degree Requirements

Engl. 800 (Introduction to Graduate Study in English) normally should be included in the student’s first semester of graduate study.

All work to be counted toward the MA degree in English must be in courses numbered above 700—with the exception of 680 (Theory and Practice in Composition)—and the following courses in linguistics and in literature: Engl. 515, 521, 522, 524, 526, 527, 610, 665, 667 and 672. Engl. 515 may be taken to fulfill in part the major author and/or optional course requirements of the degree plans. Engl. 521, 522, 524, 526 and 527 may be taken to fulfill the period and/or optional course requirements of the degree plans. Candidates offering 500-, 600- or 700-level English courses for graduate credit must satisfy a higher differential of performance relative to undergraduate students in the same courses, with the nature of this differential set by professors.

There are three programs leading to the degree. Plan A, which emphasizes literature, composition and pedagogy, is especially designed for teachers. Plan B, which requires the student to submit a master’s essay, places more emphasis on research and independent study. It is especially recommended for those who intend to pursue the PhD degree, but teachers may also find it particularly suitable. Plan C emphasizes creative writing. Students are assumed to be following Plan A unless they declare another plan.

Plan A requires the completion of 11 courses for a total of 33 semester hours distributed as follows: Engl. 800 (Introduction to Graduate Study in English); two genre courses; four period courses in the Engls. 817-823 series and/or 521-527 series, with a minimum of two courses in English literature and one course in American literature; one course in rhetorical theory (Engls. 825 or 826); one course in composition theory and pedagogy (Engls. 680 or 780); and two elective courses in linguistics, literature or methods of teaching English. With the approval of the Graduate Studies Committee, one of these electives may be taken in the College of Education. Regents' rules require that at least seven courses be at or above the 700 level. A master’s essay is not required, but students must take a comprehensive examination on one period, one genre and one area of composition, rhetoric or linguistics. In consultation with the candidate, an advisor in each of the three examination fields will designate up to five books, in addition to those covered in the candidate’s course work, for which the student will be responsible. The book list will thus include a maximum of 15 works. This list must be approved by the Graduate Coordinator.

Plan B requires nine courses plus a master’s essay for a total of 30 semester hours distributed as follows: Engl. 800 (Introduction to Graduate Study in English), two genre courses, two major author or special topics courses, two period courses, two optional courses and Engl. 870 (Master’s Essay). Regents’ rules require that at least six courses be at or above the 700 level. Plan B also requires a comprehensive examination on one period (or linguistics), one genre and one major author or special topic related to the master’s essay, as arranged with the thesis advisor. The first two examination fields should also be consistent with the subject of the master’s essay. In consultation with the candidate, an advisor in each of the three examination fields will designate up to five books, in addition to those covered in the candidate’s course work, for which the student will be responsible. The book list will thus include a maximum of 15 works. This list must be approved by the Graduate Coordinator.

Plan C, a program with an emphasis on creative writing, requires the completion of 30 semester hours plus a comprehensive examination and a thesis, which must be original work in fiction, poetry or some other suitable literary form. A student’s program, individually designed in consultation with the director of creative writing, must include nine semester hours in the graduate creative writing sequence. The final comprehensive examination will be based on a list of 40 book-length works that the student will be held accountable for; the list will be drawn up by the student in consultation with the director of creative writing and with the approval of the graduate coordinator. The number of sections of the Plan C comprehensive examination and its length will be equivalent to that given under Plan B, although the content will be based on the list of book-length works described above.

Admission to the Plan C program will be made upon the recommendation of the director of creative writing upon approval of a manuscript or other written evidence of ability to complete the degree. Such recommendation is subject to the final approval of the graduate coordinator.

Master of Fine Arts in Creative Writing

The degree program for the Master of Fine Arts (MFA) in creative writing is a terminal one in which emphasis is placed on the development of attitudes, skills and understanding in the practice of imaginative writing, along with related academic study. The WSU program is not conceived as a solely skill-oriented program. It places emphasis on the development of fine writers who also are able, as a result of additional course work in English, to demonstrate skills useful in teaching, editing and in pursuing other areas related to creative writing. The program allows for a core of activity in creative writing and for a thesis which will necessitate specialization in poetry, short fiction, the novel or work in some other appropriate form. Flexibility is provided in additional areas of required study to allow for a variety of possible emphases.

Since all MFA students participate in the English department’s graduate program, they are required to take Eng. 800 (Introduction to Graduate Study in
English). Teaching assistants are required to take the in-service training course unless specifically exempted.

Admission Requirements
Applicants must meet the general requirements of the Graduate School, with the additional requirement that they have a 3.000 grade point average in their previous work in English courses. The coordinator of graduate studies in English, in consultation with the director of creative writing, evaluates the applicant's transcript, prescribing additional undergraduate hours for those who have fewer than 24 credit hours in English and American literature and creative writing or in other work acceptable to the English department. Courses in freshman composition, grammar, teaching methods, journalism, speech, etc., may not be included in the required 24 hours. Exceptions may be made for outstanding students who have majored in related fields. Gifted writers may study in the program as special students with no specific degree intentions.

Applicants who earned their undergraduate degrees more than ten years before the time of application for admission must be interviewed by the graduate coordinator before admission to the degree program.

Applicants who have earned their degrees at institutions in countries in which English is not the native language must score at least 600 on the TOEFL (Test of English as a Foreign Language) Examination before being admitted to the MFA degree program in creative writing.

Degree Program Status
Applicants who seek to be admitted with full standing in the degree program must submit a sample of original writing in fiction (one short story or 20 pages), poetry (four to six poems) or other appropriate form to the coordinator of creative writing at the time they seek admission.

A student may be admitted into the MFA degree program in creative writing on a conditional basis pending approval of a manuscript demonstrating enough talent to suggest successful completion of the degree. Students may submit such a manuscript prior to beginning their course work or may wait until their first semester. In no case may the manuscript be submitted later than the first semester of course work. Students are notified of the dates by which manuscripts are to be submitted.

Counseling
All MFA candidates in English are advised by the coordinator of graduate studies in English, after consultation with the director of creative writing.

The graduate coordinator and the student will establish a Plan of Study that takes into account the student's interests and future vocational plans.

Transfer of Credit
A minimum of 24 of the total 48 semester hours required for the MFA degree in creative writing must be taken at Wichita State. No more than 24 hours of credit may be counted toward the degree from other graduate work taken at Wichita State or at another school. If the credit to be transferred comes from a program in which the student took a graduate degree, the time limits imposed by the Graduate School on other transfer of credit will not apply; 24 hours may be accepted toward the MFA.

Degree Requirements
Course Work. The 48 semester hours of course work are apportioned into two categories: required and elective courses.

A. Required Courses
1. A minimum of three hours per semester in Engl. 801 (Creative Writing: Fiction) or 805 (Creative Writing: Poetry) to a maximum of 12 semester hours.
2. Three hours in Engl. 800 (Introduction to Graduate Study in English) or the equivalent, required of all graduate students. Engl. 800 should be included in the student's first semester of graduate study.
3. Three hours in Engl. 830 (Graduate Studies in Drama), 832 (Graduate Studies in Fiction) or 834 (Graduate Studies in Poetry). With departmental consent, each course may be repeated for a maximum of six hours credit.
4. Three hours in Engl. 841, 860 or another suitable seminar in literature. With departmental consent, seminars may be repeated for a maximum of 12 hours credit.
5. Two to six hours in Engl. 875 (Master's of Fine Arts Essay).
6. For purposes of enrichment, candidates emphasizing fiction and poetry must take at least three graduate hours of comparative literature, literature in translation, foreign language, literary editing or an applied course in another art or discipline. The choice is contingent upon the student's having the proper prerequisites.
7. Graduate teaching assistants are required to take the in-service training course, Engl. 780 (Advanced Theory and Practice in Composition), unless specifically exempted.

B. Elective Courses

All candidates must successfully complete a minimum of 15 elective hours in English courses numbered 800 and above, with the exception of English courses numbered 515 through 527, which may be taken for graduate credit. Candidates may take up to 26 elective hours in English courses numbered 800 and above and in the approved 500-level courses. Other exceptions may be made as approved by the director of creative writing and with the consent of the graduate coordinator. Candidates offering 500-, 600- or 700-level English courses for graduate credit must satisfy a higher differential of performance relative to undergraduate students in the same courses, with the nature of this differential performance set by professors. Elective courses may be taken to strengthen areas of weakness; to pursue historical, technical or theoretical studies that candidates find useful; or to enrich their degree program appropriately. As many as nine hours of Engl. 880 (Writer's Tutorial: Fiction), Engl. 881 (Writer's Tutorial: Poetry) and Engl. 855 (Directed Reading) may be offered in technical studies related to creative writing.

Comprehensive Examination. All candidates are required to pass a written comprehensive examination in the final semester of their course work. This examination is based on a reading list of 40 books chosen by the candidate's thesis director and the director of creative writing in consultation with the candidate.

Thesis. The MFA thesis in creative writing consists of a body of original work of publishable quality. The manuscript must be of such length as is appropriate to published books in its genre and is to be written under the direction of a member of the program staff. Candidates must preface their theses with short introductions.

Oral Examination. Once a candidate has submitted the thesis, a committee is appointed to meet with the candidate and examine the work in the manner specified by the Graduate School.

Composition

Courses for Graduate/Undergraduate Credit

510. Peer Tutoring. (2) Explores strategies for using peer tutoring and collaborative learning to teach composition. Special emphasis to diagnosis and evaluation of writing abilities, conducting individual and group conferences, the writing process, the basic elements of Standard Written English and theories of second language and dialect acquisition. Concurrent enrollment in Engl. 511 recommended. This course or equiva-
lent preparation required of those intending to serve as tutors in the writing lab. Prerequisite: instructor’s consent.

511. Tutorial Practicum. (1) Required of all students intending to serve as tutors in the writing lab, this course provides supervised tutoring experience. Prerequisite: previous or concurrent enrollment in ENG 510.

680. Theory and Practice in Composition. (3). Introduction to theories of rhetoric, research in composition and writing programs and practices in schools and colleges. Students investigate the process of writing, analyze varieties and samples of the writing and develop their own writing skills by writing, revising and evaluating their own and others work. Designed especially for prospective and practicing teachers and may not be taken for credit by students with credit in ENG 780.

680Q. Advanced Composition. (3). Explores the relationships among contemporary issues, problem-solving and communication. The first objective is to engage students in interdisciplinary inquiry into some aspect of social policy, inquiry which asks students to apply the analytical approaches of their major fields to current issues of broad, general interest. The second objective is to develop students’ abilities to communicate their knowledge and assumptions about this issue to a variety of audiences and for a variety of purposes. Prerequisites: ENG 101 and 102 and upper-division standing.

780. Advanced Theory and Practice in Composition. (3). Designed for teaching assistants in English. Review of new theories of rhetoric, recent research in composition and new writing developments in composition programs in schools and colleges. Students are given practice in advanced writing problems, situations and techniques and may propose projects for further special study.

Creative Writing

Courses for Graduate/Undergraduate Credit

517-518. Playwriting I and II. (3;3). Cross-listed as Thea. 516 and 517. Not repeatable for credit.

585. Writer’s Tutorial: Prose Fiction. (3). Tutorial work in creative writing in prose fiction with visiting writer. Repeatable for credit. Prerequisite: consent of creative writing director.

586. Writer’s Tutorial: Poetry. (3). Tutorial work in creative writing in poetry with visiting writer. Repeatable for credit. Prerequisite: consent of creative writing director.

604. Writing Seminar: Fiction. (3). Advanced course designed primarily for the nontraditional student, both graduate and undergraduate, who desires intensive experience in the conceptualization and writing of poetry. Not credited toward the MFA degree. Prerequisites: six hours of undergraduate creative writing or instructor’s consent based on submitted manuscript. Departmental consent required for undergraduate enrollment.

605. Writing Seminar: Poetry. (3). Advanced course designed primarily for the nontraditional student, both graduate and undergraduate, who desires intensive experience in the conceptualization and writing of poetry. Not credited toward the MFA degree. Prerequisites: six hours of undergraduate creative writing or instructor’s consent based on submitted manuscript. Departmental consent required for undergraduate enrollment.

Courses for Graduate Students Only

801. Creative Writing: Fiction. (3). Advanced work in creative writing. Repeatable for credit. Prerequisite: consent of creative writing director.

805. Creative Writing: Poetry. (3). Advanced work in the writing of poetry. Repeatable for credit. Prerequisite: consent of creative writing director.

875. Master of Fine Arts Essay. (1-6).

880. Writer’s Tutorial: Fiction. (3). S/U grade only. Tutorial work in creative writing in prose fiction with visiting writer. Prerequisite: consent of creative writing director.


Linguistics

Courses for Graduate/Undergraduate Credit


667. English Syntax. (3). Cross-listed as Ling. 667 and Anthr. 667. A study of the major facts of English sentence construction and relating them to linguistic theory. Prerequisite: Engl. 315 or equivalent or departmental consent.

672. Studies in Language Variety. (3). Cross-listed as Ling. 672. An introduction to the study of language variety with special attention to regional and social dialect in America and methods of studying it. May be repeated for credit when content varies. Prerequisite: Engl. 315 or departmental consent.

727. Teaching English as a Second Language. (2-3). Cross-listed as Ling. 727 and ED. 727. Discusses current methods of teaching English to non-native speakers. Students learn to analyze interlanguage patterns and to design appropriate teaching units for class and language laboratory use.

740. Graduate Studies in Linguistics. (3). Cross-listed as Ling. 740. Selected topics in theories of language and methods of linguistic study. With departmental consent, the course is repeatable for credit.

Literature

Courses for Graduate/Undergraduate Credit

503. Studies in American Literature I. (3). The major fiction, poetry and nonfiction prose of the classic American period. Discussions may include the historical evolution of American letters, the development of the novel and romance, the transcenden-

tal period and the rise of western and regional literatures.

504. Studies in American Literature II. (3). Fiction, poetry and drama from the late 19th century, since World War II. Readings may also include literary criticism and other types of nonfiction prose. Discussions cover topics and literary forms inspired by the social and cultural movements and events of the first half of the 20th century.

512. Studies in Fiction. (3). Subjects announced each semester. Repeatable for credit.


514. Studies in Drama. (3). Subjects announced each semester. Repeatable for credit.

515. Studies in Shakespeare. (3). Subjects announced each semester. Repeatable for credit, except by students who take ENG 340Q. Prerequisites: junior standing and one college literature course or instructor’s consent.

521. Readings in Medieval Literature. (3). English and Continental literature, 12th to 15th century. Chaucer, Malory, the Pearl, Poet, medieval lyric, drama, epic, romance and saga. Prerequisites: junior standing and one college literature course or instructor’s consent.

522. Readings in Renaissance Literature. (3). Sidney, Spenser, Shakespeare (poetry), Donne, Jonson, Milton, and their contemporaries. Prerequisites: junior standing and one college literature course or instructor’s consent.

524. Readings in Restoration and 18th Century Literature. (3). Swift, Pope, Johnson and their contemporaries. Prerequisites: junior standing and one college literature course, or instructor’s consent.

526. Readings in Romantic Literature. (3). Blake, Wordsworth, Coleridge, Byron, Shelley, Keats and their contemporaries. Prerequisites: junior standing and one college literature course, or instructor’s consent.

527. Readings in Victorian Literature. (3). Writers from Carlyle to Yeats studied in relation to political events and the social, scientific and religious thought of the age. Prerequisites: junior standing and one college literature course, or instructor’s consent.


533. Studies in Contemporary Literature. (3). Modern literature, primarily British and American, since 1950. Subjects announced each semester. Repeatable for credit.

535. Literary Images of Women: Diverse Voices. (3). Cross-listed as WM. 535. Explores literature written in English by women of diverse ethnic, racial, class and other backgrounds, as well as of varying sexual orientations, ages and degrees of physical ability. Materials analyzed both as literary works and as expressions of women’s differences from one another. Works selected on their specific attention to the
question of gender as it intersects with other elements of culture.

536. Writing by Women. (3). Cross-listed as Wom. 5. 536Q. Explores various themes in critical approaches to literature composed by women writers, especially those whose works have been underrepresented in the literary canon. Genres and time periods covered, critical theories explored and specific authors studied vary in different semesters.

580. Special Studies. (1-3). Topic selected and announced by the individual instructor. Repeatable for credit. Prerequisite: departmental consent.

610. Old English. (3). Cross-listed as Ling. 610.

750. Workshop. (2-4). Repeatable for credit.

Courses for Graduate Students Only

800. Introduction to Graduate Study in English. (3). Especially designed to prepare students to perform effectively in graduate classes in English. Concerned with: (1) basic bibliography, methods and tools; (2) terminology both technical and historical; (3) various approaches to the study of literature, such as intrinsic analysis of a literary work, the relationships of biography to literary study and the relevance of other disciplines, such as psychology to literature; and (4) the writing of interpretative and research essays. Throughout the semester a balance between criticism and research is maintained.

817. Graduate Readings in 20th Century British Literature. (3). Yeats, Joyce, Lawrence, Auden, Spender and their contemporaries.

821. Graduate Readings in American Literature I. (3). From the beginnings to 1870 emphasizing Emerson, Thoreau, Hawthorne, Melville, Whitman and Dickinson.

822. Graduate Readings in American Literature II. (3). From 1870 to 1920 emphasizing James, Twain, Crane, Dreiser, Robinson and Frost.


826. Theories of Rhetoric: Renaissance to Early Modern. (3). Cross-listed as Comm. 831. A study of the emerging patterns of rhetoric from the Second Sophistic to modern times. Analyzes the rhetorical systems associated with such figures as Augustine, Fenelon, Bulwer, Sheridan, Steele, Rush, John Quincy Adams, Blair, Campbell and Whately.

830. Graduate Studies in Drama. (3). Selected topics in the history and nature of dramatic literature.

832. Graduate Studies in Fiction. (3). Selected topics in the development of the form and content of prose fiction.

834. Graduate Studies in Poetry. (3). Selected topics in forms, techniques and history of poetry.


841. Graduate Studies in Contemporary Literature. (3). Covers selected topics in the literature of the last quarter-century, including literature in translation. Deals with a broad range of authors and genres; but with change of content and departmental consent, it will be repeatable for credit.

845. Graduate Studies in a Major Author. (3). Careful study of the works of a major author with readings in secondary sources, reports, discussions and papers. Repeatable for credit with change of content.

855. Directed Reading. (2-3). Designed for graduate students who want to pursue special research in areas not normally covered in course work. Repeatable for credit with departmental consent. Prerequisite: departmental consent.

860. Graduate Seminar in Special Topics. (3). Intensive study of selected texts, writers or literary problems. Seminar discussions, reports and research projects. Repeatable for credit with departmental consent.


875. MFA Essay. (3-6).

Geology

Graduate Faculty

Distinguished Professor: Daniel F. Merriam (Endowment Association Distinguished Professor of Natural Sciences)

Professors: James N. Gunderson, Salvatore J. Mazzullo, Peter G. Sutterlin

Associate Professors: William E. Full, John C. Gries (chairperson and graduate advisor)

Emeritus: J. Robert Berg, Paul Tasch

The Department of Geology offers courses of study leading to the Master of Science (MS) degree.

Admission Requirements

Admission to the MS program in geology requires the completion of an undergraduate major in geology, normally including the achievement of the skills of geologic field mapping of igneous, metamorphic and sedimentary rocks; their petrology; and report writing on their geological evolution.

In general, students entering the program must have the same background required for a WSU Bachelor of Science degree, including science courses in chemistry, physics and biology; mathematics and statistics; language (English, speech and a modern foreign language); and computer science abilities. Students with undergraduate majors in the sciences, mathematics or engineering are encouraged to apply because their training is appropriate for certain fields in modern geology. Most deficiencies can be removed by appropriate course work but prior consultation and evaluation are encouraged.

Degree Requirements

Although the department emphasizes field and laboratory skills of sedimentary geology, graduates may elect advanced courses and guided research to meet professional needs in a wide variety of geologic fields. Particular attention is directed to solving problems of mineral-fuel and mineral-resource depletion and to improving the environment. The practical aspects of geology are stressed and modern approaches of computer applications are employed in solving problems.

The student must be accepted by the Graduate College and by the Department of Geology: this assures all prerequisites have been fulfilled. In general, 30 credit hours are required. One to six of these hours may be thesis credit and at least 18 must be at the 700 and 800 level. The department encourages students to take courses relevant to their program outside geology.

Tool Requirement. Although the department does not have a tool requirement, students are encouraged to obtain proficiency in modern languages (especially French, German and/or Russian), particularly if continuing for a PhD. Also it is important to have a certain level of proficiency in statistics and computer programming (FORTRAN, BASIC and/or Pascal are recommended).

Examinations. The student is required to present the thesis proposal—Geol. 890—orally before the faculty to obtain approval before initiating work on the project. The proposal must be presented in enough detail to assure the faculty of the research promise of the topic and that the candidate can complete satisfactorily the project in the allotted time. Upon passing the oral examination, the written proposal is approved. After completing the thesis, the student must give a public oral defense. All graduate students are required to enroll in Geol. 701, a one-hour credit seminar, as an introduction to experimental skills in research.

Courses for Graduate/Undergraduate Credit

501. Raw Materials of Antiquity. (3). 2R; 2L. Lab fee. Nature of rocks, minerals and metallic ores used in prehistoric and ancient times. Also weathering, sedimentation and soil-forming processes; elements of stratigraphy; geologic history of the Pleistocene and Recent Epochs; relative and absolute age dating; mineralogy of clays and ceramics; and mining and metallurgical processes of antiquity. Prerequisite: Anthr. 501 or equivalent or instructor's consent.

in the quantitative determination of rock-forming minerals and mineraloids in thin sections and identification of oil fields. Prerequisite: Geol. 320.

526. Sedimentary Geology. (3). 2R; 3L. Lab fee. Origin, classification, primary structures and physicochemical processes controlling deposition of sedimentary rocks, especially carbonates. Includes an analysis of modern and ancient sedimentary depositional environments and a systematic petrographic study of sedimentary rocks in thin section, insoluble residues and heavy-mineral analysis. May require field trips. Prerequisite: Geol. 324.

540. Field Mapping Methods. (3). 9L. Lab fee. (Instructor’s option) with special reference to the use of level, compass, barometer, alidade and airphotos. Field trips required. Prerequisite: Geog. 201 or Geol. 111Q.

544. Structural Geology. (3). 2R; 3L. Lab fee. Stress-strain theory and mechanics of rock deformation, description and genesis of major tectonic features in rocks resulting from diastrophism elements of global tectonics and laboratory solution of geometric problems in three dimensions and time. May require field trips and field problems. Prerequisites: Math. 112 or 123 and Geol. 552 (or taken concurrently).

550. Physical Stratigraphy. (3). 2R; 3L. Lab fee. Description, classification, correlation and relative ages of stratigraphic rock units and the origin of primary structures of specific sedimentary rocks. Laboratory emphasis on bioclastic microscopic examination and physical properties of unconsolidated sediments and clastic sedimentary rocks. Requires field instruction in stratigraphic mapping methods. Prerequisites: Geol. 312, 320 and 540 or equivalent.

560. Geomorphology. (3). 2R; 3L. Lab fee. Identification and interpretation of genesis of landforms and a critical examination of processes producing the landforms, including elements of quantitative geomorphology. Requires field trips (instructor’s option). Prerequisite: Geol. 111Q.

582. Regional Geology of the United States. (3). A detailed regional survey of the general geology, geomorphology, stratigraphy and structural geology and their relationship in the United States. Requires field trips and engineering works. Introduces remote sensing methods. Requires field trips (instructor’s option). Prerequisite: Geol. 560 or instructor’s consent.

584. Map and Aerial Photograph Interpretation. (3). 2R; 3L. Lab fee. Elements of map and aerial photograph composition; interpretation and application of maps and photos in geology, geography, urban planning, land-use inventory and engineering works. Introduces remote sensing methods. Requires field trips (instructor’s option). Prerequisite: Geol. 111Q, Geog. 201 or equivalent.

570. Biogeology. (3). 2R; 3L. Lab fee. Systematic survey of major fossil biogeological materials, analysis of the origin and evolution of life and palaeoecological interpretation of ancient environments and climates. Makes handlins and bioclastic microscopic examination of major fossil biogeological materials. Includes application of analyzed fossil data to the solution of problems in biogeochronology, paleoecology, paleo-

574. Special Studies in Biogeology. (3). 2R; 3L. Lab fee. A systematic study in selected areas of biogeology and paleontology. Content differs, upon demand, to provide in-depth analysis in the fields of: (a) invertebrate paleontology, (b) vertebrate paleontology, (c) micropaleontology, (d) palynology and (e) paleoecology. Gives appropriate background training in the systematic, taxonomy and biogeological relationships within the selected fields listed. May require field trips. Repeatable for credit to cover all five areas listed.

581. Numerical Geology. (3). 2R; 3L. Treatment of numerical data in geology, including univariate and bivariate statistics and elementary programming in FORTRAN. A study of geological data and computer techniques used to analyze them as well as case histories of application of these technique. Prerequisites: Geol. 312, Stat. 370, CS 200Q and 201Q or permission of instructor.

600. Field Geology. (3). Field investigation of sedimentary, igneous and metamorphic rock units and their structures. Includes the application of mapping methods in solving geologic problems. Field trips of both on-campus and off-campus field camp for five weeks (including weekends). Preparation of a report on geologic columns, sections, maps and an accompanying professionally written report are due on campus during the six week. Prerequisite: 12 credits of advanced geology, preferably including a field-mapping methods course or instructor’s consent. Offered jointly with Kansas State University.

603. Environmental Geology. (3). 2R; 3L. Lab fee. The hydrologic cycle, physical and chemical properties of water; fluid flow through permeable media; exploration for and evaluation of groundwater; water quality and pollution; and water law. Prerequisites: Geol. 552 and Math. 243 or instructor’s consent.

657. Earth Science Instructional Methods. (3). Practice in teaching an introductory course in the earth sciences. Developing and presenting the latest scientific laboratory techniques and evaluating their effectiveness. May be taken more than once if content and objectives differ. Prerequisite: senior standing and department chairperson’s permission.


680. Economic Geology. (3). 2R; 3L. Lab fee. Occurrence of metallic and nonmetallic economic mineral deposits and the physical-chemical principles governing their origin. Analysis of economic deposits and evaluation of the determinant of ore and industrial minerals and elements of mineral beneficiation. May require field trips. Prerequisite: Geol. 324.

682. Petroleum Geology. (3). 2R; 3L. Lab fee. Origin, migration and accumulation of oil and gas in the earth’s crust as well as the distribution and significant features of important fluid energy alternatives and impacts. May require field trips. Prerequisite: Geol. 544.

684. Subsurface Geology. (3). 2R; 3L. Lab fee. All subsurface methods, including laboratory, logging, testing and treatment, valuation and mapping methods. Requires field trips (instructor’s option). Prerequisites: Geol. 682 and Phys. 214Q or equivalent.

690. Special Studies in Geology. (1-3). Systematic study in selected areas of geology. Content differs and is repeatable for credit. Requires laboratory work or field trips (instructor’s option). Offered on demand. Prerequisite: instructor’s consent.

698. Independent Study in Geology. (1-3). Independent study on special problems in the field of geology: (a) general, (b) mineralogy, (c) petrology, (d) structural, (e) palaeontology, (f) economic geology, (g) sedimentary geology’s place in evidence. Prerequisites: Graduate study’s place in evidence. Prerequisite: consent of sponsoring faculty.

701. Seminar. (1). Current topics in geology. Reports on current student and faculty research. Required of all new degree-seeking graduate students.

720. Geochemistry. (3). The chemistry of earth materials and the important geochemical processes and cycles operating on and within the earth through time. Prerequisites: Geol. 324 and Chem 112Q.

750. Workshop in Geology. (1-3). Short-term courses with special focus on geological problems. Prerequisites: graduate standing and/or instructor’s consent.

Courses for Graduate Students Only

800. Research in Geology. (3). 9L. Lab fee. Research in special areas of geology: (a) general, (b) mineralogy, (c) petrology, (d) structural, (e) palaeontology, (f) economic geology, (g) settlement, (h) stratigraphy, (i) geophysics and (k) petroleum. Requires a written final report. Prerequisite: consent of sponsoring faculty.

808. History of Geology. (1-3). Selected events and personalities in geology that have led to our present understanding of geology’s place in science. Prerequisite: instructor’s permission.

810. Advanced Graduate Studies in Geology. (1-6). Systematic study in a selected topic of professional or applied geology. Course given upon demand and may be repeated for credit when locality and content differ. May require field trips. Prerequisites: graduate standing, instructor’s consent and two years of professional postgraduate practice in geology.

823. Igneous and Metamorphic Petrology. (3). 1R; 6L. Lab fee. Mineral paragenesis, bulk chemical composition, chemical relationships, textures, structures, origins and classifications of igneous and metamorphic rocks. Requires field trips (instructor’s option). Prerequisites: Geol. 520.

of mineral compositions, textures, structures, fabrics and petrogenetic relationships by the use of thin sections, peels and geochemical analyses. May require field trips. Prerequisite: Geol. 526.

830. Field Studies in Geology. (2-6). Off-campus, systematic field study in a selected area or region of geologic significance. Course given upon demand and may be repeated for credit when locality and content differ. Where appropriate, travel, lodging and board costs are charged. Prerequisites: summer field geology (or equivalent) and instructor's consent.

840. Geotectonics. (3). Physical and geological principles of crustal deformation and tectonic interpretation. Studies the relationship of interior earth processes to crustal deformation with special reference to global tectonics. May require field trips. Prerequisite: instructor's consent.

852. Field Stratigraphy. (3). 2R-3L. Lab fee. Advanced concepts and principles of stratigraphic analysis and interpretation emphasizing original sources and current research investigations. Required field problem and field trips. Prerequisite: Geol. 544 and 552 or instructor's consent.

870. Advanced Biogeology. (3). 2R-3L. Lab fee. Palaeoecological reconstruction of ancient plant/animal communities and environments emphasizing community structure, biostratigraphy, synthesis of total raw data and problem solving. May require field trips. Prerequisite: a course in biogeology or equivalent.

890. Thesis. (1-6). Prerequisite: departmental consent.

History

Graduate Faculty

Distinguished Professors: H. Craig Miner (William W. Garvey Distinguished Professor of Business History), J. Kelley Sowards (Distinguished Professor of Humanities), William E. Unrau (Endowment Association Distinguished Research Professor)

Professors: James C. Duram, Phillip D. Thomas (Dean, Fairmount College of Liberal Arts and Sciences)

Associate Professors: John D. Born, Jr. (graduate coordinator), Donald M. Douglas, John E. Dreifort (chairperson), Richard A. Tovell

Assistant Professors: Helen Hundley, Judith R. Johnson, Willard Klunder, Hal K. Rothman

Master of Arts and Areas of Specialization

The history department offers courses of study leading to the Master of Arts (MA) degree with specialization in U.S. history, European history and public history.

Admission Requirements

Admission to the MA program in history requires completion of an undergraduate major in history, or the equivalent; a grade point average of 2.750 or better, including all undergraduate hours; and a 3.000 grade point average in history. Under unusual circumstances applicants with less than a 3.000 average in history may be granted a probationary or conditional admission.

Degree Requirements

One of three plans may be followed for a graduate in history. Plan 1 is a thesis program in American or European history. Plan 2 is a nonthesis program in American or European history. Plan 3 is a thesis program in public history.

Plan 1, Thesis Program. In Plan 1 students must complete a minimum of 31 hours, including Hist. 725, which must be taken during the first year of enrollment. Thesis students must take 19 semester hours numbered 700 or above.

Students following the American history emphasis must take the following:

American history seminars .......................................................... 6 hours
European history seminars (including ancient, medieval and modern European history) ......................................................... 3 hours
Hist. 725 .......................................................... 3 hours
Hist. 727 .......................................................... 3 hours
Thesis Research .......................................................... 2 hours
Thesis .......................................................... 2 hours

A majority, but not all, of the remaining hours must be taken in American history courses for a total of 31 credit hours. Students also must satisfy the foreign language requirement, pass a written examination in one comprehensive field and pass an oral examination in defense of the thesis. A written examination must precede the oral examination.

Students following the European history emphasis must take the following:

European history seminars (including ancient, medieval and modern European history) ......................................................... 6 hours
American history seminars .......................................................... 3 hours
Hist. 725 .......................................................... 3 hours
Hist. 727 .......................................................... 3 hours
Thesis Research .......................................................... 2 hours
Thesis .......................................................... 2 hours

A majority, but not all, of the remaining hours must be taken in European history courses for a total of 36 hours. Students also must satisfy the foreign language requirement and pass written examinations in three comprehensive fields. One of these fields must be in American history.

Plan 2, Nonthesis Program. In Plan 2 students must complete a minimum of 36 hours, including Hist. 725, which must be taken during the first year of enrollment. Nonthesis students must take 21 semester hours numbered 700 or above.

Students following the American history emphasis must take the following:

European history seminars (including ancient, medieval and modern European history) ......................................................... 6 hours
American history seminars .......................................................... 6 hours
Readings in History .......................................................... 6 hours
Hist. 725 .......................................................... 3 hours

A majority, but not all, of the remaining hours must be taken in American history courses for a total of 36 hours. Students also must satisfy the foreign language requirement and pass written examinations in three comprehensive fields. One of these fields must be in European history.

Students following the European history emphasis must take the following:

European history seminars (including ancient, medieval and modern European history) ......................................................... 6 hours
American history seminars .......................................................... 6 hours
Readings in History .......................................................... 6 hours
Hist. 725 .......................................................... 3 hours

A majority, but not all, of the remaining hours must be taken in European history courses for a total of 36 hours. Students also must satisfy the foreign language requirement and pass written examinations in three comprehensive fields. One of these fields must be in American history.

Plan 3, Thesis Program in Public History. In Plan 3 students must complete a minimum of 36 hours, including Hist. 725, which must be taken during the first year of enrollment.

Students following the public history emphasis must take the following:

Hist. 727 .......................................................... 3 hours
American history seminars .......................................................... 6 hours
Hist. 725 .......................................................... 3 hours
Hist. 701 .......................................................... 3 hours
Two courses selected from the following: ......................................................... 6 hours
Hist. 702 .......................................................... 3 hours
Hist. 703 .......................................................... 3 hours
Hist. 704 .......................................................... 3 hours
Hist. 801, Thesis Research .......................................................... 2 hours
Hist. 802, Thesis .......................................................... 2 hours
Hist. 803, Internship in Public History .......................................................... 2 hours

Six of the remaining hours must be taken in American history courses
numbered 500 or above and three hours must be taken in European history courses numbered 500 or above. Students must satisfy the foreign language requirement and pass an oral exam in defense of the thesis. A written examination must precede the oral examination.

Comprehensive Fields

Fields of study included in the comprehensive examinations for the MA are:

Ancient Greece and Rome
Modern Europe since 1789
Early and late Middle Ages
American Colonial and Revolutionary Period
Early Modern Europe to 1815
United States to 1865
United States since 1865

Courses for Graduate/Undergraduate Credit

501. The American Colonies. (3). Colonization of the New World emphasizing the British colonization and its development.

502. The American Revolution and the Early Republic. (3). Examination of selected phases of the revolutionary, confederation and federal periods.

503. The Age of Jefferson and Jackson. (3). Political, economic and cultural development of the United States from the election of Thomas Jefferson to the end of the Mexican War emphasizing the growth of American nationalism.

504. Civil War and Reconstruction. (3).

505. America's Gilded Age, 1877 to 1900. (3). Emphasizes roots of urban problems, foundations of dissent policy toward minority groups and evaluation of imperial expansion.

506. The United States: the 20th Century, 1900-1929. (3). The Progressive Era, World War I, the postwar period and the twenties.

507. The United States: the 20th Century, 1929-1945. (3). The Great Depression, the New Deal and World War II.


515. Economic History of the United States. (3). Cross-listed as Econ. 627.


525. American Military History. (3). A history of the military in America, from the colonial period to the present, emphasizing warfare and military institutions and their impact on American social, economic and political traditions.

529. Indians of Kansas. (3). History of Indian occupation of the Kansas region from initial white contact to the present. Emphasizes Indian-white relations in the 19th century, forced removal of the emigrant tribes, inter tribal and intra tribal relations and consequent legal and political problems.


533. The American City: from Village to Metropolis. (3). A study of urbanization and urban life from colonial times to the present—changing life-styles and thought patterns, urban architecture, ethnic assimilation, emergence of the suburb, political and ecological adjustments and the influence of new technology and forms of business organization.

534. History of the Old South. (3). An examination of Southern civilization prior to the American Civil War.

535Q. History of Kansas. (3). History of the Kansas region from Spanish exploration to the present, emphasizing the period after 1854.

537. The Trans-Mississippi West. (3). Spanish, French and Anglo-American penetration and settlement west of the Mississippi River from the 16th century to about 1900.

538. The American West in the Twentieth Century. (3). Explores the growth of the trans-Mississippi West in the 20th century, with particular attention to political development, economic growth, cultural manifestations, the role of minority groups and the impact of science and technology.

539. Indian-White Relations in North America. (3). Indian life, culture and history from the early 16th century to the present emphasizing the impact of federal Indian policy since 1900.

541. Modern France. (3). History of the major trends in French history from Napoleon to DeGaulle emphasizing French attempts to adjust politically, socially, economically and culturally to the changing conditions of modern industrial society.

545Q. Neither War nor Peace: The World Since 1945. (3).

553. History of Mexico. (3). Pre-Columbian Mesoamerica; the Spanish conquest and the colonial period; the independence movement: Juarez, the Reform and the French intervention; the Porfiriato; the Mexican Revolution; Mexico in recent years.

554. The Mexican Revolution. (3). Mexican Revolution of 1910-1920, the Porfiriato, the Mexican Revolution, Mexico in recent years.

555. The Ancient Near East. (3). Political and cultural history of ancient Mesopotamia, Iran, Egypt, Palestine, Syria and Asia Minor to the death of Alexander the Great.

559Q & 560. Greek History. (3 & 3). 559: the hellenic world from prehistoric times to the end of the Peloponnesian War. 560: the 4th century and the Hellenistic period.


566 & 567. Medieval History. (3 & 3). 566: the history of Europe from the fall of the Roman Empire through the Crusades, 500 to 1200. 567: history of Europe, 1200 to 1500.

575Q. The Italian Renaissance. (3). Italian history from the 14th through the 16th centuries emphasizing cultural achievements.

576. The Reformation. (3). Cross-listed as Rel. 476. The great religious changes in the 16th century ideological, social and intellectual contexts.

581. Europe, 1815-1870. (3).

582. Europe, 1870-1914. (3).


590. History of Russia. (3). Political and cultural history of Kievian, Muscovite and Imperial Russia.


592. The Soviet Union Today. (3). An examination of contemporary life in the USSR: historical background, Marxist Leninist ideology, industrial and agricultural economics, roles played by women, national minorities and dissidents in Soviet society, the press, literature and art, health care and prospects for the country's future.

595. History of Eastern Europe. (3). Development of the Bulgarian, Czech, Magyar, Polish, Romanian and Yugoslav peoples.

613. European Diplomatic History. (3). European international politics and diplomatic practices, emphasizing the actions of the great powers and their statesmen. Versailles settlement, totalitarian aggression, appeasement, World War II, the cold war and decolonization of Southeast Asia and the Middle East as prelude to major power involvement.

615. Hitler and the Third Reich. (3). The establishment and collapse of the Weimar Republic, the rise and fall of Hitler's Third Reich, the divided Germany of the present and the role of each in world affairs, 1914 to the present.

616. Germans and Jews. (3). The history of antisemitism in central Europe, 19th and 20th centuries.

617Q. The Holocaust. (3). The origins and development of the concentration camp system in Nazi Germany and its transition into a death camp system.

620. Media Courses in History. (2-3). Courses created or coordinated by the Department of History, offered through various media: radio, television and newspaper. Areas of historical emphasis vary. Repeatable with instructor's approval; however, three hours maximum credit will apply towards MA degree in history.

698. Historiography. (3). Review of the major schools of historical thought, philosophies of history and historiographical development from the ancient world to the present. Required of history majors.

701. Introduction to Public History. (3). Introduces the various areas of public history including historical preservation, archival administration, museum studies, litigation support and corporate history. Students learn the philosophies, techniques and practices that comprise the field and ways these areas interact with their academic training.
Geography

Although there is no graduate program in geography, the following courses are available for graduate credit.

Courses for Graduate/Undergraduate Credit

510. World Geography. (3). A general survey of world geography, including an analysis of the physical, political, economic, historical and human geography of the major world regions.

520. Geography of the United States and Canada. (3). Physical, political, economic, historical and human geography of the United States and Canada.

530. Geography of Latin America. (3). Physical, political, economic, and historical geography of Latin America.

542. Geography of Europe. (3). Physical, political, economic, and historical and human geography of Europe.

580. Economic Geography. (3). A geographical analysis of the distribution and utilization of basic world resources.

620. Field Studies in Geography. (2-6). Field work, systematic field study in a selected area of geographic significance. Course given upon demand and may be repeated for credit when the locality and content differ. Where appropriate, travel, lodging and board costs are charged.

630. Geography of Mexico. (3). Physical, human and cultural geography of Mexico, including important archaeological and historical settings. Relations of sources to arts, crafts, industry and architecture.

670. Urban Geography. (3). 2R; 3L. Lab fee. Geography of cities; the origin, growth, functions, characteristics and environmental problems of urban areas; structure and dynamic elements of intraurban space; land-use analysis and approaches to urban planning and problems of urban ecology.

695. Special Studies in Geography. (1-3). 2R or 3L. Lab fee. Systematic study of a selected area of topic interest in geography. Course given upon demand and is repeatable for credit when content differs. May require field trips. Prerequisite: junior standing.

750. Workshop in Geography. (1-4). Short-term courses with special focus on geographical problems. Prerequisite: instructor's consent.

Course for Graduate Students Only

820. Field Studies in Geography. (2-6). Field work, systematic field study in a selected area of geographic significance. Course given upon demand and may be repeated for credit when locality and content differ. Where appropriate, travel, lodging and board costs are charged. Prerequisite: instructor's consent.

Interdisciplinary Liberal Arts and Sciences Program

The Master of Arts in Liberal Studies is an interdisciplinary graduate degree (see General Programs, Liberal Studies). The following courses are offered for graduate credit.

Courses for Graduate Students Only

800. Seminar: Research Goals and Strategies. (3). An introduction to research goals, methods and sources in the humanities, social sciences and natural sciences, emphasizing the opportunities and problems of integrating research activities involving more than one discipline. Required of all students in the Master of Arts in Liberal Studies Program.

875. Thesis. (1-6). For students who are finishing the Master of Arts in Liberal Studies (MALS). The student writing a thesis must be enrolled in this course until the thesis is completed and all thesis requirements have been satisfied. Prerequisite: consent of student's degree committee chairperson and instructor.

885. Terminal Project. (2-6). For students who are near the end of their MALS program and involved in a terminal project. The terminal project may have many aspects such as field work, practicum, internship, research report or any other individualized activity, but the scope of it must be approved by the student's advisory committee. The student involved in a project must be enrolled in this course until the project is completed and all project requirements have been satisfied.

Linguistics

Graduate Faculty
Assistant Professor: Tina L. Bennett-Kastor

Although there is no graduate program in linguistics, the following courses are available for graduate credit.

Group A—Basic Linguistic Theory

Courses for Graduate/Undergraduate Credit


682. Linguistics. Structure of a Selected Non-Indo-European Language. (3). The language offered depends on student demand and availability of staff. Course may sometimes be conducted as a field methods course and is repeatable for credit when different languages are offered. Prerequisite: Ling. 315.

Group B—Linguistic Study of Specific Languages or Language Groups

Courses for Graduate/Undergraduate Credit

635. French and Spanish. Introduction to Romance Linguistics. (3). Cross-listed as Fren. 635 and Span. 635.

Group C—Areas of Contact Between Linguistics and Other Disciplines

Courses for Graduate/Undergraduate Credit


Others

Courses for Graduate/Undergraduate Credit

590. Linguistics. Special Studies. (2-3). Topic selected and announced by individual instructor. Credit is assigned to Group A, B, or C depending on content. Repeatable for credit when content varies.

Mathematics and Statistics

Graduate Faculty

Professors: Dharam V. Chopra, Alan R. Erickat, Buma L. Fridman (chairperson), John J. Hutchinson, Victor Isakov, William M. Perel
Associate Professors: L Andrew Acker, Prem N. Bajaj, Stephen W. Brady, Jeneva J. Breuer, Gary D. Crown, Kirk E. Lancaster, Kenneth G. Miller (graduate coordinator), Hari Mukerjee, Philip E. Parker, William H. Richardson, Robert C. Sherritt
Assistant Professors: Douglas G. Burkholder, Shahar Boneh, Thomas DeLillo, Lop-Hing Ho, Gonzalez Mendiesta, Ziqi Sun, Abdullah Tamraz, Han-Kun Wang

The Department of Mathematics and Statistics offers courses of study leading to the Master of Science (MS) degree in mathematics and the Doctor of Philosophy (PhD) degree in applied mathematics.

Master of Science

Admission Requirements

Students will be admitted to full graduate standing if they have the equiv-

calent of an undergraduate major in mathematics, have a grade point average of at least 3.00 in mathematics courses and meet Graduate School admission requirements.

Degree Requirements

To complete the MS degree, students must earn 33 semester hours of graduate credit*, with a minimum of 24 semester hours in courses in mathematics or statistics offered by the department (exclusive of thesis) numbered 700 or above. The student must satisfy one of the following options:

Option 1: The 33 hours must include the completion of three two-semester sequences in mathematics and/or statistics numbered 700 and above.

Option 2: The 33 hours must include the completion of a two-semester sequence in statistics (771-772), a two-semester sequence in numerical analysis and six hours to be chosen from among courses in ordinary differential equations (753), partial differential equations (755, 856), complex variables (745, 845), real variables (743, 843) and applied stochastic processes (Stat. 762). In addition, it is recommended that the student complete a directed project in mathematical modeling supervised by a departmental graduate faculty member who is approved by the chairperson and graduate coordinator. Students not choosing the thesis option should enroll in Math. 881 for three hours credit for their directed project.

Students who plan to enter the PhD program in applied mathematics should include Real Analysis I and II and Numerical Linear Algebra in their MS program of study.

Generally not more than six hours of approved course work may be transferred from another university. Students may take either a thesis or a nonthesis option. Students electing to write a thesis should enroll in Math. 885 for up to six hours credit. A student’s program must be approved by the department. A comprehensive examination is required of all degree candidates.

*Engineering Mathematics I and II (757-758) and mathematics or statistics courses numbered below 600 do not count toward the 33 hours needed for the MS in mathematics.

Doctor of Philosophy

The primary emphases in the doctoral program in applied mathematics are partial differential equations, probability and statistics, and computational mathematics.

Admission Requirements

Admission to the doctoral program will be through the Admissions and Excep-

isons Committee of the department. Students may enter the doctoral program in mathematics and statistics if they have the prerequisites for the initial required courses, have taken the advanced GRE and have a 3.00 overall grade point average and a 3.25 grade point average in mathematics and statistics.

Students may satisfy the prerequisites for the initial requirements if they have taken three hours of course work in each of the following: advanced calculus, modern algebra, linear algebra and numerical methods.

Degree Requirements

To complete the PhD program in applied mathematics the student must satisfy the course, language and residency requirements given below; pass the qualifying and preliminary examinations; and write a dissertation containing original research in applied mathematics.

Course Requirements: A total of at least 84 hours of graduate credit is required. Engineering Mathematics I and II and mathematics or statistics courses numbered below 700 may not be included. At least 36 hours must be in mathematics and statistics courses numbered above 800 (exclusive of PhD Dissertation). Courses used toward a master’s degree may be included. A minimum of 36 hours may be transferred from another university at the discretion of the student’s committee.

Real Analysis I and II and Numerical Linear Algebra are required of all students. In addition a student must complete one of the following two sets of requirements:


Language Requirements: The student must demonstrate proficiency either in two foreign languages or in one foreign language and one high level computer language. The foreign languages are French, German and Russian. The language proficiency will be demonstrated by achieving a score at the 50th percentile or higher on the ETS examination in that language.
Residency Requirement: The student must complete at least one academic year in residence as a full-time student at WSU.

Qualifying Exam: The qualifying exam is a written exam administered near the middle of both the fall and spring semesters. The exam is a six-hour exam given on two different days within a one week period. The topics covered by the exam are real analysis, numerical analysis, advanced calculus and linear algebra. The exam should be taken at the first opportunity after completing Real Analysis I and II and Numerical Linear Algebra.

A student who does not pass on the first attempt may be permitted to take the exam a second time. A person who retakes the exam must retake the entire exam. The exam may be retaken only once.

PhD Committee: Upon the student passing the qualifying exam, the graduate coordinator, in consultation with the student, will recommend to the departmental PhD Advisory Committee a PhD Committee for the student. The student’s PhD Committee will consist of the student’s dissertation adviser as chair and four other members. At least one, but no more than two, of the committee members shall be from departments outside the Department of Mathematics and Statistics. Within one semester after passing the qualifying exam the student should submit a Plan of Study to the committee for approval. This committee will serve as examining committee for both the preliminary and final exams.

Preliminary Exam: The preliminary exam covers specific topics relevant to the student’s research area as determined by his or her PhD committee. The student will meet as soon as possible with the committee to set the topics to be covered. For full-time students, the exam should normally be taken about one year after passing the qualifying exam. Before the preliminary exam is taken all language requirements must be met. The preliminary exam should be passed before beginning work on the dissertation. A student who fails the preliminary exam may be permitted to retake the exam if the committee so determines.

Dissertation and Final Exam: Upon passing the preliminary exam the student becomes a candidate for the PhD degree. Soon thereafter the student must submit a written dissertation proposal to his or her committee for approval. While working on the dissertation the student should enroll for a total of at least 18 hours of PhD Dissertation. The student must be enrolled at the University during each semester after admission to candidacy until completion of the dissertation. After the dissertation is completed the student must present and defend it before the committee. This defense constitutes the final exam. The dissertation defense is open to the public.

Courses for Graduate/Undergraduate Credit
Credit in courses numbered below 600 is not applicable toward the MS in mathematics.

501. Elementary Mathematics. (5). A study of topics necessary to an understanding of the elementary school curriculum, such as set theory, real numbers and geometry. Not for major or minor credit. Prerequisites: elementary education major and Math. 111 or equivalent or departmental consent.

511. Linear Algebra. (3). An elementary study of linear algebra, including an examination of linear transformations and matrices over finite dimensional spaces. Prerequisite or corequisite: Math. 243 with grade of C or better.

513. Fundamental Concepts of Algebra. (3). Defines group, ring and field and studies their properties. Prerequisites: Math. 415 and 511 with C or better or departmental consent.

530. Applied Combinatorics. (3). Basic counting principles, occupancy problems, generating functions, recurrence relations, principles of inclusion and exclusion, the pigeonhole principle, Fibonacci sequences and elements of graph theory. Prerequisite: Math. 344 with a grade of C or better.

531. Introduction to the History of Mathematics. (3). Studies the development of mathematics from antiquity to modern times. Solves problems using the methods of the historical period in which they arose. Prerequisites: Math 344 with a grade of C or better.

545. Integration Techniques and Applications. (3). A study of the basic integration techniques used in applied mathematics. Includes the standard vector calculus treatment of line and surface integrals, Green's Theorem, Stokes' Theorem and the Divergence Theorem. Also includes the study of improper integrals with application to special functions. Prerequisite: Math. 344 with grade of C or better.

547. Advanced Calculus I. (3). Covers the calculus of Euclidean space including the standard results concerning functions, sequences and limits. Prerequisites: Math. 344 and 415 with C or better in each.

550. Ordinary Differential Equations. (3). Includes separation of variables, integrating factors, variation of parameters, undetermined coefficients, LaPlace transforms, power series substitution. Credit not allowed in both Math. 550 and 555. Prerequisite: Math. 344 with a grade of C or better.

551. Numerical Methods. (3). Approximating roots of equations, interpolation and approximation, numerical differentiation and integration and the numerical solution of first order ordinary differential equations. Some computer use. Prerequisites: Math. 344 with a grade of C or better and a knowledge of FORTRAN, or departmental consent.

553. Mathematical Models. (3). Covers case studies from the fields of engineering technology and the natural and social sciences. Emphasizes the mathematics involved. Each student is required to complete a term project which is the solution of a particular problem approved by the instructor. Prerequisite: Math. 344 with C or better or departmental consent.

555. Ordinary Differential Equations with Linear Algebra. (4). Includes separation of variables, integrating factors, variation of parameters, undetermined coefficients, LaPlace transforms, power series substitution, linear algebra, eigenvalue problems and linear systems. Credit not allowed in both Math. 550 and 555. Prerequisite: Math. 344 with grade of C or better.

580. Selected Topics in Mathematics. (3). Topics chosen from those not otherwise represented in the curriculum. May be repeated up to a maximum of six hours credit with departmental consent. Prerequisite: departmental consent.

615. Elementary Number Theory. (3). Studies properties of the integers by elementary means. Prerequisite: Math. 344 with C or better or departmental consent.

621. Elementary Geometry. (3). Studies Euclidean geometry from an advanced point of view. Prerequisite: Math. 344 with C or better or departmental consent.

640. Advanced Calculus II. (3). An examination of the calculus of functions of several variables and line and surface integrals. Prerequisites: Math. 511 and 547 with a grade of C or better.

657. Optimization Theory. (3). Introduces selected topics in linear and nonlinear optimization. Develops the revised simplex method along with a careful treatment of duality. Then extends the theory to solve parametric, integer and mixed integer linear programs. Prerequisite: Math. 511 with C or better.

690. Introduction to Mathematical Logic. (3). An axiomatic development of elementary mathematical logic through first-order logic culminating in theorems on completeness and consistency. Investigates connections with Boolean algebra, formal languages and computer logic. Prerequisite: Math. 415 or 511 with C or better or departmental consent.

713. Abstract Algebra I. (3). Treats the standard basic topics of abstract algebra. Prerequisite: Math. 513 with C or better or departmental consent.


720. Modern Geometry. (3). Examines the fundamental concepts of geometry. Prerequisite: Math. 513 with C or better or departmental consent.

725. Topology I. (3). Studies the results of point set and algebraic topology. Prerequisite: Math. 547 with C or better or departmental consent.

743. Real Analysis I. (3). Includes a study of the foundations of analysis and the fundamental results of the subject. Prerequisite:
Math. 640 with C or better or departmental consent.

745. Complex Analysis I. (3). Studies the theory of analytic functions. Prerequisite: Math. 640 with C or better, or departmental consent.

750. Workshop. (1-3). Topics appropriate for mathematics workshops that are not in current mathematics courses. May be repeated to a total of six hours credit with departmental consent. Prerequisite: departmental consent.

751. Numerical Linear Algebra. (3). Includes analysis of direct and iterative methods for the solution of linear systems, linear least squares problems, eigenvalue problems, error analysis and reduction by orthogonal transformations. Prerequisite: Math. 511, 547 and 551 with C or better in each, or departmental consent.

753. Ordinary Differential Equations. (3). Covers existence, uniqueness, stability and other qualitative theories of ordinary differential equations. Prerequisite: Math. 545 or 547 with C or better or departmental consent.

757. Engineering Mathematics I. (3). Includes Fourier series, the Fourier integral, boundary value problems for the partial differential equations of mathematical physics, Bessel and Legendre functions and linear systems of ordinary differential equations. Prerequisite: Math. 550 or 555 with C or better.

758. Engineering Mathematics II. (3). A survey of some of the mathematical techniques needed in engineering including an introduction to vector analysis, line and surface integrals and complex analysis, contour integrals and the method of residues. No credit for this course toward a graduate degree in mathematics. Prerequisite: Math. 550 or 555 with grade of C or better.

Courses for Graduate Students Only

813. Abstract Algebra II. (3). A continuation of Math. 713. Prerequisite: Math. 713 or equivalent.

818. Selected Topics in Number Theory. (2-3). Repeatable with departmental consent. Prerequisite: departmental consent.

825. Topology II. (3). A continuation of Math. 725. Prerequisite: Math. 725 or equivalent.

828. Selected Topics in Topology. (2-3). Repeatable with departmental consent. Prerequisite: departmental consent.

829. Selected Topics in Geometry. (2-3). Repeatable with departmental consent. Prerequisite: departmental consent.

839. Selected Topics in Foundations of Mathematics. (2-3). Repeatable with departmental consent. Prerequisite: departmental consent.

843. Real Analysis II. (3). A continuation of Math. 743. Prerequisite: Math. 743 or equivalent.

845. Complex Analysis II. (3). A continuation of Math. 745. Prerequisite: Math. 745 or equivalent.

848. Calculus of Variations. (3). Includes Euler-LaGrange equations, variational methods and applications to extremal problems in continuum mechanics. Prerequisite: Math. 547 or 737.

849. Selected Topics in Analysis. (2-3). Repeatable with departmental consent. Prerequisite: departmental consent.


854. Tensor Analysis with Applications. (3). Includes theory of tensor algebra, differential geometry, and applications to continuum mechanics. Prerequisite: Math. 545 or 757.

855-858. Selected Topics in Engineering Mathematics I and II. (3-3). Advanced topics in mathematics of interest to engineering students, including tensor analysis, calculus of variations and partial differential equations. Not applicable toward the MS in mathematics.

889. Selected Topics in Applied Mathematics. (2-3). Repeatable with departmental consent.

985. PhD Dissertation. (1-9). Repeatable to a maximum of 24 hours. Prerequisite: must have passed the PhD qualifying exam and instructor's consent.

Statistics

Courses for Graduate/Undergraduate Credit

Credit in courses numbered below 600 is not applicable toward the MS in mathematics.

570. Special Topics in Statistics. (3). Covers topics of interest not otherwise available. Prerequisite: departmental consent.

571-572. Statistical Methods I and II. (3-3). Includes probability models, points and interval estimates, statistical tests of hypotheses, correlation and regression analysis, introduction to nonparametric statistical techniques, least squares, analysis of variance and topics in design of experiments. Prerequisite: Math. 243 with C or better or departmental consent.

574. Elementary Survey Sampling. (3). Reviews basic statistical concepts. Covers simple, random, stratified, cluster and systematic sampling, along with selection of sample size, ratio, estimation and costs. Applications studied include problems from the social and natural sciences, business and other nonparametric inferential techniques. Prerequisite: any elementary course in statistics, such as Stat. 370, Soc. 501 or Psy. 401 with a C or better.

576. Applied Nonparametric Statistical Methods. (3). Studies assumptions and needs for nonparametric tests, rank tests and other nonparametric inferential techniques. Applications involve problems from the social and natural sciences, business and other disciplines. Prerequisite: any elementary statistics course such as Stat. 370, Soc. 501 or Psy. 401 with C or better.

651. Applied Regression Analysis. (3). Studies linear, polynomial and multiple regression. Includes applications to business and economics, physical, behavioral and biological sciences, and engineering. Uses computer packages for doing problems. Prerequisites: Stat. 571 and Math. 344 with C or better in each or departmental consent.

652. Analysis of Variance. (3). An introduction to experimental design and analysis of data under linear statistical models. Studies single-factor designs, factorial experiments with more than one factor, analysis of covariance, randomized block designs, nested designs and Latin square designs. Uses computer packages for doing problems. Prerequisites: Stat. 571 and Math. 344 with C or better in each or departmental consent.

761. Probability. (3). A study of axiom of probability, discrete and continuous random variables, expectation, examples of distri-
bution functions, moment generating functions and sequences of random variables. Prerequisite: Math. 344 with a grade of C or better.

762. Applied Stochastic Processes. (3). Studies random variables, expectation, limit theorems, Markov chains and stochastic processes. Prerequisite: Stat. 761 or 771 with C or better or departmental consent.

771-772. Theory of Statistics I and II. (3-3). An examination of stochastic dependence distributions of functions of random variables limiting distributions, order statistics, theory of statistical inference, nonparametric tests and analysis of variance and covariance. Prerequisite: Math. 545 or 547 with grade of C or better or departmental consent.

774. Statistical Computing I. (3). Trains students to use modern statistical software for statistical modeling and writing of technical reports. Includes many of the advanced features of most commercial statistical packages. Students are required to perform complete statistical analyses of real data sets. Prerequisites: Stat. 651 and 652 or departmental consent.

775. Applied Statistical Methods I. (3). Covers selected topics from time series analysis including basic characteristics of time series, autocorrelation, stationarity, spectral analysis, linear filtering, ARIMA models, Box-Jenkins forecasting and model identification, classification and pattern recognition. Prerequisite: Stat. 651 or departmental consent.

776. Applied Statistical Methods II. (3). Covers selected topics from multivariate analysis including statistical theory associated with the multivariate normal, Wishart and other related distributions, partial and multiple correlation, principal component analysis, factor analysis, classification and discriminant analysis, cluster analysis, James-Stein estimates, multivariate probability inequalities, majorization and Schur functions. Prerequisite: Stat. 652 or departmental consent.

Courses for Graduate Students Only

861. Theory of Probability. (3). The axiomatic foundations of probability theory emphasized coverage of probability measures, distribution functions, characteristic functions, random variables, modes of convergence, the law of large numbers and central limit theorem, and conditioning and the Markov property. Prerequisites: Math. 743 and Stat. 761 or 771.


875. Design of Experiments. (3). A study of basic concepts of experimental design which include completely randomized design, randomized block design, randomization theory, estimation and tests, latin square design, factorial experiments, confounding, split-plot designs, complete block designs and intra- and inter-block information. Prerequisite: Stat. 572 or 772.

876. Nonparametric Methods. (3). An introduction to the theory of nonparametric statistics. Includes order statistics, tests based on runs; tests of goodness of fit; rank-order statistics, one-, two-, and k-sample problems; linear rank statistics; measure of association for bivariate samples; and asymptotic efficiency. Prerequisite: Stat. 772.


878. Special Topics. (2-3). Repeatable with departmental consent. Prerequisite: departmental consent.

879. Individual Reading. (1-5). Prerequisite: departmental consent.

884. Statistical Computing II. (3). Teaches special graphics and numerical methods needed in the analysis of statistical data. Includes advanced simulation techniques, numerical methods for linear and nonlinear problems, analysis of missing data, smoothing and density estimation, projection-pursuit methods and graphic techniques. Prerequisites: Math. 751 and Stat. 772 with C or better or departmental consent.

971 & 972. Selected Advanced Topics in Probability and Statistics. (3 & 3). Topics of current research interest in probability and statistics. Repeatable for credit with departmental consent. Prerequisite: instructor's consent.

978. Advanced Independent Study in Probability and Statistics. (1-3). Arranged individual directed study in an area of probability or statistics. Repeatable to a maximum of 6 hours. Prerequisites: must have passed the PhD qualifying exam and instructor's consent.

986. PhD Dissertation. (1-9). Repeatable to a maximum of 24 hours. Prerequisite: must have passed the PhD preliminary exam.

Minority Studies

Graduate Faculty

Associate Professor: John C. Gaston (chair)

Although a graduate program is not currently available in French, the following courses may apply toward a master's degree if approved in advance of enrollment by the student's advisor, the chairperson of the Department of Modern and Classical Languages and Literature and the dean of the Graduate School.

Courses for Graduate/Undergraduate Credit

805. French Phonetics. (3). 2R; 1L. Cross-listed as Ling. 305. Corrective phonetics for...
non-native speakers of French. Includes articulatory phonetics, phonology, phonemics, accent, sound correspondences, dialectal and stylistic variations. Highly recommended for future French teachers. Prerequisites: Fren. 227 or 220 or equivalent.

515. Major Topics. (1-4). Special studies in (a) language, (b) literature, (c) commercial French, (d) the language laboratory, (e) music, (f) composition, (g) problems in teaching French, (h) civilization, (i) translation, (k) conversation and (m) phonetics. Repeatable for credit. Prerequisite: departmental consent.

525. Advanced Conversation. (3). Designed to increase fluency in speaking French. Assignments include oral reports, dialogues and work in the language laboratory. Prerequisite: Fren. 325 or equivalent.

526. Advanced Composition and Grammar. (3). Emphasizes theme writing, original compositions and detailed study of modern French grammar. Prerequisite: Fren. 220 or departmental consent.

540Q. French Literature in English Translation. (3). Topics vary. May be used to satisfy the general education literature requirement and may count toward a French major or minor if readings and papers are done in French.

541Q. French Literature of Africa and the Caribbean in English Translation. (3). A study of the concept of Negritude through the works of major contemporary African and Caribbean writers. No knowledge of a foreign language is necessary. Course may count toward a French major or minor if readings and papers are done in French.

551. French Civilization: The Middle Ages to the Restoration. (3). Emphasizes key aspects of the civilization of France as seen in its art, architecture, political structure and history, cultural evolution and intellectual traditions. Course is interdisciplinary in nature and is designed to complement studies in French language and literature. Includes slide demonstrations, guest speakers on special topics. Most classes and required readings are in French. Prerequisite/corequisite: Fren. 300.

552. Contemporary French Civilization. (3). Emphasizes the major events, themes, ideas, trends and movements in French civilization since the Revolution. Course is interdisciplinary in nature and is designed to complement French language and literature courses. Class work and readings are in French. Prerequisite/corequisite: Fren. 300.

623. Seminar in French. (3). Seminar in French literature, language or civilization. Prerequisite: two literature courses in French numbered above 300. Repeatable for credit.


631. 17th Century French Literature. (3). Prerequisite: Fren. 300.

632. 18th Century French Literature. (3). Prerequisite: Fren. 300.


634. Contemporary French Literature. (3). Prerequisite: Fren. 300.

635. Introduction to Romance Language Linguistics. (3). Cross-listed as Span. 635 and Ling. 635. An introduction to the historical phonology and morphology of the romance languages emphasizing French and Spanish. Prerequisite: departmental consent.

636. 20th Century French Literature. Reading and discussion of major works of French fiction, poetry and drama from 1900 to 1960. Prerequisite: Fren. 300.

750. Workshop in French. (2-4). Repeatable for credit.

Course for Graduate Students Only

815. Special Studies in French. (3). Prerequisite: departmental consent. Repeatable for credit.

German

Although a complete graduate program is not available currently in German, the following courses may apply toward a master's degree if approved in advance of enrollment by the student's advisor, the chairperson of the Department of Modern and Classical Languages and Literatures and the dean of the Graduate School.

Courses for Graduate/Undergraduate Credit

524. Advanced Conversation and Composition. (3). Prerequisites: Germ. 324 or instructor's consent.

650. Directed Study. (1-3). Enrollment in any of the areas listed takes place only upon consultation with the department and agreement with the instructor concerned: (a) introduction to the study of German literature; (b) survey I: from the medieval period through the Age of Goethe; (c) survey II: 19th century to 1945; (d) contemporary literature: the literature of both Germanies since 1945; (e) special topics in literature, repeatable once for credit; (f) special topics in language, repeatable once for credit. Prerequisite: Germ. 344Q or instructor's consent.

750. Workshop in German. (2-4). Repeatable once for credit.

Course for Graduate Students Only

815. Special Studies in German. (3). Readings in German literature or culture. May be repeated for credit when the topic changes. Prerequisite: graduate standing or departmental consent.

Greek (Ancient Classical)

Although a complete graduate program is not available currently in Greek, the following courses may apply toward a master's degree.

Courses for Graduate/Undergraduate Credit

530. Special Studies. (1-4). Topic announced by instructor. Repeatable for credit. Prerequisite: Greek 224 or instructor's consent.

531. Advanced Greek. (3). Sophocles and Euripides. Prerequisite: Greek 224.

532. Advanced Greek. (3). Thucydides. Prerequisite: Greek 531.

Italian

Although a complete graduate program is not available currently in Italian, the following course may apply toward a master's degree.

Course for Graduate/Undergraduate Credit

515. Major Topics. (2-4). Special studies in Italian language, literature and civilization. Repeatable for credit. Prerequisite: departmental consent.

Latin

Although a complete graduate program is not available currently in Latin, the following courses may apply toward a master's degree.

Courses for Graduate/Undergraduate Credit

Latin 224 or departmental consent is the prerequisite for all upper-division courses.

541. Roman Lyric Poetry. (3). The lyric poems of Catullus and Horace emphasizing imagery, structure, diction and meter.

542. Vergil's Aeneid. (3). Selected books of the Aeneid in the original and the translation. Studies imagery, symbolism, structure, meter and diction. Gives consideration to the place of the Aeneid in the Augustan Rome and in the epic tradition.

543. Roman Drama. (3). A study of Roman comedy and tragedy, their Greek background and their influence on European literature. Includes selected plays of Plautus, Terence and Seneca, some in the original and some in translation.

545. The Roman Novel. (3). Reading of the Satyricon of Petronius and the Golden Ass of Apuleius. The portions that are not read in Latin are read in English. Gives consideration to the development of the novel from its Greek beginnings up to the time of Apuleius and beyond.

546. Advanced Latin. (3). Directed reading of Latin. Reading may be combined with Latin prose composition at the option of the student. Repeatable for credit when content varies.


652. Cicero. (3). The orations, letters and essays of Cicero. Concentrates on Cicero as the master of Latin prose and as one of the most important political figures of the fall of the Roman Republic.

653. Lucretius and Epicureanism. (3). Reading of Lucretius' De Rerum Natura and study of Epicureanism, the atomic theory and Democritean materialism. Gives consideration to the place of Lucretius in Latin poetry.

750. Workshop in Latin. (2-4). Repeatable for credit.

Spanish

Master of Arts and Areas of Specialization

The Department of Modern and Classical Languages and Literatures offers
courses of study leading to the Master of Arts (MA) degree in Spanish. This degree program allows for specialization in Spanish language and literature or in Spanish-American literature.

**Admission Requirements**
Admission to the program requires the completion of 24 hours of undergraduate Spanish, eight hours of which have been on the junior-senior level.

**Degree Requirements**
The MA degree in Spanish requires the completion of 32 semester hours beyond the BA degree, including at least two seminars—Span. 623, 831 or 832—that require research papers. Of these hours, 20 must be in courses numbered 700 or above.

Each program must include nine hours of related fields and 23 hours of Spanish, including Span. 526 and three of the following survey courses—Span. 532, 525, 620, 621—if their equivalents were not taken as undergraduate courses.

A candidate for a degree must pass Span. 526 or an equivalent course with a grade of B or better at either the undergraduate or graduate level.

Related fields typically include another foreign language; art; English, American and foreign literatures; Latin American history; or geography. All related field courses must be approved by the chairperson of the Department of Modern and Classical Languages and Literatures and the graduate coordinator.

Special recommendation is strongly made that all MA candidates in Spanish earn a minimum of four hours of transferable credit in a university located in a Spanish-speaking country.

**Examinations**
Before the MA degree in Spanish is granted, all candidates must pass written and oral comprehensive examinations over reading lists in three areas of specialization of their choice and prove by written examination a reading knowledge of a second foreign language.

**Courses for Graduate/Undergraduate Credit**
Upper-division courses are given on a rotating basis. Span. 300 is a prerequisite for all upper-division literature and civilization courses, unless otherwise indicated. All literature courses, including Span. 223 and 300, may fulfill the general education literature requirement.

506. Spanish Phonetics. (2). Cross-listed as Ling. 505. Prerequisite: any 200-level course or departmental consent.

515. Major Topics. (1-4). Special studies in (a) language, (b) literary reports, (c) commercial Spanish, (d) the language laboratory, (e) music, (f) composition, (g) problems in teaching Spanish, (h) advanced conversation. Repeatable for credit. Prerequisite: departmental consent.

525. Spanish Conversation III. (2). Prerequisite: Span. 325 or departmental consent.

526. Advanced Grammar and Composition. (3). Prerequisite: Span. 320 or departmental consent.

531. Survey of Spanish Literature. (3). Main currents of Spanish literature from 1700 to the present. Prerequisite: Span. 300 or departmental consent.

532. Survey of Spanish Literature. (3). Spanish literature from the beginning to 1700. Prerequisite: Span. 300 or departmental consent.

534. Contemporary Spanish Theater. (3). Prerequisite: Span. 300 or departmental consent.

536. Contemporary Spanish Novel. (3). Prerequisite: Span. 300 or departmental consent.

540Q. Contemporary Spanish Literature in English Translation. (3). Content may vary from semester to semester, including Spanish and/or Latin-American literature. No knowledge of a foreign language is necessary.

552. Business Spanish. (3). Provides the opportunity to learn and practice commercial correspondence, business vocabulary, translation and interpretation of business texts. Prerequisite: Span. 526.

557. Literary and Technical Translating. (3). Extensive translation of literary works and technical and legal documents from Spanish to English and Spanish to English. Prerequisite: Span. 526 or departmental consent.

620. Survey of Latin-American Literature. (3). Main currents of Latin-American literature from 1500 to 1800. Prerequisite: Span. 300 or departmental consent.

621. Survey of Latin-American Literature. (3). Main currents of Latin-American literature from 1800 to present. Prerequisite: Span. 300 or departmental consent.

622. Special Studies. (1-4). Topic for study chosen with aid of instructor. Repeatable for credit. Prerequisite: instructor's consent.

623. Seminar in Spanish. (1-3). Special studies in (a) language, (b) Spanish and Latin-American literature, (c) Spanish and Latin-American culture and civilization and (d) methods of teaching Spanish in the elementary and secondary schools. Repeatable for credit. Prerequisite: departmental consent.

625. Contemporary Latin-American Novel. (3). Prerequisite: Span. 300 or departmental consent.

626. Spanish Civilization. (3). Intensive study of Spanish culture, including historical and geographical factors in its development and its contributions to world civilization. Prerequisite or corequisite: Span. 300 or departmental consent.

627. Latin-American Civilization. (3). Intensive study of Latin-American culture, including the historical and geographical factors of its development and its contributions to world civilization. Prerequisite or corequisite: Span. 300 or departmental consent.

628. Contemporary Latin-American Theater. (3). A study of contemporary theater from 1900 to present. Prerequisite: Span. 300 or departmental consent.

631. Latin-American Short Story. (3). Study of the main writers in contemporary Latin-American literature. Prerequisite: Span. 300 or departmental consent.

635. Introduction to Romance Linguistics. (3). Cross-listed as Fren. 635 and Ling. 635. An introduction primarily to the historical phonology and morphology of the romance languages emphasizing French and Spanish. Prerequisite: departmental consent.

720. Theory and Practice for University Teaching. (2). Deals with recent theories of language acquisition and their application to the teaching of Spanish. Required for teaching assistants. Prerequisite: graduate standing.

750. Workshop in Spanish. (2-4). Repeatable for credit.

**Courses for Graduate Students Only**


526. Grammar and Stylistics. (3). Intensive study of advanced grammar and stylistic usage.

831. Seminar in Spanish Literature. (3). (a) Middle Ages, (b) Renaissance, (c) Golden Age theater, (d) Cervantes, (e) modern novel, (f) Generation of '98, (g) contemporary novel, (h) 20th-century theater, (i) Spanish romanticism, (j) 20th-century poetry and (k) literary criticism.

832. Seminar in Latin-American Literature. (3). (a) colonial period, (b) contemporary novel, (c) short story, (d) poetry, (e) modernism, (f) essay and (i) theater.

**Philosophy**

Graduate Faculty
Professor: Gerald H. Paske
Associate Professors: Robert Feleppe (chairperson), A.J. Mandt, Ben F. Rogers, David Soles, Deborah H. Soles
Assistant Professor: J.W. Mallory

Although there is no graduate degree in philosophy, the following courses are available for graduate credit.

**Courses for Graduate/Undergraduate Credit**

518. Recent British-American Philosophy. (3). Examination of philosophical ideas and movements in recent British and American philosophy. Discusses movements such as
519. Empiricism. (3). A study of the philosophical views that emphasize sensory experience rather than reasoning as a source of knowledge with particular attention paid to the thought of Hobbes, Locke, Berkeley, Hume and Mill.

540. Theory of Knowledge. (3). A critical examination of the nature of knowledge and the philosophical problems concerning skepticism; knowledge of the self; material objects; other minds; the past, present and future; the problem of knowledge, skepticism, the nature of language and the character of philosophical inquiry.

550. Metaphysics. (3). An exploration of some basic topics in the theory of reality. Includes such notions as space, time, substance, causality, particulars, universals, appearance and reality, essence and being. Prerequisite: one course in philosophy.

555. Philosophy of the Social Sciences. (3). Studies such topics as the relations of social science with natural science and philosophy, methodological problems peculiar to social science, the nature of sound explanation, concepts and constructs and the roles of mathematics and formal theories in social science.

557. Contemporary European Philosophy. (3). An exploration of a theme, issue, philosopher or movement in contemporary European philosophy. Includes such philosophers as Heidegger, Heidegger, Habermas, Marcuse, Adorno, Bergson, Sartre, Merleau-Ponty, Bachelard, Lacan, Derrida, Foucault and Ricoeur. Examines philosophical movements such as phenomenology, idealism, existentialism, structuralism, process philosophy, hermeneutics and Marxism.

585. Studies in a Major Philosopher. (3). A concentrated study of the thought of one major philosopher announced by the instructor when the course is scheduled. Repeatable for credit. Prerequisite: instructor's consent.

590. Special Studies. (3). Topic for study announced by instructor. Repeatable for credit. Prerequisite: instructor's consent.

594. Artificial Intelligence and Philosophy. (3). Cross-listed as CS 674. Transfer of ideas between artificial intelligence and philosophy; concept and techniques of artificial intelligence and their application in philosophy (search, heuristic, problem solving, knowledge representation, learning, discovering); sources of insight for artificial intelligence in different branches of philosophy. The analogy between minds and computers "cognition is a computation and the mind is a computer," is contrasted with "there are mental features not accessible to computers." Discusses the relevance of God's theorem and of other results in the domain of computability in this context. Prerequisite: at least one 300-level course in computer science or philosophy, Math. 243 and five hours toward the major in any one of the physical or biological sciences with grades of C or better or departmental consent.

699. Directed Reading. (2-3). Designed for the student interested in doing independent study and research in a special area of interest. Repeatable for credit. Prerequisite: departmental consent.

**Courses for Graduate Students Only**

805. Business and Morality. (3). Critically examines moral issues that are particularly germane to business. Includes theories of distributive justice, theories of property rights, the concept of a right to a property; the role of an institution, employment rights and obligations, environmental issues and theories of socially responsible investment practices. Readings from classical and contemporary authors.

850. Directed Reading. (3). Designed for the graduate student desiring independent study and research in an area of special interest. May be repeated for credit. Prerequisite: departmental consent.

**Physics**

Graduate Faculty
Professor: James C. Ho
Associate Professors: David R. Alexander (chairperson), Gerald D. Loper, Jr. (associate dean), Fairmount College of Liberal Arts and Sciences, Joseph L. Strecker, Syed M. Taher (graduate coordinator).
Assistant Professors: Elizabeth Behrman, Donald L. Foster, Pawan K. Kohal
Emeritus: Henry Unruh, Jr.

**Master of Science**

The physics department offers courses of study leading to the Master of Science (MS) degree.

**Admission Requirements**

Admission to the MS program in physics requires the completion of 24 hours of undergraduate physics, including three semester hours of mechanics and three semester hours of electricity and magnetism, and meeting the Graduate School admission requirements.

**Degree Requirements**

The MS degree in physics requires the successful completion of a program approved by the student's advisor and the department chairperson. Two options are available to the student: (1) the thesis option requires the completion of 30 semester hours of graduate course work, which includes the presentation of a thesis, and (2) the non-thesis option requires the completion of 36 semester hours of graduate work. In both options at least 12 hours must be in courses numbered 800 or above. The department recommends that each Plan of Study include Phys. 821, Classical Mechanics; Phys. 871, Statistical Mechanics; Phys. 611, Quantum Mechanics I; and either Phys. 812, Quantum Mechanics II or Phys. 813, Quantum Mechanics III. Up to nine semester hours of course work may be taken outside the department under the thesis option. For the nonthesis option up to 12 semester hours may be taken outside the department.

An MS degree in physics with a chemical physics option is available. Requirements are those listed above, with the addition of three required courses and the following restricted options:

- **Chemical Physics Option**
  - Chemistry 611, 725, 741, 742, 745, 746 or other approved chemistry courses. Stu­dents who take Phys. 642 unless they took it for undergraduate credit.

Other program options are available which provide the possibility of combining the study of physics with interests in other fields such as astronomy, engineering, geology, computer science, biological sciences and education.

**Examinations**

During the first semester, students are given a diagnostic entrance examination. A qualifying examination must be passed at least one semester before graduation and an oral defense of the thesis also is required.

**Courses for Graduate/Undergraduate Credit**

501. Special Studies in Physics for Educators. (1). A series of courses covering basic physical concepts which provide physical science background for the elementary educator. Prerequisite: in-service elementary teacher.

516. Advanced Physics Laboratory. (2). Experiments in classical and modern physics designed to stress scientific methods and experimental techniques. The experiments are open ended projects requiring individual study. Repeatable up to a maximum of eight credit hours. Corequisite: Phys. 551.

517. Electronics Laboratory. (2). Experiments in electronics that treat some of the applications of electronics in scientific research. Experiments cover the uses of vacuum tubes, transistors, IC and digital circuits. Prerequisite: Phys. 314Q.

551. Topics in Modern Physics. (3). An introduction to selected areas of modern physics emphasizing the features of atomic nuclear and solid state physics that require modifications of the calculus and linear algebra. Prerequisite: Phys. 214Q or 314Q or departmental consent. Corequisite: Math. 344.

The following abbreviations are used in the course descriptions: R stands for lecture and L for laboratory. For example, 4R, 3L means four hours of lecture and two hours of lab.
555. Physical Optics. (3). Electromagnetic waves, diffraction and interference. Additional topics may include geometrical optics, coherence, radiation, scattering and optical properties of solids. Prerequisites: Phys. 214Q or 314Q and Math. 344.

590. Stellar Astrophysics. (3). Focuses on the application of basic physical principles to the study of stars. Includes stellar atmospheres, the structure of stars, formation and evolution of stars, nuclear reactions and nucleosynthesis, unusual stars, the death of stars and the interstellar medium. Prerequisite: Phys. 551.

595. Galactic and Extragalactic Astronomy. (3). Primary topics are galaxies and the structure of the universe. Includes the constituents and dynamics of our galaxy, the characteristics of normal galaxies, active galaxies and quasars, and cosmology. Prerequisite: Phys. 551.

601. Individual Readings in Astrophysics. (1-2). Studies several topics in astrophysics and astrophysics in depth. Lectures, independent readings and student projects may be assigned. May be repeated up to six hours. Prerequisites: Phys. 590 or 595 or instructor's consent.

611. Modern Physics I. (3). Introduction to quantum mechanics, the Schrödinger equation, elementary perturbation theory and the hydrogen atom. Prerequisite: Phys. 551.


621. Elementary Mechanics I. (3).* Motion of a particle in one and several dimensions, central forces, the harmonic oscillator and the Lagrangian formulation of mechanics. Prerequisites: Phys. 214Q or 314Q and Math. 344 with grades of C or better.

625. Electronics. (3). Introduces several topics in electronic devices and circuits for the student or research worker who has little or no background in electronics. Prerequisite: instructor's consent.

631. Electricity and Magnetism I. (3).* Direct and alternating currents; electric and magnetic field theory, including an introduction to Maxwell's electromagnetic wave theory. Prerequisites: Phys. 214Q or 314Q and Math. 344 with grades of C or better.

632. Electricity and Magnetism II. (3).* A continuation of Phys. 631. Prerequisite: Phys. 631 or instructor's consent.

671. Thermodynamics. (3).* The laws of thermodynamics, distribution functions, Boltzmann entropy, equipartition theorem, entropy fluctuations and an introduction to statistical mechanics. Prerequisites: Phys. 214Q or 314Q and Math. 344.


Course for Graduate Students Only

800. Individual Readings. (1-3). Repeatable for credit up to three hours. Prerequisites: 30 hours of physics and departmental consent.

801. Selected Topics in Physics. (2-3). Repeatable for credit up to six hours. Prerequisite: departmental consent.

807. Seminar. (1). Review of current periodicals; reports on student and faculty research. Repeatable for credit up to two hours. Prerequisite: 20 hours of physics.

809. Research. (1-3). Repeatable for credit up to six hours.

811. Quantum Mechanics I. (3). The Schrödinger and Heisenberg formulations of quantum mechanics. Applications include rectangular potentials, central forces and the harmonic oscillator. Additional topics include spin, time independent and time dependent perturbation theory. Prerequisites: Phys. 621 and 611 or departmental consent and Math. 550.

812. Quantum Mechanics II. (3). Applications of quantum mechanics including the WKB approximation, scattering, transformation theory, interaction picture, molecules and relativistic quantum mechanics. Prerequisite: Phys. 811.

813. Quantum Mechanics III. (3). Applications of quantum mechanics including the N-body problem, second quantization photons, the electromagnetic field, superconductivity and magnetism. Prerequisite: Phys. 811.


831. Statistical Mechanics. (3). An introduction to the basic concepts and methods of statistical mechanics with applications to simple physical systems. Prerequisites: Math. 550 and Phys. 621.

881. Solid State Physics I. (3). The basic knowledge of the nature and properties of the solid state, including the structural, thermal, mechanical, electrical and magnetic properties. Also studies the electron theory of metals and band theory of solids. Prerequisites: Phys. 551 or departmental consent and Math. 550.


Political Science

Graduate Faculty

Professors: David N. Farnsworth, Kathryn P. Griffith, Melvin A. Kahn

Associate Professors: Kenneth Ciboski (graduate coordinator), James W. McKenney, John D. Stange, Jr. (chairperson), James F. Sheffield, Jr.

Assistant Professor: James R. Burns

Master of Arts and Areas of Specialization

The political science department offers the Master of Arts (MA) degree with specializations in political science and public administration. A joint emphasis in either health administration and education or urban studies also is available.

Admission Requirements

All applicants are expected to meet Graduate School standards for admission. In addition, the department requires students to have a B average in their major field and a B average over their last 60 hours of academic credit.

Students who fail to meet these requirements may be admitted if the department's Graduate Studies Committee is satisfied that previous grades do not reflect the student's present capability for graduate study; one source of evidence is scores on the aptitude portion of the Graduate Record Examination (GRE). GRE scores are required only of those who are applying for departmental assistantships, however.

In addition to satisfactory undergraduate grades, all students are expected to have previously earned credit in Pol. S. 121Q or its equivalent. Students entering the political science specialization must also have earned three hours of credit in upper-division (300 or higher) political science and three additional hours in any social science. Students who plan to specialize in public administration must have earned credit in Pol. S. 321 and Econ. 201-202 or their equivalents.

Degree Requirements

The MA degree requires 30 or 33 hours of credit, depending upon the option selected. All students must complete Pol. S. 701 and a course in statistics that is approved by the department. An alternative research skill may be substituted with approval of the department. At least six hours of credit must be earned in political science courses at the 800 level. Up to nine hours of credit in courses outside of political science may be applied toward the degree with the advisor's approval, and up to nine hours of graduate credit earned at other universities may be transferred into this program with the approval of the department's Graduate Studies Committee. All graduate students must complete satisfactorily at least 60 percent of the course work numbered at the 700 level and above.

Political Science Specialization. Students in the political science specialization should choose a major field from
these alternatives: American government and politics, comparative politics, international relations and political philosophy. Students are strongly encouraged to earn credit in fields other than their major.

Public Administration Emphasis. In addition to courses required of all students, students in the public administration emphasis must complete one seminar from Pol. S. 841, 851 and 856 and two optional courses from Pol. S. 560, 564, 580, 587, 760, 821, 842 and 855. These students should choose one of the following tracks to complete degree requirements. Only the general track can be completed within the 30-33 hour minimum required for the MA degree.

1. General Track. Students must complete three hours of electives and appropriate hours to complete the thesis, intern or nonthesis option (nine additional hours of electives in the latter case).

2. Social Service Track. Students must take three of the following: HAE 503, 505, 507; Econ. 663 or 665; SW 502; AJ 806 or 833. They must complete the thesis, intern or nonthesis option. Courses should constitute a structured area, and other courses may be substituted with advisor's approval.

3. Health Care Administration Track. Students may take HAE 605 to fulfill the research requirement. HAE 503 and 505 are required, as is HAE 507 or Pol. S. 560. Completion of the thesis, intern or nonthesis option with appropriate courses also is required. Students choosing the latter must choose six hours in health care administration and three hours in political science.

4. Urban Studies Track. Pol. S. 841 is required, as is either Pol. S. 580 or 760. Students must elect three of the following: P. Adm. 700, Econ. 688, Soc. 634 and Soc. 834. Students must complete the thesis, intern or nonthesis option with appropriate courses.

5. Finance Track. Pol. S. 760 and 821 are required. Students must choose three of the following: Econ. 653, Econ. 853, Acct. 690 and Pol. S. 855 and complete the thesis, intern or nonthesis option.

6. Gerontology Track. Pol. S. 506 and Geron. 800 are required. Students must choose two of the following: Geron. 513, 514, 518Q, 731 or 801. Students enrolled in this program must have a minimum of nine undergraduate hours in gerontology as a prerequisite for admission.

Completion Options

Students may complete their degree programs using any one of the following options:

1. Thesis Option. This option is designed for students planning graduate work beyond the MA degree, or careers in research. Students must complete 30 hours for the degree, six of which relate to writing an acceptable thesis (Pol. S. 875-876). Candidates must pass an oral defense of a thesis prospectus and the thesis.

2. Nonthesis Option. This option is appropriate for students not planning further graduate work or research careers. It requires completion of 33 hours of credit and passing a written examination in the major field of study.

3. Intern Option. This option is for students seeking an intensive, applied learning experience. The MA degree requires 30 hours, up to six of which may be earned in the process of completing an internship (Pol. S. 874). Students must write and orally defend an intern report before being granted internship credit. Intern positions are awarded on a competitive basis and thus cannot be guaranteed.

Courses for Graduate/Undergraduate Credit

505. The Politics of Health. (3). Cross-listed as HAE 505. Designed to show how governments in the United States make decisions in the health field, describe the political environment shaping governmental policy in health and analyze the arguments for and against an increased governmental role in health.

506. Politics of Aging. (3). Cross-listed as Geron. 506. Focuses on the role of the elderly as competitors in the political arena. In assessing strengths and weaknesses, course analyzes the efforts of aging on political behavior, strategies of the aging both individually and collectively and the responses of the political system.

523Q. Government and Politics of Latin America. (3). An examination of the political institutions and processes that currently exist in the Latin American republics. Emphasizes the social, economic and psychocultural factors affecting these institutions and processes.

524. Politics of Modern China. (3). Emphasizes study of China's political system since 1949 in terms of non-Western goals and ideas of social organization. Uses theories of political integration and political development to minimize distortion or cultural bias. Emphasizes the roots of the political system, the system as it is now and the goals China is striving to realize. Some assessment about the future development of communism in China. Includes Chinese communism and the ideological heritage; political culture; political leadership; leadership succession; political participation; the Chinese Communist Party; political communications and socialization; legal developments; policy choices; and major events, such as the Hundred Flowers Campaign, Great Leap Forward and the Proletarian Cultural Revolution.


534. Problems in Foreign Policy. (3). Examines domestic and international problems associated with U.S. foreign policy.

547. Contemporary Political Theory. (3). Introduces the radically new ideas that emerged in the last century as a result of Darwin's theory of evolution, the doctrine of historicism and the growth of modern science and explores their impact upon political thought. Although the multiplicity of philosophies makes generalization difficult, most of them draw strength from common sources. Students will study such thinkers as Hans Kelsen, William Barrett, Friedrich Nietzsche and John Dewey. Gives attention to the importance of these new philosophies upon political structures and issues.

551. Public Law. (3). An analysis of the role of the U.S. Supreme Court—in the American political system. Emphasizes judicial review of state and federal legislation, the separation of powers, federalism, the taxing power and the commerce clause.

552Q. Civil Liberties. (3). An analysis of the role of the U.S. Supreme Court—in the American political system. Examines the guarantees of the Bill of Rights and the 14th Amendment.

560. The Planning Process. (3). Course for students desiring to work in an urban planning agency or who will be involved in planning issues as an administrator at the city, county, state or federal level. Also for students seeking an understanding of the complex process of urban-related life. Examines the role of planning in solving human and environmental problems. Emphasizes the relationship between specialists, citizens and elective officials as participants in the planning process.

561. Public Management of Human Resources. (3). Surveys the major areas of management of human resources in the public sector. Includes hiring, training, evaluation and pay promotion policies. Special emphasis on the laws governing public personnel management and on the unique merit, equal employment opportunity, productivity, unionization and collective bargaining problems found in the public sector.

564. Comparative Public Administration. (3). Studies the administrative system of selected developed and developing countries emphasizing the various methods and approaches of comparative analysis and the relationships between administrative institutions and their environmental settings.


587. Administrative Theory and Behavior. (3). A study of organization theory and the various approaches to the study of organization.

700. Advanced Directed Readings. (3). Repeatable for credit. Prerequisite: departmental consent.

701. Method and Scope of Political Science. (3). Emphasizes philosophy of science and methodology (as distinguished from method and technique) and exposes students to re-
Courses for Graduate Students Only

810. Seminar in Comparative Government. (3). The comparative study of selected aspects of the political and institutions of foreign governments. Prerequisite: departmental consent.

821. The Budgetary Process. (3). Analysis of the development and utilization of the budgetary process in government administration emphasizing the budget in relation to its role in policy formulation. Prerequisite: departmental consent.

851. Scope of Public Administration. (3). Cross-listed as F. Adm. 710. Review of the scope of the field of public administration including a survey of key concepts and schools of thought underlying the field and identification of issues shaping the future development of the field.

750. Workshop. (2-4). Prerequisite: instructor's consent.

760. Local Government Finance. (3). Cross-listed as Econ. 760. An analysis of state and local government expenditure and revenue systems with an introduction to state and local financial administration. Prerequisites: Econ. 207Q and a course in statistics or instructor's consent.

841. Seminar in Urban Politics. (3). An intensive analysis of urban politics emphasizing individual research projects. Prerequisite: departmental consent.

852. Administration in Local Government. (3). Examination of administrative processes and problems in local government, including the role of the professional chief executive, and the ways and means of program evaluation, government control, political decentralization, citizen participation, and service contracting. Prerequisite: departmental consent.

835. Seminar in International Relations. (3). Analysis of special problems in, and approaches to, the study of international relations. Prerequisite: departmental consent.

841. Seminar in Urban Politics. (3). An intensive analysis of urban politics emphasizing individual research projects. Prerequisite: departmental consent.

842. Administration in Local Government. (3). Examination of administrative processes and problems in local government, including the role of the professional chief executive, and the ways and means of program evaluation, government control, political decentralization, citizen participation, and service contracting. Prerequisite: departmental consent.

845. Seminar in Political Theory. (3). Detailed study of the relevant works of a major political philosopher and his/her contribution to contemporary thought. Prerequisite: departmental consent.

851. Seminar in Public Law and Judicial Behavior. (3). Analysis of special problems in and approaches to the study of legal systems. Emphasizes developing awareness of research in the field. Prerequisite: departmental consent.

855. Seminar in Public Finance Systems. (3). An analytical study of selected topics in the politics and administration of revenue, expenditure, and borrowing policies of governmental organizations. Prerequisite: departmental consent.

856. Seminar in American Politics and Institutions. (3). Analytical study of selected topics in American political behavior emphasizing individual research. Repeatable for credit when content differs substantially. Prerequisite: departmental consent.

874. Internship. (2-6). S/U grade only. An intensive applied learning experience supervised by a University department or committee. To receive credit, a student must secure approval of a written report from his/her own department. Prerequisite: departmental consent.

875. Research Design. (3). S/U grade only. Requires the development of a research design for the thesis. The design must be submitted to a departmental committee for evaluation and approval. Prerequisite: departmental consent.

876. Thesis. (1-3).

Psychology

Graduate Faculty

Professors: Charles A. Burdels, Jr. (chairperson), Gary Greenberg (graduate coordinator), Charles Halcomb


Assistant Professors: Paul D. Ackerman, Virginia Lang, M.J. Klingsporn, Marilyn Turner

Degrees Offered

The psychology department offers courses of study leading to the Master of Arts in Community/Clinical Psychology and the Doctor of Philosophy in Human Factors Psychology.

Admission Requirements

For all students: Applications for admission should be filed with the dean of the Graduate School by March 1 for enrollment the following fall. In addition to the usual application information, the following are required: (1) three letters of reference from persons acquainted with the applicant's academic background and potential and (2) a brief autobiographical statement describing particular interests, experiences and goals related to academic and professional work in psychology.

For doctoral students: In addition to the above, doctoral applicants must submit scores on the Graduate Record Exam (verbal, quantitative, and advanced).

Applicants are evaluated with respect to (1) undergraduate grade point average, (2) amount, type and scope of undergraduate preparation and (3) reference letters. Applicants are informed of admission or rejection by approximately April 1. Applications received after March 1 are acted on periodically until fall enrollment, with acceptances depending upon the department's graduate teaching capacity.

Prerequisites

Regardless of the program to which the student is applying, for full graduate standing the student must have undergraduate courses in general psychology, psychological statistics, experimental psychology and systems/theories. In addition, depending upon the intended area of study, the following courses are required:

Community/Clinical: Applicants for this program are expected to have interdisciplinary strengths in the social sciences, humanities, and related fields. In addition, students must have Psychology of Learning and one of the following: Psychology of Motivation, Physiological Psychology, Psychology of Consciousness, Cognitive Psychology, Comparative Psychology and Psychology of Perception. Students also must have Abnormal Psychology and two of the following: Social Psychology, Child Psychology, Developmental Psychology, Psychology of Personality, Community Psychology and Psychology of Aging.

Community/Clinical: Applicants for this program are expected to have interdisciplinary strengths in the sciences, mathematics, computer technology and related fields. In addition, students must have three of the following: Psychology of Learning, Psychology of Motivation, Physiological Psychology, Comparative Psychology, Cognitive Psychology or Psychology of Perception.

Important: For both the community/c clinical and human factors programs, interested students who are not psychology majors or who lack specific prerequisites may be provisionally accepted with an opportunity to make up deficiencies.

Degree Requirements

Students should be aware of the Graduate School's time limit for completing master's and doctoral degree programs. The psychology department expects all degree-bound students to make satisfactory progress toward the completion of their degree programs.

Community/Clinical: The following courses are required for each student enrolled in the community/clinical master's degree program: Univariate Research Design, Seminar in Community-Clinical Psychology I and II, Practicum in Community-Clinical Psychology and either Multivariate Research Design or Research in Community Psychology. Additionally, each student must take either Seminar in Cognitive Behavioral Assessment and Seminar in Behavior Therapy; or Seminar in Prevention and Research in Community Psychology. Each student must also take 6-8 hours of electives.
All community/clinical master's degree students are required to complete a thesis with enrollment in Psy. 875 and 876. In addition to regular course examinations, all students must pass an oral examination based on their thesis and program area. The thesis will ordinarily be a major research project which must be preceded by approval of a formal written proposal by the student's thesis committee.

Human Factors: The following courses are required for each student enrolled in the human factors doctoral degree program: Biological Foundations of Behavior, Cognitive/Affective Foundations of Behavior, Personality/Individual Differences, Social/Developmental Foundations of Behavior, Univariate Research Design and Multivariate Research Design. Each student must also take Seminar in Sensory Processes, Seminar in Motor Processes, Measurement and Management of Information in Human Performance, Seminar in Human Factors Psychology, Aerospace Psychology, and Research and Development Methods in Applied Settings. Each student must take 21 hours of elective courses, 12 of which will be outside of the Psychology Department, selected in consultation with his or her adviser. Finally, each student must enroll in one hour of Research Seminar each semester for a total of eight credit hours.

Each student must complete a predoctoral research program before admission to candidacy. Students will take a comprehensive examination prior to acceptance for doctoral candidacy and the onset of data collection for the dissertation. During each semester of supervised work on the dissertation, each student will be enrolled in Psy. 900. Each student will complete a Research Internship of three hours per semester over a period of two semesters for a total of six hours.

Courses for Graduate/Undergraduate Credit

502Q. Comparative Psychology. (3). Compares and contrasts psychological and ethological analysis of behavior. Includes a critique of the instinct doctrine and sociobiological interpretations of behavior. Field trips supplement lectures. Prerequisite: one course from Group One.

503. Psychology Tutorial. (3). Selected topics in psychology. Repeatable for a maximum of six hours' credit. Instructor's consent may be required. Check Schedule of Courses. Prerequisite: Psy. 111Q.

512. Primatology. (3). A survey of the primates (including humans) and their behavior. Includes principles of evolution and taxonomy, the transition to homo sapiens, the evolution of behavior, the development of language, learning in the primates and the development of behavior. Prerequisite: Psy. 111Q.

514. Psychology of Health and Illness. (3). A survey of the relationships between psychological/behavior and physical health and illness. Includes stress and coping, health habits, symptom perception, health care provider-client relationships, hospitalization and prevention. May include a self-study of life style and behavior in relation to health and illness. Prerequisite: Psy. 111Q.


522. Biological Psychology. (3). A review of the biological foundations of behavior. Includes the evolutionary basis of behavior, behavior genetics, a critical analysis of brain-behavior relationships, the role of hormones in behavior and neurochemical correlates of behavior. Prerequisite: Psy. 111Q.

524. Advanced Psychology of Personality. (3). More intensive treatment of the topics of psychology of personality emphasizing contemporary theories and research and application of the psychodynamic study of personality. Prerequisite: Psy. 324Q.

526. Psychological Testing and Measurement. (3). A critical analysis of the psychological foundations of tests and the interpretation of test findings. Surveys several tests representing the areas of intelligence, personality, normal and abnormal psychology, interests, special abilities and aptitudes to illustrate general principles of testing. Prerequisite: Psy. 401.

532. Psycholinguistics. (3). Cross-listed as Ling. 545. Survey of psychological, linguistic and informational analyses of language. Includes the performance-competence distinction, child development of speech, animal communication systems and the relation of language to thought. Prerequisite: Psy. 111Q.

534. Psychology of Women. (3). Cross-listed as Wom. S. 534. Psychological assumptions, research and theories of the roles, behavior and potential of women in contemporary society. Prerequisite: Psy. 111Q.

536. Behavior Modification. (3). A study of the basic assumptions, principles and behavior of behavioral approach to helping persons with psychological problems. Includes demonstration and individualized practice in general helping skills as well as individual techniques in practice. Prerequisites: Psy. 111Q and instructor's consent.

544. Abnormal Psychology. (3). An introductory survey of abnormalities of behavior. Includes a survey of the various types of abnormalities of behavior and classification of abnormal behavior. Emphasizes the role of research evidence and various methods of diagnosis and treatment. Prerequisite: Psy. 324Q.

546. Practicum in Applied Behavior Analysis and Social Learning. (3). 1R; 4L. Placement in local human service agencies for about eight hours a week for 14 weeks. Under supervision, students assist in the development and delivery of services at the agency supervised. Prerequisites: Psy. 536 and instructor's consent.

556. Introduction to Clinical Psychology. (3). A survey of current ethical, conceptual and research issues involved in the assessment and treatment of psychopathology. Reviews contemporary psychotherapies emphasizing the relevance of each and the therapeutic mechanisms through which they initiate behavioral change. Prerequisite: Psy. 324Q.

560. Computer Applications to the Behavioral Sciences. (3). 2R; 2L. Introduces comput er applications to the behavioral sciences including 1) techniques of analyzing experimental data, 2) statistical applications, 3) interactive computing, 4) "canned" statistical programs, 5) word processing and 6) other computer applications. Prerequisite: nine hours in the social sciences.

601. Systems and Theories in Psychology. (3). Includes behaviorism, Gestalt psychology, structuralism and others. Makes an attempt to develop the logical relations of these theories to each other as well as to common historical themes and current issues. Prerequisite: 15 hours of psychology including Psy. 411.

608. Special Investigation. (1-3). Upon consultation with instructor, advanced students with adequate preparation may undertake original research or directed readings in psychological problems acceptable for a maximum of six credit hours. Requires consultation with and approval by appropriate advisor prior to registration. Prerequisites: nine hours in psychology and instructor's consent.

622. History of Psychology. (3). Traces the development of philosophical and empirical concepts of psychology from the ancient Greeks through the 19th century. Examines the origins and various views of the body-mind-relationshi p. Emphasizes the influence of naturalistic assumptions and research methods on 20th century psychology. Prerequisites: nine hours of psychology or instructor's consent.

686. Human Factors Psychology. (3). The study of how people respond to the demands of complex machines and the varied environments of workplace, home and other settings. Course introduces the tools and methods of machine, task and environment design to achieve the matching of human capabilities and the demands of machines and environments so as to enhance human performance and well being. Prerequisite: Psy. 111Q.

704. Advanced Social Psychology. (3). An intensive review of selected contemporary issues in social psychology. Prerequisite: Psy. 304Q.

728. Seminar in Psychotherapy. (3). Provides an in-depth description and critical analysis of various theories and methods of psychotherapy, an examination of the efficacy of the therapeutic relationship, reviews of research and a survey of common issues in psychotherapy, such as process and outcome, and client and therapist variables in the therapeutic process. Prerequisites: Psy. 111Q and instructor's consent.

748. Research and Development in Applied Settings. (3). 2R; 2L. An introduction to re
search and development activities in industry. Lectures cover sources of research ideas, funding sources, use of company researchers, technical communications, assembling literature, research design and publishing practices. Lab work involves practice in preparing industry-type proposals and presentations, writing and analysis of industry research proposals. Prerequisite: 15 hours of psychology or instructor's consent.

750. Psychology Workshop. (1-3). Specialized instruction, using various formats in selected topics and areas of psychology.

756. Aerospace Psychology. (3). Exploration of the many roles of scientific psychology in aviation and aerospace science. Surveys the research and literature in areas such as psychophysiological aspects of flight, environmental effects on human performance in aviation, aircrew skill requirements and training, pilot workload, cockpit control and display systems and aviation safety. Prerequisites: 15 hours of psychology or instructor's consent.

Courses for Graduate Students Only

802. Seminar in Community-Clinical Psychology I. (3). Introduces basic historical, conceptual, research, methodological and ethical issues in the discipline of community-clinical psychology. Examines the responsibilities and roles of psychologists in the promotion of human functioning. Reviews models and determinants of human behavior from individual, developmental and ecological/contextual perspectives. Details the reciprocal relationship between research and practical applications of psychological knowledge and the development of human psychosocial problems. Prerequisite: instructor's consent.

803. Seminar in Community-Clinical Psychology II. (3). Introduces methods of assessment and intervention used to promote human functioning at various levels of primary and secondary prevention and clinical treatment of human psychosocial problems. Describes and integrates theories and methods relevant to the assessment of persons, environments, agencies and communities. Details theories and methods of intervention, including psychotherapy, consultation, social action and organizational development. Students apply these theories and methods to selected psychosocial problems. Prerequisite: Psy. 802.

804. Seminar in Behavioral Development. (3). A critical analysis of the concept of development and of theories of behavioral development. Begins with a review of the concept of integrative levels and proceeds to a discussion of modern evolutionary thought. Examines the concept of development from psychological, biological and anthropological perspectives. Also critically evaluates various theories of human development. Prerequisite: instructor's consent.


815. Clinical Research and Practice. (3). Gives the student further experience in clinical skills and clinical research. Students are supervised in their clinical work with individual clients and community or hospital-based clinical settings. May be taken for a maximum of six credit hours. Prerequisite: instructor's consent.

821. Biological Foundations of Behavior. (3). Reviews various biological influences on behavior and evolution genetics, biochemistry and physiology. A consideration of the development of the nervous system and the behavior of the organism as a whole. The position developed is that behavior depends on biological as well as environmental factors. Prerequisite: instructor's consent.

822. Cognitive Foundations of Behavior. (3). Focuses on human beings as information processors. This approach views the individual as an active, constructive and planning person in remembering and organizing new and prior learned knowledge. Includes the study of memory, language, speech, thought, decision making and problem solving processes. Prerequisite: instructor's consent.

823. Personality and Individual Differences. (3). Provides an advanced understanding of the theories and measurement of personality and individual differences. Also focuses on the development of personality information to an applied psychological setting. Prerequisite: instructor's consent.

824. Social and Developmental Foundations of Behavior. (3). Examines basic assumptions, theories and methods in social and developmental psychology. Describes and analyzes the research concerning the social and psychological significance of social relationships for development and the embeddedness of behavior in social, ecological and cultural contexts. Focuses on a number of substantive issues such as parental definition and social cognition, affiliation and attachment, socialization and interpersonal interaction, social support and social roles and contexts over the life span, through environmental psychology to the solution of individual and social problems. Prerequisite: instructor's consent.

825. Seminar in Environmental Psychology. (3). Explores historical, theoretical and empirical bases of environmental psychology. Preserves contemporary models of environmental psychology including the ecological, social and community mental health perspectives. Special topics could include community prevention, empowerment, community based prevention, self-help, social policy and the prevention of psychosocial problems through environmental intervention. Prerequisite: instructor's consent.

844. Seminar in Personality and Psychosocial Disorders. (3). Relationship of normal behavior development and maladjustment and also a critical review of theory and research. Prerequisite: instructor's consent.

845. Development of Abnormal Behavior. (3). A consideration of the descriptive characteristics of abnormal behavior, a description of the normal and abnormal, and an understanding of the ecological, social-environmental, personal and genetic-biological contexts and causes of such behavior. Discusses implications for preventative and clinical interventions. Prerequisite: instructor's consent.

852. Advanced Research Methods I. (4). 3R: 3L. Focuses upon the two-course sequence aimed at advanced treatment of statistical research and design issues. Statistical methods included are analysis of variance, analysis of covariance, multiple comparisons and multiple regression. Design issues include research planning, validity, quasi vs. experimental designs, prediction vs. explanation, multiple treatment analysis and multiple treatment compare. Also provides basic computer skills for access to the mainframe and some basic training in SPSS-X, SAS and BIOMED statistical routines. Prerequisite: instructor's consent.

853. Advanced Research Methods II. (4). 3R: 3L. Continuation of Psy. 852. Statistical techniques emphasize a continuation of multiple regression, structural analyses including Path Analysis and LISREL, factor analysis, canonical correlation and discrimi-
inant analysis. Includes advanced design issues. Students carry out research projects as part of the course requirements. The associated lab provides additional computer skills for accessing SPSS software and some basic training in SPSS-X, SAS and BIOMED statistical routines. Prerequisites: Psy. 852 and instructor’s consent.

865. Seminar in Psychology of Learning. (3). Intensive study of theory and research in learning processes. Includes the study of principles of individual behavior and some of the variables of which it is a function as illustrated by respondent and operant conditioning along with some areas of application. Prerequisites: Psy. 302 and instructor’s consent.

870. Seminar in Current Developments. (3). Intensive study of current issues, techniques, research and application. Repeatable for different topics for a maximum of six hours. Prerequisite: instructor’s consent.

872. Seminar in Comparative Psychology. (3). Intensive study of psychological and ethological research and theories of behavior. Oriented around the evolution and development of behavior. Includes a review of the concept of integrative levels in psychology. Prerequisites: Psy. 302Q and instructor’s consent.

873. Seminar in Motivation and Emotion. (3). Intensive study of theory and research in motivational and emotional processes. Prerequisite: instructor’s consent.


885. Seminar in Perception. (3). Intensive study in theory and research in perceptual processes. Prerequisites: Psy. 332, or equivalent, and instructor’s consent.

900. Doctoral Dissertation. (3). Graded S/U only. Repeatable for credit. Prerequisite: admission to candidacy and instructor’s consent.

901. Research Seminar. (1). Graded S/U only. Repeatable for credit. Exposes students to research in its varied forms and at its various stages, i.e., its conceptualization, design, execution and presentation. Prerequisite: instructor’s consent.

902. Measurement of Human Performance. (3). The logic of fundamental measurement is developed and applied to human performance from detection to decision. Signal Detection Theory (SDT) is developed and compared with threshold theory. Demonstrates procedures for assessing both detection and discrimination under both SDT and threshold theory. Information measurement and utility theory is developed and applied to the transmission and coding of information and to decision making respectively. Examines measures of work reliability and well-being. Prerequisite: instructor’s consent.

903. Seminar in Human Factors. (3). Focuses on a sample of contemporary human factors issues and through review of current literature and theory. Content changes as new problems attain prominence internationally but a typical sample might be human factors in the aging population; human factors in airport security and baggage marking; and human factors in third-world industrialization. Prerequisites: completion of 9 hours of Foundations of Psychology doctoral courses; for doctoral students from other disciplines, instructor’s consent after an interview.

904. Seminar in Motor Processes. (3). Focuses on motor processes in human performance. Motor processes, sensory processes, cognitive processes and affective processes comprise the major domains of human factors psychology. Seminar explores the macro-anatomy of human motor performance theories of human control responses; the nature and retention of skilled performance; and constraints on ability and strength which impact on the design of the human-machine interface. Prerequisites: any three of the following foundations courses: Psy. 821, 822, 823, 824 and instructor’s consent.

905. Seminar in Sensory Processes. (3). Focuses on human sensory systems, their roles and functions in the processing of physical stimuli and their conversion to information and explores the application of sensory behavior in human factors psychology. After review of the anatomy and neurophysiology of sensory processes, emphasis on contemporary research and literature in human sensory behavior. Prerequisite: instructor’s consent.

Religion

Graduate Faculty

Associate Professors: Stuart Lasine, Paul Wiebe

Although there is no graduate program in religion, the following courses may be taken for graduate credit.

Courses for Graduate/Undergraduate Credit

750. Workshop in Religion. (2-4).

790. Independent Study. (1-3). Designed for the student who is capable of doing graduate work in a specialized area of the study of religion that is not formally offered by the department. Repeatable for credit.

Sociology/Social Work

Graduate Faculty

Professor: John J. Hartman (chairperson and graduate coordinator)

Associate Professors: Nancy Brooks, William C. Hayes (gerontology)

Assistant Professors: Robert L. Allegrucci, Elwin M. Barrett, Laura Eells, Bernice Hutcherson, Timothy W. Lause, Ronald R. Matson, Kathleen M. O’Flaherty, Gregory L. Willfang

Master of Arts

The sociology department offers courses of study leading to the Master of Arts (MA) degree with options for thesis and nonthesis programs, as well as an emphasis in gerontology.

Admission Requirements

Applicants are evaluated for admission with respect to their undergraduate record, Graduate Record Examination scores (optional) and three letters of reference from professors who supervised their undergraduate work. For consideration for admission to degree status, applicants are expected to have at least 15 hours in sociology including courses in social statistics, social theory and research methods. Specific course prerequisites may be made up after admission by students with otherwise adequate backgrounds. Final recommendation on a candidate’s admission to the MA program in sociology is made to the Graduate School by the graduate coordinator of the Department of Sociology.

Degree Requirements

Students pursuing the MA degree in sociology may follow either a thesis or a nonthesis program.

Thesis Program. Students in the thesis program must take a total of 32 hours, including Soc. 800, Research Methods in Sociology, and 845, Seminar in Sociological Theory, and two 800-level graduate seminars as well as completion of their thesis hours. Sixty percent of the 32 hours must be 700 level or above.

Nonthesis Program. Students in the nonthesis program must take a total of 36 hours. They must take at least 21 hours of courses numbered 800 or above, including Soc. 800, Research Methods in Sociology, and 845, Seminar in Sociological Theory, and two 800-level graduate seminars. Each student must demonstrate skill in a collateral area, such as research or computer programming. Soc. 851, Directed Research, is needed to fulfill this requirement. A total of 60 percent of the 36 hours must be 700 level or above.

Degree Requirements for the MA with Gerontology Emphasis

Students may complete the MA degree in sociology with an emphasis in social gerontology under either the thesis or nonthesis program as described below. For either program 60 percent of the courses must be 700 level or above.

Thesis Program. Students must complete the sociology core, Geron. 800 and three of the gerontology courses listed below.

Sociology Core Courses

Hrs.

Soc. 510, Introduction to Methods or Soc. 511, Applied Quantitative Research ......... 3
Soc. (Geron.) 513, Sociology of Aging ......... 3
Soc. 800, Research Methods in Sociology ......... 3
Soc. 845, Seminar in Sociological Theory ......... 3
Soc. 875-876, Thesis* ......... 3-6
Seminar electives (3 seminars above 800)........... 9

Gerontology Courses
Ger. 800, Seminar I ............. 3
and three of the following courses
Ger. (Anthro.) 514, Anthropological Perspectives in Aging ..... 3
Ger. (Biol.) 518Q, Biology of Aging ............. 3
Ger. (CESP) 731, Growth and Development: Adults ........ 3
Ger. (Econ.) 663, Economic Insecurity .......... 3
Ger. 801, Field Research in Gerontology .......... 3
Total Hours: 36-39

Tri-thesis Program. Students must complete the sociology core, Ger. 800 and four of the gerontology courses listed below.

Sociology Core Courses
Hrs.
SOC. 510, Introduction to Methods or SOC. 511, Applied Quantitative Research .... 3
SOC. ( Renor.) 513, Sociology of Aging ............. 3
SOC. 800, Research Methods in Sociology ............. 3
SOC. 845, Seminar in Sociological Theory .......... 3
SOC. 851, Directed Research* ......... 3
Seminar electives (3 seminars above 800) ........... 9

Gerontology Courses
Ger. 800, Seminar I ............. 3
and five of the following courses
Ger. (Anthro.) 514, Anthropological Perspectives in Aging ..... 3
Ger. (Biol.) 518Q, Biology of Aging ............. 3
Ger. (CESP) 731, Growth and Development: Adults ........ 3
Ger. (Econ.) 663, Economic Insecurity .......... 3
Ger. 801, Field Research in Gerontology .......... 3
Total Hours: 39

*Directed research must be aging related.

Examinations
Students electing the thesis program in sociology must pass an oral defense of the thesis.

Sociology
Courses for Graduate/Undergraduate Credit

501. Sociological Statistics. (3). Generally offered fall semester only. Application of descriptive and inferential statistics to sociological problems. Includes measures of central tendency, dispersion and association, simple linear regression, hypothesis testing, and analysis of variance. Prerequisites: SOC. 111Q and Math. 111 or 331Q or equivalent.

510. Field Research Methods. (3). An examination of various qualitative research tools and techniques used by sociologists. As part of the learning experience students are involved in direct field observation in natural social environments. Prerequisite: SOC. 111Q.

511. Applied Quantitative Research. (3). An examination of the survey as a tool used to address sociological questions. Includes survey design, sampling, data collection techniques, and interpretation of results. Students gain experience in designing and administering surveys. Prerequisite: SOC. 212.

513. Sociology of Aging. (3). Cross-listed as Ger. 513. Analysis of the social dimensions of old age, including changing demographic structure and role changes and their impact on society. Prerequisite: SOC. 111Q.

515. Sociology of the Family. (3). Analysis of American family behavior, including the selection of marriage partners, the husband-wife and parent-child relationships, and the relation of these patterns of behavior to other aspects of American society. Prerequisite: SOC. 111Q.

516. Sociology of Sex Roles. (3). Cross-listed as Wom. 516. Analyzes the institutional sources of man's and woman's sex roles, the source of changes in these roles, the resultant ambiguities and conflicts. Prerequisite: SOC. 111Q.

517. Intimate Relations. (3). Examines the social dimensions of intimacy including analysis of intimacy in different types of relationships, i.e., romantic, friendship, marriage, and parent-child relationships in the area with a special focus on the place of intimacy in social interaction. Prerequisite: SOC. 111Q.

523. Sociology of Law. (3). The study of law and legal institutions within their social context. Prerequisite: SOC. 111Q.

526. Political Sociology. (3). Social basis and consequences of political behavior. Also includes the study of power and authority problems in the development and maintenance of viable democratic political structures and bureaucratization and power. Prerequisite: SOC. 111Q.

527. Violence and Social Change. (3). The analysis of the causal processes and functions of extreme and violent political behavior, i.e., revolutionary, insurrectionary, and protest movements. Includes an analysis of consequences for social change. Prerequisite: SOC. 111Q.

534. Urban Sociology. (3). Urban population organization and institutions and programs of city planning. Prerequisite: SOC. 111Q.

357. The Social Consequences of Disability. (3). Cross-listed as Ger. 357. An eclectic survey of the social aspects of disability and the impact of social values, institutions and policies upon adults with disabilities. Appropriate for both students of sociology and the service professions. Prerequisite: SOC. 111Q.

358. Medical Sociology. (3). An analysis of social and cultural factors related to physical and mental illness. Also includes the dynamics of communication and role relationships among patients and medical personnel and explores social and medical theories relevant to health professions. Prerequisite: SOC. 111Q.

359. Juvenile Delinquency. (3). The factors related to juvenile delinquency and the study of treatment and prevention. Prerequisite: SOC. 111Q.

540. Criminology. (3). The extent and nature of criminal behavior and societal reactions to it. Prerequisite: SOC. 111Q.

541. Contemporary Corrections. (3). Historical and contemporary programs for the treatment of offenders viewed as societal reactions to criminal behavior. Prerequisite: SOC. 539 or 540.

598. Internship. (1-6). Supervises persons involved in internships or placements in the community where credit can be given. Prerequisite: departmental consent.

600. Selected Topics in Sociology. (3). Study in a specialized area of sociology emphasizing student research projects. Includes field research techniques and techniques used by sociologists. Students gain experience in designing and administering surveys. Prerequisite: SOC. 111Q. Instructor's consent and substantive area course.

645. History of Sociological Theory. (3). Analysis of emergence of sociological theory. Prerequisite: nine hours of sociology.

646. Principles and Concepts of Sociology. (3). Critical evaluation of major principles and concepts, their derivation and relationship to systematic theory. Prerequisite: nine hours of sociology.

651. Directed Research. (3). Designed to give the student further research skills in an area of special interest. Prerequisites: 15 hours of sociology and instructor's consent.

670. Independent Reading. (1-3). Designed for the advanced student capable of doing independent work in an area of special interest. Prerequisite: 15 hours of sociology and instructor's consent.

750. Sociology Workshop. (1-3). Provides specialized instruction using a variable format, in a sociologically relevant subject.

*Prerequisite may be waived with departmental consent.

Courses for Graduate Students Only

800. Research Methods in Sociology. (3). The application of research methods to sociological data. Includes research design, sampling, data collection techniques, computer-based analysis of data, scaling, and report writing. Students are expected to design their own research projects. Prereq-
815. Seminar on the Family. (3). Review of recent research on the family and the theoretical implication thereof. Prerequisite: Soc. 510 or departmental consent.

820. Seminar in Social Movements. (3). Analysis of the elements in social movements as factors in social and cultural change. Prerequisite: departmental consent.

822. Seminar in Deviant Behavior. (3). In-depth examination of recent theory, methods, and research in the area of deviance. Includes implications of future theory development. Prerequisite: departmental consent.

825. Seminar in Organizational Analysis. (3). Exploration of selected problems in organizational theory based on major theoretical and empirical approaches, both classical and contemporary. Prerequisite: departmental consent.

834. Seminar in Urban Sociology. (3). Independent research projects in urban sociology. Prerequisite: departmental consent.

845. Seminar in Sociological Theory. (3). Emphasizes continuities between European and American social theory. The perspective is both historical and analytical spanning the 18th, 19th and 20th centuries and concluding with the works of representative contemporary theorists. Prerequisite: Soc. 645 or 646 or departmental consent.

847. Seminar in Recent Developments in Sociology. (3). Major issues, new theories, new techniques of research, new areas of research, and new applications. Repeatable for credit but not to exceed six hours. Prerequisite: 15 hours of sociology and departmental consent.

851. Directed Research. (1-3). Designed for the advanced student who wants to achieve research competence in a specific area. Each student is directed by a member of the graduate faculty in the development of a project in research not leading to thesis research. Prerequisites: Soc. 800 and instructor's consent.

855. Proseminar-Teaching Sociology. (1). Focuses on the teaching of sociology. Emphasis on teaching techniques, course organization and evaluation. Prerequisite: graduate student status.

870. Independent Reading. (2-3). Advanced systematic reading in a topical area under the tutelage of a member of the graduate faculty. Repeatable for credit but not to exceed six hours. Prerequisite: departmental consent.

875-876. Thesis. (3-6).

Social Work

Although a complete graduate program is not available currently in social work the following courses may apply toward a master's degree.

Courses for Undergraduate/Graduate Credit

500. Social Welfare Policy and Services I. (3). Descriptive and analytical approach to the social welfare system, emphasizing its historical, structural and value bases. Includes alternative program strategies of meeting individual and group needs. Prerequisites: Sc. Wk. 200Q and Soc. 212.

502. Strategies and Techniques in Interven­

tive Skills. (4). Introduces the study and practice of interpersonal professional interaction skills within the framework of a social work helping process. Focuses on developing skills in professional observation, communication, interviewing, recording and reporting. Course is didactic as well as interactive and includes an integrated laboratory component which focuses on exper­

imental learning. Required for social work majors and open to nonmajors. Prerequisite: Sc. Wk. 201 for social work majors, departmental consent for nonmajors.

520. Social Welfare Policy and Services II. (3). Analytical approach to social welfare problems, policies, programs and issues, including an analysis of the influence of values on the formation of social welfare policy. Includes in-depth examination of selected issues in public and voluntary areas and reading and preparation of meeting needs. Prerequisite: Sc. Wk. 500.

551. Independent Studies. (1-3). Individual projects designed for social work students who are capable of doing independent work in areas of special interest. Repeatable for credit not to exceed six hours. Prerequisite: instructor's consent.

560. Personal Human Interaction within So­c­i­ety. (3). Provides a beginning theoretical framework within which the integration of prior knowledge can be made regarding physical, mental and social development of the human being, perspectives on American culture and subcultural variations and their effect on human adaptability in the social environment and the relationship of those entities to professional social work practice. Prerequisites: Sc. Wk. 200Q and six hours from a list of social and behavioral science courses approved by the social work faculty and selected in consultation with a social work adviser.

570. Internships in Social Work. (3-6). Provides a specially designed field experience for individuals interested in professional social work training that will enhance their professional abilities and for whom academic credit is appropriate. Also designed to meet exper­

iences of students who desire to prepare for whom academic credit is appropriate. Repeatable for credit not to exceed a total of six hours. Prerequisite: instructor's consent.

580. Practicum I. (4). Placement in community social welfare agencies for supervised periods of observation and direct service assignments emphasizing performance of basic practice skills and understanding of the social welfare agency and its role in the community. To be taken concurrently with Sc. Wk. 602 except by departmental consent. Prerequisites: Sc. Wk. 502 and departmental consent.

582. Contemporary Women's Art. (3). Examines art by women in the contemporary world. Gives special attention to the impact of the women's movement on the creative


505. Practicum II. (5). Placement in community social welfare agencies for supervised direct service assignments emphasizing formulation of appropriate goals. Includes the selection of various social work roles and in-depth development of techniques and skills common to practice in the social welfare field. Sc. Wk. 604 is to be taken concurrently except by departmental consent. Prerequisite: Sc. Wk. 602.

510. Aging: Personal, Social and Profes­sional Perspectives. (3). Cross-listed as Geront. 610. A realistic look at the comprehensive role of social work practice and the helping professions in work with the aging. Focuses on work with individuals, groups and community organizations. Links social with economic and political factors. Highlights current developments in social policy, human service practice and demography as the total life cycle is conceptualized. Prerequisite: departmental consent.

750. Social Work Workshops. (1-5). Specialized instruction using a variable format in a social welfare relevant subject. May be offered together with Sc. Wk. 150. Prerequisite: instructor's consent.

Women's Studies

Graduate Faculty

Associate Professors: Sally Kitch (director), Elin­

tle Shore (psychology), Anita Sleen (English), Jacqueline Snyder (continuing education)

Assistant Professors: Elena Bastida (sociology), Dorothy Billings (anthropology), Gayle Davis, Carol Konek

Students may earn a master's degree in several areas with an emphasis in women's studies. These include curriculum and instruction; counseling, educational and school psychology; sociology; and cross-cultural communications. Women's studies may be included as one of two or more areas of interest under the MA degree in liberal studies, an individually designed, interdisciplinary graduate program (described in General Programs). In other areas, such as the community/clinical program in psychology, students may orient course electives and thesis research to accommodate an interest in women's studies. The following courses are available for graduate credit.

Courses for Graduate/Undergraduate Credit

516. Sociology of Sex Roles. (3). Cross­listed as Soc. 516.

522. Contemporary Women's Art. (3). Examines art by women in the contemporary world. Gives special attention to the impact of the women's movement on the creative
energies and on the career directions and opportunities of these women in the arts.

530. The American Woman in History. (3). Cross-listed as Hist. 530.

533. Women and the Law. (3). Introduces the legal aspects of women's rights, including the Equal Rights Amendment to the U.S. Constitution; right to choose a name; sex discrimination in employment, education and credit; welfare and criminal justice. Also gives consideration to women in the field of law, such as lawyers and legislators.


535. Literary Images of Women: Diverse Voices. (3). Cross-listed as Enid. 535. Explores literature written in English by women of diverse ethnic, racial, class and other backgrounds as well as of varying sexual orientations, ages and degrees of physical ability. Analyzes materials both as literary works and as expressions of women's differences from one another. Works are selected based on their specific attention to the question of gender as it intersects with other elements of culture.

536Q. Writing by Women. (3). Cross-listed as Engl. 536. Explores literature written in English by women writers, especially those whose works have been underrepresented in the literary canon. Genres and time periods covered, critical theories explored and specific authors studied vary in different semesters.

537. Contemporary Women's Drama. (3). Cross-listed as Engl. 537. Examines contemporary plays by and about women to discover and explore the insights of the various playwrights into the lives and roles of women. Writers considered vary. In addition to reading and analyzing plays, students write plays of their own. Prerequisites: Engl. 101 and 102 and 3 hours of English literature.

541. Women and Poverty. (3). Addresses the problem of poverty among women in the U.S. today and examines existing and proposed public policies designed to alleviate the problem. Explores theoretical models of poverty policy analysis and the role of values in their formulation and implementation. Discusses issues of age, race and family; pays special attention to poverty among women in Kansas. Prerequisites: 6 hours of social science preferably in women's studies, including Wom. S. 388Q, or instructor's consent.

542. Women in Other Cultures. (3). Cross-listed as Anthr. 542.

543. Women and Health. (3). Cross-listed as Nurs. 543. Examines the historical development of the women's health movement, focuses on current issues relevant to women and health care and explores the roles of women in the health care system and as consumers of health care. Examines self-care practices of women and studies ways to promote positive health practices. Open to non-nursing majors.

570. Directed Readings. (1-3). Designed for students who wish to pursue special reading or research projects not covered in course work. Prerequisite: instructor's consent.

580. Special Topics. (1-3). Focuses on advanced topics of interest to women's studies.

580J. Women's Traditional Arts. (3). Surveys various art forms which are usually identified as the creative work of women. Using such examples as quilts or other textile arts, students focus not only on the aesthetics of these traditional forms, but also on their historic and social value to the culture.

587. Theories of Feminism. (3). Because feminism is not a single ideological stance or perspective, course examines a variety of ideas underlying feminist cultural critiques and visions for social change. Also discusses the contribution of women's studies to various academic disciplines. Prerequisites: Wom. S. 387Q and 388G, or 6 hours of women's studies courses, or instructor's consent.

635. Leadership Techniques for Women. (3). Cross-listed as Comm. 635. Designed to provide the woman student experience in decision making and to improve skills in leadership through role playing and exercise in group dynamics.

870. Directed Readings. (2-3). Designed for graduate students who want to pursue research in areas not normally covered in course work. Repeatable for credit with departmental consent. Prerequisite: instructor's consent.

880. Seminar in Women's Studies. (3). Intensive study of selected women's studies topics. Seminar discussion, reports and research project. Repeatable for credit with departmental consent. Prerequisite: instructor's consent.
General Programs

Communication—Richard N. Armstrong, coordinator

Liberal Studies—Supervisory Committee, Tina Bennett-Kastor, chairperson and graduate coordinator

Public Administration—Edward Fentie, director; George Platt, graduate coordinator

Communication
Graduate Faculty

Professors: Leroy Clark, Vernon A. Keel (director, Elliot School), Bela Kiralyfalvi, Richard C. Welsbacher

Associate Professors: Judith Babnich, Joyce P. Cavarozzi, John Gaston, Philip Gaunt, Dennis Smith

Assistant Professors: Les Anderson, Richard N. Armstrong (graduate coordinator), J. David Blatt, John Freeman, James Hallmark, Susan Huxman, Sharon Iorio, Francis L. Kelly, Keith Williamson

The graduate program in communication at The Wichita State University is designed to provide students with a multidisciplinary foundation in human communication that will serve a broad spectrum of interests and needs in many fields of endeavor. The program is based upon integration and synthesis of academic resources in communication in several departments and disciplines throughout the University.

A program administration committee composed of representatives from participating units provides direction for the Master of Arts in Communication degree program.

Master of Arts in Communication

The Master of Arts in Communication (MAC) degree program includes five areas of emphasis: (1) communication theory; (2) cross-cultural communications; (3) mass communication; (4) theatre and drama; and (5) general communication. Students are provided with a thesis option (30-hour minimum) or a nonthesis option (36-hour minimum) in each area of emphasis except general communication. The latter provides a nonthesis program only.

Admission Requirements

In addition to the general Graduate School admission requirements, applicants for full standing status must have a 3.000 GPA over their last 60 hours of course work, must submit results of the Graduate Record Exam and must write a statement of purpose for pursuing the Master of Arts in Communication.

Degree Requirements

Program Core (Required) Courses. All students enrolled in the MAC degree program must take the courses listed below, except as noted.

Comm. 801, Introduction to Communication Research
Comm. 802, Historical and Qualitative Methodologies in Communication Research
Comm. 803, Empirical/Quantitative Research Methodology in Communication
Comm. 870, Directed Research (nonthesis 2 or 3 students)
Comm. 875-876, Thesis (thesis students)

Area Core (Required) Courses. In addition to the program core courses just listed, students must take certain required courses in their area of emphasis.

Communication Theory
Comm. 702, Contemporary Theories of Oral Communication
Comm. 865, Organizational Communication
Both Comm. 802 and 803 (see program core above)

Written comprehensive examinations will be administered to all candidates during the final semester of their degree program. In addition, those enrolled in thesis options will present an oral defense of the thesis. Examining committees will consist of the adviser, acting as chairperson, and three or four other members of the graduate faculty in communications, at least one of whom shall be from a discipline or area other than the student's area of emphasis.

Examinations

Written comprehensive examinations will be administered to all candidates during the final semester of their degree program. In addition, those enrolled in thesis options will present an oral defense of the thesis. Examining committees will consist of the adviser, acting as chairperson, and three or four other members of the graduate faculty in communications, at least one of whom shall be from a discipline or area other than the student's area of emphasis.

General Communication

At least one core course in each of the other four areas of emphasis 12 hours

Other Courses. In addition to the required program and area core courses, students in each area of emphasis, with advice and consent of their graduate faculty adviser, must select courses to complete the Plan of Study, as discussed in the Graduate School section at the beginning of the Graduate Bulletin. The Plan of Study will be individually designed to accommodate a student's background, interests and needs and must include a minimum of 60 percent of their graduate hours at the 700-899 level (i.e., 18 hours of a 30-hour program or 21 hours of a 36-hour program).

Examinations

Written comprehensive examinations will be administered to all candidates during the final semester of their degree program. In addition, those enrolled in thesis options will present an oral defense of the thesis. Examining committees will consist of the adviser, acting as chairperson, and three or four other members of the graduate faculty in communications, at least one of whom shall be from a discipline or area other than the student's area of emphasis.

Master of Education

The MEd program provides extensive study in secondary education with content emphasis in speech communication, including rhetoric and public address, theatre, broadcasting and speech education. The course of study is a 36-hour, nonthesis program, and the Plan of Study includes 18 prescribed hours in secondary education. The remaining hours may be taken in the communication arts.

Courses

For course listings, see Communication, Elliott School of, in Fairmount College of Liberal Arts and Sciences.
Liberal Studies

Graduate Coordinator: Tina Bennett-Kastor
Supervisory Committee: Michael Vincent (modern & classical languages and literatures), John Gries (geology), Jeneva Brewer (mathematics), Nancy Brooks (sociology), Gayle Davis (women's studies), Ben Rogers (philosophy, ex officio)

The Master of Arts in Liberal Studies (MALS) program is designed for persons who wish to pursue a particular topical or interdisciplinary interest at the graduate level, but find the existing programs either too specialized or insufficiently individualized. The liberal studies program offers students an opportunity to design their own program of study to answer their particular needs and interests.

Admission Requirements
Applicants should have a bachelor's degree from an accredited institution and, generally, have a grade point average of 3.000 or better. Usually no more than six hours of graduate credit from another program may be transferred into the liberal studies program.

When submitting an application to the Wichita State Graduate School, students should include a brief essay describing their reasons for selecting the liberal studies program and their educational goals for the program.

Three graduate faculty representing at least two of the departments in which the student's work will be concentrated should be secured as program advisers. One of these advisers, who must be a graduate faculty member of Fairmount College of Liberal Arts and Sciences, will serve as the student's primary adviser and chair the student's committee.

The Liberal Studies Supervisory Committee may request that the applicant submit Graduate Record Examination scores (verbal and quantitative).

Students meeting standards for admission to the program will be admitted on a conditional basis, pending final approval of their Plan of Study.

Before completing the first 12 hours of graduate work in the program, the student must:
1. Complete selection of members of the faculty advising committee and inform the graduate studies coordinator
2. With the assistance of this committee, prepare a Plan of Study to be approved by the graduate coordinator and the Graduate School.

Once accepted by the Graduate School, the Plan of Study becomes the student's individualized curriculum, and any changes to it must be approved by the Student's Advisory Committee and the MALS Supervisory Committee.

Degree Requirements
The structural framework for the degree is a Plan of Study, developed by the student in consultation with faculty in the program. It must include:
1. A minimum of 36 semester hours of credit from at least three disciplines
2. No more than 12 semester hours from any one department
3. A maximum of 12 hours in a college other than liberal arts and sciences
4. At least 22 of the 36 total hours in courses numbered 700 or above
5. Three of the 36 hours must be taken in LAS-1 800, Research Goals and Strategies, which should be taken within the first 12 hours of course work in the MALS program.

The terminal project, required of all students, may be a master's report for three hours' credit, a master's thesis for six hours' credit, a practicum or internship for either three or six hours' credit, or a comprehensive examination covering all course work and related activities and carrying no credit hours. The specific nature of the terminal project must be described in the Plan of Study.

Courses for Graduate Students Only

800. Research Goals and Strategies. (3). Introduces research goals, methods and sources in the humanities, social sciences and natural sciences. Credit is for students who have completed at least 10 semester hours in LAS programs. Required of all students in the Master of Arts in Liberal Studies program.

875. Thesis. (1-6). Prerequisite: consent of student's degree committee chairperson and instructor.

885. Terminal Project. (2-6). Prerequisite: consent of student's degree committee chairperson and instructor.

Public Administration
Graduate Faculty
Regents Professor of Urban Affairs: Glenn W. Fisher
Professors: Clark D. Ahlberg, H. Edward Flentje (director, Hugo Wall Center for Urban Studies), Joe P. Pisciotte, Samuel J. Yeager

Associate Professor: George M. Platt (director of graduate studies)
Assistant Professors: Nancy McCarthy Snyder, John Wong
Associate Faculty in Public Administration
Professors: Robert D. Alley (education), Richard Graham (mechanical engineering), John J. Hartman (sociology)

Associate Professors: William C. Hays (sociology/gerontology), Don E. Malzahn (industrial engineering), Gerald S. McDougall (economics), I.N. Yoon (economics)

Master of Public Administration
The Master of Public Administration (MPA) degree at The Wichita State University is designed to prepare students for professional careers in public and quasi-public organizations. The program is interdisciplinary in nature and is structured to respond to the unique clientele of an urban university.

The philosophy underlying the MPA degree is that interdisciplinary approaches are essential for understanding the changing urban environment and for effective performance in management and staff positions in government. In their degree programs students have the opportunity for exposure to the methods and perspectives of the social and behavioral sciences, engineering and technology and the humanities. The link between these disciplines and the problems of public management are emphasized through methods which include use of practitioners in the classroom, policy relevant research assignments, public affairs seminars led by successful professionals and internships. Most faculty contributing to the degree program have significant professional experience in state and local government and are involved in research relevant to state and local governments and nonprofit organizations in Kansas.

Graduates of the program have gone on to hold positions ranging from city managers to budget analysts in state government to management analysts in major hospitals. Although the majority are employed in the public sector, some graduates of the program hold positions in the private sector, while still others have pursued additional study in law, doctoral education or other specializations.

Admission Requirements
Applicants for the degree program must meet the requirements for admission to the Graduate School. In addition, students must have completed introductory college professional courses in the areas of microeconomics, public administration and statistics. Students may be admitted to the program with deficiencies in background
areas, but the deficiencies must be overcome within the first academic year. Courses taken to fulfill deficiencies will not count toward the 39-hour degree requirement.

Degree Requirements
The Master of Public Administration degree consists of 39 graduate hours, taken over at least three semesters of study. The degree is made up of three elements—the core curriculum, an area of specialization, and a completion option.

Core Curriculum. All degree candidates are required to complete the seven core courses:

- P. Adm. 625, Computer Applications for Public Policy. Introduces the student to microcomputer uses in the public sector.
- P. Adm. 702, Research Methods in Public Administration. An examination of research tools used to analyze public policy and administrative performance.
- P. Adm. 710, Scope of Public Administration. An examination of the field of public administration and issues shaping the future of the discipline.
- P. Adm. 730, Decision Making. A study of the relationship of political considerations to administrative decision making.
- P. Adm. 770, Environment of Public Administration. Examines the political and economic environment of public administration.
- Pol. S./Econ. 760, Local Government Finance. Examination of state and local government expenditure and revenue systems.

Areas of Specialization. The degree allows students to develop a specialization in one of three specialization options: management, financial management or policy analysis.

Completion Options. Students may complete the degree program in one of two ways:

Applied Research Option—Students may choose the applied research option for completion of the degree and earn three hours' credit. In this option the student conceptualizes and researches a policy relevant question and delivers a finished product with policy application. Students must successfully defend the paper before a faculty committee.

Thesis Option—This option is designed for students planning graduate work beyond the MPA degree or careers in research. Six credit hours may be earned in writing an acceptable thesis. Candidates must pass an oral defense of the thesis.

Specializations
Courses required for the specializations are as follows:

Management

**Required Courses**

- P. Adm. 755R, State and Local Government Administration and at least one of the following:
  - P. Adm. 761, State and Local Financial Systems
  - Pol. S. 821, Budgetary Process

**Elective Courses**

Minimum of two of the following courses or other related courses approved by adviser and graduate coordinator.

- Pol. S. 560, Planning Process
- P. Adm. 755J, Local Government Law

**Management Development**

- Mgmt. 665, Organization Development
- Mgmt. 667, Organization Structure and Design
- Mgmt. 860, Management of Organizations

**Organizational Behavior**

- Mgmt. 862, Organizational Behavior
- Mgmt. 865, Communication

**Personnel Administration**

- Pers. 866, Selection, Training and Placement
- Pers. 867, Seminar in Personnel Administration
- Pers. 868, Wage and Salary Administration

Financial Management

**Required Courses**

- P. Adm. 761, State and Local Financial Systems
- Acct. 800, Financial Accounting

**Elective Courses**

Minimum of two of the following courses or other related courses approved by adviser and graduate coordinator.

- Pol. S. 821, Budgetary Process
- P. Adm. 740, Policy Evaluation
- P. Adm. 755J, Local Government Law

**Accounting**

- Acct. 801, Managerial Accounting
- Econ. 602, Mathematical Methods in Economics
- Econ. 653, Public Finance
- Econ. 688, Urban Economics
- Fin. 640, Financial Management

Policy Analysis

**Required Course**

- P. Adm. 740, Policy Evaluation

**Elective Courses**

Minimum of two of the following courses or other related courses approved by adviser and graduate coordinator.

- P. Adm. 700, Urban Affairs
- P. Adm. 740, Policy Evaluation

P. Adm. 755J, Local Government Law
- P. Adm. 755P, Research Practicum
- P. Adm. 755S, Performance Measurement

**Statistics**

- Psy. 852, Univariate Research Design
- Psy. 853, Multivariate Research Design

**Economics**

- Econ. 631, Intermediate Business Statistics
- Econ. 831, Econometrics

Internships

Internships are an important part of the MPA Program. Pre-service students are encouraged to take an internship which must last at least nine months. Internship (P. Adm. 890) will carry three hours' credit and will include attendance at a monthly seminar. Students opting for an internship must also complete an applied research paper (3 hours) which may be based upon an appropriate internship project. Internship positions are remunerative and are awarded on a competitive basis. Although placement cannot be guaranteed, the Hugo Wall Center for Urban Studies has an excellent placement record.

Financial Assistance

The Board of Trustees of The Wichita State University, through the Graduate School and the Hugo Wall Center for Urban Studies, offers a number of graduate assistantships on a competitive basis. Recipients receive a stipend for the academic year plus a partial tuition waiver. Graduate assistants work 20 hours per week with faculty in the center's teaching, research, and public service activities.

The Hugo Wall Center for Urban Studies also designates two outstanding graduate assistants as Hugo Wall Fellows. Each fellow is granted at least $600 per semester stipend in addition to the regular graduate assistantship remuneration.

Internship positions, while not guaranteed, are remunerative and are awarded on a competitive basis.

Courses for Graduate/Undergraduate Credit

625, Computer Applications for Public Policy

- Econ. 602, Mathematical Methods in Economics
- Econ. 653, Public Finance
- Econ. 688, Urban Economics
- Fin. 640, Financial Management

625, Policy Evaluation

- P. Adm. 740, Policy Evaluation

700, Urban Affairs

- P. Adm. 740, Policy Evaluation

702, Research Methods in Public Administration

- P. Adm. 700, Urban Affairs
- P. Adm. 740, Policy Evaluation
plied public policy research methods. Emphasizes locating, collecting, appraising and utilizing both primary and secondary sources of data of the type used in policy, planning and administrative research. Students must complete several short research projects. Prerequisite: enrollment in the MPA program or instructor’s consent.

710. Scope of Public Administration. (3). Cross-listed as Pol. S. 710. Reviews the scope of the field of public administration including a survey of key concepts and schools of thought underlying the field and identification of issues shaping the future development of the field.

720. Urban Systems. (3). Cross-listed as IE 720. Develops the principles of systems analysis and the tools by which these principles can be applied. Takes example applications from urban problems. Emphasizes the formulation of realistic models and solutions. Computer techniques are developed in class as necessary. Prerequisite: instructor’s consent.

730. Decision Making. (3). Cross-listed as Mgmt. 680. Includes theories of decision-making ability under varying degrees of uncertainty. Includes theories of decision making, environment for stimulating creativity, cognitive inhibitors to problem identification, alternative evaluation techniques, decision implementation and utilization of quantitative tools in decision making. Prerequisite: instructor’s consent.

740. Policy Evaluation. (3). Designed to assist public sector monitoring and control of program and service delivery quality. The social sciences offer a variety of research tools and methods that have management feedback applications which are appropriate for evaluating performance. Prerequisite: instructor’s consent.

755. Special Topics in Urban Affairs. (3). Provides students with an opportunity to engage in advanced study in urban topics that are of immediate concern and arise only occasionally. Content varies with issues that arise, student needs and faculty expertise. Directed to Master of Public Administration students. May be repeated if topics are different. Prerequisite: instructor’s consent.

761. State and Local Financial Systems. (3). Deals with selected aspects of state and local government financial management. Introduction to fund accounting, costing of government services, capital budgeting and asset management.

770. The Environment of Public Administration. (3). Surveys the political and economic institutions that underlie the practice of public administration. Includes political systems, constitutional authority, legislative process, intergovernmental relations, the price system, market failure, government regulation, public finance and public choice. Prerequisites: Pol. S. 321 and Econ. 202.

Courses for Graduate Students Only

875-876. Thesis. (3-3). Prerequisite: adviser’s consent.

890. Internship. (3). Designed to integrate academic pursuits and practical experience. Students admitted to the internship are assigned to work in an approved government, community or private organization for a period of three to 12 months.

898. Applied Research Paper. (3). The applied research paper under the direction of a faculty committee is designed to develop and measure competency in the areas of writing research and policy conceptualization. Each paper addresses a policy relevant question and the delivery of a finished product with policy application. To be taken in the last semester of course work.
Graduate Faculty 1990-91

Full Membership

Date or dates following title refer to time of initial and successive appointments. Faculty listed have academic rank.

Acker, Andrew F., Associate Professor, Mathematics and Statistics (1987). BS, Union College, 1965; PhD, Boston University, 1972.

Adams, John A., Professor and Chairperson, Modern and Classical Languages and Literatures (1965). BA, Oberlin College, 1957; MA, Emory University, 1966; PhD, University of Minnesota, 1969.

Bernhart, Walter D., Professor, Aerospace Engineering (1954, 1964). BSCE, Kansas State University, 1956; MS, The Wichita State University, 1959; PhD, Oklahoma State University, 1964; Licensed Professional Engineer—Kansas.

Billings, Dorothy K., Assistant Professor, Anthropology (1968). BA, University of Wisconsin, 1959; PhD, University of Sydney, 1972.

Bischoff, William, Associate Professor, Geology (1984). BA, DePauw University, 1979; MS, Northwestern University, 1982; PhD, 1985.

Blakeslee, Donald J., Associate Professor, Anthropology (1976). BA, University of Nebraska, 1969; MA, 1971; PhD, University of Wisconsin-Milwaukee, 1975.

Blazick, Donald L., Assistant Professor, Administration of Justice (1976). BA, Northern Illinois University, 1967; MA, 1970; PhD, Michigan State University, 1976.

Borden, John D., Associate Professor, History (1965). BA, University of Texas, 1952; MA, University of Houston, 1958; PhD, University of New Mexico, 1963.

Bowers, Mary, Associate Professor, Psychology (1965). BS, Northwestern University, 1953; AM, University of Missouri, 1958; PhD, 1968.

Boughton, Harrison C., Professor, School of Music (1961). BA, University of Northern Iowa, 1956; MA, University of Denver, 1959; DMA, University of Missouri at Kansas City, 1975.

Broida, John David, Professor, School of Art and Design (1972). BA, California State University, Long Beach, 1968; MFA, Cranbrook Academy of Art, 1971.


Bravo-lilizondo, Pedro, Professor, Modern and Classical Languages and Literatures (1975). Universidad Tecnica del Estado, Chile, 1957; MA, Education, Catholic University, Valparaiso, Chile, 1964; MA, University of Iowa, 1971; PhD, University of California, 1975.

Brezzale, John B., Professor and Executive Vice President, Academic Affairs and Dean of Faculties (1959). BS, Milligan College, 1947; MS, University of Alabama, 1951; PhD, University of Virginia, 1955.

Britton, Clark V., Jr., Professor, School of Art and Design (1957). BAA, Auburn University, 1952; MA, 1955.


Brown, Karen Lee, Associate Professor, Biomedical Sciences (1962). BA, Miami University-Oxford, Ohio, 1974; MS, 1976; PhD, University of Georgia, 1981.

Burbach, Cindy, Assistant Professor, Nursing (1985). BA, Union College, 1972; DPN, University of North Carolina, 1975; MN, Emory University, 1976.


Burk, Kenneth W., Professor and Interim Chairperson, Communication Disorders and Sciences (1971). BA, University of Iowa, 1953; MA, University of Kentucky, 1955; PhD, Purdue University, 1961.


Burns, Dennis H., Assistant Professor, Chemistry (1989). BS, University of California-Los Angeles, 1961; PhD, University of California-Davis, 1968.


Campbell, Jo-Lynne, Assistant Professor, Clinical Sciences (1981). BA, Agnes Scott College, 1974; MS, University of North Carolina at Chapel Hill, 1965; DPH, 1979.


Carroll, Jeri Ann, Associate Professor, Curriculum and Instruction (1982). BME, University of Kansas, 1965; MS, 1973; PhD, 1980.

Chambers, Randall, Distinguished Professor, Industrial Engineering (1988). BA, Indiana University, 1948; MA, University of Missouri, 1951; PhD, Case Western Reserve University, 1953.


Chaudhuri, Jharana, Associate Professor, Mechanical Engineering (1984). BS, Lady Brabourne College, Calcutta University, 1967; MS, State University of New York, 1975; PhD, Rutgers University, 1977.


Christ, Ronald, Associate Professor, School of Art and Design (1976). BFA, Kansas City Art Institute, 1972; MFA, Indiana University, 1976.

Ciboski, Kenneth N., Associate Professor, Political Science (1968). BA, University of Kansas, 1961; MA, 1965; PhD, University of Washington, 1971.

Clark, Jerry, Associate Professor, Economics and Director, Center for Economic Education (1976). BA, Michigan State University, 1969; MA, Northwestern University, 1971; PhD, 1976.

Clark, Leroy, Professor and Chairperson, School of Performing Arts (1990). BA, University of Maine, 1966; MFA, University of Oklahoma, 1966; PhD, Kent State University, 1975.


Corbett, Donald L., Professor, School of Music (1969). BME, University of Nebraska, 1953; MME, 1953; EdD, University of Kansas, 1977.

Cranford, Jerry L., Associate Professor, Communicative Disorders and Sciences (1985). BA, The Wichita State University, 1964; PhD, Vanderbilt University, 1969.

Crum, Dorothy E., Associate Professor, School of Music (1973). BA, Barrington College, 1966; MM, Western Kentucky University, 1969; DMA, University of Colorado, 1977.

Dadashzadeh, Mohammad, Assistant Professor, Finance, Real Estate and Decision Sciences (1989). MS, Massachusetts Institute of Technology, 1976; MBA, American International College, 1979; PhD, University of Massachusetts, Amherst, 1985.


Davis, Gayle R., Assistant Professor, Women’s Studies (1982). BA, Muskingum College, 1968; MA, Michigan State University, 1975; PhD, 1981.


Decker, Jay C., Professor, School of Music (1971). BME, The Wichita State University, 1965; MSME, University of Illinois, 1966; DMA, University of Missouri at Kansas City, 1967.

delM, Dharma, Associate Professor, Management, University of Evansville (1957); MS, Southern Illinois University 1959; PhD, Indiana University, 1966.

Dey, Glen R., Professor, Counseling, Educational and School Psychology (1967); BSEd, University of Nebraska, 1954; Med, 1959; EdD, 1961.

Dilts, Donald A., Associate Professor, Biological Sciences (1963). BA, University of Louisville, 1952; MS, 1958; PhD, University of Kansas, 1970.

Doeren, Stephen E., Assistant Professor, Administration of Justice (1977). BA, Ottawa University, 1972; MS, University of New Mexico, 1974; PhD, Louisiana State University, 1978.

Dorey, Robert Cameron, Assistant Professor, Chemistry (1985). BS, Virginia Polytechnic Institute and State University, 1974; PhD, University of Wisconsin, 1979.

Doutour, Mark A., Associate Professor, Finance, Real Estate and Decision Sciences (1967). BBA, The Wichita State University, 1957; PhD, University of Texas at Austin, 1967.

Douglas, Donald M., Associate Professor, History (1965). BA, Kansas State University, 1961; MA, 1963; PhD, University of Kansas, 1972.

Dreifort, John E., Associate Professor and Chairperson, History (1970). BS, Bowling Green State University, 1965; MA, 1966; PhD, Kent State University, 1970.

Duell, Dennis C., Associate Professor, Economics; Associate Dean, Business and Director, Center for Economic Development and Business Research (1967). BS, Kansas State University, 1961; MS, 1963; PhD, University of Illinois, 1968.

Duell, Orpha K., Associate Professor, Counseling, Educational and School Psychology (1967). BS, Kansas State University, 1963; MS, University of Illinois, 1965; PhD, 1967.

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Duell, Orpha K., Associate Professor, Counseling, Educational and School Psychology (1967). BS, Kansas State University, 1963; MS, University of Illinois, 1965; PhD, 1967.

Hamdeh, Hussein, Assistant Professor, Physics (1989). BS, Lebanese University, 1978; MS, Northeastern University, 1980; PhD, 1984.


Hardy, James L., Professor, School of Music (1965). BSED, Southwest Missouri State University, 1948; MME, University of Kansas, 1959; EdD, 1969.


Hersch, Philip, Associate Professor, Economics (1983). BA, Queens College, 1974; MA, Ohio State University, 1978; PhD, 1982.


Ho, James C., Professor, Physics and Senior Staff Scientist, National Institute for Aviation Research (1971). BS, National Taiwan University, 1959; MS, University of California at Berkeley, 1965; PhD, 1966.

Hoag, Gerald B., Associate Professor, English (1967). AB, Loyola University, New Orleans, 1951; MA, Tulane University, 1955; PhD, 1965.


Hofmann, Klaus A., Associate Professor, Aerospace Engineering (1990). BS, University of Texas at Austin, 1972; MS, 1975; PhD, 1983.


Hoeft, Donald L., Associate Professor and Chairperson, Industrial Engineering (1976). BS, Friends University, 1965; MS, The Wichita State University, 1970; PhD, University of Arkansas, 1975.


Horton, Stanley, Assistant Professor, Curriculum and Instruction (1990). BA, California State University-Long Beach, 1972; MA, Boise State University, 1979; PhD, University of Washington, 1984.


Huckstadt, Alicia M., Associate Professor (1972). BSN, The Wichita State University, 1975; MN, 1978; PhD, Kansas State University, 1981.


Huntley, Diane E., Associate Professor, Dentistry (1979). BS, University of Bridgeport, 1968; MA, State University of New York at Buffalo, 1971; PhD, Kansas State University, 1985.


Hutcheson, Ronald G., Associate Professor, Administration of Justice and Associate Dean, Graduate School (1973). BS, Colorado State University, 1965; MS, 1967; PhD, University of Connecticut, 1972.


James, Michael A., Associate Professor, Curriculum and Instruction (1974). BA, University of Minnesota at Duluth, 1971; MS, Mankato State University, 1973; PhD, Iowa State University, 1975.


Jewell, Ward T., Assistant Professor, Electrical Engineering (1987). BSEE, Oklahoma State University, 1979; MSEE, Michigan State University, 1980; PhD, Oklahoma State University, 1983.

Johnson, Everett L., Professor, Electrical Engineering (1971). BSEE, University of Kansas, 1962; MSEE, University of New Mexico, 1964; PhD, University of Kansas, 1969. Licensed Professional Engineer—Kansas.


Johnson, Richard T., Professor, and Chairperson, Mechanical Engineering (1989). BSME, University of Missouri School of Mines and Metallurgy, 1962; MSME, University of Missouri at Rolla, 1964; PhD, University of Iowa, 1968.

Jones, Billy M., Endowed Professor, Entrepreneurship and Small Business Management and Dean, Business (1980). BA, Vanderbilt University, 1950; BA, George Peabody College, 1952; PhD, Texas Technological University, 1963.

Jong, Mark M. T., Professor, Electrical Engineering (1967). BSEE, National Taiwan University, 1960; MSEE, South Dakota School of Mines and Technology, 1965; PhD, University of Missouri, 1967. Licensed Professional Engineer.


Kahol, Pawan, Professor, Physics (1988). BS, Panjab University, India, 1973; MS, 1974; PhD, 1979.

Kasten, Roger N., Professor, Communications (1971). BSE, Bowling Green State University, 1955; MA, 1956; PhD, Northwestern University, 1964.


Kear, Dennis J., Associate Professor and Chairperson, Curriculum and Instruction (1978). BSE, Engineering, State University, 1970; MSEE, 1975; PhD, Arizona State University, 1978.

Keel, Vernon W., Professor and Director, School of Counseling (1969). BA, University of North Dakota, 1963; PhD, University of Minnesota, 1973.

Kelley, James W., Associate Professor and Chairperson, School of Business (1982). BS, Oregon State University, 1964; MA, University of Denver, 1966; PhD, 1970.

Kemm, David M., Associate Professor, Economics (1986). BA, Miami University, Oxford, Ohio, 1973; MA, Ohio State University, 1974; PhD, 1980.

Kiralyfalvi, Bela, Professor, School of Performing Arts (1973). BA, Phillips University, 1953; MA, University of Kansas, 1965; PhD, 1972.

Kitch, Sally L., Associate Professor and Director, Women's Studies (1969). AB, Cornell University, 1967; MA, University of Chicago, 1968; PhD, Emory University, 1984.

Klingsporn, M., James, Assistant Professor, Psychology (1965). AB, University of Nebraska-Kearney, 1976; PhD, 1980.

Klunder, Willard Carl, Assistant Professor, History (1986). BA, Saint Olaf College, 1969; AM, University of Illinois, Urbana-Champaign, 1972; PhD, 1981.

Koester, Robert L., Associate Professor, Psychology (1961). BA, Kent State University, 1954; MA, 1956; PhD, Michigan State University, 1960.

Kothe, R., Associate Professor, Communicative Disorders and Sciences (1967). AB, Bowdoin College, 1955; MS, Syracuse University, 1960; PhD, University of Iowa, 1967.

Konec, Carol W., Assistant Professor, Women's Studies and Associate Dean, Liberal Arts and Sciences (1969). BS, University of Kansas, 1961; MA, The Wichita State University, 1968; PhD, University of Oklahoma, 1977.

Koppenhaver, John H., Associate Professor, Modern and Classical Languages and Literatures (1986). BA, University of Nebraska, 1964; MA, The Wichita State University, 1964; MA, University of Iowa, 1966; PhD, 1974.


Illinois, 1959; PhD, Ohio State University, 1972.
Laue, Timothy W., Assistant Professor, Sociology (1978). BS, Central Missouri State University, 1973; MA, 1974; PhD, St. Louis University, 1981.
Liu, Ming C., Assistant Professor, Industrial Engineering (1988). BS, Fu-Jen Catholic University, 1974; MS, Arizona State University, 1975; PhD, 1987.
Mallory, J. William, Assistant Professor, Philosophy (1965). BA, Northwestern University, 1957; MA, 1962; PhD, 1970.
Mathis, Julie A., Assistant Professor, Mechanical Engineering (1990). BSE, Northern Arizona University, 1979; MSE, University of New Orleans, 1984; PhD, Louisiana State University, 1989.
McCoulum, Shirley, Assistant Professor, School of Art and Design (1975). BFA, University of Texas, 1968; MFA, North Texas State University, 1974.
Mendieta, Gonzalo R., Assistant Professor, Mathematics and Statistics (1987). Egresado, Escuela Politecnica Nacional, Quito, Ecuador, 1982; MS, Purdue University, 1984; PhD, University of Iowa, 1987.
Motavalli, Saeid, Assistant Professor, Industrial Engineering (1990). BS, Tehran Polytechnic, 1976; MS, University of Southern California, 1979; PhD, University of Pittsburgh, 1989.
Nielsen, Carl C., Associate Professor, Finance, Real Estate and Decision Sciences (1968). BS, Danish College, 1956; MA, University of Nebraska, 1965; PhD, 1966.
Rathi, Mahesh, Assistant Professor, Computer Science (1988). MSC (Hons), Indian Institute of Technology and Science, Pilani, India, 1980; MS, University of Cincinnati, 1983; MS, Purdue University, 1985; PhD, 1988.
Richardson, William H., Associate Professor, Mathematics and Statistics (1962). MS, Central Missouri State University, 1959; PhD, Iowa State University, 1961.
Romig, Charles A., Assistant Professor, Counseling, Educational and School Psychology (1985). BA, University of Illinois, 1977; MA, Trinity Evangelical Divinity School, 1979; PhD, Purdue University, 1982.
Sarmad, Mohammad, Assistant Professor, Mechanical Engineering (1988). BSEE, University of Missouri-Columbia, 1974; MSEE, 1975; PhD, 1984.
Shawver, Martha M., Assistant Professor, Nursing and Associate Dean, Health Professions (1975). BSN, Eastern Mennonite College, 1963; MA in Nursing, University of Iowa, 1974; PhD, University of Kansas, 1985.
Steinknecht, Elaine, Assistant Professor, Nursing (1990). BSN, The Wichita State University, 1979; MN, 1982; PhD, Kansas State University, 1987.
Town, Robert L., Associate Professor, School of Music (1965). BM, Eastman School of Music, 1960; MM, Syracuse University, 1962.
Wherrett, Robert C., Associate Professor of Mathematics and Statistics (1962). BS, Tulane University, 1955; MS, 1961; PhD, New Mexico State University, 1971.
Widener, Russell D., Assistant Professor, School of Music (1981). BM, Baylor University, 1968; MM, Catholic University, 1972.
Yeotis, Catherine G., Assistant Professor, Curriculum and Instruction (1997). BS, Michigan State University, 1963; MS, Purdue University, 1973; PhD, 1978.
Youngman, Arthur L., Assistant Professor, Biological Sciences (1965). BA, Montana State University, 1959; MS, Case Western Reserve University, 1961; PhD, University of Texas, 1965.
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Key to Course Descriptions

Symbols

When two course numbers are joined by a hyphen (-), the first semester is prerequisite to the second; when the numbers have an ampersand (&) between them, the two semesters may be taken in either order. Unless specifically noted otherwise, the first course listed is offered in the fall semester and the second in the spring.

The number of hours of credit for each course is indicated in parentheses following the course title. The number of class meetings per week is normally the same as the number of credit hours. Two hours of laboratory work usually are required for one hour of credit. In courses involving meetings other than lectures, the following symbols are used: R, lecture; L, laboratory; C, conference; D, demonstration; and P, practicum, with the hours of practicum per week given in front of the letter (6-8P means six to eight hours of practicum per week).

Abbreviations

The following abbreviations of academic departments and areas are used in references to courses offered by those departments.

<table>
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<tr>
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<th>Department/Area</th>
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<td>Art F</td>
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INSTRUCTIONS FOR ALL APPLICANTS
FOR ADMISSION TO THE GRADUATE SCHOOL

Students must submit the appropriate application for admission to the Graduate School, either 1) the Application for Admission to Graduate School for U.S. Citizens or Permanent Residents or 2) the Application for Admission to Graduate School for International Applicants and the Official Financial Statement for International Graduate Applicants. All application forms are printed on the following grey pages in this catalog. Please remove these pages, complete them, and return them to the Graduate School.

Now is a list of the graduate degree programs we offer and any special departmental application requirements in addition to the appropriate application and two official transcripts. Students may apply either for degree status (for students desiring to pursue a graduate degree) or non-degree status (for students desiring to earn graduate credit for personal or professional reasons).

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<td>Administration of justice</td>
<td>Master of Administration of Justice (MAJ)</td>
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<td>Aerospace engineering</td>
<td>Master of Science (MS)</td>
<td>Résumé, portfolio; examples of scholarly work</td>
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<td>Anthropology</td>
<td>Doctor of Philosophy (PhD)</td>
<td>GRE (general and biological sciences);</td>
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<td>Art education</td>
<td>Master of Arts (MA)</td>
<td>3 reference letters from science faculty at undergraduate institution</td>
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<td>Master of Science (MA)</td>
<td>GRE (general); statement of purpose</td>
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<td>Business</td>
<td>Master of Business Administration (MBA)</td>
<td>GRE (general); departmental application;</td>
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<td>Chemistry</td>
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<td>3 recommendation letters (2 from parent academic institution)</td>
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<td>Communication</td>
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<td>Master of Arts in Communication (MAC)</td>
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<td>Creative writing</td>
<td>Master of Fine Arts (MFA)</td>
<td>application; 3 letters of reference; on-campus interview; application deadlines are the first Monday in October for spring and the last Monday in March for fall</td>
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<td>Master of Education (MEd)</td>
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<td>A transfer doctoral (EdD or PhD) program is offered in educational administration and supervision through an arrangement with the University of Kansas.</td>
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<td>Strings/wind/percussion</td>
<td>Master of Science Nursing (MSN)</td>
<td>Registered nurse licensure; BS in nursing; specified prerequisite course work and liability insurance</td>
</tr>
<tr>
<td>Voice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrumental conducting</td>
<td>Master of Music (MM)</td>
<td></td>
</tr>
<tr>
<td>History-literature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory-composition</td>
<td>Master of Music (MM)</td>
<td></td>
</tr>
<tr>
<td>Music education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choral</td>
<td>Master of Music (MM)</td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>Master of Music (MM)</td>
<td></td>
</tr>
<tr>
<td>Instrumental (with recital option)</td>
<td>Master of Music (MM)</td>
<td></td>
</tr>
<tr>
<td>Music in special education</td>
<td>Master of Music (MM)</td>
<td></td>
</tr>
<tr>
<td>Nursing</td>
<td>Master of Science Nursing (MSN)</td>
<td></td>
</tr>
<tr>
<td>Physical education</td>
<td>Master of Education (MEd)</td>
<td></td>
</tr>
<tr>
<td>Physical therapy</td>
<td>Master of Physical Therapy (MPT)</td>
<td></td>
</tr>
<tr>
<td>Physical science</td>
<td>Master of Science (MS)</td>
<td></td>
</tr>
<tr>
<td>Political science</td>
<td>Master of Arts (MA)</td>
<td></td>
</tr>
<tr>
<td>Psychology-community/clinical</td>
<td>Master of Arts (MA)</td>
<td></td>
</tr>
<tr>
<td>Psychology-human factors</td>
<td>Doctor of Philosophy (PhD)</td>
<td></td>
</tr>
<tr>
<td>Public Administration</td>
<td>Master of Public Administration (MPA)</td>
<td></td>
</tr>
<tr>
<td>School psychology</td>
<td>Master of Education (MEd)</td>
<td></td>
</tr>
<tr>
<td>Science education</td>
<td>Master of Science Education (MSE)</td>
<td></td>
</tr>
<tr>
<td>Secondary education</td>
<td>Master of Education (MEd)</td>
<td></td>
</tr>
<tr>
<td>Sociology</td>
<td>Master of Arts (MA)</td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>Master of Arts (MA)</td>
<td></td>
</tr>
<tr>
<td>Special education</td>
<td>Master of Education (MEd)</td>
<td></td>
</tr>
<tr>
<td>Addresses for information and applications:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRE</td>
<td>Graduate Record Examinations</td>
<td>Miller Analogies Test</td>
</tr>
<tr>
<td>GMAT</td>
<td>Graduate Management Admissions Test</td>
<td>Controlled Testing Center Supervisor</td>
</tr>
<tr>
<td></td>
<td>Educational Testing Service</td>
<td>The Psychological Corporation</td>
</tr>
<tr>
<td></td>
<td>P.O. Box 6000</td>
<td>555 Academic Court</td>
</tr>
<tr>
<td></td>
<td>Princeton, NJ 08541-6000</td>
<td>San Antonio, TX 78204-2498</td>
</tr>
</tbody>
</table>
APPLICATION FOR ADMISSION TO GRADUATE SCHOOL FOR U.S. CITIZENS OR PERMANENT RESIDENTS

Return to: Dean, Graduate School, 107 Jardine Hall, The Wichita State University, Wichita, KS 67208-1595
Telephone (316) 689-3095 Fax (316) 689-3795

Not complete until two (2) official transcripts of previous academic work are received.
Transcripts of WSU work will be ordered by Graduate School office personnel.

1. Legal Name

2. Social Security Number

3. Birth Date

4. Address

5. (a) Have you lived solely in Kansas for the past 12 months? Yes ☐ No ☐
(b) If answer to 5(a) is Yes, were you living in Kansas primarily to attend school or perform military service with your home being in another state? Yes ☐ No ☐
(c) If answer to 5(a) is No, are you a legal Kansas resident who was out of the state for the primary purpose of attending school or performing military service? Yes ☐ No ☐

6. Are you a veteran? Yes ☐ No ☐

7. Are you a U.S. citizen? Yes ☐ No ☐ Are you a permanent resident? Yes ☐ No ☐ If yes, Card #

Country of Birth Country of Citizenship

Questions 8 and 9 are required in order to comply with Federal Civil Rights laws and regulations. Completion of these questions is voluntary. All information is confidential and will have no bearing on your admission to Graduate School.

8. Sex: Female ☐ Male ☐ Marital Status: Single ☐ Married ☐

9. Please check your racial/ethnic background:
   Black, Non-Hispanic ☐ Am. Indian or Alaskan Native ☐
   Asian, Pac. IsI. or Indian Sub-Continent ☐ White, Non-Hispanic ☐
   Hispanic ☐

10. How did you hear about the WSU Graduate School?

11. (a) When do you plan to enter WSU Graduate School? (Include year) Fall 19 __ Spring 19 __ Summer 19 __
(b) Planned enrollment status: Full time ☐ Part Time ☐

12. List other schools to which you are now applying.

13. Please check graduate study objective:
   ☐ Work toward a WSU graduate degree
   ☐ Work in unrestricted Non-Degree status—CATEGORY A
   Two official transcripts of all academic work are required.
   Two official transcripts of all academic work or of a previous Master’s degree are required.
   ☐ Study for one semester only as a Guest Student
   ☐ Work in restricted Non-Degree status—CATEGORY B
   Official letter from home Graduate School certifying student’s standing in current program is required.
   (Courses below 800 level only; includes workshops)
   Two official transcripts showing award of a bachelor’s degree or a copy of a current teaching certificate are required.

14. Field of Interest

15. List below complete information concerning all college(s) or university(s) (a) from which you received, or expect to receive, your bachelor’s degree or master’s degree; and (b) at which you have done other academic work.

<table>
<thead>
<tr>
<th>Name and Location of College or University</th>
<th>Attendance Dates</th>
<th>Major Field</th>
<th>Degree Title</th>
<th>Date Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Include WSU if previous work taken here)</td>
<td>19 - 19</td>
<td>19 - 19</td>
<td>19 - 19</td>
<td>19 - 19</td>
</tr>
</tbody>
</table>

16. List relevant professional employment or experience.

17. List academic or professional awards or special recognition of scholarship.

18. Anticipated test dates (if applicable): GRE ___________ GMAT ___________ Miller Analogies ___________

19. Place of employment __________________________ Telephone __________________________

20. Date __________________________ Signatures of Applicant __________________________

Your signature is certification that the above information is correct.

NOTICE OF NONDISCRIMINATION: The Wichita State University does not discriminate on the basis of race, color, national origin, sex, age, or handicap. Any persons having inquiries concerning this may contact James J. Rhatigan, Vice President for Student Affairs and Dean of Students, 1845 Fairmount, Wichita, Kansas 67208-1595, (316) 689-3021.
INSTRUCTIONS FOR APPLYING FOR ADMISSION
AS AN INTERNATIONAL GRADUATE STUDENT

For many years The Wichita State University (WSU) has prepared students from all over the world for a variety of career fields. We welcome international students in our academic programs and encourage multicultural diversity and increased global awareness on our campus. Our International Programs Office provides many services for international students, including orientation, counseling on social and financial matters, academic advising, assistance with university and government regulations, campus housing assistance, and a friendship families and conversation partner program.

International admission to a graduate program at WSU is a two part process. The first part consists of determining your academic admissibility. The second part requires demonstrating the sufficient English proficiency and financial means of support needed to complete your graduate degree program. The following information explains the procedure for submitting an application for admission to a graduate program.

The following items should be submitted to the Graduate Admissions Office as soon as possible:

1. a completed Application for Admission to Graduate School (attached);
2. two official copies of your undergraduate transcript translated into English. If the transcript does not indicate the awarding of a bachelor's degree or its equivalent, please submit two official copies of your degree statement or diploma. If you are transferring from an American university, you need to submit two official copies of work done at any American universities you have attended.
3. the nonrefundable application fee of (US) $25 (please make check or money order payable to The Wichita State University);
4. any additional GRE, GMAT, or special entrance exams required by your specific department;
5. a completed and notarized Official Financial Statement for The Wichita State University (attached), which documents your ability to pay for your tuition and living expenses, since financial assistance may not be available. International students are eligible to apply for graduate teaching and research assistantships. Please contact the Graduate Coordinator of your field of study if you are interested in receiving an application.
6. an official copy of a recent TOEFL score report (Test of English as a Foreign Language) less than two years old showing a minimum score of 550 or higher (depending on your department). Student copies are not acceptable. This requirement may be waived if you have been enrolled in a degree program for at least one year at an American or English language university in a country whose official language is English. To register for the TOEFL or order a score report to be sent to WSU, write to:

   TOEFL
   Educational Testing Service
   Princeton, New Jersey 08540 USA

We will evaluate your application for academic acceptance once we receive the first four items listed above. However, we cannot issue nonimmigrant visa papers until we have received your proof of English proficiency and Official Financial Statement (item 5). We strongly urge you to submit your financial statement and English language documentation with your initial application, or as soon as possible, in order to accelerate processing your papers.

Before enrolling in a graduate program at The Wichita State University, you need to obtain the minimum TOEFL score required by your department. If your TOEFL score is too low, we recommend that you enroll in the excellent English program at the Intensive English Language Center of The Wichita State University. By studying English here at WSU before beginning your graduate work, you will become acquainted with WSU and the friendly Wichita community as you improve your English skills. If you want to learn more about studying English at WSU, please write to:

   Intensive English Language Center
   The Wichita State University
   1845 Fairmount
   Wichita, Kansas 67208-1595 USA
APPLICATION FOR ADMISSION TO GRADUATE SCHOOL FOR INTERNATIONAL APPLICANTS

Return to: Dean, Graduate School, 107 Jardine Hall, The Wichita State University, Wichita, KS 67208-1595
Telephone (316) 689-3095 Fax (316) 689-3795

Not complete until two (2) official transcripts of previous academic work are received.
Transcripts of WSU work will be ordered by Graduate School office personnel.

1. Legal Name

2. Social Security Number

3. Birth Date

4. Address

5. Place of Birth

6. Country of Citizenship

7. Native language

8. If you are now in the U.S., what type of visa do you have?

9. Sex: Female □ Male □ Marital status: Single □ Married □ If married, please list names and birthdates of dependent family members who will accompany you to Wichita

10. How did you hear about the WSU Graduate School?

11. Please list other schools to which you are now applying.

12. When do you plan to enter WSU Graduate School? (Include year) Fall 19 □ Spring 19 □ Summer 19 □

13. Please check graduate study objective: □ Doctorate □ Specialist in Education □ Master's

14. Field of Interest

15. List below complete information concerning all college(s) or university(ies) (a) from which you received, or expect to receive, your bachelor's degree or master's degree; and (b) at which you have done other academic work.

<table>
<thead>
<tr>
<th>Name and Location of College or University</th>
<th>Attendance Dates</th>
<th>Major Field</th>
<th>Degree Title</th>
<th>Date Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19</td>
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<td></td>
<td>19</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. List relevant professional employment or experience.

17. List academic or professional awards or special recognition of scholarship.

18. Anticipated test dates (if applicable): GRE □ GMAT □
    TOEFL □ TSE □ Miller Analogies

19. Place of employment Telephone

20. Date Signature of Applicant

Your signature is certification that the above information is correct.

A $25.00 (U.S.) application fee is required unless entering directly after completion of WSU undergraduate study.

NOTICE OF NONDISCRIMINATION: The Wichita State University does not discriminate on the basis of race, color, national origin, sex, age, or handicap. Any persons having inquiries concerning this may contact James J. Rhatigan, Vice President for Student Affairs and Dean of Students, 1845 Fairmount, Wichita, Kansas 67208-1595, (316) 689-5021.
The Wichita State University requires that international students have a minimum of (US) $13,000 for each year of study on the Wichita State campus. This money is in addition to any money needed for travel to and from the United States.

### Breakdown of Expenses for 1990-91

Costs may be subject to change without notice.

<table>
<thead>
<tr>
<th></th>
<th>Academic Year (9 months)</th>
<th>Summer Session</th>
<th>Calendar Year (12 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and fees (18 credit hours per academic year)</td>
<td>$3,050</td>
<td>$1,025*</td>
<td>$4,075</td>
</tr>
<tr>
<td>Living expenses</td>
<td>3,500</td>
<td>1,500</td>
<td>5,000</td>
</tr>
<tr>
<td>Books and supplies</td>
<td>900</td>
<td>300*</td>
<td>1,200</td>
</tr>
<tr>
<td>Insurance (approximate)</td>
<td>300</td>
<td>-</td>
<td>300</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1,700</td>
<td>725</td>
<td>2,425</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$9,450</strong></td>
<td><strong>$3,550</strong></td>
<td><strong>$13,000</strong></td>
</tr>
</tbody>
</table>

*Students who remain in the US during the summer, but do not enroll in classes may subtract this amount from the total amount needed.

An additional $2,000 should be added if the student's spouse comes with the student to the US.

An additional $1,500 should be added for each child who comes with the student to the US.

**Please complete the appropriate section, A or B:**

(A) if you are being sponsored by someone else

(B) if you are sponsoring yourself

**Mail the notarized statement to:**

Graduate Admissions Office
The Wichita State University
1845 Fairmount
Wichita, Kansas 67208-1595 USA

(A) I, ___________________________, do affirm that I will make available to ___________________________, a minimum of (US) $13,000 for each year of study at The Wichita State University. I understand that **The Wichita State University will not be able to assist financially**, except as might be made by special graduate assistantship awards. I also understand that **tuition and fees must be paid at the time of registration**.

(B) I, ___________________________, do affirm that I will make available a minimum of (US) $13,000 for each year of study at The Wichita State University. I understand that **The Wichita State University will not be able to assist me financially**, except as might be made by special graduate assistantship awards. I also understand that **tuition and fees must be paid at the time of registration**.

**To Be Completed by a Notary Public or Government Official**

Personally appearing, ___________________________, affirms (swears) that the foregoing statement made by him/her is correct in every respect.

Title of official ______________ Date commission expires ______________

Signature of Notary Public or Government Official ___________________________ Date ______________
Academic Programs at The Wichita State University
Are Accredited by or Hold Membership in
the Following Associations

North Central Association of Colleges and Schools
Accreditation Board of Engineering and Technology
American Assembly of Collegiate Schools of Business
American Bar Association
American Chemical Society
American Dental Association
American Physical Therapy Association
American Speech-Language and Hearing Association, North
central Association of Colleges and Schools
Association of University Business and Economic Research
Association of University Programs in Health Administration
Commission on Accreditation in Education
Committee on Allied Health Education and Accreditation of
the American Medical Association
Council on Social Work Education
Kansas State Board of Nursing
Kansas State Department of Education
National Association of Schools of Dance
National Association of Schools of Music
National Council for Accreditation of Teacher Education
National League of Nursing