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Western Michigan University is located in Kalamazoo, midway between Chicago and Detroit. Three major highways and numerous bus routes connect the city with other midwestern cities. The population of Kalamazoo is 77,230 and of Kalamazoo County is 218,500.

The provisions of this catalog are not an irrevocable contract between the student and the University. The University reserves the right to change any provision or requirement at any time within the student's attendance. The University further reserves the right to ask the student to withdraw for cause at any time.

Western Michigan University retains the right to rescind any WMU degree which was improperly obtained. Before taking any such formal action, however, the University will provide appropriate due process rights to the degree holder.

It is the policy and commitment of Western Michigan University not to discriminate on the basis of race, sex, age, color, national origin, height, weight, marital status, sexual orientation, religion, or handicap in its educational programs, activities, admissions, or employment policies in accordance with Title IX of the 1972 Education Amendments, Executive Order 11246 as amended, and Section 504 of the Rehabilitation Act of 1973, and all other pertinent state and federal regulations.

Changes in administration and instruction may be made subsequent to the date of publication.

Academic calendars are subject to change without notice.

The University reserves the right to revise or change rules, charges, fees, schedules, courses, requirements for degrees, and any other regulations affecting students whenever considered necessary or desirable.

The University reserves the right to cancel any course for insufficient registration or to phase out any program.

Registration by student signifies an agreement to comply with all regulations of the University whenever approved.

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Board of Trustees

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Term Expires December 31, 1990

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Term Expires December 31, 1992

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The Graduate College

Laurel A. Grotzinger, Dean

Rollin Douma, Associate Dean

Julie Scrivener, Administrative Assistant and Dissertation Assistant

Griselda Daniel, Assistant to the Dean and Director of Minority Recruitment

Paula Boobt, Director, Student Services
Calendar of Events

Spring Session
Classes Begin
Final Day to Drop Classes
Applications for Admission to The Graduate College Due for the Summer Session
Approved Theses, Projects and Dissertations Due in The Graduate College for June Graduation
Memorial Day Recess
Applications Due for August Commencement
Session Ends
Commencement

Summer Session
Classes Begin
Final Day to Add Classes
Final Day to Drop Classes
Applications for Admission to The Graduate College Due for Fall Semester
Approved Theses, Projects, and Dissertations Due in The Graduate College for August Graduation
Sessions Ends
NO COMMENCEMENT EXERCISES

Fall Semester
Advising Day
Classes Begin
Labor Day Recess
Final Day to Add Classes
Final Day to Drop Classes
Applications Due for December Graduation
Classes Dismissed 2 P.M. Friday Only (Labs excepted)
Homecoming (Saturday classes will meet)
Applications for Admission to The Graduate College Due for Winter Semester
Thanksgiving Day Recess Begins at Noon
Classes Resume
Approved Theses, Projects, and Dissertations Due in The Graduate College for December Graduation
Final Exam Week
Semester Ends
Commencement

Winter Semester
Classes Begin
Final Day to Add Classes
Final Day to Drop Classes
Applications Due for April Graduation
Applications for Fellowships and Associateships
Applications for Admission to The Graduate College Due for Spring Session
Semester Recess
Classes Resume
Applications Due For June Graduation
Recess (All Day)
Classes Resume
Approved Theses, Projects, and Dissertations Due in The Graduate College for April Graduation
Final Exam Week
Semester Ends
Commencement

1990
May 7, 1990
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May 1, 1990
June 8, 1990
May 28, 1990
June 1, 1990
June 27, 1990
June 30, 1990
July 5, 1990
See Class Schedule
August 3, 1990
August 25, 1990
September 4, 1990
September 4, 1990
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October 19, 1990
October 20, 1990
November 1, 1990
November 21, 1990
November 26, 1990
November 30, 1990
December 17-21, 1990
December 22, 1990
December 22, 1990
January 7, 1991
See Class Schedule
February 1, 1991
March 1, 1991
March 4, 1991
March 11, 1991
March 31, 1991
April 3, 1991
April 1, 1991
April 22-26, 1991
April 27, 1991
April 27, 1991

1991
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June 7, 1991
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March 1, 1993
March 8, 1993
March 8, 1993
April 1, 1993
April 1, 1993
April 9, 1993
April 12, 1993
April 2, 1993
April 20-24, 1992
April 25, 1992
April 25, 1992
April 24, 1993
April 24, 1993
April 24, 1993
The University and Graduate Education

Western Michigan University was established by the State Legislature in 1903. Although the University has continued to meet its initial obligation, the preparation of teachers, the growing educational needs of the state have changed the role of the institution to that of a multi-purpose university. Students today may enroll in graduate programs in the Colleges of Arts and Sciences, Business, Education, Engineering and Applied Sciences, Fine Arts, and Health and Human Services. The University’s enrollment for Fall 1989, was 26,315, with 6,387 enrolled in sixty-nine graduate programs.

Graduate programs were first offered in 1938 in cooperation with the University of Michigan. This cooperative program continued until 1952, when the State Board of Education authorized Western to grant its own master’s degree. With rapidly increasing enrollments, new master’s degree programs were initiated. Today, Western Michigan University has fifty-nine master’s degree programs. Master of Arts degrees are awarded in numerous programs in the following general categories within the College of Education: Counselor Education and Counseling Psychology, Curricula in Teaching, Early Childhood Education, Educational Leadership, Physical Education, Reading, Special Education, Teaching in the Elementary School, and Teaching in the Middle School. A number of other programs at the University also lead to the Master of Arts degree: Anthropology, Art, Chemistry, Communication, Comparative Religion, Economics, English, English as a Second Language, Geography, History, Home Economics, Mathematics, Mathematics Education, Medieval Studies, Orientation and Mobility, Philosophy, Physics, Political Science, Psychology, Rehabilitation Teaching, Sociology, Spanish, and Speech Pathology and Audiology. The University also offers the Master of Science degree in Accountancy, Applied Mathematics, Biological Sciences, Biostatistics, Business, Computational Mathematics, Computer Science, Earth Science, Engineering, Engineering Management, Geology, Occupational Therapy, Operations Research, Paper Science and Engineering, and Statistics, as well as the Master of Business Administration, Master of Development Administration, Master of Fine Arts, Master of Music, Master of Public Administration, and Master of Social Work degrees.

In 1960 programs leading to the Specialist in Education degree were introduced. This degree is offered in Educational Leadership and in School Psychology.

Doctoral programs were initiated in 1966 and were fully accredited by the North Central Association in 1971. Western Michigan University offers doctoral programs in eleven areas. The Doctor of Education degree is offered in Counselor Education and Counseling Psychology, Educational Leadership, and Special Education. The Doctor of Philosophy degree is offered in Educational Leadership, Mathematics, Mathematics Education, Physics, Psychology, Science Education, and Sociology. The Doctor of Public Administration is also offered.

Admission Dates

Admission to a graduate program is required of each student planning to secure a degree beyond the baccalaureate. Applications for admission should be submitted by the following dates:

- Fall Semester: July 1
- Winter Semester: November 1
- Spring Session: March 1
- Summer Session: May 1

NOTE: Some programs have earlier deadline dates. Check with the department for specifics.

Since applications are considered on a first-come, first-served basis, it is advisable to apply well before these deadlines because admission to some programs closes early as openings are filled. Also, some programs require the results of entrance examinations which are scheduled in advance of these deadlines.

A graduate student retains active admission status for one year from the time of admission, as well as one year from the date of last enrollment in The Graduate College.

A graduate student who no longer has active admission status may request it by submitting a re-entry application to The Graduate College at least one month before registering for classes. The student will be re-entered to his/her previous graduate curriculum, with departmental approval.

If more than six years have passed since a student last had active admission status, new admission materials (application, fee, transcripts, test scores, etc.) must be submitted to The Graduate College.

Admission Application Fee

A non-refundable application fee of $25 must accompany each application for admission to The Graduate College.

Admission Procedures

Admission to a graduate program is secured through the following steps:

1. Request an "Application for Admission" from The Graduate College.
2. Determine from The Graduate College Bulletin the degree sought and the curriculum to be studied.
3. Return the "Application for Admission" and the $25 application fee before the published admission dates.
4. Request the Registrar of each college previously attended, except Western Michigan University, to send two official transcripts of credits to The Graduate College. The transcripts are due in The Graduate College prior to the published admission dates.
Types of Admission

The admission of a student to a graduate degree program requires the endorsement of the academic unit offering the program and The Graduate College.

Regular Admission—Degree Status

1. Admission is granted to the student who has a bachelor’s degree with an acceptable academic record (3.0 grade point average in the final two years of undergraduate study), who has passed the required entrance examinations, and who has met the admission requirements of the program the student plans to pursue. Acceptance to a definite program of study leading to a degree program requires the endorsement of the department or unit in which the student plans to study and The Graduate College. For further information see the admission requirements of that graduate program.

2. Admission with reservation is granted to the student with a bachelor’s degree who has fulfilled the general requirements for admission but may not have fulfilled the specific requirements of a particular program. Such admission is also granted to the student during the final semester or session of enrollment in an undergraduate program if the academic record is satisfactory.

3. Dual enrollment admission is granted to the senior at Western Michigan University who has an acceptable academic record, who has applied for graduation, and who has no more than six credits to complete for a bachelor’s degree. The student may elect graduate courses, in addition to those required at the undergraduate level to complete the bachelor’s degree, to encompass a full academic program. Such dual enrollment is permitted for one semester only. Graduate credit thus earned may not be used to meet undergraduate requirements. A student must request dual enrollment status on the application for regular admission to a degree program by the published deadline dates.

Probationary Admission

Probationary admission is granted to the student with a bachelor’s degree and a somewhat less than satisfactory academic record or anyone having a bachelor’s degree from a non-accredited college. A grade point average of at least 2.5 in the final two years of undergraduate study, as well as the approval of the department or unit in which the student plans to pursue graduate study, is required for probationary admission. A student admitted on probationary status may establish eligibility for regular admission to a degree program by completing the specified departmental prerequisites, by securing grades of “B” or better in each advisor-approved course in the first six to nine graduate credits, by passing the English Qualifying Examination, and by securing departmental approval.

Permission To Take Classes

A student with a bachelor’s degree who wishes to enroll in courses, but does not plan to pursue a program leading to a graduate degree, or is not eligible for admission, may enroll in certain classes with Permission To Take Classes (PTG) status. This status also is granted to a student enrolled in a certificate program and to a guest or visiting student from another university. PTG status does not constitute admission to a degree program, and the courses taken under this status might not apply to a particular degree program. For the student eligible for admission, a maximum of nine credits taken under PTG status may be considered in a degree program if the student should later decide to apply for admission to a degree program and if an advisor and The Graduate College approve the credit. PTG status is not available to students with dual enrollment.

English Qualifying Examination

Students in all graduate programs who do not already possess an earned graduate degree must demonstrate competency in English by passing the English Qualifying Examination. Students are encouraged to meet this requirement prior to enrollment or during their first enrollment period.

The examination is composed of 195 multiple choice and true or false questions covering punctuation, spelling, sentence construction, word usage, and reading comprehension. Students have one hour and forty-five minutes to complete the test. A score of 109 is passing. A study guide for the examination is available at the Campus Bookstore.

Schedules for the English Qualifying Examination showing dates, times, and locations are available from The Graduate College.

Admission of Foreign Students

A foreign applicant with a degree from a U.S. institution will be expected to meet the same academic standards required of U.S. citizens for degree admission. Applicants with foreign educational backgrounds must meet the minimum admission standards interpreted by the Office of International Student Services (OISS) and enforced by The Graduate College. Additionally, all foreign applicants must prove that they have sufficient financial resources to cover the educational and living expenses incurred by a typical non-resident graduate student.

When the first or primary language of a foreign applicant is not English, the applicant will be required to demonstrate proficiency in English. Proficiency may be established by submitting scores from the Test of English as a Foreign Language (TOEFL) or Michigan Test of English Language Proficiency (MTELP) (see section of Office of International Student Services for specific score requirements). Applicants who have already successfully completed at least one year of full-time academic study at another accredited U.S. institution also may be required to submit English proficiency scores at the time of application.

Foreign students wishing to apply for admission to Western may secure an application from the OISS. Credentials will be evaluated and referred to the appropriate department and to The Graduate College for an academic admission decision.

Senior Citizen Status

A special status for persons sixty-two years of age or older has been approved by the Board of Trustees providing senior citizens with special privileges and opportunities for study at Western Michigan University.

Individuals qualifying should seek Permission to Take Classes status. The Schedule of Classes should be consulted for further registration information.

Eligibility of Faculty For Graduate Study

Western Michigan University faculty members holding tenure track appointments and all University staff are eligible to apply for admission to doctoral programs at Western, but only in the academic units where they are not employed. WMU faculty holding explicitly temporary or term appointments may apply for admission to any doctoral program. All faculty and staff are eligible to apply for admission to master’s and specialist programs at Western.

Michigan Intercollegiate Graduate Studies (MIGS)

The Michigan Intercollegiate Graduate Studies (MIGS) program is a guest scholar program which enables graduate students of Michigan institutions offering graduate degree programs to take advantage of unique educational opportunities on the campuses of the other institutions. Western Michigan University participates in this program.

Any graduate student in good standing in a master’s, specialist, or doctoral program at a participating institution is eligible to participate. The student’s good standing at the home institution affords the opportunity to study at the host institution, providing the proposed program of study is approved by a departmental officer and MIGS liaison officer at both the home and host institutions. The officers of the home institution determine whether space and other necessary resources are available at the host institution. This type of enrollment is limited to one term for master’s or specialist degree students, or two terms for doctoral degree students. For further information, contact a graduate advisor or the MIGS liaison officer in The Graduate College.

Registration

Registration will be held according to the schedule and procedures given in the Schedule of Classes, which is published prior to each semester and session. This Schedule is available in the Registrar’s Office, should be consulted for details regarding the time and place of graduate classes. A student is encouraged to register as early as possible to secure the classes of choice.

Any changes in a student’s schedule must be made in accordance with the procedures announced in the Schedule of Classes. A student may not withdraw from graduate courses beyond the midpoint of each semester or session.

Student Load

The normal full-time load for a graduate student during the Fall and Winter semesters is nine to thirteen hours. During the Spring and Summer
sessions, the normal full-time load is five to eight hours. The required load for a student with a full Graduate Assistantship or Associateship is six hours per semester or three hours per session.

Course Numbering System
Two levels of courses are offered in The Graduate College: (1) Those numbered 600 and above are open only to graduate students, and (2) those numbered 500 through 599 are open to both advanced undergraduate and graduate students. No graduate credit is given for correspondence work, regardless of course number.

Repeated Courses
Any course in which a student may have been enrolled more than once is considered a repeated course. A grade must be presented for each course. With the program adviser's approval, the grade and credit earned in the repeated course may count toward curricular or degree requirements at the time of graduation. However, all courses taken, even if they have been repeated, will be included on the student's record.

Undergraduate Credit In A Graduate Program
In certain instances, an adviser may permit a student to include up to six semester hours of 300 or 400 level courses in a graduate program, provided the student receives written permission from the adviser and The Graduate College prior to registering for these courses and then earns a grade of "B" or better. Such courses are to be taken in cognate areas outside the student's department or as part of an interdisciplinary program. These courses earn undergraduate credit which is not computed into the graduate point-hour ratio. The rate of the tuition fee for these courses is the same as the rate for undergraduate credit.

Graduate Credit By Examination
Each academic unit responsible for offering a graduate program may, with the approval of its Dean, establish a procedure for granting credit by examination for any course numbered 500 through 699. All credit by examination shall be graded "Credit by Examination" and may not be repeated.

5. Credit by examination can be earned only by those students admitted to a specific graduate program and who have current enrollment.
6. Credit by examination earned at another university may transfer in accordance with the current policies of The Graduate College governing the transfer of credit.
7. Examination fees shall be assessed by the academic unit. It is expected that students will pay the examination fee in advance of taking the examination.

Research Subject Protection
Students conducting research that involves human or animal subjects must have prior approval of the research proposal by the appropriate University board, thus ensuring compliance with the regulations for the protection of such subjects. For more information, contact Research and Sponsored Programs, 387-3670.

Transfer Credit
Master's degree: Six semester hours (three and four quarter or term hours are transferred as two semester hours) of graduate credit may be transferred from other schools provided:
1. The credits were earned in institutions accredited for graduate study and are of "B" grade or better. The student's average for all graduate work taken at another institution must also be a "B" or better.
2. The Graduate College approves the credits for transfer.
3. The student's adviser verifies that the credits contribute to the student's program of study.
4. The credit is earned within a six year period prior to graduation.

Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.

Second master's degree: A student wishing to secure a second master's degree may include a maximum of six semester hours of credit from the first graduate degree program. The second degree program must fulfill all of the other usual requirements for a master's degree, except the English Qualifying Examination.

Specialist degree: A student with a master's degree from another university who completes the remaining credits for a specialist degree at Western Michigan University may transfer up to thirty-six semester hours. A student without a master's degree who completes the credits for a specialist degree at Western Michigan University may transfer up to twelve semester hours.

Residency
The following residency policy was adopted by the Board of Trustees of Western Michigan University on July 20, 1973:
1. Since normal study does not necessarily come to Western Michigan University for the primary or sole purpose of attending the University rather than to establish a domicile in Michigan, one who enrolls in the University as a non-resident shall continue to be so classified throughout his/her attendance as a student, unless and until he or she demonstrates that the previous domicile has been abandoned and a Michigan domicile established.
2. The residence of a student who is a minor follows that of his or her parents or legal guardians, except that a minor student who comes to the institution from another state or country cannot be registered as a resident of this state on the basis of being a resident of this state as a guardian, except on permission of the Board of Trustees.
3. No student 18 years of age, or older, shall be eligible for classification as a resident unless the student shall be domiciled in Michigan and has resided in Michigan continuously for not less than one year immediately preceding the first day of classes of the term for which classification is sought.
4. A student shall not be considered domiciled in Michigan unless the student is in continuous physical residence in this state for one year and intends to make Michigan his or her permanent home, not only while in attendance at the University but thereafter as well, and has no domicile elsewhere.
5. The residence of a student who otherwise would be classified as a non-resident will follow that of his or her spouse or his/ her spouse's domicile, if the spouse would qualify as a resident for tuition purposes.
6. An alien lawfully admitted for permanent residence in the United States, and who has obtained his/her permanent visa, and his/ her spouse and minor children, who have met the other requirements herein for residence, may register as residents of this state. Please note that the deadline for applying for a change in resident classification is 20 days after the first day of classes for each semester or session.

Any questions concerning residency should be directed to the Controller's Office, 3982 Sebrell Administration Building. Telephone: 387-2365.

Student Fees
During 1989-1990, the following schedule was used for graduate study on campus:

Resident, $90.25 per credit hour
Non-Resident, $216.50 per credit hour

The fee for graduate study in courses offered off-campus through the Division of Continuing Education was $99.25 per graduate credit hour.

Resident Study: Any graduate student who has previously registered for and received a grade of "Incomplete" for Master's Thesis, Specialist Project, or Doctoral Dissertation and wishes to use the services of University staff and facilities to complete the work necessary to remove the "Incomplete" must, if not otherwise enrolled, pay a resident study fee of $25.00 for the semester, or $12.50 for a session.

Graduate appointees: Appointees are entitled to a charge privilege for tuition and related fees. However, installment payments must be made. An account is considered to be delinquent sixty days after the beginning of a semester and thirty days after the beginning of a session. At that time a one percent monthly service charge will be added to the unpaid balance. Delinquent accounts are subject to all University collection procedures, including referral to an external collecting agency. All tuition and fees must be paid prior to registration for the next semester/session.
Refunds And Change Of Class Load

All changes in registration or complete withdrawal must be made in accordance with the procedures published in the Schedule of Classes. A student may not withdraw from graduate courses beyond the midpoint of each semester or session. A student who withdraws from the University or who reduces a credit hour load, resulting in lower fees, will be granted a partial refund of the total paid, subject to the following conditions:

1. Changes in student credit hour load prior to the end of the final day for adding a course are considered to be reassessments, and a refund will be granted, in full, for any net reduction in such credit hour load. Alternatively, an increase in credit hour load will result in an upward adjustment of the fee assessment.

2. Reductions in credit hour load after the final day to add a class are not subject to any refund.

3. Complete withdrawal from all courses after the final day to add a course and up through the fifth week of classes in a semester or second week in a session will result in a 50 percent refund. The refund date is determined by the date the Registrar's Office receives a change in enrollment form from the student.

Grading System

A grade is given in each course in which a student registers. Grades are indicated by letters and assigned honor points as shown in the table below. Credit toward a degree program will be granted only for courses in which a grade of "C" or better is earned.

Grade | Definition | Honor Points Per Credit Hour
--- | --- | ---
A | Outstanding, Extraordinary | 4.0
BA | Excellent | 3.5
B | Very good | 3.0
CB | High pass | 2.5
C | | 2.0
D | | 1.5

Transcripts

All students desiring a transcript of their records in this University should write or visit the Office of the Registrar, giving dates of attendance and, if a graduate, the date of graduation. All names under which the student may have been enrolled and a social security number should be provided. All copies are $3.00 each. The transcript will be released only upon written authorization of the student and only after payment is made. Official sealed transcripts are mailed only to third parties (i.e., employers, educational institutions, governmental units).

Fellowships, Associateships, Assistantships

Western Michigan University provides fellowships and assistantships for students planning to pursue graduate study. Applications are due by February 15, and appointments are usually made by April 1 for students planning to enroll in the fall semester. Students with appointments are required to pay regular tuition fees, but a tuition grant is often provided to non-resident students to supplement an appointment. Appointments are often renewable, except for Graduate College Fellowships and Thurgood Marshall Assistantships.

The following appointments are available:

1. Graduate College Fellowships of $6,000 for two semesters are offered to students entering master's degree programs. An entering student is defined as one who will have earned no more than six graduate credits by the beginning of the fall semester. Awards are made on the basis of scholarship and leadership potential.

2. Doctoral Associateships of $7,900 for two semesters are offered to students enrolled in the following doctoral degree programs: Counseling Education and Counseling Psychology, Educational Leadership, Mathematics, Physics, Psychology, Science Education, Special Education, and Sociology.

3. Thurgood Marshall Assistantships of $7,500 for three semesters are offered to students admitted to degree programs. They are awarded to students from minority groups on the basis of scholarship and financial need. Participation in the professional activities of a department is required.

4. Teaching and Research Assistantships are available for the minimum of $6,000 for two semesters of full-time appointment and are available in many departments of the University. Inquiries should be sent to the chairperson of the department.

5. Service assistantships up to $6,000 in administrative units of the University may be applied for by sending a resume and cover letter to The Graduate College. Resumes are distributed to the units with openings.

Policies Governing Graduate Appointees

1. Definitions

A graduate appointee is a student enrolled in a program leading to a graduate degree and receiving a University-administered stipend or salary which is not less than one half of the prevailing full-time rate set by the University for that particular type of appointment.

Although graduate appointments differ in many important ways, each can be classified as either an assistantship or a fellowship. The critical difference between an assistantship and a fellowship lies in the primary intent of the awarder—as payment for service (salary) or as a gift (stipend) to
help the awardee achieve an educational goal. Although there may be some aspect of service connected with a Fellow’s particular departmental activity, this activity is part of the training designated for all participants in the Fellow’s academic program, and the service rendered is secondary to the educational goal. Although all, or nearly all, of an assistant’s service to the department should also be part of the learning experience in the discipline, the primary thrust is in doing part of the work of the department.

More than one fractional appointment may be held simultaneously in the same department. However, in no case shall one person hold more than the equivalent of one full appointment.

2. Types of Appointments
   a. Assistantships
      Graduate appointees are apprentices in the profession. Although the service aspect is emphasized in the definition in order to make a distinction. Graduate Assistants, first and foremost, are students and valued members of the community of scholars. They are chosen for their scholarship and manifest interest in the discipline as well as for their ability to perform the needed service.
      1) The service of Graduate Teaching Assistants (T.A.s) consists of activities directly related to students in the teaching enterprise.
      2) The service of Graduate Research Assistants (R.A.s) consists of research activity under the supervision of a faculty member.
      3) The service of Graduate Non-Teaching Assistants (N.T.A.s) includes all other work in the department not falling under the other categories but generally accepted as appropriate.
      4) Associateships are assistantships awarded to outstanding students in doctoral programs. Service may involve teaching, research, or other appropriate activity.
   b. Fellowships
      Fellows are students who have distinguished themselves by outstanding academic achievement or special abilities. Fellowships are provided by the University or by another donor with the approval of the University. The fellowship grant ([stipend]) is a gift to help the Fellow achieve an educational goal, rather than a payment for services.

3. Service Requirement
   The kinds of service required of Graduate Assistants may vary among departments, each of which determines its own range of appropriate possibilities subject to administrative review. Whatever kinds of service are expected, however, a full assistantship in any department consists of twenty hours of service per week or its equivalent.
   1. Tuition fees: Graduate appointees who are residents of Michigan may, at the discretion of the University, be granted partial tuition remission for the non-resident portion of their tuition fees. The remitted tuition will be considered "in-kind" earnings and taxable income for students on appointments requiring service.
   2. University housing: Graduate appointees will be accorded priority in securing University housing in residence halls or family housing apartments if deadlines are observed and as facilities permit.
   3. Library: Graduate appointees will be accorded the privileges and responsibilities as faculty members in the use of the library facilities. These are specified in the faculty handbook (Western Michigan University Policy Handbook).
   4. Parking: Graduate appointees are exempt from paying the motor vehicle registration fee, but are required to register their motor vehicles.
   Application may be made to the Public Safety Annex for parking privileges in designated lots.

5. Affirmative Action
   The University’s Affirmative Action Policy shall apply to graduate appointments.

6. Professional Ethics
   Graduate Assistants shall adhere to the same standards of professional ethics as those of the regular faculty. (See “Statement on Professional Ethics” in current Agreement between WMU and the AAUP.)

7. Notification of Status
   At the time of their appointment, graduate appointees shall be informed in writing of the specific conditions of the appointment. They should be informed that the offer of an appointment is contingent upon acceptance into a graduate degree program at the University, and continuance of the appointment depends in part on satisfactory progress in that program and satisfactory performance of assigned duties. The letter should also state the amount of the award, whether a remission of non-resident fees is involved, the probable assigned activities, the length of the appointment, and, if appropriate, the criteria for renewal. Any other conditions peculiar to an individual appointment shall be contained in the letter of appointment. Each appointment shall be provided with information prepared by The Graduate College concerning current University-wide procedures, practices, privileges, and responsibilities that relate to graduate appointees. Each department is responsible for providing any supplemental information on these matters that is necessary and special.

8. Professional Development
   Assigned activities of graduate appointees shall be relevant professional experiences. Graduate Assistants can expect professional guidance and timely evaluation in the performance of their duties.

9. Enrollment Status
   A full appointment requires a minimum enrollment of six credits per semester or three credits per session.

10. Evidence of Status
    For formal identification as a graduate appointee, the student should have a special validation sticker on the ID card. This validation sticker is issued in the Graduate College at the beginning of each term. Validation may be authorized during the spring and summer sessions for graduate appointees on academic year appointments even if the appointee is no longer receiving a stipend or salary.

11. Benefits
    a. Tuition fees: Graduate appointees who are not residents of Michigan may, at the discretion of the University, be granted partial tuition remission for the non-resident portion of their tuition fees. The remitted tuition will be considered "in-kind" earnings and taxable income for students on appointments requiring service.
    b. University housing: Graduate appointees will be accorded priority in securing University housing in residence halls or family housing apartments if deadlines are observed and as facilities permit.
    c. Library: Graduate appointees will be accorded the privileges and responsibilities as faculty members in the use of the library facilities. These are specified in the faculty handbook (Western Michigan University Policy Handbook).
    d. Parking: Graduate appointees are exempt from paying the motor vehicle registration fee, but are required to register their motor vehicles.

Evidence of Status
   The Graduate College has established a Graduate Student Research Fund to encourage research by currently enrolled graduate students and to assist them in presenting their findings to professional groups. Grants range to a maximum of $600. Two basic types of proposals are considered for support:
   1. The extraordinary or unusual costs incurred in research projects.
   2. Travel costs incurred in presenting study reports and research findings at professional meetings.

The types of theses and dissertations and the purchase of supplies are commonly provided by departments are not considered to be unusual expenses.

Early in the Fall Semester each year the Awards and Fellowships Committee establishes application deadlines and the required format for the proposals. Applications for research or travel grants may be secured from The Graduate College.

Other Financial Assistance
Federal, State, and Institutional Financial Aid Programs Based on Need
Western Michigan University participates in various federal- and state-funded financial aid programs. The criteria are set by federal and state Departments of Education and are subject to periodic revision.

Application procedures for both the federal and state College Work-Study Program, the Perkins Loan Program (formerly National Direct Student Loan Program), the Stafford Loan Program, the Michigan State Direct Student Loan Program, the Michigan Adult Part-Time Grant Program, and for the WMU Nontraditional Student Scholarship: Submit a Family Financial Statement (FFS) to the appropriate address on the statement. The FFS may be obtained from college financial aid offices or from WMU Student Financial Aid. Students applying for a stipend or fellowship through United Student Aid Funds, Inc. may obtain the USAF application form, which is required in addition to the FFS, from WMU Student Financial Aid or from USAF, Inc., Box 50827, Indianapolis, IN 46250.

Students applying for the Michigan Adult Part-Time Grant program must complete the Non-Traditional Application for Student Assistance.

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Students applying for the Michigan Adult Part-Time Grant program must complete the Non-Traditional Application for Student Assistance.
Financial Aid and submit it to Self-Instructional Programs. Students applying for all programs listed above must also submit a Financial Aid Transcript from all institutions (except WMU) attended after high school and must complete their WMU financial aid file with documents required by the federal government. Forms are available at WMU Financial Aid.

The priority deadline for the College Work-Study Programs and the Perkins Loan Program is March 1 of the year preceding the award year.

The deadlines for Michigan Adult Part-Time Grant applications are August 1 for the Fall semester and December 12 for the Winter semester.

**Description of Programs**

**College Work-Study Programs**

These federal and state programs provide work opportunities for students who need financial assistance to attend college. Most students work ten to twenty hours a week while attending school and up to forty hours a week during vacation periods.

The WMU Student Employment Referral Service places students awarded College Work-Study in campus jobs. When possible, students select jobs related to their degree programs of interest.

**Perkins Loan Program (formerly National Direct Student Loan Program)**

Under this program graduate students may borrow a maximum of $18,000 including undergraduate loans. The interest rate is 5 percent.

Repayment of the loan plus interest begins six months after the student ceases to be enrolled at least half time, carrying four graduate credit hours each semester. The minimum repayment is $30 a month.

A portion of the student's loan, both principal and interest, may be canceled for each year the student teaches full time in:

1. A school designated by the United States Secretary of Education as having a high percentage of students from low income families, or
2. A school for physically, mentally, or emotionally handicapped children according to the following schedule:
   - 15 percent for the first and second year,
   - 20 percent for the third and fourth year,
   - 30 percent for the fifth year.

Note that:
1. Fifteen percent of the loan (principal and interest) may be canceled for each year that the student teaches full time in the Headstart Program, up to the whole loan amount.
2. The student's loan can be canceled at the rate of 12 1/2 percent for each complete year of service in the Armed Forces of the United States (in an area of hostility that qualifies for special pay) up to 50 percent of the loan amount.
3. The student's total disability or death cancels the loan.
4. The student may defer payment up to three years for service:
   - In the Armed Forces (Army, Navy, Air Force, Marine Corps, or Coast Guard).
   - As an officer on full-time duty in the commissioned corps of the U.S. Public Health Service.
   - As a volunteer under the Peace Corps Act.
   - As a volunteer under the Domestic Volunteer Service Act of 1973.
   - As a full-time volunteer in a tax-exempt organization performing service comparable to service performed in the Peace Corps, and when temporarily totally disabled or unable to secure employment because of providing care required by a spouse who is disabled.
5. The student may defer payments up to two years while serving an internship, the successful completion of which is required to begin professional practice or service. After the deferment period there is an additional six-month grace period.

**Stafford Loan Program**

The federal government guarantees loans made by private lending institutions to graduate students who are enrolled as at least half-time students. A cumulative maximum of $54,750 may be borrowed including both undergraduate and graduate loans. The maximum per year is $3,500 every nine months or for each graduate classification. The student pays no interest on the loan while in school at half-time status or better or for six months thereafter. Provided the student can demonstrate financial need according to the criteria set by the U.S. Department of Education. Repayment begins six months after the student ceases to be enrolled at least half time.

The interest rate for first-time borrowers in 1997 is 8 percent. For those who were new borrowers as of January 1, 1998, or thereafter, the interest rate is 9 percent. For those who have an unpaid loan balance on a loan received prior to January 1, 1981, the interest rate is 7 percent.

1. The student may defer payment up to three years for service:
   - In the Armed Forces (Army, Navy, Air Force, Marine Corps, or Coast Guard).
   - As an officer on full-time duty in the commissioned corps of the U.S. Public Health Service.
   - As a volunteer under the Peace Corps Act.
   - As a volunteer under the Domestic Volunteer Service Act of 1973.
   - As a full-time volunteer in a tax-exempt organization performing service comparable to service performed in the Peace Corps, and when temporarily totally disabled or unable to secure employment because of providing care required by a spouse who is disabled.

2. The student may defer payments up to two years while serving an internship, the successful completion of which is required to begin professional practice or service. After the deferment period there is an additional six-month grace period.
3. A single deferment for a period of not more than one year is provided for students who are unable to find full-time employment.

**Michigan State Direct Loan Program**

Michigan residents who have been denied a Stafford Loan from their local lender are eligible to apply for the Michigan Direct Student Loan Program. For the purposes of this program, a Michigan resident either (1) is dependent upon the support of parents or guardians who reside in and are legal residents of Michigan at the time of application for the loan, or (2) is independent of the support of parents or guardians and has resided in Michigan for not less than twelve consecutive months immediately prior to application for the loan. Recent federal regulations designate all graduate students who will not be claimed by parents as a federal income tax exemption as independent students.

**Michigan Adult Part-Time Grant Program**

Graduate students taking undergraduate courses toward their teacher certification may apply for this award of up to $500 for the academic year. Eligible students are those enrolled part time only, taking 3 to 11 undergraduate credit hours. Application deadlines are August 1 for Fall Semester and December 12 for Winter Semester.

WMU Non-Traditional Student Scholarship

This $200-$400 award is provided for adult learners who have had a significant break in education. Awards are given on the basis of need and/or scholarship. Graduate students must enroll for 2-6 credit hours and have a 3.5 grade point average. The priority deadline for application for fall semester is August 1; for the winter semester, the deadline is December 12.

**NON-NEED BASED OPPORTUNITIES**

**Description of Programs**

Supplemental Loan for Students (SLS) Interest rate for SLS is 2.5% above the Prime Interest rate, with a maximum of 12%. Students may borrow up to $4,000 a year. Repayment begins sixty days after the check is disbursed. Because repayment arrangements vary widely from lender to lender, students should contact their lender for repayment details.

Supplemental Loan for Students application forms are available from the student's hometown bank, savings and loan association, or credit union. Students should submit the SLS application form to WMU Student Financial Aid.

Should the student's bank not participate in the SLS Program, the student may apply for the SLS through United Student Aid Funds, Inc., and may obtain the application form from WMU Student Financial Aid.

**Payment Plans**

The Academic Management Services Plan allows parents and students to pay tuition, fees, and on-campus housing costs on a monthly basis. The plan involves no interest payments and may be renewed annually for $45. Contact AMS toll free at 1-800-556-6684 or write: Academic Management Services Incorporated 1110 Central Avenue, P.O. Box 1000 Pawtucket, Rhode Island 02862-1000

Manufacturers Hanover Educational Finance Programs provide funds which students must repay on a monthly basis. The annual percentage rate is 15.95 percent. There are no other charges. For information on the Tuition Plan, call 1-800-258-3640, or write: Manufacturers Hanover 100 Duffy Avenue Hicksville, New York 11801

**WMU Short-Term Loan Program**

WMU provides emergency short-term loans to full- or part-time WMU students. The maximum amount of the loan depends on the student's classification and the purpose of the loan. Short-term loans are issued in amounts of $50 to $500. Application forms are available at WMU Student Financial Aid and at WMU regional centers.

**Office of International Affairs Scholarships**

International exchange scholarships are awarded annually to qualified students for study in foreign universities in Europe and Asia. These scholarships are awarded on an annual basis in a competitive process including written applications and interviews. Contact the Office of International Affairs: 2090 Hannah Hall, for information and application forms.

**Free University of Berlin Exchange Scholarship**

This scholarship enables one WMU student to study at the Free University in the city of West Berlin, Germany for an academic year beginning in October. Includes tuition, housing, and stipend.
Keio University Exchange Scholarship
This scholarship enables one WMU student to study Japanese language at Keio University in Tokyo, Japan, for eleven months beginning in September. Includes tuition, housing and stipend.

Nankai University Exchange Scholarship
This scholarship enables one WMU student to study Chinese language at Nankai University in Tianjin, People's Republic of China, for an academic year beginning in August. Includes tuition and housing.

University of Passau Exchange Scholarship
This scholarship enables one WMU student to study at the University of Passau in the city of Passau, Bavaria, Germany, for an academic year beginning in October. Includes tuition and housing.

University of Tubingen Exchange Scholarship
The Japan Center for Michigan Universities established in Shiga, Japan in 1988 by Shiga Prefecture and the State of Michigan to mark twenty years of formal sister-state relationship. Educational programs at the Center include regular courses of Michigan universities in Japanese language and culture. Contingent upon State of Michigan funding, a limited number of partial scholarships, worth a maximum of $7,500 each for two semesters of study at the Center, are available to students recommended by WMU.

International Affairs Partial Scholarships
Jointly funded by the Provost and the Office of International Affairs, a limited number of $500 to $1,000 scholarships are available to assist students to participate in WMU-sponsored overseas programs such as the Oxford Seminar and field courses.

Student Employment
Referral Service
Students may find employment through networks of employers in and around Kalamazoo and on campus. Students looking for work can gain assistance through the Student Employment Referral Service room A-100, Ellsworth Hall.

The Student Employment Referral Service actively recruits employment opportunities for students within Kalamazoo and on campus. Campus departments handle their own student employment needs, and these opportunities can best be secured through direct contact with the department. Departments are asked, but not required, to list their openings with our office.

The Student Employment office also houses Professional Practice Services. This service is designed to help students secure career related employment while going to school. These opportunities may be in the form of an internship or a career-related, part-time or summer job. Many of these positions are paid, and some offer college credit. Students are encouraged to attend a career related employment workshop for details.

The Family Educational Rights and Privacy Act
The Family Educational Rights and Privacy Act of 1974 is a Federal law which states that (a) a written institutional policy must be established and (b) a statement of adopted procedures covering the privacy rights of students be made available. The law provides that the institution will maintain the confidentiality of student education records.

Veterans' Assistance
The Academic Records Office on the third floor of the Seibert Administration Building certifies veterans under the G.I. Bill and its extensions. Veterans may contact this office to initiate G.I. benefits.

The areas of assistance include, but are not limited to, veterans' educational benefits, vocational rehabilitation benefits, and tutorial assistance. If difficulties or questions arise in receiving benefits, the veteran should contact the Veterans Administration through the toll free number 344-0158.

Changes in enrollment or current address must be reported immediately to the Academic Records Office. Any change in dependents should be reported directly to the Veterans Administration. Forms may be obtained at the Academic Records Office. Students who receive benefits from the Veterans Assistance Administration are advised of their additional rights and responsibilities:

1. All students have a grade report mailed to them shortly after the close of each semester or session. Each student is required to take all classes and grades received is maintained in the Academic Records Office. A student copy of this record is available upon request with proper identification. Students copies picked up are free; there is a $3.00 charge for mailed copies.

2. A 3.00 grade point average is required of master's degree students at all times for continued certification. A 3.25 grade point average is required of specialist and doctoral degree students at all times for continued certification. Students who fall below these standards must seek the appropriate counseling from the Director of Records before recertification can be made. The VA will continue certification for more than one enrollment period below the appropriate standard. Students may not be eligible for benefits even though they have been allowed to continue in their graduate programs.

3. Even though incomplete grades in graduate courses remain on transcripts after the one year time limitation, incomplete grades more than one year old will be counted as "E" grades in considering eligibility for certification to the VA.

4. Students must be certified on the basis of attendance and academic progress toward degree goals. Serious over-payment problems can be eliminated by prompt notification to the Academic Records Office of changes in these areas.

Each student receiving benefits is required to sign a statement once a year outlining plans for enrollment for the coming year and declaring personal responsibility for regular attendance during that year.

The Family Educational Rights and Privacy Act
The Family Educational Rights and Privacy Act of 1974 is a Federal law which states that (a) a written institutional policy must be established and (b) a statement of adopted procedures covering the privacy rights of students be made available. The law provides that the institution will maintain the confidentiality of student education records.

Students arriving on campus should visit the Student Employment Referral Service immediately for all their employment needs.

which students seek to enroll, to persons or organizations providing student financial aid, to accrediting agencies carrying out their accreditation function, to persons in compliance with a judicial order, and to persons in an emergency to prevent or protect the health or safety of students or other persons. All these exceptions are permitted under the Act.

Within the Western Michigan University community, only those members, individually or collectively, acting in the student's educational interest are allowed access to student education records. These members include faculty, administrative and professional employees, and other persons who manage student record information (e.g., The Graduate College, Office of the Registrar, Academic Records Office, Controller, Financial Aid, and the Office of Admission).

At its discretion, the institution may provide Directory information in accordance with the provisions of the Act to include: student name, address, telephone number, date and place of birth, curriculum and major field of study, dates of attendance, degrees and awards received, the most recent previous educational agency or institution attended by the student, participation in officially recognized activities and sports, and weight and height of members of athletic teams. Students may request to withhold Directory information by notifying the Academic Records Office in writing within the official drop-add period of each semester or session.

The law provides students with the right to inspect and review information contained in their education records, to challenge the contents of these records, to have a hearing if the outcome of the challenge is unsatisfactory, and to submit written statements to be included in their files if they feel the decisions of the hearing panels to be unacceptable. The Registrar at Western Michigan University has been designated by the institution to coordinate the inspection and review procedures for student educational records, which include admissions, personal, academic, and financial files, as well as academic, cooperative education, and placement records. Students wishing to review their education records must make written requests to the Registrar. Only records covered by the Act will be made available within forty-five days of the request. Students may have copies made of their records with certain exceptions (e.g., a transcript of an original or source document which exists elsewhere). These copies would be made at the students' expense at the prevailing rate of ten cents per page.

Education records do not include records of institutional, administrative, and educational personnel—which are the sole possession of the maker and are not accessible or revealed to any individual except a temporary substitute—records of the law enforcement unit, student health records, employment records, or alumni records. Health records, however, may be reviewed by physicians of the students' choosing.

Students may not inspect and review the following as outlined by the Act: financial information submitted by their parents; confidential letters and recommendations associated with admissions, employment, or job placement, or honors to which they have waived their rights of inspection and review, or education records containing information about more than one student, in which case the institution will permit access only to that part of the record which pertains to the inquiring student. The institution is not required to permit students to inspect and review confidential letters and recommendations placed in their files prior to January 1, 1975, provided those letters were collected under established
Student Academic Rights

1. Introduction
The University endorses as a guideline for policy the following section from the Joint Statement on Rights and Freedoms of Students:

2. Policies and Procedures

a. Students should be fully informed by the faculty about course requirements, evaluating procedures, and academic criteria to be used in each class. This information should be provided at the beginning of the semester or sufficiently in advance of actual evaluation.

b. Procedures for Reviewing Student Grievances Related to Grading
1) Students have the right to have all such material not returned to the student for at least one full semester after the course was given. Faculty are not required to return such material to the student but must provide reasonable access to it.
2) Whenever a student believes he/she has a grievance regarding a grade, he/she should arrange a meeting with the instructor who may be able to explain the reasons for the grade or recommend a change, if warranted.
3) If the student believes that he/she has not received a satisfactory resolution of the grievance from the instructor, he/she should then go to the department chairperson or head, who may effect a satisfactory resolution.
4) If the student is still dissatisfied after seeing the department chairperson or head, the student shall next see the University Ombudsman.

The function of the Ombudsman in this situation is to collect information from both the student and the faculty member and then to make a decision that (a) the student’s grievance is unwarranted and should not be considered further, or (b) there is sufficient evidence that the situation be considered by the Graduate Committee on Academic Fairness.

5) The Graduate Committee on Academic Fairness consists of three faculty and three graduate students.
6) When a case is presented to the Committee, the Committee shall investigate it, making sure that all interested parties have a full opportunity to present their position. The Committee will be able to recommend (a) no grade change, (b) a change of letter grade, (c) credit/no credit, or (d) any other grade used by the Records Office.
7) If the Committee decides that there should be no change of grade, they will so inform the student, the faculty member, the department chairperson or head, and the Ombudsman. If the Committee decides to recommend a change of grade, the Committee will first inform the faculty member of its intent so that he/she may initiate the change. If the faculty member is not to initiate the change, the Committee will do so by notifying the University Registrar.
8) To protect all parties involved in any case, the strictest privacy consistent with the Committee’s task will be maintained.
9) Occasions do occur when faculty or an administrative official may wish to question a grade change. In such instances, these procedures, beginning with review by the Ombudsman, shall be available to them.

Policy Concerning Requirements
1) All students who seek advice on academic requirements will be provided written copies of their academic advisers’ recommendations, and students will not be held responsible for errors made by their advisers. This section is not to be interpreted to mean that the student is relieved of the responsibility of meeting the total graduation requirements stated in the catalog in force at the time he/she was admitted, or in a later catalog if he/ she chooses to meet its graduation requirements.
2) The student shall not be held responsible for meeting curricular requirements that are not available in the catalog governing the work he/she is taking.
3) Every department shall provide systematic procedures for students to express their views on matters of program and curriculum.
4) University policy and implementation of such policy should not be determined and enforced according to the needs of computer programming or records.

University Ombudsman
The Ombudsman is an intervention agent and impartial person who helps students, faculty, and staff resolve academic and non-academic concerns. The Ombudsman listens to you and discusses your question or concern, provides you with information that answers your question or helps you locate someone who can assist you. The University’s policies and procedures and how they follow up with you and others at the University to make sure your concern is resolved, and recommends changes in the institution that will make it more responsive to every member of the community. The basic principles of the University Ombudsman are independence, impartiality, and confidentiality. The Ombudsman is authorized to make thorough investigations and has access to all University offices and records, reports, and other documents in the University. No person shall suffer any penalty for seeking assistance from the Ombudsman. The Ombudsman is appointed by and reports directly to the President. The Office is located in 218 Bernhard Center. Telephone: 387-5300.

University Libraries
The University Libraries consist of the Dwight B. Waldo (Main) Library and subject oriented branch libraries located at various sites on Western’s campus. The main collection is housed in Waldo Library, which is named for the first president of the University. Built in 1959, it was enlarged in 1967 to almost double its original size. A new addition to be completed by the end of 1990 will add another 105,000 square feet and allow the integration of two branch collections into the main library.

The total University Libraries’ collection, which numbers well over two and a half million items, includes books, recordings, maps, documents, and materials in microform. Over 10,000 periodicals and serial titles are currently received. Through the use of various approval and gathering plans—as a part of the acquisitions program—the library places an emphasis on building a strong collection of current imprints in the fields of study at the University.
The University Libraries is a depository for United States and Michigan government documents and receives microform editions of United States Government Documents and official records. A microform collection of about 960,000 contains such items as the Human Relations Area File, the American Periodical Series, Early American Imprints of the 18th and 19th centuries, Early English Books printed in Great Britain from 1475-1700, and the ERIC documents (Documents in education research published by the Educational Resources Information Center).

Certain special collections are maintained by the library, and holdings have been especially strengthened in some subject areas to support University programs:  
1. The Ann Kercher Memorial Collection is an extensive collection of materials on Africa south of the Sahara. Started in 1963, the collection grew to become a noteworthy addition to library resources.  
2. Library holdings on Southern Asia represent another area of special strength. Together with the Kercher African collection, they help support the University's commitment to international and area studies.  
3. Another area of collection strength is the history and culture of the Medieval period, holdings which help support the programs of the University's Medieval Institute.  
4. The addition of Minority Services Librarian to the library staff allows the Libraries to continue to build on the wealth of material in the history and culture of Black America that was collected as a part of the Randall Frazier Memorial Collection, a collection which honored a notable alumnus of Western.  
5. The C. C. Adams Ecological Collection consists of the personal collection of books and papers of the pioneer American ecologist, Charles Christopher Adams.  
6. The Leslie H. Wood Memorial Collection is a specialized collection of books in the fields of geography and geology. Doctor Wood, who was one of the original group of faculty hired at Western, taught on campus from 1904-1933.  
7. The Map Library is the second largest academic map library in the state of Michigan, and the third largest of all map libraries in the state.  
8. The Business Library, presently located in North Hall on Western's East Campus, has a collection of 506,000 items which include special microform collections, annual reports from businesses and industries, and holds many periodic and serial titles in the field of business and finance. In late 1990 or early 1991, the library will move to West Campus and be integrated with the collections in Waldo Library.  
9. The Music and Dance Library is located in the Dorothy U. Dalton Center. In addition to a collection of some 32,000 books and scores and extensive holdings in music periodicals and scores, this branch contains a collection of 12,000 phonodiscs and tapes, and excellent listening facilities.  
10. The Physical Sciences Library contains 73,000 items in the fields of mathematics, astronomy, physics, and geology and has subscriptions to about 600 periodical and serial titles. This branch is located on the third floor of Wood Hall.  
11. The Education Library in Sangren Hall has some 506,000 bibliographic items and receives over 600 periodic and serial titles in the field of education.  
12. The Cistercian Studies Library located in Hillside West is a collection of books in the areas of monastic history, spirituality, and general church history. It supports the research and programs of the Institute of Cistercian Studies and of medieval studies at the University. The collection includes rare books, manuscripts and incunabula, most of which are on an indefinite loan to Western from the Abbey of Gethsemani. Altogether, about 1,000 of the more than 11,000 volumes in the library are rare items of interest to medieval scholars from all over the world. A rare book room will be a part of the remodeled Waldo Library, and the Cistercian Studies Library will move into its new quarters in late 1990 or early 1991.  
13. The University Archives and Regional History Collections are also a part of the holdings of the University Libraries. The staff collects, preserves and makes accessible records of the University. It is a depository for official University records, publications, and photographs documenting Western's history. Its staff also collects, preserves, and manages the Regional History Collection of books, manuscripts, ephemera, oral history tapes, photographs, local public records, and other information resources that document the history of southwestern Michigan. In addition, there are local public records from southwestern Michigan communities which are on deposit from the Archives of the State of Michigan. The University Archives is presently located in East Hall; it is also the repository for student publications as a result of the expanding and remodeling of Waldo Library.  

The University Libraries have a number of computer based services available to users. An integrated computerized library system provides an online catalog with author, title, subject and keyword-Boolean access to the library's collections. Terminals located in Waldo Library and its branches give the user access to the database of the book and periodical holdings of the University Libraries. This catalog is also available through dial access, so the user may access the database and do preliminary research from a home or office computer.  

The library has online access to the holdings of area libraries and provides an automated search service to selected vendor supplies databases. At no cost to users, the BRS ONSITE service allows the user personally to search online for material in selected subject areas and compile and print references to use in writing papers or completing reports or other projects.  

Electronic indexes provide automated access to periodical articles in general interest periodicals, in science and technology journals, in business publications, government documents and journals. A special CD-ROM index provides access to the NEWSBANK collection of articles from newspapers all over the country on a variety of topics.  

General and specialized reference service is provided at the main Reference Desk, the Science Reference Desk and in the Documents and Maps Department in Waldo Library. Reference collections of indexes, abstracts, dictionaries, handbooks, bibliographies, etc. are maintained in each of the libraries, and reference lists and personal assistance in finding the books, information, and other resources needed for class or research related problems. In addition, the reference staff offers a credit course, Library Resources, in the General Studies curriculum. The course is designed to introduce the student to the use of our library system and especially to the bibliographic tools and research methods necessary to find information in the various subject fields.  

An online automated retrieval system (OARS) offered by the library provides access to many data bases in a wide variety of subject fields. The computerized operation allows users to shorten significantly time spent on literature searches for research projects. It is available to faculty, staff, and students on a cost retrieval basis.  

Research materials which are not in our collections can usually be obtained from another library through interlibrary loan. The University Libraries participate in online interlibrary loan systems administered nationwide, nationally and internationally, and are a member of multitype library networks. They also hold membership in the Center for Research Libraries, a multi-million dollar collection located in Chicago which operates as a cooperative library for less-used but important research materials.  

Self-service photocopy machines are located throughout the library system. These machines operate with coins or copicards and have enlarging and reducing capabilities. An attendant-operated location is located in Waldo Library. Microform copiers are also available within the library system.  

Students enrolled in off-campus classes are always welcome at the University Libraries, where they have the same privileges as any other Western student and may borrow materials and use library services freely. They also are provided library services through arrangements with libraries or schools in the locality where the classes are taught.  

One goal of the University Libraries is to take an active role in the educational mission of the University, and to provide facilities, materials and an environment which will not only support the students' educational progress but also will encourage them to develop the habit of self-education.  

The above description gives a general idea of the many resources and services which are available through Western's University Libraries.

**Housing**  
All students enrolled at Western Michigan University are permitted to choose their own housing. Students are encouraged to give serious consideration to the financial, nutritional, educational, and social benefits of living in a residence hall or campus apartment as well as the convenience of being close to their classes and other University activities.  

**Residence Halls**  
Twenty-two residence halls in a variety of locations on campus attract over 6,000 students each fall and winter semester. These individuals come from all walks of life and possess diverse academic interests. Many of the 50 states and several foreign countries are represented.  

Assignments to a hall are based on the preferences of the individuals if space is available. Halls are available which accommodate male only, female only, and men and women on alternating floors or suites. In locations where coed assignments exist, separate bath and toilet facilities are provided for each sex. Most upper floor residence halls have single assignments two per room. Many freshman are in three person rooms. Some single room and three or four person room assignments are also made. Certain halls are especially attractive to individuals interested in health and wellness, The Honors College, and international culture. Most halls are available on a room and dining basis. One room only is available for continuous housing throughout the year (residents are permitted to remain during vacation periods). All other residence halls close between semesters and sessions, and residents who must remain in Kalamazoo make their own alternative housing arrangements during these periods. Residents are permitted to remain in their assigned service during the Thanksgiving and Spring Break recess periods.
Each residence hall varies slightly in its construction. The following services are available in most halls: reception desk with mail and message services; formal lounges; all-purpose meeting rooms for meetings, aerobics, etc.; saunas; television viewing areas (some 42" screens); exercise areas; rental refrigerators; pain-your-room opportunities; study rooms; and academic computer terminals. Most students creatively enhance their room with personal items which supplement the University-supplied beds, desks, study chairs.

The award winning Residence Hall Dining Service enjoys an excellent reputation with an extensive menu developed in consultation with residents and a professional dietitian. Residence halls providing dining service are available during the fall and winter semesters and the spring session. During these periods meals usually begin on the day before classes start and stop on the day the halls close for that semester/session. Meals are not served during the week preceding any holiday. Most residents select the Continuous Dining Plus plan covering all meals except Sunday evening. For persons leaving campus every weekend. The Continuous Dining plan providing meals Monday through Thursday is available. Dining rooms are open from 7 a.m. to 6:15 p.m. six days a week and from 8 a.m. until 1 p.m. on Sunday. Serving hours are subject to change. The Biggins Student Dining Room is open until 7 p.m. Monday through Saturday, and 10 p.m. on Sunday. Monday through Friday.

Assignments are made on a first-come, first-served basis. Requests received after all halls have been filled to capacity will be placed on a waiting list.

Any student enrolled at WMU for at least one credit hour may reside in a hall.

Both undergraduate and graduate students are welcome in halls. Students often prefer a specific hall because of location or assignment pattern (coed). During the fall and winter semester graduate and older students find Davis or a portion of Stinson of special interest. Both are coed dormitory service halls. Students must have junior status or above or be twenty-one or older to live in these areas. No hall is reserved for the exclusive use of graduate students.

For further information or details if information is not received near the date noted above, contact the Residence Hall Facilities Office, Faunce Student Services Building, or call (616) 387-4735.

The Sindecuse Health Center

The Health Center is a student-oriented medical facility that exists to support and promote optimal health for the University community. As a student attending Western Michigan University, you have access to high quality, convenient, low-cost health care through our many professional services which include comprehensive examinations, treatments, urgent care, and minor surgical procedures. Our physicians, physician assistants, nurses, laboratory personnel, pharmacists, and sports medicine staff work as a team to assist you with your health care needs.

The Sindecuse Health Center provides evaluation and treatment for a wide variety of illnesses and injuries, as well as preventive health checkups, pre-marital examinations, contraceptive services, pregnancy testing, and treatment for sexually transmitted infections. In addition, it offers the medical specialties of dermatology, gynecology, internal medicine, psychiatry, and orthopedics. When necessary, staff members can refer you to other medical specialists within the Kalamazoo area.

Appointment Information

You are encouraged to choose a physician or physician assistant with whom you feel comfortable and to request this clinician by appointment whenever you need health care. Appointments may be scheduled from 8:15 a.m. to 4:30 p.m. Monday through Friday.

The Sindecuse Health Center's urgent care clinic is designed for sudden injuries or problems that need immediate attention. No appointment is necessary.

Pharmacy

A full-service pharmacy provides prescription medications at a cost savings to students. It also carries a limited amount of non-prescription medications. Prescriptions written by your personal physician from home can be filled, as well as prescriptions written by Health Center physicians. You may pay for pharmacy items by cash, check, MasterCard, Visa, or you may bill your student account. Most major insurance companies cover prescription coverage.

Laboratory Services

The Center's full-service laboratory performs most standard diagnostic tests. Electrocardiograms, interpreted by a cardiologist, are also available.

The Sindecuse Health Center offers all immunization updates and immunizations required for overseas travel.

The Sindecuse Health Center

The Sindecuse Health Center provides comprehensive diagnosis and treatment of sports-related injuries, as well as any physical therapy services you may need. The Clinic is staffed by two orthopedic surgeon-consultants, a physical therapist, a certified athletic trainer, and a podiatrist consultant. These professionals serve all of southwestern Michigan, in addition to the University community.

Health Center Hours

Appointments

8:15 a.m. to 11:30 and 1:00 p.m. to 4:30 p.m., Monday through Friday.

Urgent Care Clinic Hours

8:00 a.m. to 5:00 p.m. Monday through Friday, and 9:00 a.m. to 11:30 a.m. Saturday (Closed Saturdays during summer session).

The Sindecuse Health Center

Parking

While visiting the Health Center, parking is available in student Lot No. 40, close to the front entrance. You may park in the designated Health Center parking spaces and get a one-hour permit when you check in. If the Center's spaces are full, you may park in any student parking space. Parking tickets received during Health Center visits may be avoided at the Public Safety Annex when presented with your Health Center receipt.

Student Health Fee Benefit Plan

All Western students carrying seven or more credits a semester or 4 or more credits a session are assessed a prepaid Student Health Fee. Except for a small physician visit charge, a fee for physical therapy services and the cost of medications from the Health Center pharmacy, the fee covers all health care requested by Health Center clinicians and provided at the Center.
Students enrolled for fewer than the above hours may "buy-in" to the Student Health Fee plan or use the Health Center on a fee-for-service basis. In addition, spouses of currently enrolled students, non-enrolled students with current admission status and their spouses, and recently graduated students (one semester or two sessions immediately following graduation) may also buy-in to the benefit plan or pay on a fee-for-service basis. The Student Health Fee complements your hospital and medical insurance and protects you against the majority of costs you face outside the hospital, which are not covered by most insurance programs. Eligibility extends from the first day of your applicable semester for which the fee has been paid, to the first day of the next semester or session.

Uncovered Costs
Visits to medical specialists outside the Health Center, or to hospital emergency rooms or immediate care centers, and transportation to and from the Health Center by ambulance are not covered by the fee. Services not ordered by Health Center personnel, but requested by clinicians outside the University, can be provided by the Health Center, but will be charged to you according to the current fee schedule.

Charges that are not covered by the Student Health Insurance may be paid in cash, by check, or by MasterCard or Visa credit cards. However, all fees under $1 must be paid in cash. You may also charge your health care costs against your student account, but this must be paid in full prior to registering for the following semester or session. The University assesses a service charge for any costs that are not paid within sixty days.

Optional Hospital, Medical, and Surgical Insurance
All students are urged to carry some form of medical and accident insurance that covers medical, surgical, and hospitalization expenses not covered by the Student Health Fee. Some insurance companies offer coverage for emergency medical care if you're hospitalized. Other companies pay for diagnostic procedures performed by specialists outside the Health Center, as well as hospitalization. It's important to verify the services included in any insurance policy you purchase.

If you are not presently covered by a major medical insurance program, consider the student plan for hospitalization insurance offered through Western Michigan University. This plan is provided at reduced rates to students and their dependents.

Mandatory Hospital, Medical and Surgical Insurance
All international students are required to carry health insurance for the semester/session they are enrolled if health care coverage is not provided by their sponsor. These students will be automatically enrolled in the University-sponsored policy unless an approved alternate policy is chosen.

Non-sponsored international students must show proof of coverage through end of the semester/session and have alternate policies approved at the Health Center during the first two weeks of the semester/session. No refunds of insurance premiums can be given after that time.

The Insurance Coordinator at the Health Center is available to assist students between 8:00 - 11:30 a.m., Monday thru Friday, or can be reached at 387-5287.

Student Health Advisory Committee
The Student Health Advisory Committee gives students the chance actively to help plan ways in which the Health Center can offer high-quality health services at the lowest possible price for students. The committee participates in policy formation, program review, and program development for the Health Center. For more information regarding meeting times or application for committee membership, contact the committee's recording secretary in the Health Center director’s office.

University Wellness Programs
You're more than anyone else, in charge of your health. A healthy body, high self-esteem, the ability to develop meaningful relationships, the skills to manage stress, and prevention of illness are all within your personal power to achieve. The Health Center's Office of University Wellness Programs offers a wide range of opportunities to help you achieve your health potential. All programs are provided for you at no charge as a Student Health Fee benefit. Health promotions opportunities include:

- A Wellness Resource Center, located in the front lobby of the Health Center, containing written information on a variety of health promotion and disease prevention topics.
- Total Fitness Programs, designed to help you achieve fitness using exercises set to music.
- Aqua Fitness Programs, for low-impact aerobic exercise.
- The Zen Fitness Room, located in the Gary Center, containing a full line of weight equipment, exercise bicycles, rowing machines, hand weights, and a Nordic ski machine.
- Computerized Nutrition Assessment to help you analyze your diet and suggest food sources that can help you achieve a balanced nutrient intake.
- Weight Management Programs to help you develop skills in eating and nutrition management, stress management, thought management, behavioral techniques, and commitment to increased physical activity.
- Managing Stress Programs, because feeling overstressed and out-of-control can affect your emotional stability, your relationship with others, your ability to concentrate and think clearly, and your sense of purpose in life.
- A Quit-For-Life Stop Smoking Program to help you develop skills for a lifetime of freedom from smoking.
- A Healthy Sexual Choices Program covering sexual health concerns for men and women, prevention of common sexually transmitted infections, and effective methods of contraceptive protection.
- A Take Care of Your Back Program to keep you active and minimize low back pain.
- Cholesterol Screening, by appointment.
- A Cholesterol Countdown Workshop to help students lower their cholesterol through healthful, low fat shopping and cooking choices.

The Health Center invites you actively to participate in maintaining and improving your health by developing habits that will enhance your physical well being, self-esteem, and ultimately your sense of personal satisfaction and fulfillment in life.

Testing And Evaluation Services
The services of the Testing and Evaluation Department are open to all graduate students.

1. Individual Counseling To provide students with an opportunity to discuss various concerns, including career counseling, academic counseling, educational goals, psychological counseling and counseling for married couples are available to students on active admission status with the University.

2. Career Exploration and Media Center To disseminate a wide variety of information concerning careers, as well as a substantial number of catalogs and bulletins from other American colleges and universities.

3. Career Development Program To assist students in the exploration of individual career possibilities and increases skills necessary for decision-making and future planning.

4. Training and Internship Programs To provide training opportunities for graduate students from the Department of Counselor Education and Counseling Psychology, the Department of Psychology, and the School of Social Work.

The Counseling Center is accredited by the International Association of Counseling Services, Inc., and is staffed with professionally trained counselors and psychologists. Staff members maintain confidentiality of client information in a manner consistent with professional standards of ethical practice and conduct.

Appointments may be made by telephone or by stopping at the Counseling Center reception desk between 8:00 a.m. and 5:00 p.m., Monday through Friday. Graduate students unable to use the Counseling Center services during regular hours may make arrangements for Thursday evening appointments by calling the Center office, (616) 387-1850.

Career Planning and Placement Services
Assistant in total job search planning is offered free of charge by the Career Planning and Placement Services to graduate students of Western Michigan University. These services include career planning, a career resource center, on-campus interviewing, weekly job opportunities bulletin and vacancy postings, direct referrals to employers, maintenance and distribution of credentials, assistance with job search correspondence (such as resumes and letters of application, interviewing videotapes, workshops and seminars, and referral to specialized campus agencies providing career planning services.

Counseling Center
The services of the University Counseling Center are located in 2510 Faunce Student Services Building. Among the major services offered to all graduate students are:

1. Individual Counseling To provide students with an opportunity to discuss various concerns, including career counseling, academic counseling, educational goals, psychological counseling and counseling for married couples are available to students on active admission status with the University.

2. Career Exploration and Media Center To disseminate a wide variety of information concerning careers, as well as a substantial number of catalogs and bulletins from other American colleges and universities.

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Testing And Evaluation Services
The services of the Testing and Evaluation Department are open to all graduate students.

The department offers career counseling utilizing their own career guidance inventory, which is available to all WMU students, staff, and faculty for a small fee. The test includes a Personality Questionnaire, Vocational Interest Inventory, Occupational Value Questionnaire, and a Diagnostic/Achievement Quiz.
Information and applications for most of The Graduate College tests are also available in the Testing Office. This department serves as the regional office for the Graduate Record Admissions Test, which is given by appointment only. Testing and Evaluation Services has the largest selection of test files in Michigan. These tests may be obtained in the Testing Office and are for the use of students and faculty members for informational purposes, class projects, research purposes, or almost any other valid reason.

If the student is working on a research project, survey, or collecting data for any valid reason, the same response/answer sheets used by faculty members are available. Testing staff members can assist in the planning of the project and advising on data output. Testing and Evaluation Services is located at

Career English Language Center For International Students (CELCIS)
The Career English Language Center for International Students (CELCIS) provides intensive English language instruction for those prospective students who need further training in English in order to qualify for regular admission to the University. Most students in the CELCIS program must be enrolled full-time; part-time study is not permitted for students entering the U.S. on an F or J visa. Those with F2 or J2 (visitor's) visas and U.S. residents, however, may elect to take from one to four classes per day.

Classes at the various levels include:
- Speaking and Listening Comprehension
- Grammar, Reading and Vocabulary
- Writing
- Research Paper Writing
- and work in the Language Laboratory

There are four CELCIS terms per year. Fall and winter terms are 15 weeks each, while spring and summer terms are each seven weeks long. A progress report that evaluates the student's capabilities in each English skill area is issued at the end of each term.

The Certificate of Eligibility, allowing a student to apply for a visa (Form 1-20 AB or IAP-66), is issued by CELCIS for admission to the CELCIS program. Admission to CELCIS does not, however, imply admission to the University for academic study. For further information and application forms, contact Career English Language Center for International Students, Western Michigan University, Kalamazoo, Michigan 49008. Telex 6877099 WESTMICH UNIV INTERED. Telephone (616) 387-4609. Fax: (616) 387-4800.

Office of International Student Services
Western Michigan University has long recognized the value of international education. Over the years, thousands of students from other nations have entered the University to pursue their educational goals. This educational exchange has given the University an international atmosphere which has fostered both formal and informal cross-cultural contacts in the classroom as well as in the community.

The Office of International Student Services was established to assist international students by processing applications for admission, conducting orientation programs for new international students, assisting with housing arrangements, coordinating community programs involving international students, providing immigration advising, serving as a liaison between students and sponsors, and offering personal and social counseling. While attending the University, international students are encouraged to participate in academic and social activities as their interests and time allow.

International Student Admission
International students interested in seeking admission to Western Michigan University should contact the Office of International Student Services for an application form and instructions. To qualify for admission, a student must demonstrate that he/she is academically, financially, and linguistically capable of undertaking the academic program being proposed. Before a student can be admitted and the Visa Form I-20 or IAP-66 issued, educational records documenting all previous secondary and post-secondary schooling must be on file along with a financial statement showing that adequate funds are available to cover the cost of educational and living expenses for the duration of studies.

English Competency of Students from Non-English Speaking Backgrounds
Prospective students whose native language is not English and who have not successfully completed at least one year of full-time academic study at another U.S. accredited institution will be required to demonstrate proficiency in the English language prior to enrollment in an academic program at Western Michigan University. The University strongly prefers examination through the Test of English as a Foreign Language (TOEFL), the Michigan Test of English Language Proficiency (MTELP), or the Michigan English Language Assessment Battery (MELAB). Exceptions to these standard tests require special approval.

To be eligible for unrestricted full-time enrollment in an academic program, a minimum total score of 550 must be achieved in the TOEFL examination. For the MTELP/MELAB, a minimum score of 85 is required. Within certain limits, a prospective student who has achieved less than the minimum score for unrestricted enrollment may be allowed to register for courses on a restricted basis, which will include a course of study designed to improve the student's ability to use the English language. Limits and restrictions for such qualified enrollment will be established and applied by the Office of International Student Services.

Office of International Affairs
Western Michigan University conducts active programs of international education, research, and service on campus and in a variety of overseas locations. Administration of these programs at the University is provided by the Office of International Affairs.

The responsibilities of the Office of International Affairs include the management of all the University's relations with foreign universities and agencies, as well as American universities and agencies operating internationally. The office administers the University's international programs, faculty exchanges, student exchange programs, and study tours abroad. It also aids in the development and implementation of various international programs for visiting and technical assistance programs.

For further information contact the Office of International Affairs, 2090 Friedmann Hall, Western Michigan University, Kalamazoo, Michigan 49008. Telex 6877099 WEST MICH UNIV INTERED. Telephone (616) 387-3965. Fax (616) 387-3962.

Foreign Study Services
Students who are interested in or who are planning to study and/or travel in a foreign country are encouraged to utilize the services of the Foreign Study Office. The Foreign Study Coordinator maintains an extensive library of materials on overseas programs. Students who are undecided may receive advice and counsel which will help them to decide on the appropriateness of a foreign study/travel experience and which of the numerous opportunities would be best designed to suit their circumstances and purposes. Information regarding financial aid opportunities is also available, as is information on the International Student Identification Card, the Youth Hostel Pass, and other discount travel documents.

For further information contact the Foreign Study Office, A404 Ellsworth. Telephone (616) 387-5890.

Vehicle Registration
Detailed regulations concerning the use of motor vehicles on campus are available from the Parking Violations Bureau of the Department of Public Safety. All students are eligible to park a motor vehicle on University property; however, they must first register the motor vehicle, motorcycle, and/or moped with the Parking Violations Bureau (located in the Public Safety Annex) and pay a registration fee. Information concerning parking regulations, parking permits, and parking violations can be obtained by visiting the office, located at the corner of West Michigan Ave. and Marion St., or by telephoning during normal University business hours. (616) 387-4609.

Publications
Western Herald, WMU's student newspaper, is published Mondays through Thursdays during the fall and winter semesters, Mondays and Thursdays during the spring semester, and Wednesdays during the summer semester. The Western Herald is made available to students through support from the general fund of Western Michigan University. All positions on the paper are filled by students with the exception of the general manager/advisor.

Western News is the official publication for administration, faculty, and staff members. It is published Thursdays by the Office of Public Information, which also produces the Westerner in association with the Office of Alumni Affairs and Development. The Westerner is published four times each year for alumni and other friends of the University.
Section II
Master's Degree
Programs and Requirements

General Requirements
For A Master's Degree

Admission
See Calendar of Events for application deadline.
1. Bachelor's degree from an accredited institution, indicated on an official transcript.
2. Transcripts of all courses taken beyond high school.
3. A point-hour ratio of at least 3.0 in the last two years of undergraduate work.
4. Meet any additional admission requirements as stated in the individual program descriptions.
5. Acceptance by the academic unit offering the master's program and by The Graduate College.

Candidacy
1. A Graduate Student Permanent Program which will constitute an application for admission to candidacy should be submitted to The Graduate College during the first semester or session of enrollment.
2. Reservations indicated on the Certificate of Admission and/or the Graduate Student Permanent Program must be removed before candidacy will be approved.
3. A point-hour ratio of at least 3.0 (A = 4.0) is required. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.
4. A program of study may include a maximum of four hours of credit in 598 (Readings) courses.

Graduation
See Calendar of Events for application deadline.
1. Diploma Application: A diploma application must be submitted by October 1 for the December Commencement, by February 1 for the April Commencement, by April 1 for the June Commencement, and by June 1 for the August graduation. The University has no commencement ceremony in August.
2. Minimum Credit Hours: Completion of a minimum of thirty hours of accepted credit in an approved program of study. Normally only courses numbered 500 and above are acceptable. One-half of the credits earned must be in courses numbered 600 or above. Each course included in the program must be completed by the day of graduation.
3. Point-hour Ratio: An overall point-hour ratio of at least 3.0 (A = 4) is required. No undergraduate credit is computed in the graduate point-hour ratio. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.
4. Hours After Candidacy: The election and completion of at least six hours is required after being approved for Candidacy.
5. Transfer Credit: Six semester hours (three and four quarter or term hours are transferred as two semester hours) of graduate credit may be transferred from other schools provided:
   - The credits were earned in institutions accredited for graduate study and are of "B" grade or better. The student's average for all graduate work taken at another institution is also "B" or better.
   - The Graduate College approves the credits for transfer.
   - The student's adviser verifies that the credits contribute to the student's program of study.
   - Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.
6. Time Limit: All work accepted for the degree program must be completed within six years preceding the date on which the graduate degree is conferred.
7. Research Subject Protection: Students conducting research that involves human or animal subjects must have prior approval of the research proposal by the appropriate University board, thus ensuring compliance with the regulations for the protection of such subjects. For more information, call Research and Sponsored Programs, 387-3670.
8. Master's Thesis: A student who intends to register for the Master's Thesis is required to meet with the Dissertation Assistant in The Graduate College before registering for the class so that the student is informed about the regulations pertaining to the preparation of the manuscript.

General Requirements
For A Second Master's Degree
A student wishing to earn a second master's degree may include a maximum of six credits from the first graduate degree program. The second degree program must fulfill all of the other usual requirements for a master's degree.

General Requirements
For A Graduate Specialty Program
A Graduate Specialty Program is a fifteen- to twenty-hour, normally, aggregate of cohesive, topical graduate level courses and, as a unit, independent of any single degree program. Students who wish to pursue a Graduate Specialty Program must have already completed, or be currently enrolled in, a graduate degree program.
There may be some overlap in courses between a student's program of study for a Graduate Specialty Program and the program of study for a graduate degree. However, since a Graduate Specialty Program is distinct from the student's degree program, the entire aggregate of courses in a student's Graduate Specialty Program cannot be applied to the degree program. To signify that a student has satisfactorily completed an approved curriculum in a Graduate Specialty Program, a certificate is awarded; however, the certificate is not an award of license, accreditation, or certification to render professional services. The certificate is to be awarded at the completion of the Graduate Specialty Program for those students who have already received their graduate degree. For those students concurrently enrolled in a graduate degree program, the certificate will be awarded at the same time the graduate degree is awarded.
Regular admission to The Graduate College and to the unit offering the Graduate Specialty Program is required. A student must complete the requirements of the Graduate Specialty Program with a "B" or better average within a six-year period. The Graduate Specialty Programs offered by Western Michigan University are described on pages 39 and 40.
Programs Leading To The Master's Degree

Anthropology
Adviser: Allen Zagarell
Room 127, Moore Hall

The Master of Arts in Anthropology is designed to provide the students with a basic understanding of the major methods and theories of the discipline as a whole. Students have the opportunity to specialize in one of three major branches of anthropology: archaeology, socio-cultural anthropology, and physical anthropology. Graduate seminars are available on such specialized topics as Cultural Resources Management, Development Anthropology, Gender, Religion and Ritual, Ethnicity, Old World Archaeology, Archaeological Theory (Processual and Post-Processual), Great Lakes Archaeology, Osteology, Forensic Anthropology, as well as a number of courses focusing on Asia, Africa, and the Americas. In addition to coursework, students will be encouraged to pursue original and independent research; archaeological and ethnographic field experience is encouraged. The M.A. program in anthropology prepares students with studios and encourages them to work independently under the advice of one or more faculty members. An extensive schedule of exhibitions and visiting artists is an important part of the graduate program.

Admission requirements
1. Students should have completed a minimum of fifteen semester hours in undergraduate work in Anthropology, or twenty-four hours in Anthropology and related disciplines, such as Geology, Zoology, and the Social Sciences, of which at least nine hours must be in Anthropology.
2. Accumulation of a grade point average of at least 3.0 during the final two years of undergraduate work.
3. Students are required to have completed at least three semester hours of statistics. This requirement can be satisfied by the student’s undergraduate program.
4. If these requirements have not been met on the undergraduate level, the student may be admitted with the understanding that additional course work as specified by the department will be required to provide the necessary background.
5. Three letters of recommendation are required from persons able to assess the applicant’s academic record, potential for success in a Master of Arts program in Anthropology, and suitability for an assistantship in this discipline. These letters should be submitted directly to the Adviser.
6. Each applicant must submit to the graduate adviser a one-page statement outlining his or her career goals and interests in anthropology.

Program requirements
1. Complete at least thirty semester hours, at least twenty of which must be in Anthropology. The remainder may be in Anthropology or in related disciplines as determined by the interest of the student and with the approval of the adviser.
2. ANTH 601, 602, and 603, or their equivalents, are required.
3. Complete an acceptable Master’s Thesis (6 hrs.).
4. Pass a comprehensive written examination on the field of Anthropology.

Art
Adviser: Patricia Oppel, Graduate Coordinator
Room 1406, Sangren Hall

The Department of Art offers two graduate programs. The Master of Arts in Art is a one-year program. This program requires 30 credit hours. The Master of Fine Arts is a two-year program. This program requires 60 credit hours. The following are the major areas of concentration in both programs: Ceramics, Graphic Design, Painting/Watercolor, Photography, Printmaking, and Sculpture.

Admission requirements for both programs
1. An undergraduate degree with a major in art or its equivalent.
2. A completed application for admission to The Graduate College.
3. A portfolio of slides must be submitted directly to the Graduate Coordinator of the Department of Art. It should include twenty slides in the applicant’s area of concentration. The slides must be submitted in a plastic sleeve with artist’s name, size of work, year, and medium.
4. A statement of intent outlining the reasons for seeking admission to a graduate program in a specific area of concentration.
5. Three letters of recommendation for admission.
6. A current resume.

Master Of Fine Arts

Adviser: Allen Zagarell
Room 127, Moore Hall

The Master of Fine Arts degree is recommended as a terminal degree for practicing artists and for prospective higher education art professors. It is intended for artists who have a clear notion of their artistic purposes and are primarily interested in continuing their personal and artistic development.

Program requirements
1. Twenty-four hours in the major area of concentration.
2. Nine hours in art history.
3. Fourteen hours in electives, of which nine must be in art.
4. Three hours in ART 610, Advanced Drawing.
5. Two hours in ART 625, Graduate Seminar.
6. Six hours in courses outside the Department of Art.
7. Reviews of all art work by a graduate committee before the end of the first and third semesters.
8. Minimum of one year residence on campus.
9. Two hours in ART 613, Graduating Presentation. This course includes a final exhibition and oral presentation which must be approved by a graduate committee before the M.F.A. degree is granted.

Biological Sciences
Adviser: Robert C. Eisenberg
Room 5010, McCracken Hall

The Master of Science in Biological Sciences is designed to enhance the student’s ability to plan, carry out, analyze, and report original research. Course work, with approval of the student’s Advisory Committee, both increases scientific preparation and supports the student’s research. This degree may serve as a foundation for continued graduate or professional study or may lead to positions in the private or public sector.

Areas of available specializations include Aquatic Biology, Botany, Cell and Molecular Biology, Ecology, Genetics, Human and Comparative Physiology, Microbiology, Morphology, Plant and Environmental
Admission Requirements

Separate applications for admission must be made to The Graduate College (for application materials contact The Graduate College, international students should contact the Office of International Student Services) and to the Department of Biological Sciences (obtain application forms from the Graduate Adviser of this department).

The following requirements must be met for admission to the program:

1. A bachelor's degree from an accredited college or university.
2. Requirements for admission to the graduate program are:
   a. grade point average of 3.0 or greater OR
   b. Verbal and Quantitative scores on the Graduate Record Exam consistent with a minimum OVERALL, undergraduate grade point average of 3.0.
3. College course prerequisites:
   a. Appropriate courses in biology as determined by the Graduate Adviser.
   b. Organic chemistry
   c. Two sequential courses in general physics
   d. Two appropriate courses in mathematics as determined by the Graduate Adviser.
4. Three letters of recommendation.
5. Availability of a potential Major Adviser in an area of specialization.

NOTE: Some course deficiencies in admission requirements listed above may be completed after "admission with reservations." However, these course deficiencies must be completed in addition to the minimum credit hours required for a graduate degree. All reservations including course deficiencies must be removed before advancement to candidacy. Probationary admission for students whose GPA is less than 3.0 or who may not meet other regular admission criteria may be possible via "Probationary admission," as described previously in Section I, General Policies and Procedures, of this Graduate College Catalog.

Program requirements

Thesis and non-thesis options are available. Both programs are directed by the student's Major Adviser and Advisory Committee.

1. Thesis Option
   b. Any proposed research using live vertebrates requires the student to have written approval from the WMU Institutional Animal Care and Use Committee.
   c. Completion of a minimum of 27 hours of graduate credit course work with prior approval of Major Adviser and 6 hours of BIOS 710, Master's Thesis.
   d. Preparation, in consultation with and approval of the Advisory Committee, and defense of a thesis.

2. Non-Thesis Option
   b. Any proposed research using live vertebrates requires the student to have written approval from the WMU Institutional Animal Care and Use Committee.
   c. Completion of 27 hours of graduate credit course work with prior approval of Major Adviser and 6 hours of BIOS 710, Independent Research.
   d. Preparation of manuscript suitable for publication in a refereed journal in consultation with and approval of the student's Advisory Committee and defense of its content in an oral examination before the student's Advisory Committee. Suitability for publication is determined by the student's Advisory Committee.
   e. Presentation of results at a departmental seminar or at a state or national scientific meeting.

Biostatistics

Adviser: Michael R. Stolte
Room 3319, Everett Tower

The objective of this program, which leads to a Master of Science in Biostatistics, is to prepare students for professional careers in biostatistics, primarily in pharmaceutical-related industries and in medical or health-related research facilities. This program is administered through the Department of Mathematics and Statistics, with the assistance of faculty in the Department of Biology and Biomedical Sciences. The program requirements contain an equivalent of thirty-one credit hours of graduate work, including a five credit hour internship experience.

Admission requirements

For admission to this program a student should have completed successfully an undergraduate program with a major in mathematics or statistics and a minor in biology or biomedical sciences, or a minor in biology or biomedical sciences and a minor in mathematics or statistics, or the equivalent. Most specifically, the undergraduate program should have included the following (numbers refer to WMU courses that would be acceptable):

1. Biology or Biomedical Sciences:
   - Courses in at least three of the following four areas—ecology (BIOI 301), genetics (BMED 250 or BIOL 302), physiology (BMED 365 or BMED 317 or BMED 527), microbiology (BMED 312); or sufficient undergraduate course work so that three 500-level biology courses or three 500-level biomedical sciences courses can be taken in the graduate program.

2. Mathematics and Computer Science:
   - Multivariate calculus (MATH 274), linear algebra (MATH 230), probability (MATH 362 or MATH 560), intro. FORTRAN programming (CS 306).

3. Chemistry:
   - Organic chemistry (CHEM 360 or 365), biochemistry (CHEM 450).

4. Physics:
   - General physics (PHYS 210 and 211).

Admission procedures

1. The Biostatistics Admission Committee will admit candidates to the program based on the following criteria:
   a. Strength and breadth of the undergraduate course work, and
   b. availability of internships. (Admission to the program is limited by the number of internship opportunities available.)
2. A promising student may be admitted to the program with deficiencies in the Admission Requirements and be required to complete this work as extra program requirements.
3. Students are urged to submit scores received on the Graduate Record Exam (GRE).

Program requirements

1. Statistics Component (14 credit hours):
   - MATH 562 (Statistical Analysis), MATH 660 (Statistical Inference I), MATH 662 (Applied Linear Models), MATH 664 (Design of Experiments I).
2. Statistical Computing Component (3 credit hours):
   - MATH 580 (Topics in Statistical Computing).
3. Biology or Biomedical Science Component (5 credit hours):
   - Two approved 500-level biomedicall science courses. These courses are chosen to fit a student’s individual interest.
4. Effective Component (3 credit hours):
   - An approved 500-600 level course from Statistics, Biology, or Biomedical Science.
5. Internship Component (5 credit hours):
   - A professional field experience internship with a health-related industry. (Normally this is taken as MATH 712.)
6. Final Examination: Before beginning the internship each intern must have successfully passed a written comprehensive examination covering the material of MATH 562, 660, and 682.
7. Final Report: At the completion of the internship each candidate must submit a final report on the internship project.

Financial Assistance

The Department of Mathematics and Statistics offers opportunities for financial support of graduate students through Graduate Assistantships and Fellowships. During the internship phase of the Biostatistics program students normally receive a stipend contributed by the sponsoring agency. Individuals desiring further information about financial support, or about graduate programs related to mathematics as a whole, should contact the Department (Room 3319, Everett Tower).

Blind Rehabilitation

Western Michigan University, in cooperation with the Rehabilitation Services Administration of the Department of Education, offers two graduate programs in leading careers in the emerging field of Blind Rehabilitation. All applicants must have completed their bachelor's degree at an accredited college or university. All Orientation and Mobility students must possess the ability to monitor consistently the environment and the persons whom they are teaching to insure their safety. Adequate distance is required so that the monitoring does not influence the interaction of the learner with the public or the physical environment.

Students are admitted into the programs at the beginning of the Fall, Winter, and Spring sessions.

Orientation And Mobility

Adviser: Marvin Wessells, Room 3410, Sangren Hall

An orientation and mobility instructor teaches visually impaired children and adults the conceptual and physical processes involved in moving independently, safely, and efficiently in their homes and communities. The instructor is employed by public or private schools and agencies. The professional preparation for the orientation and mobility specialist requires twelve months of study, which includes academic work, simulated experiences, and practice. The equivalent of two semesters is spent off-campus in a supervised
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clinical experience. If a student so chooses, an additional semester's work may be elected to complete a specialized concentration in either Transition, Low Vision, or Gerontology.

Rehabilitation Teaching
Adviser: Susan Ponchilla, Room 3405, Sangren Hall

The rehabilitation teacher offers individualized instruction to blind and visually impaired persons in the following skills of independent living: communications, personal management, home management, minor household repairs, and leisure time activities. The rehabilitation teacher is employed in public or private agencies.

The professional preparation for the rehabilitation teacher requires twelve months of study, which includes academic work, supervised experiences, and practice. The equivalent of two semesters is spent in residence on campus, and the third semester is spent off campus in a supervised clinical experience. If a student so chooses, an additional semester's work may be elected to complete a specialized concentration in either Transition, Low Vision, or Gerontology.

Business
Derrell G. Jones, Dean
Lowell E. Crow, Associate Dean
All Metwall, Director, Grand Rapids MBA Program

Michèle M. Moe, Admissions Officer

The degree programs leading to the Master of Business Administration, the Master of Science in Accountancy, and the Master of Science in Management are offered within the framework of the objectives of the Haworth College of Business which are to excel in instruction, research, and the provision of service to students, business, and the community.

The undergraduate and master's business programs offered by the Haworth College of Business, Western Michigan University are accredited by the American Assembly of Collegiate Schools of Business (AACSB).

Master Of Business Administration

This professional degree program leading to the Master of Business Administration is designed to prepare graduate students to function effectively in administrative positions. This preparation emphasizes the development of the student's ability to make and execute decisions. The program of study is designed to provide the student with skills and knowledge in the areas of critical analysis, business operations, changing environments, professional development, and specialized professional interests.

Students are challenged to develop the judgment, discriminating capacity, knowledge, and understanding which will permit them to work effectively in administrative and other leadership roles. Under the guidance of the graduate staff of the Haworth College of Business, personal programming for the participant is provided.

Admission requirements

MBA applicants must submit scores for the Graduate Management Admission Test (GMAT) prior to consideration for admission to the program. The Graduate College's English Qualifying Examination is required for all graduate students in the Haworth College of Business.

Advisers: Jerry G. Kreuze Gale E. Newell William R. Welke

The Master of Science in Accountancy is a thirty-hour graduate program of which at least fifteen hours are in accounting. The program prepares the student for professional careers in industry, commerce, finance, government, and public accounting. The degree meets the Michigan educational experience requirement evidenced by official transcripts from all colleges and universities attended. Attention is given to overall grade averages, especially to grade trends and areas of scholastic strength.

The applicant must have received a satisfactory score on the Graduate Management Admission Test (GMAT).

Prerequisites

Graduate students must have completed the prerequisite courses. These include coursework or the equivalent in Accounting, Economics, Law, Finance, Management, Marketing, Statistics, and Computer Programming.

Program requirements

The Master of Science in Accountancy is a thirty-hour graduate program of which at least fifteen hours are in accounting. The program prepares the student for professional careers in industry, commerce, finance, government, and public accounting. The degree meets the Michigan educational experience requirement evidenced by official transcripts from all colleges and universities attended. Attention is given to overall grade averages, especially to grade trends and areas of scholastic strength.

The applicant must have received a satisfactory score on the Graduate Management Admission Test (GMAT).

Prerequisites

Undergraduate prerequisites are Principles of Accounting, Financial Accounting, Managerial Accounting, Cost Accounting, Marketing, Statistics, Finance, Business Law, and a course in Computer Usage.

Program requirements

Each individual program must include twenty-one graduate credits earned in courses numbered 600 and above and must have prior approval of a department advisor. In addition to the Accountancy major requirements, the student must elect a minimum of six graduate courses outside the Department of Accountancy.
The Option in General Communication and Option B—Organizational Communication.

The more specialized option in Organizational Communication is designed for those students whose professional interests involve using communication in an organizational setting. Individual programs are designed in consultation with the graduate adviser based on a student's needs, interests, and professional objectives.

Admission requirements

The primary criteria for admission are based on the following questions: Does the applicant have a clear understanding of his/her educational objectives? Will the graduate curriculum and staff provide a satisfactory educational experience for him/her? Undergraduate records, letters of recommendation, academic interest and ability, and a personal interview—when possible—are requested of each applicant. Undergraduate work in communication, speech, or allied disciplines is expected of all applicants. Academic deficiencies or reservations may be determined at the time of application.

OPTION A—GENERAL COMMUNICATION

The Master of Arts in Communication is intended for students who desire a terminal degree or who wish to qualify for further graduate work. Students will receive a general overview of the areas of communication and may emphasize specialization within communication. Present areas for degree emphasis include interpersonal communication, organizational communication, mass communication theory, and communication theory.

Program requirements

1. A minimum of thirty-three hours of graduate work.
2. COM 601, Introduction to Graduate Study in Communication.
3. One approved course in organizational communication*
4. One approved course in interpersonal communication*
5. One approved course in mass communication or public relations*
6. One approved course in small group communication*
7. Electives to complete the 33 hours, which may include up to 6 cognate hours, selected in consultation with the graduate adviser.*
8. Each semester the student is enrolled, he/she must consult with the graduate adviser.

*See the graduate adviser for the list of approved courses. The approved courses for the Organizational Communication option include only those courses with a specific relevance to organizational communication.

OPTION B—ORGANIZATIONAL COMMUNICATION

The Organizational Communication option is designed for those students desiring an understanding of the communication process in organizations, the nature of relationships among its members, and a knowledge of preparation and presentation of messages. The program will prepare individuals for positions in public relations and information services, and for such positions as the directors or coordinators of communication in organizations.

This program is also designed for those currently in the field of organizational communication who are individuals holding (or expecting to hold) positions in organizations which require high levels of communication activity and ability. Training for such positions involves the development of effective communication in functioning organizations as well as dealing with non-routine matters such as: (1) facilitating the flow of ideas and personnel coordination among individuals and groups concerned with the development of new projects such as action research programs; (2) coordinating diverse members and groups for organizational projects; (3) coordinating efforts to resolve conflicts among individuals and groups within the organization; and (4) implementing and monitoring the flow of messages to and from the organization in its relations with other organizations.

Course work combines communication theory and social scientific methods in the exploration of how information is exchanged and relationships are developed and maintained in effective organizations.

Program requirements

1. A minimum of thirty-three hours of graduate work.
2. COM 601, Introduction to Graduate Study in Communication
3. The Organizational Communication Core:
   A. COM 682 Communication in Organizations
   B. COM 673 Conflict Management OR COM 683 Power and Leadership in Organizational Communications
   C. COM 670 Seminar in Organizational Communication Theory (Prerequisite: Twelve hours of graduate work in communication, including COM 682)
4. One approved course in interpersonal communication*
5. One approved course in mass communication or public relations*
6. One approved course in small group communication*
7. Electives to complete the 33 hours, which may include up to 6 cognate hours, selected in consultation with the graduate adviser.*
8. Each semester the student is enrolled, he/she must consult with the graduate adviser.

*See the graduate adviser for the list of approved courses. The approved courses for the Organizational Communication option include only those courses with a specific relevance to organizational communication.

Communication Director, Graduate Program: Shirley A. Van Hoven, 312 Sprau Tower

The Master of Arts in Communication is primarily a professional program that emphasizes computer software development. It is designed to prepare students for professional positions in industrial corporations, government service, or computer services companies. Graduates will also be well prepared to teach computer courses in two-year colleges or to undertake more advanced studies in computer science. Graduates of this program, in addition to receiving a strong theoretical background, should also become competent programmers and system designers.

Students with a strong undergraduate background in computer science and mathematics may be able to complete the program in sixteen months, but most students will probably require a longer period of time.
Admission requirements
Candidates for admission to this curriculum must have satisfactorily completed an undergraduate program containing courses in both mathematics and computer science. The mathematics courses should include a calculus sequence, a course in linear algebra, and a course in discrete structures. Students without this background will be required to complete appropriate course work, which may include MATH 122, 123, 145, and 230 as an admission requirement. Candidates should have computer science coursework including a thorough knowledge of computer assembly language, computer organization, data structures, file structures, structured programming, and logic design. Students without this background will be asked to complete additional undergraduate course work. Applicants are urged to submit Graduate Record Examination aptitude scores and TOEFL scores, if appropriate.

Program requirements
Each student must complete an approved program consisting of at least 33 hours of graduate work including the following:
1. CS 580 and 631.
2. Three approved sequences from the following:
   - CS 543-643 (554-655), (580-680), (581-681), (631-632) and MATH 507-607 or (507-637).
   - The Computer Science Department may introduce additional approved sequences.
   - The student must earn a grade of B or better in all courses used to satisfy this requirement.
   - The master’s thesis may be substituted for one sequence with prior approval of the Graduate Committee.
   - Additional approved electives from the following:
     - CS 518, 527, 543, 544, 554, 555, 581, 582, 585, 598, 603, 625, 632, 643, 655, 680, 681, 682, 710, MATH 507, 567, 607, 637, 640, and PHIL 520, for a program total of 33 hours. (Note: At least 15 hours of course work must be at the 600 or higher level.)
   - Students who, with the approval of their adviser, elect the thesis option will register for 6 credits of work in CS 700.
   - Prospective students should realize that the general requirements for a Master’s degree include the attainment of a satisfactory score on the English Qualifying Examination. There are a variety of channels available for financial support of graduate students.
   - Graduate Fellowships are available through the Graduate College. A number of teaching assistantships and possible research assistantships are provided through the Computer Science Department. Certain other departments provide assistantships to computer science students. In addition, many students are engaged in part-time employment with private businesses, educational institutions, or other areas of WMU. Individuals desiring further information on fellowships or assistantships should contact the Department Office.

Counselor Education And Counseling Psychology
Advisers:
- Alan J. Hovestadt, Chairperson; Michael W. Bahr, Beverly Benson, Robert L. Betz, Kenneth Bullough, Carlison, John S. Geelas, Suzanne Hedstrom, Joseph R. Morris, Laura A. See, Edward L. Trembly.
- The Department office is located in Room 3102, Sangren Hall.

The Master of Arts programs in Counselor Education and Counseling Psychology are accredited by the Council for Accreditation of Counseling and Related Educational Programs and offered in three areas of concentration with seven options:
1. Community Agency Counseling
   - a. Counseling in Community Agency Settings
   - b. Counseling in Clinical Mental Health Settings
2. Pupil Personnel Services, K-12
   - a. Counseling in Elementary Education
   - b. Counseling in Secondary Education
3. Career Development Specialist
   - a. Administration of Student Personnel Services
   - b. Counseling in Post-Secondary Education

These master’s programs are designed to prepare individuals for entry level positions in counseling, educational, personnel services in a variety of educational and non-educational settings. All programs require a minimum of forty-eight semester hours of course work. The program of study for each of the seven options includes six, three semester hour, core courses. Listings of course requirements for the program options are available from the Department Office.

Students are expected to work with advisers in order to be informed of policies, course offerings, prerequisites, and applications required for designated courses. A student’s performance and progress will be evaluated throughout the program. This process includes “check points,” such as candidacy, assignment of a grade below “B” in any course, and final evaluation prior to graduation.

The Counseling and Community Agency option provides great flexibility in designing a course of studies to meet the interests and needs of the student. In addition to theory and practice courses, students must, with the approval of an adviser, select courses for a special area of concentration related to counseling. Selection may be made from, but not limited to, such areas as gerontology, criminal justice, alcohol and drug abuse, marriage and family, and holistic health care.

The Counseling in Clinical Mental Health option provides, beyond the departmental required core course work, a focus on psychopathology, psychological assessment, counseling and psychotherapy theories and practices, and advanced practical experiences. This option is selected by students seeking limited licensure as a psychologist in the State of Michigan.

Programs in Counseling in Elementary Education, Counseling in Secondary Education, and Career Development incorporate courses emphasizing counseling theory and practice, personality, ethics, testing/appraisal, career development, and psychoeducational consultation. In addition, students desiring school counselor certification will elect courses related to the administration of pupil personnel services in elementary and/or secondary schools.

The Administration of Student Personnel Services program focuses on college student development, student services programs, legal and ethical issues, program evaluation, communication skills, and administration of student affairs in post-secondary education.

The program Counseling in Post-Secondary Education accords college students and their families’ needs and situations. Individual and group counseling, personality, psychopathology, ethics, testing, counseling, and student service delivery systems in higher education.

Admission to a Master of Arts program in the Department is based upon undergraduate grade point average, educational background, and counseling and/or related professional experience. Prior to consideration by the M.A. Admissions Committee, applicants are required to complete and return a questionnaire indicating, among other things, the program option desired. Interviews, letters of recommendation, test scores, and other material may be required. Upon admission, each student is assigned an adviser who will assist in preparing a Program of Study for submission to The Graduate College. It is recommended that the program of study, which also serves as the application for candidacy, be completed during the first semester or session of enrollment.

Development Administration
Adviser:
- Elizabeth H. Dalton, Room 3007, Friedmann Hall

The graduate program in Development Administration is offered by the Department of Political Science and leads to the degree of Master of Development Administration (MDA). The program is designed for students who plan to pursue careers in public administration in Africa, Asia, the Middle East, Latin America, or other areas usually described as "developing." The objective of the program is to provide graduate students with professional training in public administration, with special attention given to the problems of countries attempting to develop economically, politically, and socially.

In this context, public administration becomes an exceptional burden of translating public policy into successful sequences of change. A major strength of this program is the highly qualified faculty who have devoted many years of research, residence, and travel in the developing areas and who apply their knowledge of these areas to the problems of public administration. By combining these faculty with appropriate courses, students will get a good grounding not only in public administration, but in techniques for analyzing and coping with the special problems of developing areas.

Admission requirements
Applicants must satisfy the requirements for admission to The Graduate College in order to be considered for admission to this program. Actual admission to the program requires, of graduates of U.S. universities, a 3.0 average (on a 4.0 scale) in the social sciences. Graduates of foreign universities must show an overall grade level of “very good” and demonstrate English proficiency.

Program requirements
The Master of Development Administration requires forty-two (42) semester hours of study. Full-time students will ordinarily take sixteen (16) to twenty (20) calendar months to complete the program. The basic requirements are as follows:
1. Prerequisites (non-credit): The following core courses or their equivalents: PSCI 330, Introduction to Public Administration, and ECON 201 or 202, Principles of Economics.

2. The General Program.
   a. Core requirements: Seven (7) courses: PSCI 533, Personnel Administration; PSCI 534, Administrative Theory; PSCI 535, Politics of Budgeting and Finance; PSCI 536, Comparative Public Administration; PSCI 542, Administration in Developing Countries; PSCI 646, Seminar: Development Administration; and ECON 588 or 688, Economic Development.
   b. Tools or Skills. One course in PSCI 572, Computer Applications, PSCI 590, Research Methods, or PSCI 591, Statistics.
   c. Specialization. Two courses, from among various courses: PSCI 552, Studies in International Relations; PSCI 553, United Nations; PSCI 555, International Law; PSCI 557, Studies in Foreign Policy; PSCI 541, Comparative Political Systems; and PSCI 650, Seminar: International Relations: Third World Problems.
   d. Electives. Three courses from among at least two courses in nine different departments: Economics, Management, Marketing, Political Science, Psychology, Public Affairs and Administration, Sociology, and Social Work.

All elective courses may be selected by the student with the approval of the Graduate Adviser.

Program requirements

1. A minimum of thirty hours of graduate credit in earth science or related disciplines with consent of graduate adviser.
2. Students are expected to attend Departmental seminars and are required to give one presentation in residence. Students may enroll for credit in GEOL 660 for seminar presentations.
3. Complete a general exploratory examination in earth science covering astronomy, oceanography, meteorology, and geology at the beginning of the first semester in residence.
4. Optional election of GEOL 700 (Thesis) or GEOL 710 (Independent Research).
5. Oral defense of the thesis or independent research will substitute for the comprehensive exam.

Earth Science

The Master of Science in Earth Science permits students to design programs of study, in consultation with the program adviser, that are compatible with the individual's goals. The program may be adapted for students with backgrounds in biology, geography, agriculture, geology, junior college science education, journalism, landscape architecture, anthropology, and physics. Some remedial work may be necessary for students entering the program with a minimal background. Courses for the program will be drawn from geology, geography, biology, anthropology, economics, political science, communication, chemistry, physics, agriculture, and others.

Program requirements

1. A minimum of thirty-five hours is required for the degree.
2. A core of eighteen semester hours in geology is required, including GEOL 539 (or equivalent).
3. May include satisfactory completion of four hours of GEOL 710 (Independent Research) or three hours of GEOL 712 (Field Experience), or both, but not to exceed fifteen hours.
4. Pass a comprehensive oral examination. If the first attempt at the oral exam is not considered satisfactory, then a second oral exam or a written exam will be required.

Economics

Advisor: Werner Sichel
Room 5075, Friedmann Hall

The Master of Arts in Economics is designed to provide students with a strong foundation in economic analysis combined with the ability to apply theory to contemporary problems. Graduates of the program are employed in industry, government, and teaching. Some graduates continue their formal training in economics, pursuing the Ph.D. degree at another university.

Program requirements are:

1. The satisfactory completion of either thirty-five hours including the Master's Thesis (6 hrs.) or thirty-three hours, if additional courses are submitted in lieu of the thesis, in a planned program prepared in consultation with the graduate adviser.
2. At least an overall "B" average in the Economics courses that the student takes in an adviser-approved program of study.
3. ECON 504, Introduction to Mathematical Economics, ECON 603, Advanced Price Theory; and ECON 662, National Income Analysis, are required.
4. Pass comprehensive examination.
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Education And Professional Development
Office of Admissions and Advising
Ms. Joyce DelRight, Director
Ms. Wendy Amsue, Adviser
Ms. Maxine Gilling, Adviser
Certification Office
Ms. Diane Piel, Certification Officer
2504 Sangren Hall

Those seeking information on graduate programs within the College of Education may seek general assistance in the Office of Admissions and Advising. Information regarding specific graduate degree programs may be obtained from the faculty adviser designated with each program description. Students with a bachelor's degree seeking teacher certification are required to be counseled by the certification officer.

Admission Requirements
In addition to meeting the regular admissions standards of The Graduate College, the following requirements must be met before a student will be admitted to one of the master's degree programs offered by the department.
1. Satisfactory completion of a department approved writing examination.
2. Possess a valid Michigan Teacher Certification Certificate of equivalent at the appropriate level for all programs except the Secondary Master of Education program. Exceptions may be granted by the advisers in Early Childhood Education (ECE) and in Reading (RDG).
3. Provide evidence of the completion of the State of Michigan approved appropriate subject area examination(s) beginning September 1991.

Applicants with lower grade point averages than 3.0 may be granted non-degree probationary status and allowed to establish eligibility for regular admission by completing nine hours of approved graduate courses with a grade of "B" or better in each course. Persons who meet these criteria then will be considered for admission to a specific program by the appropriate departmental unit. Because admission in some programs is governed by the number of available openings in the programs, the academic criteria above should be considered as minimum standards.

Upon admission each student is assigned an adviser who will assist in preparing a Program of Study for submission to the Graduate College. It is recommended that the program of study which serves as the application for candidacy, be completed during the first semester or session enrollment.

A maximum of six appropriate graduate credits taken before admission may be included in a master's degree program with the consent of the adviser. A maximum of six appropriate graduate credits used to obtain initial certification may be applied to a master's degree program with the consent of the adviser.

Early Childhood Education
Advisers:
Artel Anderson, Mary Cain, Suzanne Davis, Rachel Inselberg

The master's degree program prepares professionals to work in early childhood education, parent education, and other programs involving the nurture and welfare of infants and young children from birth to nine years. The program includes academic qualifications for a ZA (Early Childhood) Endorsement on the Continuing Certificate. Individualized programs help to prepare candidates for their personal career goals in public schools or in a variety of other settings.

Program requirements
1. Each candidate's program will include a core of courses (ED 606, 607, 608, and 609) to be taken with the candidate's entering group, and to provide common understandings regarding the growth and nurture of young children and the effects of public policy on young children's lives. For some candidates, experiences in program administration and evaluation will also be expected.
2. Each candidate's program beyond the core will be individually designed in consultation with an adviser to provide courses, independent and research studies, and field experiences pointing toward the candidate's individual career goals. Flexibility is stressed in order to meet a variety of interests and objectives.

Reading
Advisers:
Jim Burns, Joe Chapel, Ron Crowell, Jeanne Jacobson, Paul Wilson.
The Reading Center and Clinic is located In Room 3514 Sangren Hall.

Graduate programs in reading at Western Michigan University prepare educators for advanced positions in education. The program provides a Master of Arts in Reading with a concentration in one of three types of preparation.

Elementary—designed to assist the elementary classroom teacher to improve reading instruction for the classroom or to serve as an elementary school reading teacher.
Secondary—designed for secondary teachers, college instructors, and/ or teachers of adults. The focus is to assist in the improvement of the reading abilities of secondary-aged, college, and adult readers.

Special Services—designed to help the prospective special reading teacher improve the reading achievement of students at all grade levels.

The Special Services concentration particularly emphasizes diagnostic and therapeutic work.

Program requirements
Thirty-six hours of graduate work are required and must include a minimum of 30 graduate hours.
1. Education Core—Nine hours selected from the following courses:
   a. ED 600, Fundamentals of Measurement and Evaluation in Education or ED 601, Fundamentals of Educational Research
   b. ED 602, School Curriculum
   c. ED 603, Social and Philosophical Foundations of Education
   d. ED 604, Psychological Foundations of Education
2. The Reading Concentration—Thirty-two hours in reading, fifteen to eighteen of which must be in the candidate's selected concentration: elementary, secondary, or special services. Three to six hours may be selected from the various reading electives. All courses must be approved by the candidate's program adviser.
3. Related Electives—Six hours selected from courses outside the College of Education which have been approved by the adviser.

Teaching In The Elementary School
Advisers:
Richard Harring, George Miller
Room 2112, Sangren Hall

The Master of Arts in Teaching in the Elementary School is intended to prepare teachers for superior classroom performance. The program will provide opportunities for candidates to explore their roles as teachers in a rapidly changing society and to continue to develop their skills in working with elementary school children. The program affords great flexibility and can be individualized, with the aid and consent of the candidate's adviser, to fit the needs and professional goals of each candidate. The degree requires a minimum of 30 graduate hours.

Program requirements
1. Nine hours selected from the following courses:
   b. ED 602, School Curriculum
   c. ED 603, Social and Philosophical Foundations of Education
d. ED 604, Psychological Foundations of Education
2. Electives, as necessary, to bring the total program credits to a minimum of thirty semester hours.

Teaching In The Middle School
Adviser:
Mary Strubbe, 2425 Sangren Hall

The thirty-six hour Master of Arts in Teaching in the Middle School is designed for teachers who teach (or plan to teach) in grades 5 through 9.

The program core of required courses focuses on adolescent learners, the school, and effective teaching. Options are provided to permit individuals well grounded in their academic specialty to build the understanding of the teaching/learning process or conversely, for those deficient in their subject-matter background to strengthen that area.

Program requirements
Thirty-six semester hours of required courses, are selected with the adviser's advice and approval in the general categories of the learner (6 hrs.), the school (6 hrs.), teaching practice (9 hrs.), subject matter concentration (9 hrs.), and a culminating middle grades seminar and project (6 hrs.).

Educational Leadership
Advisers:
Room 3312, Sangren Hall

The Department of Educational Leadership offers a Master of Arts degree to individuals interested in developing and enhancing leadership skills for use in various settings within business, industry, government, education, and other institutions. The master's degree in Educational Leadership offers specializations in the several areas of concentration, in addition to the general degree: human resource
Chief School Business Official: A program of study leading to a master’s degree with endorsement as a chief school business official consists of a minimum of 33 credit hours and includes the following required courses: EDLD 602, Educational Leadership; EDLD 640, Introduction to Research; EDLD 661, School Law; EDLD 662, School Business Management; EDLD 663, Personnel Administration; EDLD 664, Curriculum Development; EDLD 672, School Finance; and EDLD 682, Computer Applications in Administration. In addition 9 credit hours are selected, with adviser approval, from courses designed to increase technical skills and understanding of client needs. Nine credit hours are selected, with adviser approval, from cognate courses that broaden the student’s expertise.

Human Resource Development: The Human Resource Development (HRD) program is designed for persons who are interested in leadership roles in predominately non-school educational settings (e.g., technical training or management development in business, industry, finance, health, government, community agencies, etc.). This highly structured program is intended for either the entering HRD professional or the mid-career HRD professional seeking professional development and credentialing. The emphasis in this program is placed on the acquisition of technical skills needed to develop, design, deliver, and manage projects of a training/educational nature. The program of study consists of a minimum of 33 credit hours including EDLD 602, Educational Leadership and EDLD 640, Introduction to Research. Eighteen credit hours are selected, with adviser approval, from courses designed to increase technical skills and understanding of clientele. Nine credit hours are selected, with adviser approval, from cognate courses that broaden the student’s expertise.

Educational Evaluation, Measurement, and Research Design: Persons applying to this program, in addition to satisfying the admission requirements for The Graduate College, must submit Graduate Record Examination (GRE) scores. Students completing this degree program will be qualified to serve in a staff position in educational evaluation, testing, or research units in school and non-school settings, or in local, state, or federal government agencies. This 33 credit hours program requires the satisfactory completion of EDLD 602, Educational Leadership; EDLD 640, Introduction to Research; EDLD 641, Measurement Techniques in Education, EDLD 642, Program Evaluation, EDLD 645, Research Design and Data Analysis I; EDLD 647, Survey Research Design and Analysis; EDLD 673, Supervision, and EDLD 712 Professional Field Experience, 3 credit hours. In addition, 9 credit hours are selected, with adviser approval, from courses designed to complement and strengthen skills acquired by the student.

Master Of Arts In English

The Master of Arts in English provides advanced study of literary history, literary theory, and other literary concerns. A student desiring to enter the program should present a thirty-hour undergraduate major with a grade-point average of 3.0. At least twenty hours of the major must be in courses in literature. More than fifteen of the thirty should be at the freshman-sophomore level. Students should consult with the adviser at the earliest opportunity concerning their programs of study.

Required courses in the program are ENGL 615, Literary Criticism; ENGL 630, Research and Writing; and ENGL 640, The Nature of Poetry. All other courses in the student’s program are selected by the student and the graduate adviser to complete a coherent thirty-semester hour program. Other requirements are detailed in a general informational sheet titled “Graduate Programs Offered by the English Department at Western Michigan University,” which is available from the Department of English or the English graduate adviser.

The Department of Electrical Engineering offers a graduate program leading to a Master of Science in Electrical Engineering (M.S.E.E.) and a Master of Science in Computer Engineering (M.S.C.E.). The program is designed to prepare students for advanced level professional practice or further graduate study in electrical engineering. It provides an opportunity for engineering graduates to enhance their background in engineering science and design. Courses are offered in the areas of electrical engineering, computer engineering, electromagnetics, power, and digital signal processing.

Admission requirements

Applicants must have:
1. Bachelor of Science in Electrical Engineering or Computer Engineering from an approved program.
2. Grade point average of 3.0 or better (A = 4) in the last 2 years of undergraduate work. Applicants with lower grade point averages than 3.0 may be granted non-degree probationary status and allowed to establish eligibility for regular admission by completing nine hours of approved graduate courses with a grade of “B” or better in each course.

Applicants with degrees in other engineering fields or related areas may be considered for admission on an individual basis if they show sufficient preparation to benefit from the program.

Program requirements

Thirty semester credit hours are required for the completion of the Master of Science in Engineering (Electrical) and must include the following:

1. At least 15 hours must be in courses at the 600- or 700-level.
2. A minimum of 12 credit hours must be from the approved graduate level courses offered by the Department of Electrical Engineering.
3. Other graduate level courses may be selected from: Engineering, Mathematics, Physics, and Computer Science if they are appropriate to the program and approved by departmental adviser.
4. Complete 6 hours of EE 697. Problems in Electrical Engineering. The course is designed to provide students with an opportunity to apply knowledge they have acquired to the solution of non-trivial problems or job-related projects. Students may select EE 700, Master’s Thesis (6 hours) instead of EE 697.

English Adviser:
E. Blodford Jorgens,
Room 618, Sprague Tower
Master Of Arts In English With An Emphasis On Professional Writing

The Master of Arts in English with an Emphasis on Professional Writing is a thirty-eight hour degree program designed to meet the increasing demand for people with liberal arts educations skilled in the writing of non-fictional prose. Those entering the program should have had either an undergraduate major in English or a substantial number of undergraduate English courses.

The program requires that students take four writing courses (ENGL 630, Research and Writing; ENGL 631, Essay Writing; ENGL 632, Article Writing; and ENGL 633, Professional Writing); several courses in a field other than English (8-12 hours); and other graduate-level courses in English to bring the total hours taken to thirty-eight. Students should consult with the adviser at the earliest opportunity concerning their individual program of study.

For more detailed information about the Professional Writing program see the informational sheet titled "Graduate Programs Offered by the English Department at Western Michigan University," which is available from the Department of English or the English graduate adviser.

Master of Fine Arts In Creative Writing

The Master of Fine Arts in Creative Writing is a 48-hour degree program for students who wish to become professional writers of poetry, fiction, or drama; it is the academic qualification appropriate for those who wish to teach the craft of writing at the college or university level. A student seeking to enter the program must have had an undergraduate major in English and must present a portfolio of writing in the genre in which he or she expects to specialize.

The program requires that the student take 12-18 hours in writing workshops; ENGL 640, The Nature of Poetry; either ENGL 642, Studies in Drama, or ENGL 644, Studies in the Novel; 6-8 hours in courses in modern literature; ENGL 699, M.F.A. Project; and other courses in English and cognate fields to bring the total to 48 hours. Applicants already holding a Master of Arts in English may expect that some but not all of the credits from that degree will count towards the M.F.A. degree.

For more detailed information about the requirements for the M.F.A. program and for the form needed to apply for admission to the program, write to the department's graduate adviser.

Geography

Adviser: Eldor C. Quandt,
Room 321, Wood Hall

Master of Arts In Geography

The goals of the geography master’s program are: 1) to assist students in acquiring the skills needed for independent geographic research, including organizational and communication skills; and 2) to enable the student to develop a concentration in a particular aspect of the field.

At the same time, each program is individually designed to suit career or personal objectives. Students may prepare for a geographic career in government, business and industry, or for pursuit of a higher degree. A minimum of 30 graduate hours is required.

Admission requirements

Experience indicates that geography majors/minors, or social/biological/physical science majors with some geography normally can meet program requirements. Prior to the successful completion of ten graduate hours, the following admission requirements must be met or the student will not be admitted to further 600- or 700-level courses.

1. The attainment of passing scores on the comprehensive qualifying examinations in physical and human geography, and map, chart and air photo reading. If unsuccessful the student may retake an examination. If a passing score is still not obtained the student must receive a B or better in a course with comparable subject matter (GEOG 375).

2. Successful completion ("B" grade or better) of GEOG 375 Principles of Cartography or approved equivalent.

Program requirements

1. Completion of a minimum of three courses in one of the six following areas of concentration:
   a. Community Development and Planning
   b. Economic and Urban Geography
   c. Environmental and Resource Analysis
   d. Physical Geography
   e. Geographic Techniques
   f. A Regional Concentration: Africa, Asia, Europe, or Latin America.

2. Completion of 30 hours of approved graduate credits in all concentrations except Community Development and Planning, where 36 hours are required; at least 20 hours to be completed in the Geography Department.

3. Completion of GEOG 661 (Geographic Research), GEOG 567 (Computerized Geodata Handling and Mapping), and GEOG 666 (Professional Development Seminar). GEOG 556a (Urban Planning and Zoning) also is required for the Community Development and Planning concentration.

4. Completion of 6 hours of GEOG 700 (Master's Thesis) or two to six hours of GEOG 710 (Independent Research). In addition, students may enroll in GEOG 712 (Professional Field Experience), and students with the Community Development and Planning concentration must complete a six-hour internship (enrolling in GEOG 712).

5. Successful completion of an approved rock-oriented field course if not completed in the student's undergraduate program.

6. Pass an oral thesis defense examination. In the case of failure, one retake is possible.

Admission requirements

The prospective candidate should examine state teacher certification requirements if those have not been fulfilled in an undergraduate program. Before the completion of ten graduate hours, all students must meet the following requirements:

1. Completion of GEOG 460, Concepts and Strategies in the Teaching of Geography, or an equivalent approved with a grade of "B" or better.

2. The attainment of passing scores on the comprehensive qualifying examinations in physical and human geography.

Program requirements

The minimal requirements for the Master of Arts in the Teaching of Geography include the following:

1. Completion of 34 hours of graduate-level courses.

2. Completion of at least 20 hours of 600- and 700-level geography courses.

3. Completion of ED 601 (Fundamentals of Educational Research) or GEOG 661 (Geographic Research).

4. Completion of at least six hours of graduate-level education courses (not including ED 601).

5. Completion of GEOG 666 (Professional Development Seminar).

6. Completion of a two- or three-hour capstone experience, consisting of either GEOG 710 (Independent Research) or GEOG 712 (Professional Field Experience).

Geology

Adviser: David A. Barnes,
Room 1135, Rood Hall

The Master of Science in Geology is designed to prepare the student for professional work in geology and for further graduate study.

Admission requirements

Undergraduate major in geology. Consideration of other preparation will be handled on an individual basis.

Program requirements

1. Thirty semester hours (excluding deficiencies) of graduate credit in Geology and related areas (in other sciences and mathematics), with at least twenty-one hours in Geology. Up to nine hours in related areas may be chosen with the consent of the graduate adviser. Areas of specialization in the Geology Department include Sedimentary Geology-Paleontology, Structural Geology, Petrology-Mineralogy, Environmental and Surficial Geology, Hydrogeology, and Geophysics.

2. All students are expected to attend Departmental seminars and are required to give one presentation in residence. Students may enroll for credit in GEOG 680 for seminar presentations.

3. A copy of the Graduate Record Examination score in Geology must be supplied to the department before the end of the first semester in residence.

4. Satisfactory completion of GEOG 700 (Master's Thesis 6 hrs.)

5. Successful completion of an approved rock-oriented field course if not completed in the student’s undergraduate program.

6. Pass an oral thesis defense examination. In the case of failure, one retake is possible.
History
Adviser: Ronald W. Davis, Room 4075, Friedmann Hall

The Master of Arts in History serves both as preparation for doctoral study and as a professional degree in many fields of research, teaching, and public history.

Admission requirements
Substantial undergraduate course work in history and related social sciences and humanities. The department may admit promising students deficient in background pending completion of preliminary undergraduate course work.

Program requirements
The following courses are required of all students in the program:
- HIST 510 Colloquium ..................................... 1 hr.
- HIST 591 Topics in Theory and Practice .......................... 1-3 hrs.
- HIST 600 Historical Method .................................. 3 hrs.
- HIST 601 Historiography ..................................... 3 hrs.

Students who anticipate doctoral study normally complete the Thesis Option, in which most of the remaining course work consists of readings courses and seminars in a field of specialization, followed by the thesis. The Thesis Option requires a minimum of 31 hrs. of course work. With prior approval two courses may be elected in other disciplines. Students in education, public history, and related professions normally complete the General Option, in which remaining course work may embrace more than one field and may include internships and practice appropriate to professional objectives. The General Option requires a minimum of 34 hrs. of course work. With prior approval up to four courses may be elected in other disciplines. Each candidate must complete satisfactorily a comprehensive examination at or near the end of the program of study.

All students must demonstrate proficiency in common computer applications skills. Students completing the Thesis Option must demonstrate reading proficiency in a foreign language broadly applicable to historical research, other skills may be required by the thesis topic.

Home Economics
Adviser: Linda Dannlson, Room 3018, Kohrman Hall

The Master of Arts in Home Economics, offered through the Department of Consumer Resources and Technology, is designed to provide a comprehensive program of studies in Home Economics or in an in-depth program of studies for the person desiring to strengthen specialized interest areas.

The Master of Arts in Home Economics is designed for the person with a Bachelor of Science or Arts in Home Economics or Home Economics-related program of studies.

Because of the diversity of the field and unique needs of students desiring graduate training, an individualized program plan is designed for each student within the parameters of the program requirements.

The degree may be used as a foundation for continued graduate work leading to a doctoral degree at another institution.

Program requirements
1. All master’s programs include a minimum of 30 semester hours, fifteen of which must be of 600-level or higher and at least two hours of CRT 710, Independent Research.
2. Complete a total of twenty hours in Home Economics in graduate level courses in two or more areas, planned in consultation with departmental adviser.
3. Complete a minimum of ten hours at the graduate level in allied areas, planned in consultation with departmental graduate adviser.

Assistantships may be available to those wishing to pursue full-time graduate study.

Industrial Engineering
Coordinator, Graduate Programs
Kailash Bafna, 2007 Kohrman Hall

The Department of Industrial Engineering offers graduate programs in Engineering (Industrial) and in Engineering Management. Also, together with the participating departments of Economics, Management, and Mathematics and Statistics, the Department of Industrial Engineering offers a graduate program in Operations Research.

Master of Science in Engineering (Industrial)
Advisers: Kailash Bafna, Richard Munsterman, Grand Rapids Regional Center

The objectives of the program leading to a Master of Science in Engineering (Industrial) are:
1. To prepare students who hold a baccalaureate degree in Industrial Engineering or other engineering or related disciplines for advanced level professional practice in Industrial Engineering.
2. To prepare students for formal post-master’s and doctoral programs, as their inclination and professional growth require. Graduates of the program can look forward to career opportunities with higher levels of responsibility and remuneration. These include jobs at a variety of levels in manufacturing and service-related industries.

Admission requirements
1. Possess a baccalaureate degree in engineering or a related discipline.
2. Have an undergraduate grade point average of 3.0 for regular admission. Probationary admission may be granted to students with a grade point average of at least 2.5 and less than 3.0.
3. Submit GRE (Graduate Record Examination) scores for The General Test.

Electives
The specified number of elective courses may be taken at any level (500 or 600) from courses offered within the Department of Industrial Engineering or elsewhere in the University unless restricted by program requirements. The elected courses must be compatible with the overall program and the career objectives of the student, and must be approved by Program Adviser prior to registration. No more than half of the credit hours needed for graduation can be at the 500 level.

Core courses common to both Options
The core consists of 8 courses from which the student must elect any 6 (18 hours). These courses have been selected to prepare students in advanced concepts in different areas of industrial engineering. The core courses are:
- IE 507 Computer Integrated Manufacturing
- IE 518 Design of Experiments and Regression Analysis
- IE 604 Facilities Planning and Design
- IE 606 Capital Budgeting and Cost Analysis
- IE 611 Operations Research for Engineers
- IE 612 Productivity and Operations Management
- IE 630 Advanced Simulation Modeling and Analysis
- IE 642 Ergonomics and Occupational Biomechanics

Electives
The specified number of elective courses may be taken at any level (500 or 600) from courses offered within the Department of Industrial Engineering or elsewhere in the University unless restricted by program requirements. The elected courses must be compatible with the overall program and the career objectives of the student, and must be approved by Program Adviser prior to registration. No more than half of the credit hours needed for graduation can be at the 500 level.

Master of Science in Engineering Management
Advisers: Richard Munsterman, Grand Rapids Regional Center

The objectives of the graduate program leading to a Master of Science in Engineering Management are:
1. To increase the breadth of understanding of the students’ responsibilities as technically educated individuals through the development of analytical and management skills, and knowledge in cognate areas.
2. To develop the capabilities to deal appropriately with resources available in commerce and industry (i.e., people, time, and money).
3. To prepare students for formal post-master’s and doctoral programs, as their inclination and professional growth require.

The scope of the graduate program includes studies in the areas of engineering, technical resource management, and industrial leadership. The program requires completion of a minimum of thirty semester hours beyond the entry level prerequisites in the student’s program.

Admission requirements
1. Possess a baccalaureate degree with a major in a technical field, such as engineering, technology, mathematics, computer science, or the physical sciences. For other programs, see item 2.
2. Show evidence of completion of at least eight semester hours of mathematics and eight semester hours of physics and/or chemistry with a minimum overall grade point average of 2.5 in these areas.
3. Submit GRE (Graduate Record Examination) scores for the General Test.
4. Undergraduate courses should have been completed in statistics, computer programming, work methods analysis, operations planning and control, and quality control. Where the student’s background is deficient, foundation courses will be required.

Program requirements
1. Complete a minimum of thirty hours of graduate work, including 21 hours of required core courses and 9 hours of electives as follows:
   a. Required core of seven courses (21 hours):
      - IE 507, Computer Integrated Manufacturing
      - MATH 560, Advanced Quality Management
      - MATH 650, Concepts and Principles of Manufacturing Administration
      - MATH 560, Capital Budgeting and Cost Analysis
      - IE 612, Productivity and Operations Management
      - IE 614, Project Management
      - MATH 673, Psycholinguistics in Reading
   b. A minimum of nine hours to be selected from graduate courses available in the Department of Industrial Engineering, or any other department within the University. The elected courses must be compatible with the overall program and the career objectives of the student, and must be approved by the Program Adviser prior to registration.
2. The IE 697 project will be developed around a significant topic resulting from graduate study interest and will be written as a formal project report. This report will form the basis of the candidate’s oral presentation.
3. A 3.0 overall grade point average will be required for all graduate courses on the student’s permanent program.

Master of Science in Operations Research
Advisers:
Frank Wolf, 2017 Kohrman Hall
Abdolazim Houshyar, 2070B Kohrman Hall

The Master of Science in Operations Research is an interdisciplinary program permitting the student to build a flexible plan of study emphasizing the relationship between operations research and his or her professional field. The participating departments are Economics, Industrial Engineering, Management, and Mathematics and Statistics. The responsibility for administering the program is with the Department of Industrial Engineering.

The objective of the program leading to the Master of Science in Operations Research is to provide the student who has an undergraduate degree in one of the involved disciplines with a basic knowledge of the philosophy and techniques of operations research. The student’s program will be based on his or her undergraduate preparation, work experience, and occupational goals.

Admission requirements
1. Possess a baccalaureate degree in economics, industrial engineering, management, or mathematics. Students with degrees in other areas will also be considered.
2. Where the student’s background is found deficient, prerequisite courses will be required.

Program requirements
1. Complete a minimum of thirty hours of graduate work distributed as follows:
   a. Seven hours of Mathematics:
      - MATH 560, Applied Probability
      - MATH 652, Statistical Analysis I
   b. Twelve hours of operations research related courses selected from an approved list.
   c. Eight hours of courses cognate to the student’s undergraduate degree.
   d. Three hours of a project-oriented course developed around a significant topic resulting from graduate study interest. It includes a written report and an oral presentation.
2. A 3.0 overall grade point average will be required for all graduate courses on the student’s permanent program.

Languages and Linquistics
Master Of Arts In English As A Second Language
Adviser: Daniel Hendriksen, Room 411, Sprau Tower

The Master of Arts in English as a Second Language is primarily for those students who wish to be teachers of English as a Second Language (ESL) and for those students who wish to enter doctoral programs in Teaching English as a Second Language (TESL).

Admission requirements
The completion of a baccalaureate degree at an accredited institution and the fulfillment of Western Michigan University’s requirements for graduate admission are necessary for acceptance into the Master of Arts Program. In addition, international students must present a TOEFL score of 550, or a Michigan English Language Assessment Battery score of 85.

Program requirements
Students must complete thirty hours of work in courses numbered 500 and above. At least fifteen hours must be at the 600 level or above.

Required Courses:
- LING 500 Introduction to Linguistics
- LING 551 Psycholinguistics
- LING 552 Sociolinguistics
- LING 611 Methods of TESL
- LING 612 Principles of TESL
- LING 690 Seminar of Linguistics
- ENGL 673 Psycholinguistics in Reading

Cognate Course (One course from the following three):
- COM 574 Intercultural Communication
- ENGL 572 American Dialects
- ENGL 574 Grammar for Teachers

Capstone Course (One course must be selected from the following two):
- LING 691 Practicum
- LING 710 Independent Research

Master of Arts in Spanish
Adviser: John Benson, Room 513, Sprau Tower

The Master of Arts in Spanish enables students to extend and deepen their knowledge of language, literature, and culture in the Hispanic world. The program provides advanced study for those who intend to pursue professions in Spanish or related fields as well as for those students who desire to do further graduate work.

Admission Requirement
1. Possess a baccalaureate degree with a major of thirty hours in Spanish, or equivalent.
2. Have a minimum 3.0 grade point average in the undergraduate Spanish major.
3. Provide two letters of recommendation from persons able to evaluate the applicant’s potential for graduate work in Spanish.
4. Submit a brief statement regarding areas of interest and academic/professional goals.

Applicants who do not meet all of the above requirements may be admitted at the discretion of the Spanish graduate faculty. In such cases, students may be required to do course work to remove certain deficiencies.

Program requirements
1. Complete thirty hours of work in courses numbered 500 and above. At least one third of these credits must be in courses numbered 600 and above. A maximum of six hours of the required thirty hours may be taken in appropriate cognate fields, as approved by the Spanish graduate adviser.
2. Complete required courses:
   - SPAN 600, Don Quijote (3 hrs)
   - SPAN 680, Research and Writing (3 hrs).
   These two courses form part of the required thirty hours.
3. Pass a two-part comprehensive examination conducted in Spanish on the field of Hispanic literature, culture, and language.

For additional information about the Master of Arts in Spanish and for forms needed to apply...
for admission, students may write to The Department of Mathematics and Statistics offers graduate programs leading to the Master of Arts in Mathematics, the Master of Science in Applied Mathematics, the Master of Science in Computational Mathematics, the Master of Science in Bionetrics, the Master of Science in Statistics, the Master of Science in Operations Research, and the Doctor of Philosophy in Mathematics.

Mathematics Coordinator, Graduate Programs Gary Chartrand, Room 3319, Everett Tower

The Department of Mathematics and Statistics offers graduate programs leading to the Master of Arts in Mathematics, the Master of Science in Applied Mathematics, the Master of Science in Computational Mathematics, the Master of Science in Bionetrics, the Master of Science in Statistics, the Master of Science in Operations Research, and the Doctor of Philosophy in Mathematics.

Admission requirements
To gain admission to this program the student must have completed, with satisfactory grades, an undergraduate major in mathematics. This major must ordinarily include a course in modern algebra and a course in advanced calculus or real analysis. If the student's undergraduate program in mathematics does not meet approved standards, the student may be required to elect additional courses or otherwise satisfy the requirements of the department.

Program requirements
1. Complete a minimum of thirty hours of approved course work, with at least twenty-four hours in mathematics, including:
   a. MATH 622, General Topology I, or have had the equivalent prior to entering the program;
   b. MATH 530, Linear Algebra, or have had the equivalent prior to entering the program;
   c. MATH 673, Real Analysis, or have had the equivalent prior to entering the program;
   d. MATH 630, Abstract Algebra I; or have had the equivalent prior to entering the program;
   e. One of the following: MATH 677, Measure and Integration, or MATH 676, Complex Analysis I;
   f. An approved graduate level sequence.
2. Pass the Departmental Graduate Examination, which will cover the basic material in topology, algebra, and analysis. The algebra part includes topics from introductory modern algebra and MATH 530. The analysis part covers MATH 673, and the topology part covers MATH 622. This examination is to be taken as soon as possible after the student has covered the required material.

Students with a strong undergraduate background in mathematics may be able to complete this program in a twelve month year. However, most students will require more than one year.

The specific requirements for an M.A. in Mathematics with concentration in Statistics are listed under the master's degree program in Statistics. Students interested in a M.S. program in Applied Mathematics, Bionetrics, Statistics, Computer Science, or Operations Research, or the M.A. program in the Mathematics Education should consult the requirements listed under those headings.

Financial assistance
The Department of Mathematics and Statistics offers opportunities for financial support of graduate students through Graduate Assistantships and Fellowships. Individuals desiring further information about such opportunities, or about the graduate program as a whole, should contact the Department Office (Room 3319, Everett Tower).

The Master of Arts in Mathematics Education provides secondary school mathematics teachers with opportunities to prepare themselves for superior classroom performance by developing a broader and deeper understanding of mathematics, mathematics education, and the impact of computer technology on school curricula and instruction.

Admission requirements
In addition to the general admission requirements of The Graduate College, admission to this curriculum requires a bachelor's degree with at least a secondary teaching minor in mathematics, equivalent to that offered at Western, and fifteen hours of undergraduate work in professional education or its equivalent.

Program requirements
1. Complete at least fifteen approved semester hours in graduate level mathematics courses, usually selected from:
   a. MATH 622, General Topology I;
   b. MATH 530, Linear Algebra;
   c. MATH 580, Further Theory;
   d. MATH 611, Mathematical Statistics Applications;
   e. MATH 615, Intermediate Analysis;
   f. MATH 616, Survey of Algebra;
   g. MATH 649, Studies in Geometry.
2. Complete nine semester hours of approved mathematics education courses selected from:
   a. MATH 619, Computer Methods in Secondary Mathematics;
   b. MATH 653, Studies in Teaching Secondary Mathematics;
   c. MATH 654, Curriculum Studies in Secondary Mathematics;
   d. MATH 695, Seminar in Mathematics Education;
3. Complete six semester hours of approved electives, usually selected from:
   a. CS 503, Programming the Microcomputer for Teachers;
   b. CS 504, Advanced Microcomputer Concepts for Teachers;
   c. ED 600, Fundamentals of Measurement and Evaluation in Education;
   d. ED 601, Fundamentals of Educational Research;
   e. ED 602, School Curriculum;
   f. ED 604, Psychological Foundations of Education.

In meeting these program requirements an effort is made to select courses that deal with concepts and skills related to the central themes in secondary school mathematics programs. These themes are given substance in courses that deal with topics enabling students to review and build on their previous course work, to explore new areas, to develop thorough understandings of concepts that are initiated in secondary school mathematics courses, and to achieve a high level of mastery of skills associated with these concepts.

Financial assistance
The Department of Mathematics and Statistics offers the Master of Science in Applied Mathematics emphasizes a broadly based study of the mathematical sciences, including statistics, differential equations, computer programming, computer science, and graph theory. The use of mathematical models to study practical problems will be heavily stressed. Students receive broad training for professional employment in industry or government. Those completing this program would also be prepared to teach in the area of mathematical applications.

Admission requirements
The entering student will be expected to have two years of calculus, including multivariate calculus and differential equations, a course in linear algebra, a course in probability, a course in advanced calculus, a knowledge of the programming languages PASCAL and FORTRAN, some experience with numerical methods, and a course in data structures. The courses at WMU which satisfy the admission requirements are: MATH 122, 123, 272, (374) or (230 and 274), (362 or 560), 570, and CS 111, 112, (201 or 206), 506. A promising student may be admitted with some deficiencies in these admission requirements. The missing work would then become an extra program requirement.

Program requirements
1. Complete the following 26 semester hours of specified courses:
   a. MATH 507, Numerical Analysis I;
   b. MATH 510, Applied Matrix Algebra;
   c. MATH 562, Statistical Analysis I;
   d. MATH 574, Ordinary Differential Equations;
   e. MATH 602, Mathematical Modeling;
   f. MATH 607, Numerical Analysis II;
   g. MATH 637, Numerical Linear Algebra;
   h. MATH 608, Linear Programming;
   i. IE 610, Linear Programming for Engineers.
2. MATH 662, Applied Linear Models
3. MATH 690, Applied Mathematics (Seminar 1 hr.)

With the approval of the adviser, a student may substitute approved electives listed below for any of the specified courses which were previously taken as an undergraduate.
2. Complete at least 6 semester hours of approved electives which are different from the above selected courses. These 6 hours are to be selected from the following courses.

Mathematics
MATH 586 Nonparametric Statistical Methods
MATH 572 Vector Calculus and Complex Variables
MATH 605 Optimization
(MATH 507 Numerical Analysis II OR MATH 637 Numerical Linear Algebra)*

* MATH 609 Studies in Applied Mathematics

MATH 673 Real Analysis
MATH 667 Introduction to Random Processes
MATH 676 Complex Analysis

Computer Science
CS 527 Theory of Computer Graphics
CS 580 Theory of Computation
CS 631 Advanced Data Structures
CS 680 Mathematical Theory of Formal Languages

Electrical Engineering
EE 530 Power System Analysis

Industrial Engineering
IE 611 Operations Research for Engineers

Management
MGMT 664 Simulation

Physics
PHYS 520 Analytical Mechanics
PHYS 540 Electricity and Magnetism I
PHYS 541 Electricity and Magnetism II

* These courses may be repeated for credit.

3. Pass written examinations over the program or successfully complete an approved project on an applied problem.

Financial assistance
The Department of Mathematics and Statistics offers opportunities for financial support of graduate students through Graduate Assistantships and Fellowships. Individuals desiring further information about such opportunities, or about the graduate program as a whole, should contact the Mathematics Department Office (Room 3319, Everett Tower).

Master of Science in Computational Mathematics
Advisors: Dennis Pence, John Petro, Jay Treiman Room 3119, Everett Tower

The Master of Science in Computational Mathematics emphasizes numerical and computer methods which have become very significant in the solution of computer intensive scientific problems, including large scale problems. The primary objective of the program is to prepare students in the development and implementation of critical computational techniques from inception to algorithm to software.

Admission requirements
In addition to the general requirements of The Graduate College, the entering student will be expected to have two years of calculus, including multivariate calculus and differential equations, courses in linear algebra, modern algebra, probability, advanced calculus, numerical analysis, a knowledge of the programming languages FORTRAN and Pascal, and a course in data structures. The courses at WMU which satisfy the admission requirements include MATH 122, 123, 272, (230 and 274) or 374, 330, (362 or 560), 570, 507, and CS 111, (210 or 306), 112, (alternately CS 331 recommended). A promising student may be admitted with some deficiencies in these admission requirements. The missing work would then become an extra program requirement.

Program requirements
1. Complete the following 23 semester hours of specified courses:

   Mathematics
   MATH 510 Applied Matrix Algebra
   MATH 530 Linear Algebra
   MATH 541 Statistical Analysis I
   MATH 562 Mathematical Modeling
   MATH 605 Optimization
   MATH 606 Linear Programming
   MATH 607 Numerical Analysis II
   MATH 637 Numerical Linear Algebra
   MATH 673 Real Analysis
   MATH 690 Applied Mathematics Seminar (1 hr.)
   CS 580 Theory of Computation

2. Complete at least 9 semester hours from the following:

   CS 631 Advanced Data Structures
   CS 652 Analysis of Algorithms

3. Pass written examinations over the program or successfully complete an approved project on an applied problem.

Financial assistance
The Department of Mathematics and Statistics offers opportunities for financial support of graduate students through Graduate Assistantships and Fellowships. Individuals desiring further information about such opportunities, or about the graduate program as a whole, should contact the Mathematics Department Office (Room 3319, Everett Tower).

Mechanical Engineering
Adviser: Jerry Hamelink
Graduate Committee: C. Cho, J. Hemmye, I. Sahin

Graduates with the Master of Science in Engineering (Mechanical) look forward to career opportunities at higher levels of responsibility. The areas of opportunities include, but are not limited to, manufacturing, machine tool design and product development; energy conversion and distribution; computer hardware and software; air, land, sea and space transportation; environmental systems; and construction and development. Opportunities for mechanical engineers continue to develop with the rapid expansion of the knowledge base.

Class sequencing and scheduling (in the evening hours) are arranged so that a working engineer can complete the program in three years while maintaining full-time employment.

Admission requirements
Applicants must have:
1. Bachelor of Science degree in Mechanical Engineering from an institution with an ABET/EAC accredited program.
2. Grade point average of 3.0 (A = 4.0) or better in the last two years of undergraduate work.

Applicants with degrees in other engineering fields or related disciplines may be considered for admission if they have completed the necessary undergraduate prerequisite courses prescribed by the department's graduate adviser.

Probationary admission is granted to a student with a baccalaureate degree and less than the required academic record or anyone having a baccalaureate degree from a non-accredited college or anyone needing more than three prerequisite courses. A student admitted on non-degree probationary status may establish eligibility for regular admission by completing the specified prerequisite courses, and securing grades of "B" or better in each course in the first nine hours of graduate work, and by passing the English Qualifying Examination.

A student with a baccalaureate degree who wishes to enroll in courses but does not plan to pursue a program leading to a master's degree, or is not eligible for regular admission may enroll in courses for which prerequisite requirements are satisfied with Permission to Take Classes (PTG) status. If the student should later decide to apply for regular admission, no more than nine hours of work taken under PTG status will be considered part of a degree program.

Program Requirements
The Master of Science in Engineering (Mechanical) consists of thirty hours, of which six hours may be taken as a thesis or project. A specific program of study for each student is determined in conjunction with and is subject to the approval of the student's adviser.

The program of study includes the following:
six hours of mathematics, eighteen hours in the area of mechanical engineering, and six hours of electives. Elective courses may be selected from mechanical engineering, other engineering departments in the College of Engineering and Applied Sciences, or in mathematics and the physical sciences.

Medieval Studies
Adviser: Otto Gründler
The Medieval Institute, Hillside West

The Master of Arts in Medieval Studies is designed to provide students with a broad interdisciplinary background in medieval and Renaissance history, languages, literatures, philosophy, religion, the arts, and research methodology.

The degree may be pursued, either in preparation for further doctoral work (Option I), or as a terminal degree (Option II).
Program requirements

The requirements for the degree are as follows:

Option I (pre-Ph.D. option)

1. A total of at least 30 hours of course work, including 14 hours of required core courses and 16 hours of electives, the latter to be chosen from the list of approved courses.
2. Preparation of an acceptable Master’s Thesis (6 hours) under the direction of a thesis advisory committee.
3. Demonstrated reading proficiency in Latin, and in either French, German, Italian, or Spanish.

Option II (Terminal degree option)

1. A total of at least 36 hours of course work, including 14 hours of required core courses and 22 hours of electives, the latter to be chosen from the list of approved courses.
2. Demonstrated reading proficiency in Latin.
3. Oral examination in the student’s area of concentration.
(Note: Option II has no thesis requirement and no modern language requirement)

Music

Advisors:
Mel Ivey
Room 2146, Dalton Center
Brian Wilson,
Room 2117, Dalton Center

Master of Music

The Master of Music is designed to enhance the student’s teaching, performing, research, and creative abilities in music. The School of Music offers course work leading to a Master of Music degree in five different areas of concentration: Performance, Composition, Conducting, Music Education, and Music Therapy. Western’s School of Music is accredited by the National Association of Schools of Music, and all areas of concentration carry curriculum approval from that accrediting association. The Music Therapy program is certified by the National Association of Music Therapists.

Admission requirements

A Bachelor of Music degree, or its equivalent, including 60 semester hours of acceptable work in music, is required for admission. Students are admitted to graduate study in music on the basis of transcripts. Exceptions to admission requirements may be granted if competency can be demonstrated through Preliminary Examinations. Admission to The Graduate College and the School of Music does not imply that the student will be permitted to pursue a specific area of concentration (performance, composition, etc.). Program of study will not be determined until Preliminary Examinations are taken and the student has completed 6-10 semester hours of course work. At that time a recommendation for degree candidacy will be approved if the student has demonstrated a sufficient level of scholarship and musicianship.

Preliminary Examinations are administered upon entry to the graduate music program. Areas of examination include performance, music history, music theory, music therapy, functional piano, and conducting (including aural skills). The areas in which the student will be tested are determined by the choice of area of concentration.

Program requirements

The graduate student advisor in the School of Music works closely with each student in planning and implementing a degree program which will accommodate the student’s professional needs and interests and, at the same time, will realize the full value and depth of the University’s offerings. The student’s needs are determined by an evaluation of the results of Preliminary Examinations and review of the first 6-10 semester hours of course work taken. After this evaluation and review, the graduate adviser provides information to the student regarding probable success in the degree program and any time limitation that may apply to the student’s completion of degree requirements.

The program of study in each of the five areas of concentration is as follows:

PERFORMANCE (Minimum of 30 hrs.):

Entrance Requirements

Preliminary Examinations in theory, history/literature, and performance. Performance preliminary examination will determine if the student will be permitted to pursue this major area of concentration. Sight-reading may be required. Vocalists must demonstrate piano skills and a proficiency in French, German, and Italian dictation. Difficulty course work will not apply toward the degree.

1. Required courses: MUS 610, Introduction to Research in Music (3); MUS 600, Applied Music (8); MUS 690, Graduate Recital (2), including oral exam
2. Cognate music studies: composition, music education, history/literature, theory, jazz studies (9-12)
3. Electives to make a total of at least 30 semester hours.

COMPOSITION (Minimum of 30 hrs.):

Entrance Requirements

Preliminary Examinations in theory, history/literature, and performance, and sixteen hours of course work. Before the student will be admitted to this area of concentration, the composition faculty must approve and review the student’s prior compositional work.

1. Required courses: MUS 610, Introduction to Research in Music (3); Music Composition 662 (6); MUS 700, Master’s Thesis in Composition (6), including oral exam
2. Cognate music studies: applied music, music education, history/literature, theory, jazz studies (9-12)
3. Electives to make a total of at least 30 semester hours.
4. Proficiency in keyboard must be demonstrated, but course work may not apply to degree.

CONDUCTING (Minimum of 30 hrs.):

Entrance Requirements

Prior to admission to the M.M. in Conducting, it is recommended that students have a minimum of two years of public school experience in conducting or its equivalent. Preliminary Examinations in theory, history/literature and conducting will be given. In addition, the student must demonstrate aural perception skills. Vocalists must demonstrate piano competency (MUS 321 level), and singing proficiency. Upon formal admittance to the conducting program, the Coordinator of Graduate Studies, along with the student’s major conducting supervisor, will assign the student’s graduate seminar. The studies will be composed of the following:

1. Required courses: MUS 610, Introduction to Research in Music (3); Conducting 530, 531, 600 (8); MUS 684, Form in Music (2); MUS 690, Graduate Recital (2), including oral exam
2. Cognate music studies: applied music, composition, history/literature, jazz studies, music education (9-12)
3. Electives (not necessarily limited to music) to make a total of at least 30 semester hours.
4. Special information: Regular and frequent experiences in conducting are a requirement in this program. These experiences will include conducting an approved public school ensemble (at the student’s own school) or an apprenticeship with a major University ensemble. Students who are selected as apprentices with a University ensemble must be full-time graduate students and participate in a major ensemble while in residence. Conducting 800 students must schedule frequent meetings on campus with the supervising teacher in addition to the regular visitations by the instructor. The Graduate Recital (890) requires presentation of a complete public program, either with an approved school ensemble or with an ensemble of University students. At the direction of the student’s committee, piano study may be required in the program of study.

MUSIC EDUCATION (Minimum of 30 hrs.):

Special Admission Requirements

A Bachelor of Music degree, or its equivalent, with a major in music education, and a teaching certificate are required for admission.

Entrance Requirements

Preliminary Examinations in theory and history/literature.

1. Required courses: MUS 610, Introduction to Research in Music (3); MUS 642, Philosophy of Music Education (2); MUS 650, Seminar in Music Education (2); MUS 691, Special Project in Music Education (2)
2. Electives in music education (5-8)
3. Cognate music studies: applied music, composition, theory, history/literature, jazz studies (9-12)
4. Electives to make a total of at least 30 semester hours.

*MUSIC THERAPY (Minimum of 30 hrs.):

Special Admission Requirements

A Bachelor of Music degree, or its equivalent (60 hours of music courses) and a major in music therapy are required for admission. Students who have a Bachelor of Music degree but do not have a major in music therapy may compete the required undergraduate courses, including the six-month internship, for RMT certification while the graduate program is in progress. This undergraduate credit, however, will not apply to the graduate degree. Equivalency requirements may be obtained from the Director of Music Therapy in the School of Music.

Entrance Requirements

Upon entrance to the program, the student will take Preliminary Examinations in theory, history/literature, music therapy, and functional piano. Information derived from these examinations plus that derived from the audition, transcripts, and initial interviews will be used to determine the program of study.

1. Required courses: MUS 610, Introduction to Research in Music (3); MUS 680, Seminar in Music Therapy (2); MUS 681, Research in Musical Behavior (2); MUS 700, Master’s Thesis, including oral exam
2. Elective music courses (6-9)
3. Non-music electives—selected from one of the following departments and including at least one course in statistics: Anthropology, Blind Rehabilitation and Mobility, Counseling Psychology, Mathematics and Statistics, Occupational Therapy, Psychology, Sociology, Special Education, Speech Pathology and Audiology, Education and Professional Development.

4. Six hours of electives, selected in consultation with the graduate adviser.

Adviser: Barbara Rider, Room 169, Wood Hall

The Occupational Therapy Department provides three graduate programs which lead to the Master of Science. The graduate professional program for non-therapists, the graduate program for certified therapists, and the combined Bachelor of Science-Master of Science program.

Admission requirements

Adviser: Barbara Rider, Room 169, Wood Hall

To be eligible for the program, each applicant must present evidence of the following:

1. A grade point average of 3.0 or better in the professional curriculum.

2. A grade point average of 3.0 or better in the last two years of undergraduate work.

3. Scores on the Graduate Record Examination-General (Aptitude) Test.

4. Completion of prerequisite courses:
   - Human Anatomy with lab
   - Human Physiology with lab
   - Life Span, Abnormal Psychology
   - Human Growth and Development
   - Mammalian Anatomy
   - Statistics
   - Human Anatomy or Human Physiology
   - Administration in Occupational Therapy (21 hours)
   - MUS 610, Introduction to Research in Music (3)
   - MUS 642, Philosophy of Music Education (2)
   - MUS 650, Seminar in Music Education (2)
   - Electives in Music Education (2)
   - OT 688, Graduate Seminar
   - OT 700 or OT 710 (6 hours)

Cognates in occupational therapy or related fields selected with advice and consent of the Graduate Coordinator.

1. An earned bachelor's degree from an accredited college or university.

2. A grade point average of 3.0 or better in the last two years of undergraduate work.

3. Scores on the Graduate Record Examination-General (Aptitude) Test.

4. Be a registered occupational therapist.

Because admission is competitive, the criteria listed above should be considered as minimum academic standards. To apply, the applicant must complete both The Graduate College application and the departmental application. For full-time study, enrollment should be scheduled for fall or spring session. Part-time study may begin in any semester or session.

Program requirements

Through Preliminary Examinations. Program of study will not be determined until Preliminary Examinations are taken and the student has completed 6-10 semester hours of coursework. At that time, a recommendation for degree candidacy will be approved if the student has demonstrated a sufficient level of scholarship and musical aptitude. Preliminary Examinations will be administered in the areas of music history and music theory.

Program requirements

The graduate student advises in the School of Music and the Department of Education and Professional Development. The professional curriculum in the Fall semester, or during the academic criteria listed above should be considered as minimum academic standards. To apply, the applicant must complete both The Graduate College application and the departmental application. Full-time study commences in the fall semester.
3. Scores on the Graduate Record Examination - General (Aptitude) Test.
4. Positive Faculty recommendation.

Program Requirements
1. Completion of seventy-five semester hours in the following areas:
   a. Forty-five hours of professional occupational therapy education, including six months of full-time fieldwork.
   b. Thirty hours of graduate courses which include the following:
      - Occupational Therapy (21 hours): OT 610, Professional Issues OT 633, Administration in Occupational Therapy
      - OT 640, Theory in Occupational Therapy
      - OT 660, Research in Occupational Therapy
      - OT 686, Graduate Seminar
      - OT 700 or OT 710 (6 hours)

2. The student must manifest emotional and behavioral characteristics which, in the judgment of the department faculty, will not jeopardize his/her professional competence.

Paper Science and Engineering
Advisor: 
Rale G. Arumuthan, Room 1010, McCracken Hall

The Master of Science degree program in Paper Science and Engineering is designed to provide theoretical, laboratory, and pilot plant experiences which are basic to the development of professional competence in pulp and paper science and engineering. The department is internationally recognized in the fields of paper coating, fiber recycling, and printing for its outstanding semicommercial-sized thermomechanical pulping, papermaking, coating, and printing operations and for a complete recycled fiber pilot plant installation. Its laboratories and equipment are the most complete of any similar academic institution.

Admission requirements
Applicants with widely diversified science and engineering backgrounds may qualify for admission based upon demonstrated competence in an accredited college or university degree program. In all cases the applicant's academic credentials and professional experience will be reviewed by the graduate adviser to determine whether any background courses are necessary. These may be taken concurrently with the graduate courses.

Applicants are encouraged to submit results of the Graduate Record Examination as a supplement to a credential for admission. The following gives the general guidelines of prerequisites for four classes of applicants:
1. Graduates from four year pulp and paper science programs will generally have the necessary prerequisites in Paper Science but may need one or two background courses in Process Engineering, Mathematics, or Chemistry.
2. Chemical Engineering graduates will generally satisfy the Science, Engineering, and Mathematics requirements but will be required to take three Pulp and Paper systems graduate level courses (PAPR 690, 691, and 696) within the normal graduate program.
3. Chemistry degree graduates will generally be required to complete two background undergraduate courses in Process Engineering and three Pulp and Paper systems graduate courses (PAPR 690, 691, and 696) within the normal graduate program.
4. Graduates of other science, engineering, or technology programs may be required to take background undergraduate courses in Process Engineering, Mathematics, Chemistry, or Physics, depending on the particular credentials of the applicant. Also, three graduate courses in Pulp and Paper systems (PAPR 690, 691, and 696) will be required within the normal graduate program.

If the graduated mention in paragraphs 2-4 (above) don't have any pulp and paper experience, they are to take two basic undergraduate courses in pulp and paper processes (PAPR 203 and 204). In some instances, it may be recommended that the applicant register for one or more semesters of undergraduate course work in order to satisfy particular academic areas prior to applying for graduate admission. Many students have found it desirable to obtain a second bachelor's degree in Paper Science or in Engineering. This approach is useful to those applicants having non-conventional academic backgrounds and who desire to establish their credentials for graduate study.

Program requirements
1. A minimum of fifteen hours of Paper Science selected from these twenty four or more hours of offerings subject to the stipulations set above. Surface and Colloid Chemistry 600, Paper, Printing, and Inks 620; Coating Rheology 640; Mechanics and Optics of Paper and Fibers 660; High Polymer Topics 680; Pulp and Paper Operations 690; Pulp and Paper Operation II 691; Grad Topics in Paper/Papering 695; and Paper Industry Control Systems 696.
2. A minimum of nine additional hours of graduate courses from Chemistry, Computer Science, Physics, Mathematics, Electrical Engineering, Industrial Engineering, or Mechanical Engineering, or Business Information Systems, selected with the consent of the graduate adviser. Approved courses include: Chemistry 520, 530, 550, 560, 570, 624, 626, 653, 661, 663; Computer Science 506, 625, 631; Physics 520, 563; Mathematics 506, 510, 561, 562, 565, 557, 568; Electrical Engineering 501, 605; Industrial Engineering 508, 604, 606, 608, 610, 611; Mechanical Engineering 531, 560, 573; Business Information Systems 602. 3. Satisfactory completion of a Master's Thesis (6 hrs.) based on either an experimental or theoretical topic; under the guidance of a Thesis Committee using procedures established by the Department.

Philosophy
Advisor:
A. Falk
Room 320 Moore Hall 387-4389

The Master of Arts in Philosophy offers advanced study in all the main subject areas and historical periods of Western philosophy, with the resources to emphasize applied ethics and critical thinking skills for those students wishing them.

Admission requirements
In addition to satisfying the admission requirements of The Graduate College, the student’s undergraduate program must have included at least eight hours of philosophy courses, with a 3.0 average grade in philosophy. Those seeking admission without the minimum number of courses may satisfy the requirement by taking two undergraduate philosophy courses at WMU and receiving a 3.0 average grade.

Those seeking admission must submit an essay on their motives for pursuing the program and their preparedness to do so.

The Department may require a personal interview with a candidate prior to admission.

Program requirements
The program is 30 credit hours and offers students two options, thesis and nonthesis. Students wishing to go on to a Ph.D. program and a career of teaching and research in philosophy should elect the thesis option.

Non-thesis option:
The student must complete a minimum of 28 hours of coursework in philosophy which may include up to 4 hours of coursework in other departments, if the Department of Philosophy approves, and an additional 2 hours of PHIL 710, Independent Research, for which the student writes a monograph or takes a comprehensive examination on a list of assigned readings. A faculty committee will assess the student’s work.

Thesis option:
The student must complete a minimum of 24 hours of coursework in philosophy, which may include up to 4 hours of coursework in other departments, if the Department of Philosophy approves. The student then elects to write a thesis, if the Department consents, by registering for PHIL 700, Master’s Thesis (6 hrs.).

All students should take the seminar called "Colloquium" in their first term, to orient themselves to graduate research.

Physical Education
Advisor: 
Debra S. Berkey
Room 216 Gary Center
Bilise Ann Chestam,
Room 226 Gary Center
Mary Dawson,
Room 3220 Health Center
Robert Maze,
Room B-311 Ellsworth Hall
Harold Ray,
Room B-320 Ellsworth Hall
William Gross,
Room 220A Gary Center
Roger Zabik,
Room 204 Gary Center

The Department of Health, Physical Education, and Recreation offers a Master of Arts degree program which prepares teachers, coaches, supervisors, and administrators to assume leadership roles in the following: Administration, Sports/Exercise Science, Motor Development, Athletic Training, Physical Education, and Special Physical Education for Handicapped Children.

Admission requirements
To be admitted to the master's degree program in this department, The Graduate College admission standards must be met, and the graduate student must have successfully completed an undergraduate major or minor or
Equivalent in Physical Education, Health, Recreation, Athletic Training, or Coaching.

Program requirements
Each graduate student is expected to show competence at least three professional areas in research, socio-cultural, curriculum or psychological foundations. Such competence will normally be provided through eight to ten graduate semester hours of course work in the following: (1) PEGR 690, PEGR 650, and PEGR 692 required and (2) one course from PEGR 645 (ED 602), or PEGR 691 (ED 604). The Master of Arts degree in the Department of Health, Physical Education, and Recreation requires the successful completion of a minimum of thirty graduate credit hours beyond the bachelor’s degree in one of the following areas of emphasis: Administration, Sports Studies, Athletic Training, Exercise Science, Motor Development, General Physical Education, or Special Physical Education.

Master’s degree candidates are required to complete a comprehensive, integrated capstone experience which can be met through (1) PEGR 700, Thesis; (2) Advanced Seminars PEGR 648, 668, 680, 698, (3) PEGR 710, Independent Research; or (4) PEGR 712, Professional Field Experience. Graduate students in the Athletic Training emphasis area seeking certification must meet the National Athletic Trainers’ Association standards.

Physics
Adviser: D. W. Halderson, Room 1135, Everett Tower
The Department of Physics offers a graduate program leading to the Master of Arts in Physics. Thirty semester hours of graduate credit are required. The objective of the program is to enable students to acquire the knowledge and technical skills needed in physics-related occupations and in graduate study at the doctoral level. Participation in research is an important part of the program and occurs in any of three major fields:
1. Theoretical physics—for example, classical liquids, nuclear structure, nuclear reactions, classical fields, and solid state.
2. Experimental physics—for example, atomic physics, optics, optical spectroscopy, nuclear physics, cosmic ray physics, neutron physics, nuclear analysis with accelerator ions. Equipment available for experimental research includes a vacuum ultraviolet spectrometer, and a 12 MeV tandem Van de Graaff accelerator.
3. Computer and instrumentation physics, including the use of PDP-11 and VAX computers and assorted microprocessor-based instruments.
4. Or any combination of these, or some interdisciplinary areas.

Admission requirements
Students entering this program are expected to have acquired a bachelor’s degree in physics or at least an equivalent amount of experience and training (including training in mathematics at the appropriate level). The departmental graduate adviser will provide assistance to students seeking admission to this program and will recommend courses eliminating any deficiencies in course work.

Program requirements
The thirty semester hours of graduate credit must include the following:
1. Fifteen hours of required courses in physics, namely: Research Seminar 810, Quantum Mechanics 1622, Statistical Mechanics 624, Classical Mechanics 630, and Electricity and Magnetism 662. Substitutions for these courses may be made only with the approval of the graduate adviser.
2. Nine additional hours from Physics, Mathematics, or other departments chosen with the consent of the graduate adviser.
3. Satisfactory completion of a Master’s Thesis (6 hrs. of PHYS 700).

The thesis may be either theoretical or experimental in nature and is accomplished under the guidance of a committee of the graduate faculty in physics. The topic of the thesis may be based on one of the research areas noted above, or it may be based on some other research areas chosen by the student and approved by the thesis committee. The committee may require an oral defense of the thesis before approving it for submission to The Graduate College.

Graduate students are required to attend the Physics Research Lectures, which constitute a program for graduate students and Physics staff members, presented by members of the WMU Physics staff and visitors from other institutions on topics related to their research specialties. Graduate students are also expected to attend the Physics Public Lectures, a series of talks on general interest in Physics and related fields.

The Physics courses available for graduate study are listed elsewhere in this catalog.

Political Science
Adviser: Elizabeth H. Dalton, Room 3007, Friedmann Hall
The Master of Arts degree program in Political Science seeks to prepare the student to function effectively as a citizen, and it offers the student a variety of options to prepare him/her for various career goals: (1) positions in the public service and quasipublic agencies, (2) further professional training in Political Science and related professions, such as law, (3) teaching positions in community colleges, and (4) general positions in the business world.

Admission requirements
In addition to meeting the general admission requirements of Western Michigan University, a master’s student must have completed at least twenty-four hours of work in the social sciences with a 3.0 record (on a 4.0 scale) or have equivalent preparation acceptable to the department. The department may require the student to make up deficiencies in undergraduate preparation and/or require the Graduate Record Examination.

Program requirements
In order to qualify for the Master of Arts in Political Science, the student, in addition to satisfying the general requirements of The Graduate College, may choose between the thesis and non-thesis options.

Requirements in the two options may not be interchanged.

Requirements for the thesis option
1. Thirty hours of graduate credit in Political Science. With the written approval of the graduate adviser, a student may substitute up to two courses with a maximum of eight hours of cognate work appropriate to his/her program.
2. PSCI 610, American Political Institutions; PSCI 645, National Political Systems and International Politics; PSCI 661, Principles of Politics.
3. PSCI 700, Master’s Thesis (six hours).
4. Pass an oral examination on the thesis and on the student’s political science program.

Requirements for the non-thesis option
1. Thirty hours of graduate credit in Political Science. With written approval of the graduate adviser, a student may substitute up to two courses with a maximum of eight hours of cognate work appropriate to his/her program.
2. PSCI 610, American Political Institutions; PSCI 645, National Political Systems and International Politics; PSCI 661, Principles of Politics.
3. Pass written and oral field examinations on the student’s political science program.

Psychology
Jack Michael, Department Chairperson
Adviser: Secretary
Room 255, Wood Hall
The Psychology Department offers course work leading to graduate degrees in three areas of concentration: Applied Behavior Analysis, Experimental Psychology, and Industrial/Organizational Psychology. The Department has a strong emphasis on professional concentration, which influences all of the Department’s programs. The master’s program is designed primarily for the student with a bachelor’s degree in psychology or related discipline to prepare the individual to assume a professional role in business and industry, a variety of mental health services, or to pursue doctoral training. A research oriented degree in experimental psychology is also offered for a limited number of students.

Graduate students receive a personal appointment to a faculty adviser and two faculty sponsors in an apprenticeship role. These arrangements facilitate the development of a personal program to accommodate the academic and professional goals of the student and to utilize the full range of research and practicum facilities within the University. The student is encouraged to participate in the daily conduct of the Department’s academic program and research activities.

Graduate students in all programs of the department are expected to abide by the “Ethical Principles of Psychologists,” including the Guidelines for the Use of Human Subjects, the Care and Use of Animals in Research, and the “Standards for Providers of Psychological Services” as published by the American Psychological Association. The Department expects students to be familiar with the content of these documents and to abide by the principles therein as they apply to academic endeavors, professional service and research activities conducted in partial fulfillment of degree requirements as well as professional service and scholarly or research activities which are not directly awarded academic credit but are completed as part of program requirements of the Department of Psychology at Western Michigan University. The members of the department faculty conduct an annual review of student progress and recommend to The Graduate College advancement from program applicant to candidacy for a degree within each program. This evaluation includes a review of academic performance, professional responsibility and adherence to the accepted ethical and professional guidelines of the discipline and the profession as published by the American Psychological Association. Failure to meet these standards and the ethical principles of the American Psychological Association and the State or failure to abide by “A Student Guide to Academic Dishonesty” and “University Policy
on Sexual Harassment and Sexism published by Western Michigan University may lead to disciplinary action and/or dismissal from the program. Disciplinary reviews, including a due process hearing for the student, are conducted by the Department's Graduate Training Committee and a summary of the findings and a recommendation for action are sent to the Dean of The Graduate College.

Admission requirements
Applications are reviewed in terms of five sources of information, although performance related to any one source is not sufficient to assure or deny admission. Applicants are assumed to have substantial training in Psychology at the undergraduate level with a minimum of 18 hours of credit in Psychology, including introductory statistics. Applicants may be required to complete additional courses following matriculation in order to satisfy these basic requirements.

Applicants to the master's degree program in experimental or applied behavior analysis must have a minimum of eight hours of basic experimental laboratory courses including an experimental design. Equivalent courses at Western Michigan University are PSY 252/258 and PSY 330. Applicants to the master's degree program in applied behavior analysis are expected to show evidence of some professional experience. Applicants with no experience may be required to complete an additional three hours of practicum following matriculation. The application procedure includes submission of:

1. A transcript showing the completion of a major or minor in psychology
2. Graduate Record Examination (verbal, quantitative, and analytical tests)
3. Three letters of recommendation
4. An autobiography describing academic interests and professional goals.

Students are admitted only during the Fall Semester each year. The deadline for receipt of all application materials is February 15. Applicants should apply directly to both The Graduate College and the Department of Psychology.

Advisers:
- M. K. Malott—Experimental
- Wayne Fuqua—Applied Behavior Analysis
- Richard Taegye-Spates—Clinical
- Alyce Dickinson—Industrial/Organizational
- Howard Farris—School Psychology

Program requirements

Experimental Psychology:
The experimental program requires a minimum of thirty hours of credit including PSY 700, Masters Thesis (6 hrs.), history of psychology (3 hrs.), and twenty-one credit hours in basic behavioral processes, laboratory techniques, and data analysis including PSY 634. Advanced Statistics: Research areas may include animal learning, operant behavior, physiological psychology and perceptual processes. This program is designed to prepare students for doctoral training in experimental psychology.

Applied Behavior Analysis:
The applied behavior analysis program requires a minimum of thirty-six hours of credit including PSY 700, Masters Thesis (6 hrs.), practicum activity (3 hrs.), and twenty-seven credit hours of Psychology. These twenty-seven hours include three hours of PSY 634, Advanced Statistics; three hours of PSY 608, Current Research in Applied Behavior Analysis; three hours of PSY 651, Behavioral Systems Analysis; three hours in learning, and twelve hours of credit in applied behavior analysis from selected courses in behavior theory, technology, and applications. This program is designed to prepare the student for doctoral study or a professional position in one or more areas of psychological service. This thirty-six hour program is not designed to meet the requirements for licensure in the State of Michigan.

Clinical Psychology:
No terminal Master of Arts is offered by the Department. A master's degree in the area is offered only as part of the Doctor of Philosophy. See description of doctoral program in clinical psychology.

Industrial/Organizational Psychology:
This program requires a minimum of thirty-six credit hours, including nine hours in personnel selection, training and development, and psychology of work, behavioral principles (3 hrs.); statistical analysis (6 hrs.); and industrial/or organizational research applications (6 hrs.). Six elective hours may be selected from within psychology or from a discipline consistent to the student's program emphasis. A master's thesis is required of persons planning to pursue a Ph.D. degree, while those with a professional orientation select a research project (3 hrs.), and a professional practicum (3 hrs.), in an industrial setting. The selection of elective courses outside the core, including the thesis option, is approved by the adviser for the industrial/or organizational psychology program.

School Psychology:
Applicants are admitted to the School Psychology specialist degree program and receive the Master of Arts only within that sequence. No terminal MA is offered in School Psychology. The master's degree requires a minimum of thirty-five credit hours, including six hours of electives from one or more fields related to School Psychology, as well as written validation of the required School Psychology competencies. Core courses include PSY 517, 519, 601, 602, 603, 634, 655, 683, 686, and 688. Two practica and other school setting experiences are required within the apprenticeship training model of the program. Students at this level are expected to master basic educational, behavior analysis and research skills, and the methods for applying them directly with clients within educational settings. Study is focused on learning characteristics of mainstream and exceptional children, as well as careful analysis of the educational environments in which these children are required to perform. Educational and behavioral techniques focus on constructing educational environments to maximize each child's personal set of learning characteristics. The master's program is considered to be an integral part of the Specialist in School Psychology, and basic preparation in doctoral training in School Psychology.

Adviser:
F. J. Mortimore—School of Public Affairs and Administration

B-1, Hillside Building-East

The multi-disciplinary graduate program in Public Administration, leading to a Master of Public Administration (MPA) degree, is designed to provide advanced professional training for in-career public employees and pre-professional training for recent college graduates. While the program content emphasizes administration of local, regional, and state government agencies, it is sufficiently flexible to meet the need for training in a wide variety of career positions with public and voluntary agencies at the national level also. This program allows the student to utilize fully and develop further his or her special talents, skills, and experience while acquiring the knowledge appropriate for administrative leadership positions in public and public-related agencies.

Reflecting the multi-disciplinary nature of this professional field, the School for Public Affairs and Administration draws upon the diverse talents of highly qualified faculty specialists in several colleges and numerous departments throughout Western Michigan University. By this means the School finds it possible to offer those enrolled in the MPA program a comprehensive grounding in public administration principles and practice while also permitting a substantial degree of specialization within a principal sub-area of this field.

Admission requirements
Anyone who possesses the minimum qualifications for degree admission to The Graduate College is eligible to be considered for admission to the MPA program regardless of the academic discipline in which previous study has been undertaken. Actual acceptance into the program, however, is competitive, previous academic accomplishments, a history of professional success in increasingly responsible positions for in-career students, appropriate career aspirations, and other factors indicating seriousness of purpose will all be considered when those enrolled in the MPA program are selected from among those who have applied for admission.

Program requirements
The Master of Public Administration degree requires between thirty-nine (39) and forty-five (45) semester hours of study for completion. This credit hour requirement can be reduced in certain cases by the Graduate Adviser when, through previous graduate study, the degree candidate has acquired skills deemed essential to the professional administrator. Full-time graduate students should find it possible to complete MPA requirements in four semesters (two years) while part-time and mid-career degree candidates should find it possible to complete requirements for the MPA in approximately 24-48 months. Ordinarily, pre-career candidates (recent college graduates) will be required to complete the following program components, while in-career candidates (those with some previous administrative/supervisory experience) will be required to complete only the first three components listed below:

1. A professional core consisting of five courses: PADM 621 (3), Foundations of Public Administration; PADM 633 (3), The Political Environment of Public Administration; PADM 634 (3), Professional
Science Education

Advisers: Robert H. Poel, A-428 Ellsworth Hall
Kamlesh Sharma A-429 Ellsworth

The science departments (Biological Sciences, Chemistry, Geology, Physics, and selected courses from Geography and Psychology) of the College of Arts and Sciences and the Department of Education and Professional Development offer a graduate program leading to the Master of Arts in Science Education. The program is designed for both elementary and secondary school science teachers who wish to expand their preparation in the sciences and to enhance their teaching abilities. In addition, the program can meet the needs of teachers for a "planned program" necessary for continuing certification to teach in Michigan schools. It is possible to specialize in any of the above science areas or to take courses from more than one of the sciences, providing the proper prerequisites have been met.

Admission requirements

The minimum admission requirements to this degree program are: (1) an undergraduate minor in one of the science departments listed above, and (2) fifteen hours of undergraduate work in professional education. These requirements are in addition to the general admission requirements of The Graduate College.

Program requirements

Each student's program is planned in consultation with the adviser and consists of the following:

1. Nine hours from the following education core courses:
   b. ED 602, School Curriculum and Evaluation in Education
   c. ED 603, Social and Philosophical Foundations
   d. ED 604, Psychological Foundations of Education

2. Fifteen hours of graduate work selected from the regular course offerings of one or more of the above science departments.

3. Six hours from either professional education or the sciences or both.

Social Work

Director of Admissions and Student Services
Room 402, Moore Hall

An M.S.W. degree program in professional social work is designed to prepare students for direct service and leadership positions in the field of social welfare. The program is accredited by the Council on Social Work Education. The curriculum is structured as an integrated and sequential set of conceptual and practical educational experiences. These experiences are focused around alternative approaches to the solution and amelioration of contemporary social problems. Social Work practice is examined as a problem-solving response to emerging and existing social conditions which have negative consequences for individuals, the family, special groups, the local community, and the society at large.

In addition to the core curriculum, students elect a concentration in either of the areas of Social Treatment or Social Policy, Planning, and Administration. There are five major content areas in the curriculum: Social Policy; Social and Behavioral Theory; Social Welfare Research and Technology; Social Work Practice (Social Treatment Concentration, and Social Welfare Policy, Planning, and Administration Concentration); and Field Education.

In conjunction with the basic M.S.W. program, students may pursue areas of individual special interest such as Community Organization, Criminal Justice-Corrections, Family and Child Welfare, Industrial Social Work, Minority Issues, Rural Mental Health, Social Justice, School Social Work, Social Work in Health Care, Social Work Licensing and Regulation, and Women's Issues.

Advisers will assist students with selection of appropriate courses within the School and University which relate to the area of interest being pursued. In addition, the school offers opportunity for participation in an interdisciplinary Graduate Specialty Program in Alcohol and Drug Abuse (SPADA), a multidisciplinary Graduate Specialty Program in Gerontology, and a Graduate Specialty Program in Holistic Health Care.

Admission requirements

Applicants for graduate study in social work must complete two applications—one for The Graduate College and one for admission to the School of Social Work. Both applications can be obtained from the School of Social Work. Admission is granted for the Fall Semester only. Deadline for filing applications is April 1st of each year. In addition to The Graduate College's requirements for admission to a master's degree program, the following criteria will be considered:

1. Evidence of adequate academic preparation for graduate study in social work. This includes consideration of both undergraduate performance and area of study. (Undergraduate preparation in the social and behavioral sciences and social work/social welfare is given particular attention.)
2. Evidence of personal qualifications considered desirable for successful social work practice. These include motivation for a human service profession, personal maturity, and leadership ability.

Program requirements

1. The successful completion of sixty hours of credit is required for the master's degree in Social Work. This will include the following course credits:
   Required Courses in Social Work (33-36 hours)
   Elective Courses in Social Work or in other University departments (6-9 hours)
   Field Education (12 hours)
   Field Studies in Research and Practice (6 hours)

2. Proficiency exams are available in SWRK 610, 630, 631, and 640. Students have the option of receiving full credit or a waiver with no credit for those courses in which proficiency exams are passed.

3. Waiver of up to twelve semester hours of required courses, except field work courses, may be arranged upon verification of successful completion of course work covering the same content. Credit hours for all courses thus waived must be substituted for with an equal number of credit hours from transfer credit and/or enrollment in courses. (While undergraduate course work may be a basis for waiver, approved graduate courses must be completed to achieve the M.S.W. degree requirement of 60 hours.)

4. Waivers are arranged on a course-by-course basis through advisers. Students who have successfully completed
the first year of an M.S.W. program from an accredited school of social work may enter the second year of W.M.U.'s M.S.W. program.

4. One academic year of residence is required for all students in the M.S.W. degree program. An academic year of residence is defined as a fall semester followed by a winter semester of full-time work. Nine semester hours, including Field Education, will be considered to be full-time.

In addition to the regular two-year, full-time program, the School offers a planned part-time program on campus and a part-time off-campus degree program located in Grand Rapids in cooperation with the Division of Continuing Education. Persons interested in part-time programming should contact the Director of Admissions and Student Services. Financial aid is available to a limited number of qualified, full-time students. Information regarding the various types of available assistance may be obtained by writing to the Director of Admissions and Student Services, School of Social Work, Room 402 Moore Hall.

**Sociology**

**Director, Graduate Studies:**

**David Chaplin,**

2412 Sangren Hall

**Advisor:**

**Robert Wait,**

2512 Sangren Hall

**Disciplinary Master's Option I**

The Master of Arts in Sociology is designed to give students an advanced understanding of the significant factors and processes of human society, to further the preparation of those planning to teach in secondary or higher education; to prepare students for doctoral study in sociology, and to provide professional training for a variety of occupational opportunities in government, industry, education, research organizations, social agencies, and correctional systems. Each student's program is prepared individually in consultation with a graduate adviser.

**Admission requirements**

1. Twenty-four semester hours in undergraduate social sciences, with at least fifteen semester hours in sociology, including courses in theory and research methods.

2. Grade-point average of 3.0 or better in undergraduate sociology courses.

3. If these requirements have not been met, the student may be required to complete additional course work as a condition of admission.

4. Applicants must supply three letters of recommendation from academic and/or professional sources to Graduate Admissions Committee, Department of Sociology.

**Program requirements**

1. Complete at least thirty graduate credit hours, some of which must be in consultation with the departmental master's adviser. At least eight hours, including thesis, must be in sociology; up to ten hours may be in an approved cognate area. SOC 581, 683, 689, 700, and 704 are required of all master's students.

2. Maintain a grade-point average of 3.0 or better in all course work.


4. Pass an oral examination on the thesis or the essay.

**Applied Master's Option II**

The Master of Arts in Sociology, Applied Option, is a 40-42 hour professional degree program designed to prepare students for non-academic careers in governmental agencies, businesses, non-profit organizations, or (in special circumstances) for a doctoral program. Graduates are well trained for such positions as data analysts, social systems and policy analysts, survey researchers, field directors, market researchers and directors of research. This program will prepare graduates for the changing job market and the increased use of survey techniques and quantitative analysis to evaluate programs and shape decision making in organizations.

**Admission requirements**

The admission requirements for this program are the same as for Option I above.

**Program requirements**

1. Complete 40-42 graduate credit hours: fifteen hours in core courses, twelve hours of research methods and statistics, and an additional nine hours of elective disciplinary and research courses.

2. Maintain a grade-point average of 3.0 or better in all course work.

3. Complete an internship and internship report (internship essay) at the conclusion of the program. A thesis option is possible with the addition of two credits, under special circumstances. Consult the departmental master's adviser for the exercise of this option.

**Financial support**

A number of departmental, University, and governmental assistantships, fellowships, and associateships are available to qualified students. Educational opportunities and part-time employment may be available through the facilities of the Leonard C. Karcher Center for Social Research. Research through the Center includes studies of education, mental illness, marital roles, race relations, group dynamics, deviant behavior, comparative institutions, and numerous other topics. Graduate students frequently participate in these studies. Additional information and application forms may be obtained from the department chair.

**Special Education**

**Advisors:**

Alonzo Hannaford, Christine Bahr, Barbara Harris, Dona Icabone, Abraham Nicolaou, Elizabeth Patterson, Donald Sellin.

**Department office is located in Room 3506, Sangren Hall.**

**Initial Endorsement Program**

The Initial Endorsement Program is a non-degree program which provides the coursework and experience necessary to obtain an initial Special Education endorsement in one of the following areas: Emotionally Impaired, Mentally Impaired, Physically and Otherwise Health Impaired, or Visually Impaired.

**Prerequisites:**

1. Michigan Teaching Certificate or equivalent with a special education endorsement.

2. A point-hour ratio of at least 3.0 during the last sixty hours of undergraduate study.

**Degree Program**

The Master of Arts is awarded in four programs provided by the Department of Special Education. These programs are individually designed to prepare graduates to work effectively with certain types of exceptional children and/or qualify for supervisory or leadership roles in special education.

**Prerequisites**

1. Michigan Teaching Certificate or equivalent with a special education endorsement.

2. A point-hour ratio of at least 3.0 during the last sixty hours of undergraduate study.

The Master of Arts in Special Education is designed for the following:

1. **The Master Clinical Teacher Program**

This program is designed to accommodate experienced special education personnel who already qualify for a Michigan Teaching Certificate and want to obtain an initial Special Education endorsement in Special Education and are desirous of acquiring advanced knowledge, skill, and experience in working with exceptional persons. Prerequisite courses or equivalents to be completed prior to admission to this degree program are specified by the department.

2. **Additional Endorsement Programs**

Certified and endorsed special education teachers may earn additional teaching endorsements by qualifying for and gaining admission to the master's degree program. Endorsements may be completed in the following categorical areas: emotionally disturbed, mentally retarded, physically and otherwise health impaired, visually impaired, autistically impaired, learning disabled, and preimpranry impaired.

3. **Leadership/Supervisory Programs**

Special Education personnel who wish to obtain professional preparation which will enable them to serve in leadership roles are expected to have earned an undergraduate degree in one of the categories of exceptional children and have special class teaching experience. Major emphasis in this program will be placed on research, supervision, and administration in special education.

**Program requirements**

All students who receive a master's degree in the field of Special Education must complete the following requirements:

1. A minimum of thirty hours of graduate level work, 15-18 of which must be in Special Education.

2. A minimum of nine hours of credit in courses offered by departments outside the Department of Special Education.

3. A comprehensive written examination administered after the student has completed a minimum of twenty semester hours. Responsibility for scheduling this examination is to be assumed by the graduate student after consulting with the program adviser.
2. Completion of an undergraduate major, or
Specific admission requirements are outlined
for the Winter term will be announced on
full-time study beginning only in the Fall or
Winter term of each year. Admission decisions
governed by the number of available openings
in the program. Students will be admitted for
clinical practice is required during every term of
thirty-five academic credit hours and 150 hours
program will be considered, but admission will
competence by the American Speech-
Language-Hearing Association. The master's
degree program consists of a minimum of
thirty-five academic credit hours and 150 hours
of supervised clinical practicum. Supervised
clinical practice is required during every term of
registration. It includes regular case work
responsible in the Charles Van Riper
Language, Speech, and Hearing Clinic, as well
as an assignment, for at least one term, to an
off-campus practicum site.

Admission requirements
All eligible applicants for the master's degree
program will be considered, but admission will
be granted only to those who most satisfactorily
meet the requirements described below. The
number of new admissions for each term is
governed by the number of available openings
in the program. Students will be admitted for
full-time study beginning only in the Fall or
Winter term of each year. Admission decisions
for the Fall term will be announced on March
15, April 30, and July 15. Admission decisions
for the Winter term will be announced on
September 15, October 15, and November 15.
Applicants are advised to complete the
application process as early as possible.
Specific admission requirements are outlined
below:
1. A point-hour ratio of at least 3.0 during the
last sixty hours of undergraduate study.
2. Completion of an undergraduate major, or
equivalent undergraduate course
case work. The student who has not
completed these requirements as an
undergraduate will need to do so prior to
enrollment in departmental graduate courses.

- Undergraduate preparation must include at
least ten semester hours in courses that
provide fundamental information on the
normal development and use of
speech, hearing, and language. Among
these ten hours should be at least one
course in phonetics, one course in
anatomy and physiology of the speech
and hearing mechanisms, one course in
speech and language development, and
one course dealing with the science of
speech and hearing. Course work in
linguistics, biology, mathematics, and
physics is highly recommended.
- Undergraduate preparation must also
include a minimum of twelve semester
hours in courses which provide basic
information on the evaluation and
treatment of language disorders,
articulation disorders, stuttering, and
impaired hearing.
- A point-hour ratio of at least 3.00 in all
undergraduate speech pathology and
audiology coursework.
- Submission of scores on the General Test of
the Graduate Record Examination.
- Evidence of personal and professional
qualifications considered necessary for
successful professional practice as reflected in:
  a. Three letters of recommendation from
individuals able to judge the applicant's
academic and practicum achievements and
potential for successful graduate study.
  b. A departmental questionnaire-application.

Program requirements
Two options are available in the degree
program. The student who elects to complete a
Master's Thesis (6 hrs.) must complete at
least twenty-nine hours of course work plus the
thesis. The student who elects the non-thesis
option must complete at least thirty-five hours of
course work. Students who desire Michigan
Teaching Certification should contact the
Certification Office, College of Education,
Sangren Hall. Specific program requirements are
as follows:
1. Completion of a core of required graduate
courses.
2. Completion of at least one departmental
graduate topical seminar registration.
3. Completion of at least 300 hours of
supervised practicum, at least 150 of
them at the graduate level. This experience
must include work with a variety of specified
disorders in children and adults.
4. Evidence of emotional and behavioral
characteristics which, in the judgment of the
departmental staff, will not jeopardize the
student's professional competence.

A Master's Thesis (6 hrs.) or one or more
independent research registrations may be
applied toward degree requirements by students who demonstrate research aptitude and
interest. Students who anticipate doctoral study are expected to evidence the ability to
formulate and conduct a research project.

The academic and practicum requirements
can usually be satisfied in one calendar year
plus one semester (five consecutive terms of
enrollment). Students who enter with very few
practicum hours may anticipate the possibility
of some extension in the length of their
programs. For students who have considerable
undergraduate clinical experience and who are
able to carry a heavier academic schedule, an
accelerated course sequence lasting one
calendar year (four terms of enrollment) is
occasionally possible.

Information regarding the various forms of
financial assistance available to graduate
students may be obtained by writing to the
Department.

Statistics
Advisers:
Joseph McKean, Michael Stoline
Room 3319, Everett Tower
The master's program in Statistics is offered
through the Department of Mathematics and
Statistics. Two types of programs are available in
this area:

Option I (Theoretical)
This option combines a regular Master of Arts in
Mathematics with substantial work in statistics.
A graduate from this option is well prepared to
proceed into a doctoral program in statistics, to
teach basic statistics at the college level, or to
use statistics professionally. A minimum of thirty
hours is required, and the resulting degree is a
Master of Arts in Mathematics with
concentration in Statistics.

Admission requirements
Requirements are the same as for the Master of
Arts in Mathematics.

Program requirements
In this option the student must complete the
requirements of the Master of Arts in
Mathematics with a program including the
following courses: MATH 660, 665, and three of
the following: 661, 662, 663, 664, 667, 669.

Option II (Applied)
This option will give students a combination of
knowledge of statistical techniques, experience
with using these techniques in applied
situations, and understanding of the theoretical
principles behind these techniques. Students
receive excellent training for professional
employment in industry or government, and at
the same time obtain sufficient theoretical
background to qualify them to teach
elementary statistics or to continue into more
advanced degree programs. This program
includes an internship experience where it is
expected that students will collaborate with
professional statisticians in an actual work
environment with real problems. The internship
placement will be with an area industry or with
the statistical laboratory in the department. A
minimum of thirty-one hours is required, and the
resulting degree is a Master of Science in
Statistics.

Admission requirements
For admission to this option, candidates must
have completed an undergraduate program
containing a substantial amount of
mathematics, including a calculus sequence, a
course in probability, and a course in
computer programming. A complete
undergraduate mathematics major is not
required since the requirements in option II
mathematics are not as extensive as in Option I.

Program requirements
This option requires at least thirty-nine hours of
approved courses from the following groups:
1. MATH 510, 562, 660, 662, 664, and 680.
2. Three of the following: MATH 563, 566, 661, 663, 665, 666, 667, 669.
3. Two hours of MATH 691 and/or 696.
4. Three credit hours of MATH 698 or 712.
5. Pass the Department Graduate Exams in
Statistics covering material in MATH 562, 660, and 662.

Financial assistance
The Department of Mathematics and Statistics
offers opportunities for financial support
of graduate students through Graduate
Assistantships and Fellowships. Individuals
desiring further information about such
opportunities, or about the graduate program as
a whole, should contact the Department
Office (Room 3319, Everett Tower).
Vocational Education
Adviser: Jack T. Humbert, Carl Woloszyn, Room 1009, Distributive Education Building

The Department of Education and Professional Development and the Department of Consumer Resources and Technology offer the Master of Arts in Vocational Education.

This thirty-hour degree program offers advanced course work in the practical arts and vocational education to improve teaching capabilities in general, and teaching competencies specifically. The program is flexible to provide advanced techniques for teachers, and career preparation for administrators, supervisors, coordinators, and for any other specialized positions in the vocational education areas of distributive education, home economics, and technology education.

Admission requirements
This program is designed for bachelor's graduates in distributive education, home economics, industrial arts, industrial education, or vocational-industrial education, plus professional preparation in teacher education, including directed or supervised student teaching.

Program requirements
Complete at least thirty graduate credit hours, selected in consultation with a program adviser. The program of study will consist of 3-9 hrs. of Professional Education courses, 15-18 hrs. of Professional preparations, interpretation, and scope operation and maintenance. It will equip the student with a productive member of an operating electron microscopy laboratory.

Programs Leading To A Graduate Specialty

The following Graduate Specialty Programs are offered by Western Michigan University. Students interested should consult the adviser about the complete admission and program requirements.

Alcohol And Drug Abuse
Adviser: Janice Dekker, Room B-301, Ellsworth Hall

Western Michigan University offers a program for the training of substance abuse specialists through the Graduate Specialty Program in Alcohol and Drug Abuse (SPADA). The departments of Biological Sciences, Counselor Education and Counseling Psychology, Occupational Therapy, Psychology, Public Administration, Sociology, and the School of Social Work provide the multidisciplinary and interdisciplinary bases to the Specialty. Courses are planned and taught by faculty from the contributing disciplines.

Students receive training for dealing with varied aspects of substance abuse, including prevention, community education, treatment and rehabilitation, program management, and evaluation. Program graduates are employed by many public and private organizations, including social agencies, psychological clinics, family counseling services, alcohol and drug counsels, hospitals, schools, and industries. Students receive their master's degree in their respective disciplines and upon completion of the eighteen hour SPADA program requirements receive a certificate of Specialty in Alcohol and Drug Abuse.

Admission requirements
Students must be accepted by The Graduate College and admitted to a master's, specialist, or doctoral degree program. Persons who have previously completed a graduate degree or an acceptable equivalent (e.g., B.D. or L.I.B. from an accredited institution) may apply for admission to the SPADA Program only.

Program requirements
In addition to satisfactory completion of the requirements of the individual department or school, each student will satisfactorily complete a program consisting of nine semester hours of courses related to substance abuse, three hours from a list of approved electives, and a six hour field placement in one or more agencies dealing with some phase of substance abuse. Credit for the field placement will be elected from the courses designed for such activities in the department or school in which the student earns his or her graduate degree. The hours taken for the academic and seminar components of the Graduate Specialty Program are in addition to the degree requirements of the department or school in which the student is enrolled. In some of these units the required SPADA courses may be integrated with the regular degree requirements. Specific requirements of this integration vary and can be determined for each department or school. In addition to the six semester hours field training experience, the following courses are required in the Graduate Specialty Program in Alcohol and Drug Abuse:

- BIOL 507—The Biology of Addictive Drugs (3 hrs.)
- SOC 617—The Etologies of Substance Abuse (3 hrs.)
- BIOL 603, CECP 631, SOC 618, or SWRK 663—Seminar in Substance Abuse (3 hrs.)*

*These courses are cross-listed in the departments and school indicated and graded on a Credit/No Credit basis.

SPADA participants must elect one of the following courses:
- PSY 526 Human Drug Use and Abuse (3 hrs.)
- PSY 663 Mental Therapy (3 hrs.)
- SOC 642 Social Epidemiology (3 hrs.)
- SOC 687 Evaluation Research (3 hrs.)
- SWRK 636 Theory and Practice of Group Treatment (3 hrs.)
- SWRK 687 Seminar in Social Policy, Planning, and Administration (3 hrs.)
- HHS 530 Clinical Theory for Health and Human Services (variable topics course) (3 hrs.)
- Women and Substance Abuse Treatment (3 hrs.)
- Legal and Illegal Drugs (3 hrs.)
- The Family and Addiction (3 hrs.)
- Drugs and the Elderly (3 hrs.)
- 586 Applied Alcoholism Recovery Techniques (3 hrs.)

Electron Microscopy
Adviser: Leonard Beving, Room 5351, McCracken Hall

The Graduate Specialty Program certificate will be awarded to those candidates who have completed a minimum of 16 credit hours of prescribed course and laboratory work beyond a Master of Science degree. The candidate must demonstrate to the satisfaction of a committee composed of three members (2 of which must be Biological Sciences faculty) competence in preparation of specimens, operation and maintenance (reasonable and required) of equipment, and photographic processing and printing. The evaluation of competence will be by an oral or written examination and practical demonstration of skills. The purpose of the program is to allow the interested student to acquire skills beyond the master's degree but short of the requirements for a Ph. D. The program will be balanced between theoretical, practical preparations, interpretation, and scope operation and maintenance. It will equip the candidate to be a productive member of an operating electron microscopy laboratory.
Requirements for entry
1. Completed master's degree in a biologically related area.
2. A degree of competence in electron microscopy (i.e., the Master's Thesis or project area required use of an electron microscope laboratory).
3. Chemistry background through two courses in biochemistry.

General Course requirements
The candidate must complete 632, 710, 712, and a course in histology. List of required courses:

- BIOS 632 Advanced Techniques in Electron Microscopy, 4 hrs.
- BIOS 712 Professional Field Experience—Working experience in a professional electron microscope laboratory, 6 hrs. (Fall or Winter)
- BIOS 537 Histology, 3 hrs. (Winter)
- BIOS 554 Histological Techniques, 3 hrs. (Spring)
- BIOS 574 Embryology, 3 hrs. (Winter)

*Tobe arranged as projects between W.M.U. and a commercial Electron Microscope Laboratory.
**Tobe arranged between W.M.U. and the Argonne and Western Michigan Laboratory full-time on projects mutually directed by Argonne and Western Michigan University faculty. The progress of the student will be monitored by frequent site visits by the W.M.U. participant. (Details of the appointment must be arranged on an individual basis between Argonne and W.M.U. personnel at least 5 months prior to actual work. Appointments can be made for only 1 candidate for each of the Fall and Winter terms.)

**Gerontology**
Adviser: Ellen K. Page-Robin, B106 Henry Hall

Western Michigan University offers a multidisciplinary Graduate Specialty Program in Gerontology. This program, designed for graduate students in master's or doctoral programs who wish to add Gerontology to their degree programs, consists of 20 hours of course work, field experience, and/or thesis/dissertation credit. Ordinarily the specialization will require some work beyond that required for master's or doctoral degrees. A certificate of completion of the Graduate Specialty Program in Gerontology will be awarded at the completion of the course of study.

Admission requirements
Students must be admitted to The Graduate College and to a regular master's, specialist, or doctoral degree program in the University and must apply for admission to the Graduate Specialty Program through the Gerontology Program Office at The Graduate College.

Program requirements
In addition to completing the requirements of the degree program, persons seeking the Graduate Specialty Program in Gerontology must complete a course of study totaling 20 semester hours. Some required courses for the specializations may be integrated with regular degree requirements. Three courses are required: Blind Rehabilitation 599, Gerontology, 2 credit hours; Health and Human Services 680, Multidisciplinary Seminar in Gerontology, 3 credit hours; and Health and Human Services 682, Program Planning and Development in Gerontology, 3 credit hours.

Up to six hours of thesis/dissertation or field experience from the student's graduate department may also be counted, provided the thesis/dissertation topic or the field placement is certified as relevant to gerontology by the Gerontology Adviser. The remainder of the 20-hour requirement will be arranged through elective courses chosen from a list of approved courses available through the Gerontology Program Office.

**Holistic Health Care**
Adviser: Molly Vase, B112 Henry Hall

The Specialty Program in Holistic Health Care is designed to provide education and experience in holistic approaches to health for students in clinical and non-clinical graduate programs. Multidisciplinary in nature, it includes eighteen semester hours of study in holistic health care and related topics.

The Holistic Health Care Specialization can be used to supplement graduate training in related fields such as counselor education and counselor psychology, psychology, social work, speech pathology and audiology, occupational therapy, blind rehabilitation and mobility, and physical education and recreation. It also complements many other graduate areas such as business, public administration, theology, nursing, medicine, and education.

The Specialty Program can help health and human service professionals gain new knowledge and skills to be more effective in their present professional role or to equip themselves for new job opportunities in a health care facility that emphasizes holistic approaches. The program is designed to provide opportunities for advanced training in the following areas: health care paradigms, lifestyle assessment, health counseling, stress management and biofeedback, spirituality in health and healing, and environment and health. Graduates of the program are employed by various public and private agencies and often work with interdisciplinary teams of health care professionals.

Admission requirements
All persons wishing to apply for admission to the Graduate Specialty Program in Holistic Health Care either must already hold an appropriate graduate degree or must pursue the program in conjunction with a related graduate degree program. Candidates must also be admitted or obtain permission to take classes by The Graduate College. Successful completion of HHS 531, Introduction to Holistic Health Care (3 hrs.), is a prerequisite to admission. Admission forms are available through the College of Health and Human Services.

Program requirements
The academic core and clinical program consists of fifteen semester hours, distributed in the following manner:

- HHS 560 Holistic Methods, Part I (3 hrs.)
- HHS 561 Holistic Methods, Part II (3 hrs.)
- HHS 712 Field Experience in Holistic Health Care (3 hrs.)

Cognates in Holistic Health (6 hrs.)

Policy, Planning, And Administration
Adviser: Policy, Planning, and Administration Coordinator or Director of Admissions and Student Services, School of Social Work Room 402, Moore Hall

The School of Social Work Graduate Specialty Program in Policy, Planning, and Administration provides experienced M.S.W. social work practitioners who have shifted or who plan to shift to administrative roles with opportunities to develop competencies in policy, planning, and administration. The Policy, Planning, and Administration program is designed to build on the practitioner's development, service delivery experience, career aspirations, and his/her understanding of social services. Students develop a course of study involving identification, analysis, and solution of significant policy, planning, and administrative problems. Individual course assignments will be developed that have a problem-solving or developmental character and that have relevance for the individual's organization.

Admission requirements
Students must be admitted by The Graduate College and the School of Social Work, present evidence of a master's degree in social work with a major in social treatment, have evidence of a master's degree insocial treatment, have an interview as conditions of acceptance.

Program requirements
Completion of a minimum of eighteen hours of graduate courses. A minimum of twelve hours must be completed within the policy, planning, and administration concentration in the School of Social Work, and six hours of electives must be completed from the list approved by the policy, planning, and administration faculty.
Section III
Specialist Degree Programs and Requirements

General Requirements For A Specialist Degree

Admission
See Calendar of Events for application deadline.
1. See specific program description to determine the minimal entrance requirements.
2. Official transcripts of all courses taken beyond high school showing the degrees earned.
3. A point-hour ratio of at least 3.0 in the last two years of undergraduate work for a program permitting entrance with a bachelor’s degree. A point hour ratio of at least 3.25 for all graduate work undertaken beyond the bachelor’s degree.
4. Attainment of satisfactory scores on standardized tests approved for each program by the Graduate Studies Council. A satisfactory score usually is considered to be one that is at the fiftieth percentile or better.
5. Admission by the academic unit offering the specialist program and by The Graduate College.

Candidacy
1. A Graduate Student Permanent Program which will constitute an application for admission to candidacy should be submitted during the first semester or session of enrollment.
2. Reservations indicated on the Certificate of Admission and/or the Graduate Student Permanent Program must be removed before candidacy will be approved.
3. A point-hour ratio of at least 3.25 must be secured in all graduate work taken. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.

Graduation
See Calendar of Events for application deadline.
1. Diploma Application: A diploma application must be submitted by October 1 for the December Commencement, by February 1 for the April Commencement, by April 1 for the June Commencement, and by June 1 for the August graduation. The University has no commencement ceremony in August.
2. Minimum Credit Hours: Completion of a minimum of sixty hours of accepted graduate credit in an approved program of study.
3. Residence Requirement: 1) One semester (Fall, Winter, or Spring-Summer) of full-time enrollment at Western Michigan University, or 2) enrollment in two sessions in consecutive years and the intervening semesters.
4. Point-hour Ratio: A point-hour ratio of at least 3.25 is required for all work taken for the degree. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.
5. Hours After Candidacy: The election and completion of at least six hours is required after being approved for Candidacy.
6. Transfer Credit: A student with a master’s degree from another university who completes the remaining credits for a specialist degree at Western Michigan University may transfer up to thirty-six credits. A student without a master’s degree who completes the credits for a specialist degree at Western Michigan University may transfer up to twelve credits.
7. Time Limit: A student who has a master’s degree is required to complete a specialist degree program in five years; a student admitted without a master’s degree is required to complete the specialist degree program in six years.
8. Research Subject Protection: Students conducting research that involves human or animal subjects must have prior approval of the research proposal by the appropriate University board, thus assuring compliance with the regulations for the protection of such subjects. For more information, call Research and Sponsored Programs, 387-3670.
9. Specialist Project: A student who intends to register for the Specialist Project is required to meet with the Dissertation Assistant in The Graduate College before registering for the class so that the student is informed about the regulations pertaining to the preparation of the manuscript.

Educational Leadership
Advisers:
The Department office is located in Room 3312, Sangren Hall.
The Specialist in Education (Ed.S.) prepares persons for leadership roles in educational administration positions. The Ed.S. is a terminal degree appropriate for students wishing to earn a post-master’s, but not doctoral, degree. Persons seeking admission to the Ed.S. program should be definite about academic and professional goals and aspirations. Students are cautioned that satisfactory completion of courses prior to admission to the Department program does not guarantee admission to the program.
Further information can be obtained from advisers by calling the Educational Leadership Department.

Admission Procedures
Applicants to the Ed.S. program should apply to The Graduate College and designate Educational Leadership. In addition to The Graduate College requirements, the Department of Educational Leadership requires the submission of an autobiography, completion of a Resume of Leadership Experience Form (available from the Educational Leadership office), an interview with at least two members of the Educational Leadership faculty, and review and acceptance by the faculty as a whole at a meeting scheduled for student admission.

Program Requirements
A program of study consists of a minimum of 66 credit hours beyond the baccalaureate degree and leads to an Ed.S. degree and endorsement as a central office administrator or superintendent, if the appropriate electives are completed, and includes the following courses: EDLD 602, Educational Leadership; EDLD 640, Introduction to Research; EDLD 660, The Principalship; EDLD 661, School Law; EDLD 662, School Business Management; EDLD 673, Supervision; EDLD 674, School Community Relations; EDLD 712, Professional Field Experience (6 credit hours); and EDLD 720, Specialist Project (6 credit hours).

In addition, 24 semester credit hours of elective courses will be selected, with adviser approval, which will complement and broaden strengths and skills already acquired. Contact the Teacher Certification Officer at Western Michigan University to be sure you meet the State of Michigan requirements for Certification beyond satisfactory completion of the course work required. Persons wishing additional information are urged to speak with an adviser or with the Educational Leadership Department office.
School Psychology
Howard Farrls, Program Coordinator
Julia Cooper, Program Secretary
Room 255, Wood Hall

The Specialist in Education in School Psychology is a competency-based program designed to prepare persons for careers in Professional School Psychology. Applicants are admitted to the specialist program and receive the master's degree in the process of completing the specialist sequence.

The program has adopted an apprenticeship training model in which the applicant receives a personal appointment to one faculty adviser and two faculty sponsors. These faculty form the training committee for the student. Apprentices are encouraged to participate in the daily conduct of the Department's various training and research activities.

The focus at the master's level is on learning basic psycho-educational, behavior analysis and research skills, and the methods for applying these directly with clients within the school setting. At the specialist level, the student develops the consultation and system analysis skills needed to implement the educational and behavior change programs through other professionals and parents.

The program emphasizes the learning characteristics of mainstream and exceptional children as well as careful analyses of the various educational environments in which these children are required to perform. The student masters educational and behavioral techniques which focus on constructing educational environments to maximize each child's personal set of learning characteristics.

Completion of the specialist degree is recommended for temporary approval. After one year of successful practice as a school psychologist, the graduate is eligible to be recommended for full approval as a Michigan School Psychologist. Applicants must apply directly to both The Graduate College and the Department of Psychology. Admission is offered for Fall semester each year. Applicants must submit all materials by February 15.

Admission requirements
1. Completion of a major or broad minor in Psychology.
2. Graduate Record Examination: Verbal, Quantitative, and Analytical Test scores.
3. Three letters of recommendation.
4. Vita and/or Autobiography.

Experiences with children and educational staff in school settings, course work in education, or teaching certificate are considered but not required for admission.

Program requirements
Upon successful completion of a program of 65 graduate credit hours, a Specialist in Education in School Psychology is awarded. The program is approved by the Michigan State Board of Education. The program was reviewed for accreditation by the National Association of School Psychologists and the National Council on Accreditation of Teacher Education during 1989. Approval is expected by April 1990. Applicants should contact the Department of Psychology for more information. The training sequence will include:

1. Up to nine credit hours of prerequisite course work may be required of an entering student who does not have sufficient undergraduate training in behavior analysis or who fails to pass an exam in basic applied behavior analysis concepts. The need for such prerequisites and the specific courses will be decided by the major adviser, and these hours will not be included in the 65 credit hours required in the program.
2. Course work in Psychology 517, 519, 570, 601, 602, 603, 608, 634, 655, 668, 683, and 686.
3. Practicum experiences in at least two settings.
4. Six hours of course work outside of Psychology.
5. Completion of a 600 clock hour (12 credit hour) internship experience, half of which must be in a school setting under supervision of a fully approved school psychologist or consultant and a WMU faculty member.
6. Specialization in one or more topical areas, which may include: (a) educational assessment and planning; (b) educational technology; (c) behavior analysis and modification; (d) curriculum design, programming, and coordination; (e) teacher consultation techniques; (f) parent and child counseling; (g) work with deaf, blind, speech, or orthopedically impaired; (h) American sign language and braille; (i) work with general and/or specific social and academic behavior adjustment problems; (j) mainstreaming procedure and models; (k) research methods; (l) administration and program management; (m) interdisciplinary learning approaches; (n) criterion referenced behavioral assessment techniques; (o) professional ethics and legal issues; and (p) educational system analysis, synthesis, and evaluation.
7. Completion of a six-credit-hour Socialist Project.

In addition to preparation for full approval as a Michigan School Psychologist, the Specialist degree program is considered as basic preparation for doctoral training in School Psychology.

Graduate students in all programs of the department are expected to abide by the "Ethical Principles of Psychologists," containing the Guidelines for the Use of Human Subjects, and the Care and Use of Animals in Research, and the "Standards for Providers of Psychological Services" as published by the American Psychological Association. The Department expects students to be familiar with the content of these documents and to abide by the principles contained therein as they apply to academic endeavors, professional service and research activities conducted in partial fulfillment of degree requirements as well as academic, professional service or research activities which are not awarded academic credit but are completed during the student's formal tenure within the programs of the Department of Psychology at Western Michigan University. The members of the department faculty conduct an annual review of student progress and recommend to The Graduate College advancement from program applicant to candidacy for a degree within each program. This evaluation includes a review of academic performance, professional responsibility and adherence to the accepted ethical and professional guidelines of the discipline and the profession as published by the American Psychological Association. Failure to meet these standards and ethical principles of the American Psychological Association or failure to abide by "A Student Guide to Academic Dishonesty" and "University Policy on Sexual Harassment and Sexism" published by Western Michigan University may lead to disciplinary action and/or dismissal from the program. Disciplinary reviews, including a due process hearing for the student, are conducted by the Department's Graduate Training Committee and a summary of the findings and a recommendation for action are sent to the Dean of The Graduate College.
Section IV
Doctoral Degree Programs and Requirements

Western Michigan University offers doctoral programs in eleven areas. The Doctor of Education is offered in Educational Leadership, Counselor Education and Counseling Psychology, and Special Education; the Doctor of Philosophy is offered in Educational Leadership, Mathematics, Mathematics Education, Physics, Psychology, Science Education, and Sociology. The Doctor of Public Administration is also offered. Each program involves approximately three calendar years of study, of which at least an academic year of two consecutive semesters must be spent in full-time study.

Each student’s program will be planned by a committee selected in consultation between the student and the graduate adviser of the program in which the student wishes to study. A student will be expected to register for at least ninety hours of graduate level work while completing his or her program. The exact distribution of the ninety hours among courses, seminars, and research will depend upon the program and will vary from one student to another. Each program, however, will contain a significant amount of research, and each student will be required to register for and prepare a dissertation for fifteen hours of graduate credit.

A student will select two appropriate research tools. The decision regarding the specific research tools must be made by the student’s doctoral committee. The committee wishes to recommend research tools other than languages, computer programming, or statistics, the recommendation and standard of proficiency must be approved by the Graduate Studies Council. Appropriate competency in language, statistics, and computer programming has been established for each program and approved by the Graduate Studies Council.

After admission, all requirements for the degree must be completed within seven years preceding the date on which the degree is conferred. Under extenuating circumstances, additional time may be granted by The Graduate College.

A student will be expected to pass those examinations established by the unit in which he or she is studying. In all cases these examinations will include comprehensive examinations of the subject matter areas included in the student’s program of study and a final oral examination.

General Requirements
For A Doctoral Degree

Admission
See Calendar of Events for application deadline.

1. See specific program description to determine the minimal entrance requirements.
2. Official transcripts of all courses taken beyond high school showing the degrees earned.

Applicacy

1. A student admitted with less than twenty hours of graduate study must request status as an applicant after completing two full semesters of graduate work at Western Michigan University or twenty semester hours of graduate work beyond those accumulated at the time of admission, whichever comes first. A student should present this request to the adviser who will submit a recommendation to The Graduate College.
2. A student admitted with more than twenty hours of graduate study must request status as an applicant after completing one full semester of graduate work at Western Michigan University or forty semester hours of graduate work, whichever comes first.

Criteria for being awarded status as an applicant include:

a. An overall point-hour ratio of at least 3.25 in all graduate work completed.
b. Commitment to a specific degree program.
c. Appointment of a doctoral dissertation committee.
d. A decision by the unit that the student should be permitted to continue study toward a doctoral degree.

Graduation
See Calendar of Events for Application deadline.

1. Completion of a minimum of ninety hours of courses, seminars, research, and other requirements including fifteen hours of dissertation with an overall point-hour ratio of at least 3.25. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.
2. Completion of the residency requirement: An academic year of two consecutive semesters must be spent in full-time study.
3. After admission, completion of all requirements for the degree within seven years preceding the date on which the degree is conferred. Under extenuating circumstances, additional time may be allowed by The Graduate College.
4. Consultation with the Dissertation Assistant in The Graduate College before registering for 730, Doctoral Dissertation, in order to be informed about the regulations pertaining to the preparation of the manuscript.
5. Prior approval by the appropriate University board of any research proposal that involves human or animal subjects. For more information, call Research and Sponsored Programs, 387-3670.
6. Approval of the dissertation by the Dissertation Committee, composed of a minimum of three members of the Graduate Faculty, at least one of whom shall be from outside the student’s department or academic unit. The dissertation must be in a form acceptable to the unit and to The Graduate College.
7. Satisfactory performance on the doctoral oral defense.
Counselor Education and Counseling Psychology

Advisers:
The Department office is located in Room 3102, Sangren Hall.

Five doctoral program options are offered through the Counselor Education and Counseling Psychology Department. These programs, leading to a Doctor of Education degree, are governed by training committees comprised of Department faculty. The Counseling Psychology Training Committee is responsible for the Counseling Psychology doctoral program concentration. The Counseling and Related Educational Program Training Committee is responsible for The Counselor Education and Supervision, Pupil Personnel Services in Schools, and Student Personnel Services in Higher Education. The Counseling Education concentration is Accredited by the Council for Accreditation of Counseling and Related Educational Programs.

Admission
Admission to a specific doctoral program is made by the appropriate departmental training committee and then by The Graduate College. Applicants should request current admission information from The Graduate College and the Department.

A student admitted to a specific doctoral program is expected to develop leadership skills by actively participating in professional activities of the Department, College, University, and of relevant professional associations.

Counseling Psychology
This doctoral program is designed to prepare professional counseling psychologists. The program of study requires students to pursue a combination of course work, practica, research, dissertation, and internship training typically expected for psychologist licensure/certification eligibility. The program is designated as a doctoral program in psychology by the Council for the National Register of Health Service Providers in Psychology.

The credit hour requirements and the coursework for the Counseling Psychology Program include:
1. Basic course requirements Psychology core (53 hrs.)
2. Advanced preparation and specialization (14-15 hrs.)
   a. Methodology (9 hrs.)
   b. Cognitive-affective basis of behavior (3 hrs.)
   c. Biological basis of behavior (3 hrs.)
   d. Social basis of behavior (6 hrs.)
   e. Individual differences (9 hrs.)
   f. Other scientific foundation courses (3 hrs.)
   g. Knowledge and use of ethics (3 hrs.)
   h. Supervised practica (17 hrs.)
3. Electives (9 hrs.)
4. Internship (4 hrs.): 2,000 clock hours in an American Psychological Association approved setting or the equivalent setting.
5. Doctoral Dissertation (18 hrs.)
   a. Dissertation Seminar (3 hrs.)
   b. Doctoral Dissertation (15 hrs.)
Total Hours 96

All Counseling Psychology students are expected to demonstrate competencies in psychological theory, practice, and research by passing a series of doctoral comprehensive examinations in the following areas: 1) general knowledge of psychology; 2) counseling psychology information and knowledge; 3) scholarly inquiry and communications; and 4) practitioner skills.

Community Agency Counseling
The significant growth in the number of community counseling and mental health centers has created a need for professionals who possess excellent counseling skills and sound leadership qualifications. Upon completion of the Community Agency Counseling doctoral program, graduates should be prepared to assume leadership, administrative, and supervisory roles in mental health centers, substance abuse agencies, family counseling services, juvenile and youth consultation centers, rehabilitation clinics, outpatient and after-care services, and other human services agencies which provide counseling, psychological, and educational services for their clientele.

This doctoral program of study has been developed to enhance significantly the skills, attitudes, and competencies of students entering and progressing through doctoral course work designed to ensure that the student develops: 1) an advanced understanding of human behavior; 2) demonstrable expertise in counseling and psychotherapy with a wide variety of individuals, groups, couples, and families; 3) a working knowledge of the full spectrum of the counseling, consulting, and supporting services in the community; 4) research skills; and 5) administrative and leadership competencies relevant to the design, funding, organization, implementation, and evaluation of community mental health service delivery systems.

Counselor Education and Supervision
The Department recognizes its responsibilities to educate persons who will become the counselor educators of the future and in this way contribute to the further development and enhancement of the counseling profession. Doctoral students pursuing this specialization are expected to demonstrate: 1) a wide range of individual and group counseling skills; 2) a sound theoretical foundation in counseling; 3) teaching and supervision competencies; 4) an understanding of academic program development, curriculum and administration; 5) research skills; and 6) competencies associated with being an educational leader. Students are expected to involve themselves in appropriate activities of the Department, College, University, and of relevant professional associations. Graduates of the program are prepared to function productively and effectively as counselor educators and supervisors in colleges, universities, and in governmental and regulatory agencies.

Pupil Personnel Services
This specialization is designed for experienced school counselors and guidance specialists who wish to prepare for administrative and leadership positions in public and private school systems and intermediate school districts. To administer an integrated and systematic program of guidance services, an individual needs to demonstrate: 1) competencies in guidance and counseling activities; 2) organizational and administrative skills; 3) competencies in personnel services, program conceptualization, budget development, accountability, evaluation, and research; 4) competency in public relations; 5) competency in career development; 6) competency in program delivery systems; 7) competencies in planning, goal setting, role development, and coordination; and 8) competencies associated with being a professional educator. Doctoral students are expected to develop leadership skills by actively participating in professional organizations which promote and enhance the school counseling and pupil personnel fields.

Student Personnel Services in Higher Education
The student personnel option in higher education has been developed to prepare individuals to administer college and university student personnel programs. Students completing the graduate program should be prepared to administer programs related to or incorporating the services of: 1) admissions; 2) housing and residential life; 3) academic and special advisement; 4) career development, planning, and placement; 5) financial aids; 6) records and registration; 7) international student advisement; 8) student activities and organizations; and 9) other student support systems. Students desirous of emphasizing course work related to counseling center positions should consider the Counseling Psychology program, Department of Counselor Education and Counseling Psychology.
DOCTORAL DEGREE PROGRAMS AND REQUIREMENTS

Competencies viewed as essential are 1) a broad understanding of the history of higher education and specifically the history, philosophy, and current practices within the area described as student services; 2) the ability to articulate the theories of student development and conceptualize the application of theoretical concepts to the administrative areas of student affairs; 3) a knowledge of organization models, budgetary systems, personnel practices, and administrative tools and techniques; 4) an understanding of methodologies related to assessment of student needs and program evaluation; 5) an awareness of the law and education as it affects educational provisions, legislative enactment, and court decisions; and 6) an understanding of the development of influencing strategies relevant to institutional decision-making processes and political realities.

Educational Leadership

Advisers:

The Department office is located in Room 3532, Sangren Hall. The Department of Educational Leadership offers programs that lead to either a Doctor of Education (Ed.D.) or a Doctor of Philosophy (Ph.D.), depending upon the area of concentration selected. At Western Michigan University the term concentration is a formal designation obtained through the curriculum review process. Transcripts and degrees, when granted, carry the formal designation of any concentration which has been adopted and approved.

In addition to the general degree (Ed.D.) the Department offers degree programs that lead to concentrations in Central Office Administration (Ed.D.), Superintendent (Ed.D.), Human Resource Development (Ed.D.), and Evaluation, Measurement, and Research Design (Ph.D.). Admission to the Department requires that students meet Graduate College criteria for admission and that they complete a Resume of Leadership Experience form (available in the Department). Each student will be interviewed by a minimum of two members of the faculty, and each application will be reviewed for acceptance by the entire faculty at a meeting scheduled to consider student admissions. After admission, a doctoral chair will be appointed from among the faculty advisors, and the student will work with this advisor to complete an appropriate doctoral advisory committee to guide the student through the program. Students are cautioned that acceptance of courses prior to admission to a Department program does not guarantee admission to the program. Further information can be obtained from advisors by calling the Educational Leadership Department.

REQUIREMENTS

Educational Leadership General Degree (Ed.D. 90 credit hours minimum)
The following courses will lead to a general doctoral degree (Ed.D.) in Educational Leadership, designed to develop and enhance leadership skills for those who find specialization unnecessary.

Required courses:
EDLD 602, Educational Leadership; EDLD 609, Theories of Leadership, EDLD 640, Introduction to Research; EDLD 645, Research Design and Data Analysis I; EDLD 646, Research Design and Data Analysis II; EDLD 673, Supervision; EDLD 695, Dissertation Seminar; EDLD 712, Professional Field Experience (9 credit hours); and EDLD 730, Doctoral Dissertation (15 credit hours). In addition to these courses, students will choose elective courses with doctoral advisory committee approval, addressing human resource development, leadership, or evaluation, measurement, and research design (18 credit hours); addressing strengths needed (12 credit hours of electives); addressing professional or research interests (15 hours).

Central Office Administrator (Ed.D., 90 credit hours minimum)
This degree is designed for persons who wish to develop leadership skills and serve in administrative positions in the State of Michigan school systems. Contact the Teacher Certification Officer at Western Michigan University for complete information on compliance with State of Michigan certification as a central office administrator. It is to be sure that you meet the other requirements.

Required courses:
EDLD 602, Educational Leadership; EDLD 609, Theories of Leadership; EDLD 640, Introduction to Research; EDLD 645, Research Design and Data Analysis I; EDLD 646, Research Design and Data Analysis II; EDLD 660, The Principalship; EDLD 661, School Law; EDLD 682, School Business Management; EDLD 684, Curriculum Development, EDLD 672, School Finance; EDLD 673, Supervision; EDLD 674, School Community Relations; EDLD 680, Doctoral Certification; EDLD 695, Dissertation Seminar; EDLD 712, Professional Field Experience (9 credit hours); and EDLD 730, Doctoral Dissertation (15 credit hours). In addition, 21 of these hours of elective courses are selected with advisory committee approval, from related courses. A minimum of 6 credit hours will be selected from courses outside the Department of Educational Leadership.

Superintendent (Ed.D., 90 credit hours minimum)
The following courses will lead to a doctoral degree (Ed.D.) in Educational Leadership with an endorsement as a superintendent. This degree is designed for persons who wish to be certified as superintendents in the State of Michigan school systems. Contact the Teacher Certification Officer at Western Michigan University for complete information on compliance with State of Michigan certification as a superintendent to be sure that you meet the other requirements.

Required courses:
EDLD 602, Educational Leadership; EDLD 609, Theories of Leadership; EDLD 640, Introduction to Research; EDLD 645, Research Design and Data Analysis I; EDLD 646, Research Design and Data Analysis II; EDLD 660, The Principalship; EDLD 661, School Law; EDLD 662, School Personnel Management; EDLD 664, Curriculum Development; EDLD 672, School Finance; EDLD 673, Supervision; EDLD 674, School Community Relations; EDLD 680, Superintendentship; EDLD 685, Dissertation Seminar; EDLD 712, Professional Field Experience (9 credit hours); and EDLD 730, Doctoral Dissertation (15 credit hours). In addition, 27 credit hours will be selected with advisory committee approval, from related courses.

Educational Evaluation, Measurement, and Research Design (Ph.D., 99 credit hours minimum)
The following requirements and courses will lead to a doctoral degree (Ph.D.) in Educational Leadership with a concentration in Educational Evaluation, Measurement, and Research Design. The program prepares graduates to serve in leadership roles in educational evaluation, testing, or research units in school and non-school settings, as well as in local, state, or federal government agencies and to serve in faculty positions in education evaluation, measurement, and research at institutions of higher education.

Required courses:
EDLD 602, Educational Leadership; EDLD 609, Theories of Leadership; EDLD 640, Introduction to Research; EDLD 645, Research Design and Data Analysis I; EDLD 646, Research Design and Data Analysis II; EDLD 664, Curriculum Development; EDLD 672, School Finance; EDLD 673, Supervision; EDLD 674, School Community Relations; EDLD 680, Superintendentship; EDLD 685, Dissertation Seminar; EDLD 712, Professional Field Experience (9 credit hours); and EDLD 730, Doctoral Dissertation (15 credit hours).
Mathematics
Arthur T. White, Chairperson of Advisers

46 DOCTORAL DEGREE PROGRAMS AND REQUIREMENTS

The Doctor of Philosophy in Mathematics is designed to give the student a broad and intensive background in a variety of fields of mathematics with special emphasis on some selected area in which the student will be prepared for, and participate in, creative mathematical research. In this Department, doctoral work that is mathematics, can be in pure mathematics, applied mathematics, and mathematics education. More specifically, the area of specialization may be chosen from among algebra, analysis, approximation theory, college mathematics teaching, complex analysis, differential equations, graph theory, group theory, optimization theory, and topological theory. Alternately, a student may pursue a Ph.D. in Mathematics with Concentration in Graph Theory and Computer Science or with Concentration in Statistics. These two programs are described below.

Admission requirements
A student may enter this program with a master's degree or directly upon completion of a bachelor's program. In addition to satisfying the general admission requirements of The Graduate College, the student must have acquired a sufficient level of mathematical training with satisfactory grades as determined by the Department Doctoral Committee. Upon entrance to the program the student is assigned an adviser who assists him/her in planning his/her program until he/she reaches the stage of having a Dissertation Adviser appointed.

Program requirements
A minimum of ninety hours is required in this program. As early as possible in his/her program the student must pass the Departmental Graduate Examinations in Algebra, Real Analysis, Complex Analysis, and a semester course in Complex Analysis; (2) an approved graduate sequence in some area other than those specified in (1). (3) one approved graduate course in Discrete Mathematics, Probability, or Statistics. For students specializing in college mathematics teaching these requirements are (1) two-semester graduate sequences in Algebra and in one other approved area in which preliminary examinations are offered (usually analysis, graph theory or topology); and a semester course in Complex Analysis; (2) three additional advanced courses including at least one graduate course in each of Advanced Mathematics, Probability/Statistics, and Computer Science. The balance of the student's program will consist of advanced courses, seminars, and research leading ultimately to a dissertation constituting a significant contribution to some field of mathematics.

Each student must pass the Departmental Preliminary Examination. For a student concentrating in Algebra, Analysis, or Topology, the Preliminary Examination will consist of three written examinations in each of these three areas; for a student concentrating in some other area, the Preliminary Examination will consist of three-hour examinations in his/her specialty, in Analysis, and in either Algebra or Topology (the choice being subject to the approval of the Departmental Doctoral Committee); for a student concentrating in college mathematics teaching, the Preliminary Examination will consist of a three-hour examination in each of the following: Mathematics Education, Algebra, and one other approved area. A student must take each Preliminary Examination at least once, and the first time it is offered following his/her completion of the required course work in that field. If the student fails an examination, he/she may be permitted to take a second examination in that area at a time designated by the Committee. A student may not take any part of the Preliminary Examination more than twice. A second failure in any area results in dismissal from the doctoral program. After successfully completing this examination, the student is assigned a Dissertation Adviser and a Dissertation Committee who supervise his/her final research and dissertation.

In accordance with the requirements of The Graduate College, each student is required to attain competency in two research tools. Normally these will consist of two foreign languages selected from French, German, and Russian. One of these may be replaced by demonstrated competence in computer usage, subject to approval of the Doctoral Committee. Students in mathematics education may meet these requirements by demonstrating competence in computer usage and statistics.

Many mathematics Ph.D.'s will eventually undertake research outside the United States. Therefore, to train graduate students adequately to meet the demands of this kind of research, the Department expects each student to complete four foreign language examinations or to demonstrate his/her ability to engage in research that uses languages that are not English.

Students in mathematics education may meet the research tools requirement by demonstrating competence in computer usage, subject to approval of the Doctoral Committee. Students in mathematics education may meet these requirements by demonstrating competence in computer usage and statistics.

A student who completes all basic course requirements, the Preliminary Examination, and otherwise satisfies the requirements of The Graduate College is designated as a candidate for the doctoral degree. The selection of a dissertation adviser is by mutual consent of the student and faculty member. If a student needs assistance in this matter, then he or she will make an appointment with the Graduate Program Coordinator. When a faculty member accepts a doctoral student, he or she in writing, to the chair of the Doctoral Committee and the Graduate Program Coordinator. Prior to beginning work on a dissertation, a student commonly discusses possible directions for research with his or her adviser, does background reading on the subject and, with the aid of the adviser, develops questions for possible research.

When enough results have been obtained that the direction of the dissertation is clear, a Dissertation Committee is proposed and submitted to the Doctoral Committee for approval. This is done during the semester or session preceding the anticipated defense. The Dissertation Committee must contain at least five members. The dissertation adviser is the Chair of this Committee. Another member is designated as 2nd Reader. The Committee must contain a member from outside the Department of Mathematics and Statistics (possibly outside the University). This member is designated as the Outside Reader.

The Chair and 2nd Reader submit written reports on the dissertation certifying that the work constitutes acceptable research for a Ph.D. dissertation. Receipt of these reports will precede the announcement of the defense by ten working days. A defense will not be scheduled unless all program requirements have been satisfied.

A dissertation defense should only be scheduled at a time when at least four Committee members (including the adviser) are present. A defense cannot be held unless three Committee members (including the adviser) are present. If a Committee member is not present at the defense, then this member must have submitted a positive report to the Chair of the Committee at the time of the defense. The candidate for the Ph.D. will be introduced by the adviser, and the candidate will give a public lecture on his or her dissertation. Following this presentation, a period of time will be allowed for questions to the candidate by those in attendance. After a brief break, the candidate will be examined on the dissertation and related topics by the Committee and any other faculty members. At the conclusion of the examination, the candidate will be excused while the Committee determines the acceptability of the dissertation and the defense. Unanimous approval of the Committee is required for both the dissertation and the defense.

Financial assistance
The Department of Mathematics and Statistics offers opportunities for financial support of graduate students through Graduate Assistantships, University Fellowships and Associateships, and other Fellowships. Individuals desiring further information about such opportunities, or about the program as a whole should contact the Department Office (3319 Everett Tower).

Concentration In Graph Theory and Computer Science

Advisers:
Gary Chartrand, S.F. Kapoor, Allen J. Schwenk
Room 3319, Everett Tower; Alfred J. Boals, Ajay Gupta, Naveed Sherwani, Kenneth L. Williams
Room 4045, Friedmann Hall

Courses in this program emphasize a strong cross-section of discrete mathematics and computer science. Increasing demand for employees in business, industry, and academic settings with background in computer science and in applied mathematics ensures that graduates from this new doctoral option will be particularly attractive to employers.

Admission requirements
A student may enter the doctoral program, Graph Theory and Computer Science option, with a master's degree or directly upon completion of a bachelor's degree. In addition to satisfying the general admission requirements of The Graduate College and the Mathematics Department, the student must have acquired a sufficient level of training in mathematics, as well as a knowledge of a high level programming language (preferably both PASCAL and FORTRAN), an assembly language and data structures. Three letters of recommendation are required.

Advising
Upon entrance into the doctoral program, Graph Theory and Computer Science option, the student will be assigned a program adviser who will help the student plan his or her program until the student has a dissertation adviser.

Program requirements
1. Departmental Graduate Examinations: As early as possible, a student must pass Departmental Graduate Examinations in:
   a. Linear Algebra (530),
   b. Topology (622), and
   c. Real Analysis (673).
2. Courses in Reading and Dissertation (minimum of 90 hours):
The Statistics Doctoral Subcommittee will be completed (or be completing) a master's degree in statistics or a closely related field. Applications must include three letters of recommendation by the Department Doctoral Committee. Grades, progress towards completion, etc. will be considered in this decision.

Financial assistance

The Department of Mathematics and Statistics offers opportunities for financial support of graduate students through Graduate Assistantships, University Fellowships and Associateships, and other Fellowships. Individuals desiring further information about such opportunities, or about the program as a whole should contact the Department Office (3319 Everett Tower).

Mathematics Education

Advisers:
Robert Laing, Ruth Meyer
Room 3319, Everett Tower

The Doctor of Philosophy in Mathematics Education focuses on K-12 curriculum development and its teaching, as well as psychological foundations and theories of the learning of mathematics. This program will prepare students to teach and conduct research in mathematics education at the university level and serve as consultants in K-12 school systems.

Admission Requirements

A student may enter the program with either a bachelor's or master's degree. In addition to satisfying the general admission requirements of The Graduate College, the student must have a mathematics background at least equivalent to that provided by the secondary mathematics teaching major at Western Michigan University. Classroom teaching experience at the elementary, middle or high school level is required for admission.

Program Requirements

Coursework and Dissertation

The program includes:

1. Six approved graduate mathematics courses selected from algebra, analysis, applied mathematics, computational mathematics, geometry, graph theory, number theory, probability, and topology;
2. an approved two-semester 600-level graduate sequence in analysis, algebra, graph theory, or computational mathematics;
3. two approved graduate courses in statistics;
4. fifteen graduate credit hours in mathematics education;
5. twelve graduate credit hours in professional education;
6. participation in research seminars for at least 6 graduate credit hours;
7. a dissertation (15 credit hours) in mathematics education.

Department Examinations

1. Students must pass one Department Graduate Exam (DGE) in linear and abstract
algebra and one DGE selected from analysis, statistics or topology.

2. After coursework is completed students must pass three preliminary examinations: one in K-12 mathematics curriculum and its teaching, another in psychological foundations and mathematical learning, and the third in mathematics education research and design.

Research Tools
Students must demonstrate competency in the two research tools of statistics and computer usage.

Financial Assistance
The Department of Mathematics and Statistics offers opportunities for financial support of graduate students through Graduate Assistantships, University Fellowships and Associateships, and other Fellowships. Individuals desiring further information about such opportunities, or about the program as a whole, should contact the Department Office (3319 Everett Tower).

Physics
Adviser: D. W. Haiderson

The Department of Physics offers a program leading to the degree Doctor of Philosophy in Physics. The main objective of this program is to prepare students for careers in teaching and/or research at colleges and universities and research in industry. Research is an integral part of the program and may be performed in either experimental physics or theoretical physics. In experimental physics the area of specialization may be atomic physics, nuclear physics, or applied physics and in theoretical physics the area may be nuclear physics or condensed matter physics. Special facilities available for research include a model EN tandem accelerator. The graduate adviser of the Physics Department will counsel the student until a research adviser is selected.

Admission Requirements
Students entering this program are expected to have acquired a bachelor's degree in physics or an equivalent amount of experience and training (including training in mathematics at the appropriate level). Prospective students are required to take the Graduate Record Examination General Test. Performance on this examination will be used as one measure in the determination of admission and financial support. It is also recommended that students take the Physics Subject Test part of the Graduate Record Examination. The departmental graduate adviser will provide assistance to students seeking admission to this program and will recommend ways of eliminating any deficiencies in course work.

Program Requirements
The Doctor of Philosophy in Physics requires a minimum of 90 hours of graduate credit. These credits are composed of course work, supervised reading, seminars, and research. The Graduate College requires an overall point-hour ratio of 3.25 in all graduate work. The research must culminate in a dissertation suitable for publication. The required 90 hours of graduate credit shall consist of the following:

1. A core of basic courses listed below (34 credit hours).
2. Physics 730 Doctoral Dissertation (15 credit hours).
3. Additional courses chosen from:
   a. Research courses (PHYS 680, 681, or 682)

b. Courses mutually agreed upon by the student and the departmental graduate adviser.

   The basic core courses are:
   - PHYS 610 Research Seminar
   - PHYS 615 Mathematical Physics
   - PHYS 622 Quantum Mechanics I
   - PHYS 623 Quantum Mechanics II
   - PHYS 624 Statistical Mechanics
   - PHYS 630 Classical Mechanics
   - PHYS 650 Relativistic Quantum Mechanics
   - PHYS 662 Electricity and Magnetism I
   - PHYS 666 Electricity and Magnetism II
   - PHYS 671 Nuclear Physics
   - PHYS 672 Solid State Physics

The research tool requirements must be met by demonstrated competency in two of the following research tools: FORTRAN programming at the level of CS 506; a non-native foreign language at the level of FREN 400, GER 400, etc.; differential equations at the level of MATH 574; or the use of physics research equipment at a level equivalent to PHYS 566.

   The courses PHYS 615, 622, 624, 630, and 662 usually are taken during the student's first year. Upon completion of these courses the student is required to take the Qualifying Examination. The Qualifying Examination consists of two testing sessions of four hours each and will cover the contents of the five courses. This examination is a written examination; however, if deemed necessary for a more precise judgment, the student may be required to take an additional oral examination. The examination must be passed before any hours of research are taken. A student is allowed to take the Qualifying Examination only twice. It is recommended that the Qualifying Examination be taken at the end of the first year. This examination may not be taken later than the beginning of the student's third year. The grade awarded on the Qualifying Examination is based not only on the student's performance on the written examination, but also on his or her performance in courses. The grade represents the faculty's judgment, based on all available evidence, on whether or not a student should become a doctoral candidate. After successful completion of the Qualifying Examination, the student will, upon counsel with the graduate adviser and with the consent of the faculty member involved, select a research adviser. The adviser must be a member of the graduate faculty. With the agreement of the graduate college, the adviser and three additional graduate faculty members, at least one of whom is from outside the Physics Department.

As soon as possible after completion of all the core courses, the student must take the Comprehensive Examination. This examination consists of questions from these core courses. A student will be given a grade of pass or fail. If a student fails the Comprehensive Examination, it may be repeated only once. At the completion of the dissertation, the student will take a Final Oral Examination. During this examination, the dissertation committee will ask questions concerning the dissertation and concerning the student's research area. Members of the committee should be provided with copies of the dissertation at least one month in advance of the examination. The dissertation and the student's knowledge of the subject areas must be deemed acceptable by the committee.

The requirements and procedures for submission of a dissertation to The Graduate College can be obtained from that College.
The research activity of the doctoral student is continuous and is encouraged through participation in the apprentice research program, completion of a six credit hour Master’s Thesis, the completion of approved practicum, and completion of a fifteen credit hour dissertation. In addition to the required hours of formal course work, research activity, and professional experience, the student is required to demonstrate competence in each research tool selected from foreign languages, American sign language, computer usage, or advanced statistics. The doctoral candidate will also show evidence of an ability to interpret, integrate, and discuss research data by the satisfactory completion of comprehensive examinations in two areas of concentration and the preparation of a review paper of publishable quality.

The program is arranged to provide formal education of the student as he/she progresses from baccalaureate apprentice to doctoral applicant with the completion of the Master’s Thesis and to doctoral candidate degree with completion of the comprehensive examinations and the review paper. The award of the Ph.D. degree is made following the satisfactory completion of the required hours of approved course credit, demonstration of competence in two research tools, submission of an approved review paper and two area examinations, and the oral defense of the dissertation before the student’s doctoral committee at a public presentation.

Graduate students in all programs of the department are expected to abide by the “Ethical Principles of Psychologists,” containing The Guidelines for the Use of Human Subjects, and the Care and Use of Animals in Research, and the “Standards for Providers of Psychological Services” as published by the American Psychological Association. The Department expects students to be familiar with the content of these documents and to abide by the principles contained therein as they apply to academic, professional service or research activities which are not awarded academic credit but are completed during the student’s formal tenure within the programs of the Department of Psychology at Western Michigan University. The members of the department faculty conduct an annual review of student progress and recommend to The Graduate College advancement from program applicant to candidacy for a degree with each program. This evaluation includes a review of academic performance, professional responsibility and adherence to the accepted ethical and professional guidelines of the discipline and the profession as published by the American Psychological Association and, when relevant, the rules for licensure within the State of Michigan. Failure to meet these standards and ethical principles of the American Psychological Association and the State or failure to abide by “A Student Guide to Academic Honesty” and “University Policy on Sexual Harassment and Sexism” published by Western Michigan University may lead to disciplinary action and/or dismissal from the program. Disciplinary reviews, including due process hearing for the student, are conducted by the Department’s Graduate Training Committee and a summary of the findings and disciplinary action and/or dismissal from the academic, professional service or research activities area of the findings and disciplinary action and/or dismissal from the academic, professional service or research activities area, are prepared and available for review by the student.

Additional information concerning financial assistance through Department assistantships and program fellowships may be obtained from the Department office.

Public Administration

Adviser: Fredric Mortimore
School of Public Affairs and Administration
B-1, Hillade Building-East

The Doctor of Public Administration is designed for those who have experience in an administrative or high-level staff position with federal, state, or local government or counterpart responsibilities in the private nonprofit or private sectors. A major purpose of the doctoral degree is to fill the state’s upper-level management and staff positions with public executives who possess excellent skills in leadership, public management, and policy analysis. Courses in the DPA program focus on strategic planning and management, administrative leadership, and policy analysis. The program is structured to provide decision makers with a more sophisticated understanding of the total governing process. Completion of the DPA will provide graduates with the background to analyze a wider range of alternative policies and to weigh competing choices in the decision-making process. Courses are taught by faculty graduate members drawn from several departments and colleges at Western Michigan University. The program is offered only in Lansing and is administered by the School of Public Affairs and Administration through the WMU Lansing Study Center. Although the program is primarily intended for upper-level state employees, others are welcome to apply. Admission and other program requirements for the DPA include those applicable to doctoral study at WMU contained in The Graduate College Bulletin, plus those outlined below:

Admission Requirements
1. Master’s degree in Public Administration or related area.
2. At least four years of experience in a supervisory or administrative staff position.
3. Two academic references and two letters of recommendation by persons acquainted with applicant’s professional work.
4. A career resume.

Program requirements
1. Sixty semester hours of course work beyond the master’s.
2. Satisfactory performance on comprehensive examinations in Strategic Planning and Management, Policy Research, and Administrative Leadership. The sixty hours of course work are divided into five core areas which contain the following courses:

   STRATEGIC PLANNING AND MANAGEMENT CORE (12 hours)
   - PADM 670 Public Policy and Strategic Planning (3 hrs.)
   - PADM 683 Seminar in Administrative Theory and Practice (3 hrs.)
   - PADM 674 Human Behavior in Public Organizations (3 hrs.)
   - PADM 684 Management of Public Financial Resources (3 hrs.)

   ADMINISTRATIVE LEADERSHIP CORE (9 hours)
   - PADM 677 The Public Administrator (3 hrs.)
   - PADM 685 Bureaucracy and Society (3 hrs.)
   - PADM 686 Intellectual Foundations of Public Administration (3 hrs.)

   POLICY RESEARCH CORE (15 hours)
   - PADM 678 Program Evaluation (3 hrs.)
   - PADM 691 Statistics for Public Administrators (3 hrs.)
   - PADM 699 Action Research Project (3 hrs.)
   - PADM 673 Quantitative Public Policy Analysis (3 hrs.)
   - PADM 694 Qualitative Research Methods (3 hrs.)

   ELECTIVE CORE (9 hours)
   Course sequences in four areas:
   - Administration, Quantitative Analysis, Health Policy and Administration, and Policy and Administration.

   DISSERTATION CORE (15 hours)
   - PADM 730 Doctoral Dissertation (15 hrs.)

The first three years of the program involve course work with classes meeting two evenings per week. The fourth year will be devoted to the dissertation. This work involves a review of the literature in a policy area and then research and interpretation of the findings in that policy area. The course schedule will entail two courses or their equivalent each semester. Advising will be done at the WMU Lansing Study Center.

Science Education

Adviser: Robert H. Poesi, Room A-428 Ellsworth Hall

The Doctor of Philosophy in Science Education involves a minimum of ninety semester hours of graduate work in a broad based science program with course elections in more than one science. Three options of specialization or concentration are possible. In the first option, 30 hours of graduate work in one science, selected from Biological Sciences, Chemistry, Geology, or Physics are required. Ten hours of graduate work in each of two other sciences must also be elected. The elections are designed to provide depth in one science area and a breadth in other sciences in order to prepare graduates of the program to be (1) directors of science education or department heads in large school systems or in state agencies, (2) college instructors who are likely to teach science and science education methods courses for both preservice and inservice teachers, (3) teachers of college science courses, or (4) researchers in the area of science education.

A second option emphasizes environmental science. This option requires graduate work in two sciences, 20 semester hours in one and 10 in another selected from the departments mentioned above, and additional courses dealing with environmental issues offered in departments such as: Geography, Geology, the Social Sciences, and Biological Sciences. This option is designed to prepare graduates to be (1) developers, teachers, and/or administrators of academic environmental science programs, (2) consultants in environmental education, (3) advisors to developing nature centers and other environmental education centers, (4) supervisors of student teachers in conservation or elementary and secondary school environmental science programs, or (5) environmental managers, including individuals with background in the areas of management of energy and material resources.

The third option, the biological sciences option, requires a concentration of 40 graduate hours in biological sciences, behavioral sciences, related fields such as biostatistics and health related issues in addition to graduate work in education and research techniques. This option
is centered on an in-depth study of at least 20 graduate hours in either the biological or biomedical sciences and at least 10 graduate hours in the other. It is designed for students who want background depth in the biological sciences or are involved in training and educating technicians, practitioners, and professionals in health related fields and who need to communicate these concepts in administrative programs, or develop, implement, and/or evaluate curricula and programs in these areas.

Admission requirements
The minimum admission requirements to this degree program are an undergraduate major in one science (Biological Sciences, Chemistry, Earth Science, Geology, or Physics) and an undergraduate minor in a second science. Students electing Option I should have a minor in a third science and a minimum of one year of undergraduate work in a fourth science. It is expected that all students in the program will have some undergraduate preparation in Biological Sciences, Chemistry, Geology, Physics, and Mathematics. Students entering with less than these requirements will be expected to complete them at the undergraduate level. Undergraduate deficiencies may be made up after admission to the doctoral program. In addition, all students are expected to meet the regular admission requirements established by The Graduate College.

Program requirements
Individual programs are planned by the adviser (Coordinator of Graduate Science Education) and the student in consultation with faculty representatives from the various science departments and the College of Education. The basic program of 90 semester hours of graduate work consists of the following:

1. Science and related areas:
   - **Option I:** Twenty hours of graduate credit in one of the following sciences: Biological Sciences, Chemistry, Geology (Earth Science), or Physics and ten semester hours of graduate credit in each of two other sciences.
   - **Option II:** Twenty hours of graduate work in Biological Sciences, Chemistry, Geology (Earth Science), or Physics and ten hours of graduate credit in a second science. Ten hours of courses dealing with environmental issues offered in such departments as Geography, Geology, the Social Sciences, and Biological Sciences.
   - **Option III:** A minimum of 30 semester hours of graduate credit in biological sciences, and at least 10 hours of graduate credit in another approved science area such as biochemistry, biostatistics, or health related techniques or issues.

2. Professional Education: Twenty hours of research related courses at the graduate level.
3. Research tools: Six to twelve hours. Students are required to demonstrate competency in two research tools, and this is usually done by satisfactorily completing one or two courses in each research tool area. The two research tools generally elected are statistics and computer programming.
4. Doctoral Seminar: Four to eight hours.
5. Dissertation: Fifteen hours.
6. Electives: Zero to five hours to make a total of ninety hours and to include additional courses from science, education, research, or other appropriate areas.

At the end of the second year of full-time graduate study or at the time the course work is completed, the student will take the Comprehensive Examinations. These examinations consists of two parts, one of which is written and the other oral. The written part of the examination consists of two sections, one over the science areas studied and the other in the area of Science Education. The oral examination consists of the presentation and defense of an original research proposal other than the dissertation research.

The research and dissertation are completed under the direction of a major adviser and a committee. The major adviser is selected by the student, with the approval of the Program Director, and the Committee members are selected by the student in consultation with the major adviser, and with the approval of the Program Director. The research problem generally is formulated by the student and is in an area of Science Education, Environmental Science, Biomedical Science, or a science topic approved by the student's Doctoral Advisory Committee.

The residency requirement for this degree program is an academic year of two consecutive semesters of full-time study on the campus.

To be admitted to candidacy for the doctoral degree, the student must complete the course work, the research tools, the comprehensive examination, and also two years of successful teaching experience in addition to the other requirements of all doctoral degree programs. Exceptions to the teaching requirement may be made on an individual basis for students in Option II and III.

Sociology

**Director and Adviser, Graduate Studies: David Chaplin, 2412 Sangren Hall**

The Ph.D. program in Sociology is designed to prepare students for careers in sociological research and teaching. Broad training in sociology is provided through a wide variety of courses and research experiences. Each student's program is individually guided by a doctoral committee.

A basic feature is the core training in general sociology, theory, research methods, and social psychology. Concentration is required in only one of these areas for the Ph.D. degree. Two are selected by the student from the departmental areas of concentration: Applied Sociology, criminology, medical sociology, social psychology, sociology of science, sociology of knowledge, comparative sociology, race relations and theory, as well as others approved by the student's doctoral committee.

Course work in a cognate area, approved by the student's doctoral committee, is also required. The areas of concentration are important and active ones in the field, and thus provide students with valuable specialties to augment the doctoral training in the discipline as a whole.

**Admission requirements**

1. Master's degree in Sociology.
2. Grade-point average of 3.25 in all graduate work.
3. Applicants who hold a master's degree in a related field may be admitted to the program, but may be required to make up deficiencies as a condition of admission.
4. Applicants must supply three letters of recommendation from academic and/or professional sources to Graduate Admissions Committee, Department of Sociology.

**Program requirements**

1. Complete, beyond the master's degree, at least sixty hours of course and dissertation credits, courses in addition to the required core courses are selected in consultation with the student's doctoral committee.
2. Demonstrate competence in two research tools selected from a foreign language other than English, research methodology, statistics, and computer programming.
3. Pass oral and written examinations in two departmental areas of concentration.
4. Write and successfully defend an original dissertation to the satisfaction of the doctoral committee and The Graduate College.

Financial support
A number of departmental, University, and graduate assistantships, teaching fellowships, and associateships are available to qualified students. Educational opportunities and part-time employment may be available through the faculty adviser, Mr. Kercher Center for Social Research. Research through the Center includes studies of education, mental illness, marital roles, race relations, group dynamics, deviant behavior, comparative studies, and numerous other topics. Graduate students frequently participate in these studies.

Additional information and application forms may be obtained from the department chair.

Special Education

**Advisors:**

Alonzo Hannaford, Christine Bahr, Barbara Harris, Dona Icbone, Abraham Nicolaou, Elizabeth Patterson, Donald Sellin, 3506 Sangren Hall

The Doctor of Education in Special Education is designed to prepare an individual to serve as a college teacher in a Department of Special Education and as a director of educational programs for the handicapped.

Application for admission to the Ed.D. program must be submitted to The Graduate College. Prospective students are expected to satisfy all requirements for admission to doctoral programs specified by The Graduate College. They must also have a minimum of two years of successful professional experience in serving handicapped persons. Admission to the program is contingent upon a satisfactory score on the Graduate Record Examination and the successful completion of a personal interview with a committee comprised of graduate faculty of the Department of Special Education.

Upon acceptance to the Department, a Program Adviser will be designated to work with the student in developing the student's overall program. In addition to the prescribed course work, the student will complete an internship in college teaching and an internship in administration of programs in special education. During the last semester of course work, the student will be required to complete successfully a written comprehensive examination.

All students in the program will be required to complete successfully a scholarly dissertation. Following the guidelines established by The Graduate College, the student must select a dissertation adviser and a dissertation committee who will guide the student in the development of a dissertation. Following the completion of the dissertation, the student will be required to complete successfully an oral defense of the dissertation as per Graduate College policy.
Section V
Description of Graduate Courses

COLLEGE OF ARTS AND SCIENCES

Douglas P. Ferraro, Dean
David O. Lyon, Associate Dean
Earl M. Washington, Assistant Dean

Graduate Offerings:
Anthropology, Arts and Sciences, Biological Sciences, Black Americana Studies, Chemistry, Communication, Computer Science, Economics, English, Geography, Geology, History, Languages and Linguistics, Mathematics and Statistics, Medieval Studies, Philosophy, Physics, Political Science, Psychology, Public Affairs and Administration, Religion, Science Division, Social Science Division, Sociology

The College of Arts and Sciences offers a variety of subjects that familiarize the graduate student with the world of ideas and deepen his/her understanding of our cultural heritage. Graduate programs are offered in Anthropology, Biological Sciences, Biostatistics, Chemistry, Communication, Comparative Religion, Computer Science, Development Administration, Earth Science, Economics, English, English as a Second Language, Geography, Geology, History, Mathematics, Medieval Studies, Philosophy, Physics, Political Science, Psychology, Public Administration, School Psychology, Science Education, Spanish, Sociology, and Statistics.

The College of Arts and Sciences cooperates with the College of Education in offering the program in Teaching of Geography.

Anthropology (ANTH)

Professors Cremin, Garland, W. Garland, Greenberg, Helvec, Jacobs, Loeffler, Sundick; Associate Professors Israel, Zaragrell; Assistant Professor Constable; Adjunct Professor and Visiting Scholar in Anthropology, Clifton.

Open to Upperclass and Graduate Students

ANTH 500 Topics in Archeology 3 hrs.
A consideration of the prehistory of a particular geographic area (e.g., the southwestern United States, the Circumpolar) or of selected theoretical problems (e.g., artifact typology, prehistoric ecology). The topic to be studied will be announced each semester. May be repeated for credit. Prerequisite: ANTH 110, 210, or consent of instructor.

ANTH 501 The Rise of Civilization 3 hrs.
The archeological science in one or more of the nuclear centers of prehistoric civilization will be considered in some detail. The course may focus intensively upon one area, or it may give equal emphasis to two or more areas in a comparative framework. The specific area or areas to be studied will be announced each semester. May be repeated. Prerequisites: ANTH 110, 210, or consent of instructor.

ANTH 502 The Origins of Agriculture 3 hrs.
An intensive study of the human transition from hunting-gathering to cultivation during the post-Pleistocene period. Topics to be treated include: both archeological and botanical models to explain these processes; the comparison of agricultural systems in various parts of the world; the geographic distribution and biosystematics of selected cultivars; and the cultural systems which have arisen from the economic foundation of plant domestication. Prerequisite: ANTH 110, 210, or consent of instructor.

ANTH 510 Field Methods in Archeology 3 hrs.
Instruction in the archeology of a particular area (e.g., the Great Lakes, Midwest Riverine area) with emphasis on cultural processes and ecological relationships as these emerge during the course of field work on the specific problems chosen for investigation in a given field season. May be repeated for credit. Prerequisites: Consent of instructor.

ANTH 511 Field Methods in Archeology 3 hrs.
Implementation of the field research strategy. Instruction in the basic skills of site excavation, mapping, and retrieval and recording of data; also laboratory analysis, including classification and cataloguing of artifacts. Depending upon the problem orientation in a given field season, instruction may include site location survey, site sampling techniques, and paleoenvironmental reconstruction. To be taken concurrently with ANTH 510. May be repeated for credit. Prerequisite: Consent of instructor.

ANTH 520 Social Science Theory 3 hrs.
The philosophical/theoretical and conceptual foundations of the social sciences in general will be discussed with special emphasis on contemporary anthropology, including traditional as well as post structuralist ways of thinking. Prerequisite: ANTH 240 or social science equivalent.

ANTH 522 Research Methods in Ethnography 3 hrs.
A course dealing with research design and ethnographic techniques in the context of the relationship between field research and sociocultural theory. Prerequisite: ANTH 120, 220, 240, or consent of instructor.

ANTH 531 Medical Anthropology 3 hrs.
An examination of anthropological research relating to cross-cultural beliefs and practices about health and illness and the relationship between folk and scientific medical care systems. Included is analysis of public health programs in Western and developing societies, the effect of institutional/bureaucratic social structure on the adequacy of health care systems, and patients' right in this age of extraordinary medical technology. Prerequisites: ANTH 220, 240, or consent of instructor.

ANTH 536 Cultural Evolution 3 hrs.
An inquiry into the dynamics of culture through a study of selected theories of cultural change and their application to concrete situations such as the rise of complex civilizations and the reactions of non-Western societies to contact with the West. Prerequisites: ANTH 220, 240, or consent of instructor.

ANTH 538 Law and Politics 3 hrs.
The scientific study of law and politics through comparative cultural dynamics, ranging from simple to complex societies. Examples from primarily non-Western societies will be studied. Prerequisite: ANTH 240 or consent of instructor.

ANTH 540 Social Impact Assessment 3 hrs.
The application of anthropological knowledge to assess and evaluate the sociocultural effects of proposed developmental policy, programs, or projects as they relate to environmental impact assessment while in the planning stage, to improve project design, and mitigate undesired secondary effects.

ANTH 542 Development Anthropology 3 hrs.
An examination of the role of social science when applied to the solution of specific development problems, particularly in the Non-Western World. Explores a wide range of
Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

ANTH 700 Master’s Thesis
6 hrs.

ANTH 710 Independent Research
2-6 hrs.

**Arts and Sciences (A-S)**

**Open to Undergraduate and Graduate Students**

**American Studies**

A-S 501 Studies in American Culture
1-4 hrs.

An interdisciplinary study of perennial issues in American life. The materials for this course are drawn from literature, the arts, the social sciences, philosophy, and religion. This course must be approved by the American Studies Program Adviser.

**Environmental Studies**

ENVS 650 Contemporary Environmental Projects
1-4 hrs.

Contemporary Environmental Projects is designed for students who wish to carry on advanced investigation in the work in Environmental Studies under the direction of a faculty member. Work will be geared to a single project in which there is outside investigation, research, field experiences, and/or workshop experiences. Students selecting this course will work on projects especially designed for their programs. The goal of this course is to identify a problem, outline the approach to study, and to consider paths to solving the problem. The course is repeatable for up to eight hours of academic credit. Prerequisite: Consent of instructor and approval of the Director of the Environmental Studies Program.

**Foreign Studies Seminars**

Students may receive up to six hours credit in any combination of departments as described provided the seminar is planned with that combination in mind. No student will receive credit under any of the course plans indicated here for work done in seminars planned and conducted by other institutions or for work done independent of seminars planned by the College of Arts and Sciences.

A-S 504 Foreign Studies Seminar
1-6 hrs.

Seminars in the Social Sciences conducted outside the U.S. Students who complete such a seminar may receive credit in the departments of Anthropology, Economics, Geography, History, Political Science, or Sociology if the credit is approved by the chairperson of the department prior to registering for the seminar. May be repeated for credit.

A-S 505 Foreign Studies Seminar
1-6 hrs.

Seminars in the Humanities conducted outside the U.S. Students completing such a seminar may receive credit in the departments of Communication, English, Languages and Linguistics, Philosophy, Religion, and the departments of the College of Fine Arts if the credit is approved by the chairperson of the department prior to registering for the seminar. May be repeated for credit.

**Biological Sciences (BIOS)**

Pippen, Chairperson; Professors Beving, Brewer, Ehrl, Eisenberg, Engerman, Fischer, Friedman, Wood; Associate Professors Cowan, Ginsberg, Inselberg, Jackson, McIntire; Assistant Professors Essani and Johnson.

Open to Undergraduate and Graduate Students

BIOS 507 The Biology of Addictive Drugs
3 hrs. Winter

The study of modes of action and effects of psychoactive drugs, such as alcohol, marijuana, cocaine, amphetamines, heroin, methadone, LSD, PCP, and nicotine.

Prerequisites: An introductory physiology course or enrollment in Specialty Program in Alcohol and Drug Abuse or consent of instructor.

BIOS 509 Evolution
3 hrs. Winter (alternate years)

A consideration of the theory of evolution by natural selection, including discussions of the mechanisms of evolution and predictions generated by the theory. Prerequisites: BIOS 250 and BIOS 301 or consent of instructor.

BIOS 512 Environment and Health Problems
3 hrs.

The impact of the environment on the health of the individual and of populations, the resulting physiological and anatomical difficulties, and the various means employed in meeting these challenges. Prerequisites: 8 hours of Biological Sciences.

BIOS 515 Plants for Food and Industry
3 hrs.

Representative cereal, fiber, and industrial plants of primary economic importance will be examined, such as wheat, corn, soybeans, and grapes. Following discussion of plant composition and some of the important processes involved in plant growth, we will look into the botanical characteristics of each plant, the areas where it is grown and why, the special aspects of its composition and growth habits that account for its economic prominence, its value in human nutrition, and some of its special problems. The course is enriched with several demonstrations and lab experiences that include diverse practical applications. Prerequisites: BIOS 102 and a course in organic chemistry.

BIOS 518 Endocrinology
3 hrs. Fall (alternate years)

A survey of the hormonal integration of organ-system function, including the chemical nature of these secretions, the cellular and biochemical mechanisms of hormone actions, and the endocrine feedback control mechanisms. The regulatory nature of hormones in developmental processes, in adaptation, and in disease processes will be stressed. Prerequisite: BIOS 350; biochemistry recommended.

BIOS 520 Human Genetics
3 hrs. Winter (alternate years)

The principles of human heredity with particular emphasis on the clinical significance of biochemical and chromosomal variation. Abnormalities of development, test and methods of risk analysis in genetic counseling are discussed. Prerequisites: BIOS 250; biochemistry is recommended.

BIOS 524 Microbial Genetics
3 hrs. (alternate years)

A molecular approach to microbial genetics, dealing primarily with bacterial and viral systems. Emphasis is placed on current literature and on the application of concepts of
biomedical research. Prerequisites: BIOS 250 and 312 or consent of instructor; biochemistry is recommended.

BIOS 525 Genetics Laboratory 3 hrs. Fall (alternate years)
Students will acquire techniques currently used in the field of genetics. Although all areas of genetic interest will be presented, emphasis will be placed on the areas of cytogenetic, biochemic, genetic toxicology, and genetic counseling techniques which are currently used in industrial and biomedical research areas. In addition time will be provided for in depth experimentation. Prerequisite: BIOS 250 or equivalent.

BIOS 527 Systematic Botany 4 hrs.
Principles and techniques of plant classification, nomenclature, and bioecosystems are presented in lectures in the field, and laboratory exercises using vascular plants as examples. Evolutionary trends, family characteristics and experimental systematics of vascular plants are emphasized. Students will be expected to learn to recognize 100-150 plant species by common and scientific name. Prerequisite: BIOS 102 or equivalent.

BIOS 528 Biology of Non-Vascular Plants 4 hrs.
A detailed comparative study of the morphology, life cycles, and ecology of the algae, fungi, and bryophytes. Laboratory study will be complemented by field investigations. An independent project may be required. Prerequisite: BIOS 102.

BIOS 529 Biology of Vascular Plants 4 hrs.
A detailed comparative study of the morphology, life cycles, and phylogeny of the vascular plants. Laboratory study will be complemented by field trips. An independent project may be required. Prerequisite: BIOS 102.

BIOS 531 Biology of Aging 3 hrs. Fall (alternate years)
This course is designed to provide students with an understanding of the aging process. The discussions will emphasize the anatomical, physiological, and molecular changes which occur in cells and organs with aging. Clinical applications are introduced where they provide additional insight into the aging process. Prerequisites: An introductory physiology course or consent of instructor.

BIOS 532 Bacterial Physiology 3 hrs. Winter (alternate years)
Bacterial structure-function relationships are examined in a biochemical context. Current concepts of cell biochemistry are organized in the field of genetics. Although all areas of genetic interest will be presented, emphasis will be placed on the areas of cytogenetic, biochemic, genetic toxicology, and genetic counseling techniques which are currently used in industrial and biomedical research areas. In addition time will be provided for in-depth experimentation. Prerequisites: BIOS 250 or equivalent.

BIOS 533 Plant Nutrition 3 hrs.
The elements essential for plant growth and development, their uptake, and their main functions in the plant are examined. Some important relationships of plant nutrition to human nutrition will be pointed out. Throughout the course a balance between theory and application will be maintained. The cycling of elements in nature provides insights into ecological aspects of plant nutrition. Several demonstrations and lab experiments serve to enrich the course; for example, the students make up nutrient solutions, grow various plants in them, and observe the effects of nutrient deficiencies. Prerequisites: BIOS 102, CHEM 101, and a course in physiology.

BIOS 536 Immunology 3 hrs. Fall
A study of the biological and biochemical mechanisms of the immune response and the chemical nature of antibodies, antigens, and their interaction. Emphasis will be placed on in vitro and in vivo humoral and hypersensitivity reactions. Prerequisite: BIOS 312; biochemistry is recommended.

BIOS 537 Histology 3 hrs. Fall
A study of the function and microscopic anatomy of mammalian tissues. Prerequisite: BIOS 211 or consent of instructor.

BIOS 539 Animal Behavior 3 hrs. Winter (alternate years)
Animal behavior with emphasis on evolution and ecology. Includes an introduction to the ethological point of view. One student project. Prerequisite: Eight hours of biological sciences or consent of instructor.

BIOS 541 Invertebrate Zoology 3 hrs.
A study of the anatomy, physiology, embryology, and life history of representatives of the major groups of invertebrate animals. Prerequisite: Twelve hours of biological sciences, including BIOS 101.

BIOS 542 Entomology 4 hrs. Fall (alternate years)
A general study of insects, their structure, classification, life histories, ecological relationships and economic importance. Collection and identification of local species is included as a prerequisite. Eight hours of biological sciences, including BIOS 101.

BIOS 547 Ornithology 3 hrs.
An introductory course that explores both scientific and popular aspects of bird study. Life history, behavior, ecology, and identification are emphasized.

BIOS 548 Animal Ecology 3 hrs.
Principles of animal populations and communities, with emphasis on the interrelations of life history features (such as habitat selection and reproductive patterns) and population traits; competition and predation and their role in the evolution of community structure; and the roles of animals in the functioning of ecosystems. Methods of determining abundance are studied. Prerequisite: BIOS 201 or equivalent.

BIOS 549 Field Ecology 3 hrs.
Field studies of forest, native grassland, wetlands, and other local ecosystems. Plant and animal composition, geological history, human effects, successions, and other aspects of the structure and working of ecosystems are integrated. Field ecological methods are emphasized. Prerequisite: A course in ecology.

BIOS 553 Limnology 3 hrs.
Biological, chemical, and physical aspects of lakes, ponds, and streams. Ecological relationships of plants and animals are emphasized. Prerequisites: BIOS 101 and CHEM 101 recommended.

BIOS 554 Historical Techniques 2-3 hrs. Winter (alternate years)
A variety of techniques, including celluloid, paraffin, decalcification, and special stains, will be used to prepare mammalian tissues for histological examination. Prerequisite: BIOS 537 or consent of instructor.

BIOS 555 Marine Biology 4 hrs.
A survey of marine biology topics including the physical marine environment and general principles of marine ecology; marine plants and animals, with emphasis on their special roles and adaptations; major marine communities; and marine biotic resource conservation and utilization. Selected topics of current research are included.

BIOS 556 Tropical Biology 4 hrs.
A travel study course providing an introduction to both terrestrial and marine ecosystems in the tropics. The course, consisting of lectures, field explorations, and individual projects, examines the major life zones and biogeography of the region visited, from an ecological perspective. Tropical Rain, Montane, and Dry Forests and the biology of a coral reef will be studied. Human ecology, agriculture (tropical fruits and vegetables, sugar cane and coffee) and environmental issues will also be included. The course will be presented on one of the islands of the Caribbean and/or in Central America. Prerequisites: Two courses in biological sciences or consent of instructor.

BIOS 557 Water Pollution Biology 3 hrs.
A comparison of organisms which live in clean waters as contrasted with those in polluted waters. Streams, lakes and ponds will be studied. Water conditions will be analyzed, and the use of biological indicators will be studied. The course will include field trips, laboratory work and lecture presentations. Prerequisites: BIOS 101 and 102.

BIOS 570 General Pathology 4 hrs. Fall (alternate years)
An introduction to pathology which describes the structural and biochemical changes occurring in cells and tissues following injury or disease. Prerequisite: BIOS core curriculum and organic chemistry.

BIOS 574 Embryology 4 hrs. Fall
Embryology is the study of the development of an organism from a single fertilized cell to a complex multicellular fetus. The course will present this material from both a classical descriptive and experimental cellular point of view. In addition to the lecture, laboratory exercises will provide experience in the recognition of the various stages of development and in the culturing and manipulations of embryos in vitro and in vivo. Prerequisites: BIOS 213, 250, or equivalent.

BIOS 577 Comparative Animal Physiology 3 hrs.
An examination of how different groups of animals have adapted to different aspects of a dynamic environment. Prerequisites: One course in physiology and one course in organic chemistry.
BIOS 598 Readings in Biomedical Sciences
1-3 hrs.
Approved application required.

BIOS 599 Independent Studies in Biomedical Sciences
1-4 hrs.
Approved application required.

Open to Graduate Students Only

BIOS 601 Special Investigations (various areas)
2-6 hrs.
An independent study in one of the various specialties represented by members of the department. The field in which work is offered will be indicated on the student record. May be repeated for credit up to a maximum of six hours. Prerequisite: Consent of instructor.

BIOS 602 Seminar: Variable Topics
2-6 hrs.
Several seminars in various areas of Biological Sciences will be offered. The student’s record will indicate the seminars in which he/she has participated. May be repeated for credit. Prerequisite: Consent of instructor.

BIOS 603 Seminar in Substance Abuse I
3 hrs.
An interdisciplinary seminar designed to reflect broadly conceived intervention strategies ranging from primary prevention to rehabilitation of the addict. The basic training in the principles of intervention and clinical practice will continue to be taught within the student’s basic professional discipline. In part, the seminar will be used to elaborate upon the applications of these principles to the problems of substance abuse. This course is cross-listed with Counselor Education and Counseling Psychology, Social Work, and Sociology. Prerequisite: Admission to Specialty Program in Alcohol and Drug Abuse, or consent of instructor. Graded on a credit/no credit basis.

BIOS 604 Seminar in Substance Abuse II
3 hrs.
Continuation of BIOL 603. This course is cross-listed with Counselor Education and Counseling Psychology, Social Work and Sociology. Prerequisite: Admission to Specialty Program in Alcohol and Drug Abuse, or consent of instructor. Graded on a credit/no credit basis.

BIOS 610 Biomedical Science for Secondary Education
3 hrs.
Instructional laboratory techniques suitable for secondary education programs in health and human biology. This course is directed toward graduates with science degrees who teach secondary education units in health and human biology. Course content is variable to take advantage of new techniques, available instruction, and the interests of the students. Prerequisite: Consent of instructor.

BIOS 621 Mutagenesis/Carcinogenesis
3 hrs.
Through lectures, presentations by students, and reading of the current literature, the mechanisms of action, impact on human health as well as practical aspects of detection of mutagens and carcinogens are examined. Prerequisites: One course in genetics and one in biochemistry or consent of instructor.

BIOS 630 Electron Microscopic Techniques
3 hrs.
A technique oriented laboratory stressing the various preparatory procedures employed for viewing biological materials. Prerequisite: Consent of instructor.

BIOS 632 Advanced Techniques in Electron Microscopy
4 hrs.
A laboratory course emphasizing currently developing technology. This course is designed for graduate students who have a working knowledge of electron microscopy and its application to biologic problems. The course will be personalized in instruction in techniques of autoradiography; protein tracer, such as peroxidase, ferritin, lanthanum, etc.; special tissue preparations, such as in vivo perfusion, varied fixatives, varied embedding material, etc.; and particulate materials preparation. The student will conduct detailed examinations of his/her preparations and prepare critical critiques.

BIOS 633 Topics in Biomedical Sciences
3 hrs.
Courses in which a selected area of biological sciences is studied in depth. Possible topics will reflect the areas of expertise of the biological sciences faculty. The specific topic dealt with in a given semester will be indicated in the Schedule of Classes and on the student’s record. Students may take one or all topics offered for credit. Prerequisite: Consent of instructor.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

BIOS 700 Master’s Thesis
6 hrs.

BIOS 710 Independent Research
2-6 hrs.

BIOS 712 Professional Field Experience
2-12 hrs.

Black Americana Studies (BAS)

LeRoi R. Ray, Jr., Director; Professor Jones; Associate Professor Wilson.

BAS 500 Black Humanism
3 hrs.
An examination of the creative dimension of the Black Experience. Isolated and set apart in a hostile environment, Black Americans of African descent have been very creative in a wide range of human undertakings. This fact has been acknowledged and accepted, but this creativity has not had free range. One of the outcomes of the Black Revolution has been the emergence of “soul,” a concept to label the artistry and the artfulness of Black American life. The creative dimension has also included contributions to science and technology. Black humanism is a way of getting at the life-styles of Black communities and individuals and the viability of the Black presence and experience. What universal elements can be identified in “soul?” What would American life and culture be like without this elusive quality?

BAS 510 Multiethnic Education
3 hrs.
This course is designed to prepare teachers and administrators who will work in a multiethnic setting. The course is primarily aimed at helping teachers at any level who teach a social studies component, but teachers of other subjects (e.g., physical and biological sciences and special education and school administrators) will find the course useful. Students will learn how to compile data on the ethnic make-up and resources of the local community, develop instructional packages for use in multiethnic courses, and evaluate materials prepared for multi-ethnic audiences.

BAS 598 Individual Study
2-4 hrs.
Independent research or investigation of a specific topic related to the Black experience. May be repeated for credit.

Open to Graduate Students Only

BAS 600 Black Americana Studies-Seminar
4-6 hrs.
In depth study of specific areas of Black American life and culture. Since Black Americans have been involved in the total life of the nation, special study is called for. There are at least two dimensions which lend themselves to special study. The first and most obvious is that of unusual achievement by persons of known and identifiable African ancestry. A second and more elusive dimension is Black "influence"—positively and negatively—in American life and culture.

Chemistry (CHEM)

Professors Anderson, Berndt, Brown, Cooke, Harmon, Houser, Howell, Kanamuller, Lowry, McCarville, Stenhaus, Stenesh; Associate Professor Warren; Assistant Professor Kelly.

Open to Upperclass and Graduate Students

CHEM 501 Chemical Communications
1 hr.
Principles and techniques involved in writing and/or presenting technical information is discussed and practiced through a series of lectures and assignments. Prerequisite: Twenty-four hours of chemistry.

CHEM 505 Chemical Literature
2 hrs.
An introduction to the use of the various types of chemical literature such as journals, abstracts, monographs, government and institutional publications, and patents. Both manual and computer search techniques are employed in the course of completing assigned problems involving literature searches in analytical, biological, inorganic, organic, and physical chemistry fields. Prerequisite: Twenty-three hours of chemistry.

CHEM 506 Chemical Laboratory Safety
1 hr.
A study of toxic, corrosive, flammable, explosive, electrical, mechanical, thermal, and radiant energy hazards frequently encountered in chemical laboratory work. Emphasis is placed on precautionary methods to avoid damaging accidents and on emergency procedures to apply when accidents occur. Prerequisite: Twenty-four hours of chemistry.

CHEM 509 Topics in Chemistry
3 hrs.
A topic is presented in greater depth or from a perspective different from that of a typical undergraduate course. Representative topics, such as pesticides and drugs, industrial chemistry, chemical pollution, etc., according to student interests and requests. Prerequisite: Sixteen hours of chemistry or consent of instructor.

CHEM 510 Inorganic Chemistry
4 hrs.
The course includes descriptive and theoretical inorganic chemistry as well as preparation of different types of inorganic compounds. Prerequisite or concurrent enrollment: CHEM 431.

CHEM 520 Instrumental Methods in Chemistry
3 hrs.
An introduction to the theory and application of
CHEM 550 Qualitative and Spectroscopic Analysis of Organic Compounds 4 hrs.
A course in the spectroscopic and chemical methods of identification of organic compounds in the pure state and in mixtures which has as a secondary goal the development of deductive reasoning in the field of organic chemistry. Prerequisites: CHEM 561 and twenty-four hours of chemistry.

CHEM 554 Drugs and Pesticides 3 hrs.
This course introduces students to the chemical nature and uses of drugs and pesticides. Abuses and potential toxicological hazards are also discussed in respect to biological-chemical properties and the behavioral-sociological implications. Prerequisites: 361 or 365.

CHEM 570 Polymer Chemistry 3 hrs.
The aspects of macromolecular chemistry which are significantly different from the chemistry of small molecules are studied. In particular, mechanisms and techniques involved in the synthesis of macromolecules, and the structure, composition, mechanical properties, and solution properties of polymers are studied in terms of their organic, physical, and analytical chemistry involved. Prerequisites: CHEM 361 or 365, and CHEM 431 or 535.

CHEM 580 History of Chemistry 3 hrs.
This course is taught from the point of view of the history of chemical theory in which the evidence for the theories is critically presented. Prerequisite: Sixteen hours of chemistry, including at least one semester organic.

CHEM 590 Special Problems in Chemistry 2 hrs.
Research work on a problem in chemistry in association with a faculty member. May be repeated for credit. Graded on a Credit/No Credit basis. Prerequisites: Twenty-four hours of chemistry, which includes CHEM 436, and approval of the department chairperson and a faculty director.

Open to Graduate Students Only

CHEM 601 Graduate Seminar 1 hr.
Graduate seminar in chemistry. Required of all candidates for advanced degrees in chemistry. Graded on a Credit/No Credit basis. Prerequisites: CHEM 361 or 430 or 535.

CHEM 605 Advanced Chemistry Laboratory Technique 1 hr.
Content of course will vary depending on needs and interest of students. Topics may include glassblowing, laboratory electronics, vacuum line, manipulations under controlled atmosphere, separation and purification, and radio-chemical techniques. May be repeated for credit. Prerequisite: Approval of instructor.

CHEM 609 Advanced Topics in Chemistry 3 hrs.
Topics are presented at a more advanced level than that used for undergraduate courses. Representative topics would be Organometallic Chemistry, Theories of Liquids and Solutions, Organic Quantum Chemistry, etc., the offering of which would depend on student interest. Repeatable for credit. Prerequisite: Consent of instructor.

CHEM 610 Advanced Inorganic Chemistry 3 hrs.
Covers the principles in inorganic chemistry and the chemical elements. Such topics as extraneous structure of the atoms, periodic classification of the elements, valency and the chemical bond, complex ions and coordination compounds, acids and bases, and nonaqueous solvents are included in the study of chemical principles. The remainder of the course concerns the chemical elements and their compounds. Prerequisite: CHEM 510.

CHEM 611 Advanced Inorganic Chemistry 3 hrs.
The chemistry of the transition elements. Consideration of the electronic and magnetic states of the transition metals and their compounds; the symmetry, stability, and reaction mechanisms of coordination compounds; application of bonding theories; systematic chemistry of the transition and inner transition elements. Prerequisite: CHEM 510.

CHEM 622 Theory of Analytical Chemistry 3 hrs.
A course in the fundamental principles underlying chemical methods of analysis. Special emphasis is placed on equilbria, kinetics, and mechanisms of the important types of chemical reactions (acid-base, precipitation, complex formation, and redox) involved in chemical analysis; on methods of separation (precipitation, electrodeposition, and distillation techniques); and on the application of statistical methods of sampling, experiment design, and interpretation of results. Prerequisite: CHEM 431.

CHEM 624 Analytical Spectroscopy 3 hrs.
A comprehensive treatment of those instrumental techniques which are based upon either the emission or absorption of energy by matter. Emission spectroscopy; Raman spectroscopy; mass spectrometry; ultraviolet, visible, and infrared absorption spectroscopy; fluorometry; and other selected topics. Prerequisite: CHEM 520.

CHEM 625 Electroanalytical Chemistry 3 hrs.
The theory and application of electrochemical measurements are discussed with particular emphasis on the theoretical aspects of potentiometry, amperometry, conductometric titrations, and other selected topics. Prerequisite: CHEM 520.

CHEM 626 Chemical Instrumentation 3 hrs.
Principles and characteristics of construction and design for chemical and optical instruments. Prerequisite: CHEM 520.

CHEM 630 Advanced Physical Chemistry 3 hrs.
A study of the fundamentals of quantum mechanics and some of its applications to chemistry. Included are the exactly solvable systems, some approximation methods used for chemical bonds and in more complicated molecules, and introduction to group theory representations and character tables. Some prepared computer programs will be used. Prerequisite: CHEM 431.

CHEM 633 Chemical Thermodynamics 3 hrs.
Includes a review of the three laws of thermodynamics, state functions, activities, partial molar quantities, thermodynamics of solutions, equilibrium, and statistical thermodynamics. Prerequisite: CHEM 431.

CHEM 635 Chemical Kinetics 3 hrs.
Measurement of reaction rates, reaction rate theory, mechanisms of elementary processes, reactions in solution and on surfaces, complex reactions, application of kinetics to mechanisms, and photochemistry. Prerequisite: CHEM 431.
CHEM 650 Proteins and Nucleic Acids
3 hrs.

CHEM 652 Lipids
3 hrs.
The chemistry, metabolism, and methods of isolation and analysis of the major classes of lipids are discussed. Specific topics include fatty acids, fats, phospholipids, glycolipids, and chromatography. Prerequisite: CHEM 554 or consent of instructor.

CHEM 653 Enzymes
3 hrs.
A study of enzyme catalysis, kinetics, structure and mechanism, and a survey of experimental methods for determining these aspects of enzyme function. Prerequisite: CHEM 550.

CHEM 661 Organic Reactions
3 hrs.
An intensive study of organic reactions with emphasis on preparative scope and utility. The following types are considered: Aliphatic substitution, oxidation, reduction, condensation, etc. Prerequisite: CHEM 361.

CHEM 662 Stereochemistry
3 hrs.
A consideration of shapes of molecules and the isometric consequences. Atomic and molecular orbital interpretation of molecular shape. The stereochemical relationships in substitution and alkie addition reactions will be considered. Prerequisite: CHEM 361.

CHEM 663 Mechanisms in Organic Chemistry
3 hrs.
Free radical, ionic, and multicenter reaction types are considered. The influence of structure and media on reactivity is included. Prerequisites: CHEM 361 and 431. Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

CHEM 700 Master's Thesis
6 hrs.

CHEM 730 Doctoral Dissertation
15 hrs.

CHEM 735 Doctoral Research
2-10 hrs.

Communication (COM)
Dieker, Chairperson; Professors Cottrell, Henig, Jaks, Northouse, Rhodes, Smith; Associate Professors Crane, Gilchrist, Joyce, Lipkin, Pagel, Robeck, Rossman, Sill, VanHooven, Washington, Woodworth, Yelsma; Assistant Professors Ford, Gershon, White.

Open to Upperclass and Graduate Students
COM 505 Special Topics in Communication 1-3 hrs.
Advanced group study of special topics in communication education, interpersonal and organizational communication, mass communication, oral interpretation, and film. Many of these special courses are organized in response to special needs or interests of students on campus, in the community, and in the region. Some topics are announced in the Schedule of Classes; some are added during the semester. Further information and a full listing of topics may be obtained from the Departmental offices, 300 Sprau Tower. Six hours of 505 and 605 may be accumulated as credit toward a Master of Arts in COM. Required text materials, students must provide supplies averaging about $10.00 per student.

COM 548 Broadcast Management
3 hrs.
Studies the functions and responsibilities of broadcast station management. Students examine theories of station management, audience research, budgeting and accounting principles, sales and regulatory problems. Prerequisite: COM 549

COM 549 Public Relations and Organizations 3 hrs.
The course will examine the role of public relations and public information in a variety of organizations with a communication theory perspective. The course is designed to prepare individuals for positions in public relations and public information, or for other positions in organizations concerned with the flow of information across organization boundaries.

COM 560 Studies in Communication Education: Variable Topics
3 hrs.
Selected studies in background, methods, materials, and procedures in any one of the several speech areas. Possible topics include directing speech activities, communication behaviors of change agents, as well as others. Topics will vary from semester to semester, and students may take one or all topics for credit.

COM 561 Teaching Communication in the Elementary School
4 hrs.
Examination of the linguistic development of pre-school and elementary school children, the functions of language, study of the nature of the emotional and physical development of children as related to symbol-using behaviors, study of materials and methods for affecting desired behaviors in children's thinking, communicating, and entertainment. The undergraduate student must have completed at least twelve hours of work in COM or obtain consent of instructor. Prerequisites: ED 300 and COM 385 or 386. Offered Fall semester only.

COM 562 Teaching Communication in the Secondary School
4 hrs.
This is a course in becoming a professional teacher of communication. The focus of the course is self-examination, openness, and individual initiative. Some of the major topics are an examination of self in relation to teaching, the evolving and changing philosophies of speech communication education, the world of high school teaching as it now exists, innovative procedures in teaching communication, and how to get and hold a job in speech communication. The class is, for the most part, a laboratory-workshop, using a mixture of group work, guests, visitations, and special projects. The student must have completed at least fifteen hours of work in COM and, ideally, take the course immediately prior to student teaching. Prerequisite: ED 301. Offered Winter semesters only.
COM 564 Creative Drama for Children 
4 hrs.
Study of the principles, materials, and techniques of using informal drama as a classroom activity in elementary grades. Emphasizes theoretical and practical application through the planning and teaching of drama experiences. There is a $5.00 class fee.

COM 570 Studies in Communication: Variable Topics 
3 hrs.
Selected areas of study within the total range of communication. Each course carries separate credit, and a student may take any or all of the offerings listed under COM 570. The topics will be listed in the Schedule of Classes.

COM 571 Theories of Interpersonal Communication 
3 hrs.
A study of the dynamics of interpersonal communication from various theoretical perspectives. Emphasis is on the assumptions, conceptualizations, and models which explain how people interact at the content and relationship levels.

COM 572 Nonverbal Communication 
3 hrs.
The course examines theory and research in the nature and function of nonverbal message systems. Topics include: the role of nonverbal communication in the developmental stages of humans; individual differences in ability to interpret messages; the relationship of nonverbal communication to the concept of culture; extensions of a person such as space, clothing, possessions; and specific messages related to the face and body.

COM 573 Personality and Communication 
3 hrs.
The course examines the major personality theories as they contribute to an understanding of the role of communication in self-development. Particular emphasis is given to humanistic theories.

COM 574 Intercultural Communication 
3 hrs.
An examination of the factors contributing to effective communication in an intercultural context. The course focuses on such topics as ethno-centrism, cultural perceptions, values and beliefs, language and meaning, and nonverbal factors. Communication systems of selected countries are described and analyzed.

COM 575 Family Communication 
3 hrs.
Examines the current literature pertaining to holistic systems, power influences, and satisfactory patterns of family communications. Students analyze family interactions and identify satisfactory patterns of marital family communication.

COM 577 Communication Ethics 
3 hrs.
Principles and perspective of ethical speech communication are studied and applied to a variety of private and public communication situations. The impact of honest versus deceptive communication on the individual and society is evaluated.

COM 579 Female/Male Interaction 
3 hrs.
Examines the variable of gender as it influences communication between women and men. Topics include female-male stereotypes, interpersonal attraction, differences in female-male verbal and nonverbal codes, relational dialogues and patterns, and female-male interaction on the job. Cross-listed with SOC 599.

COM 582 Group Communication Theory 
3 hrs.
A study of small group communication from theoretical perspectives. The emphasis will be on analyzing small group communication based on an understanding of group communication theories, concepts, and research methods.

COM 584 Health Communication 
3 hrs.
Studies concepts and theories relevant to the maintenance and enhancement of effective communication in health care settings. Emphasis is given to the study and application of communication theories to the transactions which occur among health professionals and between professionals and clients/patients.

COM 591 Introduction to Communication Research 
3 hrs.
In this introductory course, students will acquire skills and knowledge of basic research design, data collection, data analysis, computer usage, and report writing needed for the completion of a research project.

COM 598 Independent Study 
1-4 hrs.
A program for advanced students with an interest in pursuing independently a program of readings, research, or projects in areas of special interest. To be arranged in consultation with a member of the staff and the Chairperson of the Department.

Open to Graduate Students Only

COM 600 Listening 
3 hrs.
Explores the role of listening in learning. Research in the field is examined and appraised. Listening tests are taken and discussed. Class members design listening projects or research projects. Focus increases sensitivity to the impact of speech.

COM 601 Introduction to Graduate Study in Communication 
3 hrs.
Introduces COM graduate students to the research literature, methodology and theoretical domains of the communication discipline. Students will learn the standards of scholarly writing and be introduced to the criteria for choosing and evaluating research methodologies.

COM 605 Special Topics in Communication 
1-3 hrs.
Intensive group study of special topics in communication education, interpersonal and organizational communication, mass communication, oral interpretation, and film. Many of these special courses are organized in response to special needs or interests of students on campus, in the community, and in the region. Some topics are announced in the Schedule of Classes; some are added during the semester. Further information and a full listing of topics may be obtained from the COM Department, Third Floor, Sprau Tower. Six hours of COM 505 and 605 may be accumulated as credit toward a master's degree in COM.

COM 670 Seminar in Communication: Variable Topics 
3 hrs.
Exploration of selected topics in communication. Possible topics, each of which may be taken for credit, include:

a. Current Issues in Communication 
b. Conference Leadership 
c. Communication and the Future 
d. Organizational Communication Theory

COM 671 Cognition and Emotion 
3 hrs.
Examination of cognitive, affective, and psychomotor aspects of communication. Emphasis is on current research and theory pertaining to the information processing of the individual, particularly in the areas of self-discovery, self-control, the creative self, the thinking self, the relating self, and the mediating self.

COM 672 Seminar in General Semantics 
3 hrs.
A seminar which explores the differences between language and behavior. In depth study of differences between symbol and signal behavior, intensional and extensional languages, role of language in developing brain systems, a consideration of the Koyreans analogy of "map and territory," among other subjects.

COM 673 Conflict Management 
3 hrs.
Based on the assumption that conflict pervades human life, the course explores the strategies of productive and nonproductive interpersonal and social conflict within the organizational setting. Theories of conflict are examined, and an explanation of the sources that stimulate conflict in humans is made.

COM 681 Group Communication Processes 
3 hrs.
A study of small group communication as it affects problem solving and decision making procedures. Emphasizes will be on developing an understanding of how participants in problem solving groups work together and how they can be made more effective through leader facilitation. The student will have practical experience in studying problem solving and decision making methods.

COM 682 Organizational Communication 
3 hrs.
This course examines the theoretical foundations and research methodologies of organizational communication. Students will apply this theory and research in analyzing a functioning organization. The focus is on a system analysis in diagnosing communication problems and developing plans for change.

COM 683 Power and Leadership in Organizational Communication 
3 hrs.
This course is designed to study power and leadership within the organization from a communication perspective of sender and receiver of messages. Students will examine research in power, leadership traits, styles, contingency theories and group leadership approaches and make application to individual career development.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

COM 700 Master's Thesis 
6 hrs.

COM 710 Independent Research 
2-6 hrs.

COM 712 Professional Field Experience 
2-6 hrs.
Computer Science (CS)

Nelson, Chairperson; Professors Williams, Motzkin; Associate Professors Boals, de Concert-Kaminski, J. Kapenga, Kerstetter, Koutnians, Pinkowski, Trenary; Assistant Professors Gupta, Sherwani.

Open to Undergraduate and Graduate Students

CS 501 Computer Concepts for Public Administrators
3 hrs.
A fundamentals course for students in academic programs in Public Administration. An introduction to how computers work, how they are programmed and their use in information systems. Students learn to work with computer input and output on the WMU VAX-Cluster and write at least one elementary computer program. Course requirements include several reports and a term project. This course may not be used toward a major or minor in Computer Science.

CS 502 Introductory Microcomputer Concepts for Teachers
3 hrs.
This course is designed to provide teachers with a minimum foundation in computer concepts and programming. Emphasis is on the use of the BASIC language to perform a variety of educational applications on microcomputers. Computer terminology and capabilities are explored as well as the significance of computers in contemporary society. Students will write a number of programs in BASIC which will introduce them to the use of standard system software. Flowcharting is introduced. Examples of Computer Assisted Instruction will be given. Not for Computer Science majors or minors. Prerequisite: MATH 150 or equivalent.

CS 503 Programming the Microcomputer for Teachers
3 hrs.
A course in programming at an intermediate level for teachers. An introduction to file handling and graphics on small computers will be provided. Flowcharting, top-down design and the development of algorithms are stressed. Some programming projects in each teacher's area of interest will be assigned. Not for Computer Science majors or minors. Prerequisite: 502.

CS 504 Advanced Microcomputer Concepts for Teachers
3 hrs.
A course which will provide teachers with an understanding of how microcomputer software is developed to fit the hardware. A review of number systems and an introduction to machines and assembly languages is given. An introduction to several data structures is provided. Concepts in graphics and file handling will be extended. Not for Computer Science majors or minors. Prerequisite: 503.

CS 506 Scientific Programming
3 hrs.
An introduction to solving scientific and engineering problems on computers. The topics include root-finding, matrix calculations, numerical integration and the numerical solution of differential equations. The FORTRAN language and various library software packages will be used. Prerequisite: MATH 230 or MATH 374, and CS 201 or CS 306. Jointly listed with Mathematics and Statistics.

CS 518 Introduction to Computer Modeling and Simulation
3 hrs.
This course provides an overview of both model development and computer simulation. A methodology is introduced which is generally applicable to simulation projects. The relationships between real systems, models, and simulation are presented, and the concept of experimental frames is discussed. General purpose simulation languages (e.g. Simscript, GPSS, CSMP, Simula) and the formalisms they support are presented. An introduction to random variables and elementary frequency distributions is provided. Simulation as a tool for exploring ill-defined systems will also be discussed. Several small projects and a simulation project will be assigned the student. Prerequisite: CS 331 and a course in probability or statistics.

CS 520 Algorithms for VLSI Design
3 hrs.
Students will be expected to learn the basics of VLSI technology. The course will include a project involving the design of VLSI systems. Different phases of the physical design, algorithms for logic partition, placement, global routing, channel generation and local routing will be covered. Additional topics may include algorithms for circuit compaction, circuit extraction, and design rule checking. Prerequisites: EE 250 and CS 331.

CS 527 Theory of Computer Graphics
3 hrs.
A first course in the design of interactive computer graphics systems. Currently available hardware and software systems are described. Emphasis is on theoretical considerations in the design of interactive computer graphics software systems. Prerequisites: MATH 230 and CS 331.

CS 530 Artificial Neural Systems
3 hrs.
An introduction to neural net concepts, algorithms, and applications. A history of neural nets will be presented along with some discussion of models of biological neural systems. The salient features of a neural net (architecture, activation functions, weighting scheme) will be characterized. Standard algorithms will be presented including Hopfield nets, linear associative models, bidirectional associative memories, and adaptive resonance models. The student will apply neural net software to experiment with standard models and to develop an application for a project. Prerequisite: CS 331. An introductory statistics course is recommended.

CS 543 Principles of Database Management Systems
3 hrs.
The fundamental concepts of database design and efficient usage are presented. Topics include: an overview of data-bases; the three data models—relational, hierarchical, and network; conceptual, logical, and physical database design and evaluation. The design theory of relational data models will be emphasized. Query languages, query optimization, security, integrity, and concurrency control will also be covered. A student may not receive credit for both CS 433 and CS 543. Prerequisite: CS 342.

CS 544 Software Systems Development
3 hrs.
Advanced computer programming techniques used in the specification, design, and implementation of large software systems. Testing and maintenance of software systems. Modular programming, top-down structured design, composition of large software packages, project management. Emphasis is placed on the solution of large software systems problems using a team approach. Prerequisite: CS 331.

CS 554 Operating Systems
3 hrs.
Fundamentals are stressed. A historical survey of the development and growth of computer systems is given to lend perspective to the ideas that follow. Basic concepts and terminology will be emphasized. Programming assignments leading to the construction of a simple operating system are required. Processes, communication and synchronization, shared resources, memory management, resource allocation, scheduling, deadlocks, file management, and protection are discussed. Applications to a real system are investigated to motivate the ideas presented in the text and lectures. Prerequisite: CS 331.

CS 555 Computer Networks and Distributed Systems
3 hrs.
The design and evaluation of computer networks using current hardware and software are explained. Various types of computer buses, local area networks, and long haul networks are defined. Case studies of popular networks are presented. Layered network models are studied. There is lab work with local area and long haul networks. Prerequisites: CS 224 and CS 331.

CS 580 Theory of Computation
3 hrs.
Provides an introduction to the theory of computation in the framework of programming languages. Basic definitions and concepts dealing with algorithms, sets, relations, functions, induction, operations on functions and cardinality are covered. Primitive and partial recursive functions are defined, and their properties treated with application to coding techniques. The Chomsky hierarchy of languages, including recursive and recursively enumerable sets and their acceptors, is introduced. Students are assigned theoretical as well as implementation oriented problems. Prerequisites: MATH 312 and CS 331.

CS 581 Compiler Design and Implementation
3 hrs.
Students are introduced to major aspects of compiler design. These include lexical analysis, parsing, and translation. Each student will implement a small compiler using modern compiler writing tools. Prerequisite: CS 485 or CS 580.

CS 582 Artificial Intelligence
3 hrs.
This course provides an overview of artificial intelligence including basic A.I. techniques and concepts, e.g., production systems, heuristic searching techniques, knowledge representation, predicate calculus, and pattern recognition. It introduces A.I. application areas such as game playing, expert systems, vision, natural language processing, and learning. Prerequisite: CS 331.

CS 585 Advanced Topics in Computer and Information Science
1-3 hrs.
The content of this course varies. It is intended to introduce the student to advanced topics which are normally offered as separate courses. The course may be taken more than once with approval of the student's adviser. Prerequisite: Approval of Department.

CS 599 Independent Study in Computer Science
1-3 hrs.
Advanced students with good scholastic records may elect to pursue independently the study of some topic of special interest. Topics are chosen and arrangements are made to suit
the needs of each particular student. Prerequisite: Written approval of instructor.

Open to Graduate Students Only
CS 603 Studies in Computer Science 3 hrs.
Advanced work organized around topics related to the field of study indicated in the above title. Students may take this course more than once.

CS 625 Computer Structures 3 hrs.
Provides the principles of design of modern digital computers. Circuit implementations of switching networks and of sequential machines are investigated. Recent computer developments such as microprocessors, disk memories, integrated circuits and microprogramming are included. Designs of various CPU circuits and memory organizations are considered. Prerequisite: CS 331 and EE 250.

CS 631 Advanced Data Structures 3 hrs.
Stresses the representation and implementation of various data structures. The effect of data structures on program complexity is investigated. The uses of data structures in a variety of application areas are covered. Introduces complex data structures. Prerequisite: CS 331.

CS 632 Analysis of Computer Algorithms 3 hrs.
Computing time and space requirements of algorithms are analyzed with emphasis given to the effect of data structure choice on program complexity. Various abstract models of computation are considered. Methods for proving program correctness and the related problems are identified. Students implement a number of algorithms on a computer and discuss aspects of the complexity and correctness of their programs. Prerequisites: CS 560 and 631.

CS 643 Advanced Data Base Management Systems 3 hrs.
This course is an in-depth study of data base management systems with concentration on efficient design and usage. Topics covered include: the design of data models, the theory of relational data bases, query optimization, recently developed protocols to guarantee consistency of data bases, the design of physical models, and performance analysis techniques. Algorithms and data structures such as B-trees, transposed files, phantom files and hybrid structures are also studied. Distributed data bases, data base machines and current query languages will be covered. Prerequisites: CS 331 and 543.

CS 655 Advanced Operating Systems 3 hrs.
Advanced and current topics in operating systems research will be discussed. Analysis of competing techniques will be undertaken to present a broader understanding of tradeoffs in design decisions. Modeling and performance evaluation will also be presented. A detailed and theoretical view of the basic operating system concepts will be emphasized. Programming assignments involving simulation and performance evaluation will be required. Prerequisite: CS 554.

CS 672 Pattern Recognition 3 hrs.
A survey of modern methods for computer recognition of patterns in varied applications such as digital images, human speech and sound, and natural language and program-based sequences. Various approaches are developed, including heuristic search, Fourier analysis, Markov models, template matching, and grammatical inference. Computational aspects and efficiency of different methods and algorithms are emphasized. Students must complete a project using methods developed in the course. Prerequisite: CS 582.

CS 680 Mathematical Theory of Formal Languages 3 hrs.
Definition of grammars and languages, recursive and recursively enumerable sets, decidability and undecidability, the Chomsky hierarchy of languages and their relation to models of automata. Prerequisite: CS 580.

CS 681 Compiling Theory and Practice 3 hrs.
A study of theoretical and applied strategies for designing compilers and other types of language translation systems. Students will be assigned a programming project on compiling. Prerequisite: CS 581.

CS 682 Advanced Artificial Intelligence 3 hrs.
This advanced A.I. course examines current research in one or more artificial intelligence application areas, e.g., computational and image processing, natural language and speech processing, expert systems, computer learning or other A.I. topics. Prerequisite: CS 582.

CS 691 Seminar in Computer Science 1-3 hrs.
Open to Graduate Students Only—Please refer to The Graduate College section for course description.

CS 700 Master's Thesis 6 hrs.

CS 710 Independent Research 2-4 hrs.

CS 712 Professional Field Experience 2-6 hrs.

Economics (ECON)


Open to Underclass and Graduate Students

ECON 500 Continuing Education in Economics: Variable Topics 1-3 hrs.
Application of economic principles and analysis to selected topics of interest to students in Continuing Education courses and workshops. Topics will vary and course may be repeated twice. May not be counted in fulfilling economics major, minor, or M.A. requirements.

An examination of a selected area of concern not intensively covered in other courses. The focus of the course will be substantive as well as analytical. Topics may include such areas as poverty, the war industry, farm problems, misallocation of resources, welfare programs, unemployment, and others. May be repeated for credit with a different topic. Prerequisites: ECON 201 and 202.

ECON 502 Economic Statistics 4 hrs.
An introduction to statistical methods used in the analysis of economic data. Topics include descriptive statistics, probability theory, regression analysis, and hypothesis testing (including parametric and nonparametric methods). Prerequisites: ECON 201 and 202; MATH 118 or consent of instructor.

ECON 504 Introduction to Mathematical Economics 4 hrs.
An introductory course to acquaint the student with the application of basic mathematical concepts to economic analysis, including such topics as revenue curves, cost curves, capital assets, growth models, and multipliers and accelerators. Prerequisites: ECON 201 and 202; MATH 122 or consent of instructor.

ECON 505 History of Economic Thought 3 hrs.
A survey of the origin and development of economic thought from early times to the present. After a brief consideration of early mercantilism and the evolution of the philosophy of natural liberties, special emphasis will be placed on the contributions of significant thinkers and the influence of various schools of economic thought on national policy and economic development. Prerequisites: ECON 201 and 202.

ECON 507 Monetary Theory and Policy 3 hrs.
This course concentrates on the main elements of monetary theory and policy having to do with such problems as promoting economic growth, maintaining full employment and price stability, influencing the flow of capital into the various economic sectors with different possible social goals in mind, and stabilizing international trade and financial relationships. Prerequisite: ECON 420 or equivalent.

ECON 509 Econometrics 3 hrs.
The application of econometric techniques to the estimation of economic models. Topics include single and multi-equation models, properties of estimating procedures and time series analysis. Prerequisites: ECON 201, 202, and 502 or equivalent.

ECON 512 Collective Bargaining 3 hrs.
An analysis of the major problems in present-day collective bargaining, including the negotiation of collective agreements, the practical aspects, and the economic implications. Prerequisites: ECON 201 and 202 or consent of instructor.

ECON 515 Economics of Human Resources 3 hrs.
The course will examine the development and utilization of manpower in the United States, including such topics as labor force components, contributors to productivity such as education, training, health and mobility, and issues of manpower policy. Prerequisites: ECON 201 and 202.

ECON 516 Collective Bargaining in Public Employment 3 hrs.
This course examines collective bargaining developments in local, state, and federal governments, including bargaining units, negotiations, grievance procedures, strikes, and dispute settlements. Prerequisites: ECON 201 and 202 or consent of instructor.

ECON 517 Economics of Health and Human Services 3 hrs.
Economic problems of health and human services will be considered. Alternative policy solutions are viewed from the economist's point of view. Not open to Economics graduate students.
ECON 525 State and Local Government Finance
3 hrs.
Practices, effects, and issues in state and local expenditure, taxation, and borrowing, with particular attention to property and sales taxation, to the financing of education and highways, and to intergovernmental fiscal relations. Prerequisites: ECON 201 and 202.

ECON 586 Economic Development
3 hrs.
An analysis of the economic factors such as population, resources, innovation, and capital formation which affect economic growth. Selected underdeveloped areas will be studied to understand the cultural pattern and economic reasons for lack of development and the steps necessary to promote economic progress. Special attention will be paid to evaluating the effectiveness of the United States foreign-aid program and examining the issues arising as a result of the conflict with the U.S.S.R. Prerequisites: ECON 201 and 202.

ECON 591, ECON 592 Guest Economist Seminar
1 hr.
Seminar series on a topic of current interest featuring invited visiting economists. Topics will vary and courses may be repeated. Prerequisites: ECON 201 and 202.

ECON 598 Readings in Economics
1-3 hrs.
An independent program of study for qualified students to be arranged in consultation with the instructor. Prerequisite: Consent of Department Chairperson.

ECON 600 Applied Economics for Management
3 hrs.
The course examines the relationship between the theory of the firm and recent developments in the area of operations research. Among the concepts and tools discussed are game theory, linear programming, capital budgeting, inventory theory, input-output analysis, price policy, and cost analysis. This course may not be taken for credit if a student has received credit for ECON 400.

ECON 602 Applied Economics
3 hrs.
Emphasis will be placed on decision-making under conditions of uncertainty. Topics will include advanced material in linear programming, game theory, capital budgeting and forecasting. Prerequisite: ECON 600.

ECON 603 Advanced Price Theory
3 hrs.
An advanced study in the logic of the pure theory of production, joint production and joint costs, and introduction to the multiperiod production theory. Advanced theory of consumer behavior; aggregation problems in product supply, factor demand and consumer demand analysis; review of selected empirical studies on consumer demand analysis; consumer surplus; problems involving optimization over time and under conditions of uncertainty; role of savings in consumer demand theory (utility maximization over time). Prerequisites: ECON 303 and 504.

ECON 609 Seminar in Economics
3 hrs.
Open to Graduate Students Only—Please refer to The Graduate College section for course description.

ECON 700 Master's Thesis
6 hrs.
ECON 710 Independent Research
2-6 hrs.
ECON 712 Professional Field Experience
2-12 hrs.

English (ENGL)

ENGL 510 Special Topics in Literature
4 hrs.
Topics are different. Offered as open campus, interinstitutional courses by the Division of Continuing Education to meet for thirty-six contact hours during the semester. 500-level English courses will carry three credits.

ENGL 520 Issues in Public Finance
3 hrs.
An exploration of issues in taxation, government spending, fiscal policy, and intergovernmental relations with emphasis on recent literature in these areas. Prerequisites: ECON 201 and 202.

ENGL 650 Industrial Organization and Public Policy
3 hrs.
The interest of this course centers on the areas where markets are characterized oligopolistically. After a brief review of the different market types, the more important market structure, behavior, and performance variables and their accompanying public policy implications are dealt with.

ENGL 662 National Income Analysis
3 hrs.
A basic course in economic theory with emphasis on modern theories of output of the economy as a whole and on the uses of these theories as guides to policy. Prerequisites: ECON 201 and 202.

ENGL 680 Problems in International Trade and Finance
3 hrs.
An analytical understanding of contemporary issues in international trade and finance will be emphasized. Prerequisite: ECON 480 or consent of instructor.

ENGL 688 Issues in Economic Development
3 hrs.
An intensive examination of a number of selected key topics in development economics, centering on issues of crucial importance to developing nations. Examples of such issues are primary products, capital formation, technological change, inflation, debt servicing, population, etc. Prerequisites: ECON 201 and 202.

ENGL 700 Master's Thesis
6 hrs.
ECON 710 Independent Research
2-6 hrs.
ECON 712 Professional Field Experience
2-12 hrs.
ENGL 597 Studies in English: Variable Topics 1-3 hrs.
Group study of special topics in literature, film, English language, and writing. Many of these special courses are organized around special events or speakers on campus or in the community, or in response to special needs or interests in students. Some topics are announced in the Schedule of Classes; some are added during the semester. Further information and full listing of topics may be obtained from the English Department, sixth floor Sprau Tower.

ENGL 598 Readings in English 1-4 hrs.
Advanced students with good scholastic records may elect to pursue independently the study of some topic having special interest for them. Topics are chosen and arrangements are made to suit the needs of each student. Approval of English adviser required. May be elected more than once.

Open only to Graduate Students admitted to English Curricula or by Permission of the English Graduate Adviser.

ENGL 610 Seminar 3 hrs.
Study of a problem in literary history or criticism. May be repeated once with the permission of the graduate adviser.

ENGL 615 Literary Criticism 3 hrs.
Readings in several significant theorists on the nature of literature, the characteristics of audience response to literature, and principles underlying the analysis and evaluation of literature. Works in at least two genres will be examined in light of these theoretical writings.

ENGL 621 Studies in British Literature 3 hrs.
The advanced study of selected aspects of British literature. May be repeated once with the permission of the graduate adviser.

ENGL 622 Studies in American Literature 3 hrs.
The advanced study of a topic in American Literary history, such as The American "Renaissance," The 1920's, The Transcendental Tradition in American Literature, Fiction (or Poetry, or Drama) in America, or The Development of Modern American Prose Style. May be repeated once with the permission of the graduate adviser.

ENGL 630 Research and Writing 3 hrs.
A survey of aids in research leading to completion of a writing project.

ENGL 631 Essay Writing 3 hrs.
A course in the writing of informal expository prose in the forms used for addressing general audiences. There will be a generous amount of reading in exemplary works and a concern for understanding the rhetorical principles underlying good modern prose. Prerequisite: A bachelor's degree.

ENGL 632 Article Writing 3 hrs.
A course in the writing of informative prose directed toward a non-specialist audience. There will be study and practice in the methods of gathering and analyzing information and in the effective organization and presentation of factual material.

ENGL 633 Professional Writing: Form and Technique 3 hrs.
A course in writing in the various formats needed by large institutions, whether academic, corporate, or public. Particular emphasis will be placed on the use of the interview to gather information, on preparing speeches, brochures, newsletters, and other publications, and on the techniques of non-personal prose.

ENGL 640 The Nature of Poetry 3 hrs.
A study of styles, techniques, forms, and conceptions of poetry, involving practice in explication, both oral and written, of individual poems.

ENGL 641 Studies in Modern Poetry 3 hrs.
An intensive study of the work of several modern poets.

ENGL 642 Studies in Drama 3 hrs.
Selected areas of drama from classical times to the present.

ENGL 644 Studies in the Novel 3 hrs.
An examination of significant forms and techniques employed in the novel from its beginnings to the modern age.

ENGL 645 Studies in the Modern Novel 3 hrs.
An intensive study of the works of some important novelists of the twentieth century.

ENGL 652 Studies in Shakespeare: Tragedy 3 hrs.
Selected tragedies of Shakespeare.

ENGL 653 Studies in Shakespeare: Comedy 3 hrs.
Selected comedies of Shakespeare.

ENGL 666 Graduate Writing Workshop 3 hrs.
Any given section of this course will focus on either poetry, fiction, or drama. Course organization will emphasize roundtable discussion of student writing. Course may be taken more than once; a student may elect up to 12 credit hours in one genre and up to 18 hours in all. M.F.A. candidates must take at least 6 hours in their area of specialization.

ENGL 673 Psycholinguistics in Reading 3 hrs.
An examination of psycholinguistic insights into the nature of the reading process, with emphasis on practical implications and applications for the classroom. No prerequisite.

ENGL 680 Advanced Methods in Teaching Literature 3 hrs.
A study of theories and methods of teaching language and composition.

ENGL 681 Advanced Methods in Teaching Language and Composition 3 hrs.
A study of theories and methods of teaching language and composition.

ENGL 697 Studies in English: Variable Topics 1-3 hrs.
Group study of special topics in language, literature, and composition. These special courses and workshops may be offered on campus, in the off-campus centers, or as in-service work in schools. Students may repeat this course, providing topics vary. For further information, consult the graduate adviser.

ENGL 699 M.F.A. Project 3-6 hrs.
A collection of short fiction, a collection of poetry, a collection of one-act plays, a full-length play, or a novel. The work presented in fulfillment of this requirement must be judged by a committee of the graduate faculty to be worthy of publication or production; a public reading or performance is required.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

ENGL 700 Master's Thesis 6 hrs.

ENGL 710 Independent Research 2-6 hrs.

ENGL 712 Professional Field Experience 2-12 hrs.

Geography (GEOG)
Quandt, Chairperson; Professors Dickason, Eichenlaub, Heller, Horst, Kirchherr, Micklin, Raup, Stoltman, Vuich; Associate Professors Erhart, Stolle, Assistant Professor Lawrence.

Systematic Geography
Open to Upperclass and Graduate Students
GEOG 521 Studies in Climatology and Meterology 3 hrs.
Studies at an advanced level in climatology and meteorology. Topics of current interest to atmospheric scientists are examined in depth. Regional climatic phenomena and their relation to atmospheric circulation patterns are also investigated. Prerequisites: GEOG 225 or consent.

GEOG 544 Studies in Economic Geography 2-3 hrs.
Presents world patterns of agriculture, manufacture, or transportation which link global production and consumption. In any term, the course focuses upon one of these three economic sectors. Prerequisites: GEOG 205 or 244 or consent.

1. Agriculture. Describes and analyzes agricultural systems throughout the world; focuses on selected crop-livestock systems and the changing character of agricultural land use in the United States.

2. Manufacture. Examination of theories and strategies of industrial plant location, the relationship of industrialization to regional economic growth and development, and selected industry case studies evaluating the interrelations of locational, economic, technological, and political factors in the respective industry's historic evolution.

3. Transportation. Examination of the historic evolution of transport systems in developed and developing nations, transport factors in location theory, techniques of transport analysis, the urban transport dilemma, and competitive and complementary characteristics of the different transport modes.

GEOG 545 Studies in Human Geography 2-3 hrs.
Each course listed under this general title is a concentrated study of one of the principal subdivisions of human geography. The scope and principal themes of each specialized field are reviewed, with consideration given to current research on selected problems. Prerequisites: GEOG 205 or GEOG 244, or by consent of instructor. Course may be repeated for credit.

1. Cultural Geography. Techniques of spatial analysis applicable to the study of humans and
their environment. The place of origin, diffusion and present distribution of selected cultural patterns will be traced with emphasis given to cultural traits which strongly influence human occupation of the earth's surface.

2. Historical Geography. Studies of geographic and related features which have combined to influence the course of historical development. This course will concentrate on a particular region and/or period of time during each semester in which it is offered. Each specialization will be designated in the Schedule of Classes.

3. Political Geography. General survey of the principles and the applied aspects of political geography; primary emphasis on the physical and cultural resource bases and conflicts of national states, the assessment of location, boundary delimitation and the territorial sea, politically-organized territories within the administrative hierarchy, and electoral geography.

GEOG 553 Water Resources Management 3 hrs.
Examination of water resources management with emphasis upon national development and utilization of available supplies. Topics include supply and demand, methods of technological and geographical augmentation (desalination, inter-basin transfers, etc.), water administration and policies, and various water problems together with possible approaches to their solutions.

GEOG 554 Outdoor Recreation: Resources and Planning 3 hrs.
Examination of extensive, resource-based outdoor recreation (such as parks, wilderness, wild rivers, hunting and fishing, hiking, etc.) with emphasis upon recreational planning. Topics include supply and demand for outdoor recreation, identification of present and future recreational needs, policy considerations, administration of recreational land uses, and various problems associated with outdoor recreation. Readings, discussion, and student-designed and executed individual studies provide professional orientation.

GEOG 555 Contemporary Issues in Resources Management 3 hrs.
Examination of selected contemporary natural resource and environmental problems, such as questions of natural resource adequacy, environmental pollution, energy shortages, political and economic problems related to resource management, and individual studies of local environmental problems. Prerequisite: GEOG 350 or consent.

GEOG 556 Studies in Urban and Regional Planning 3 hrs.
Each of the courses listed under this number focuses on a major aspect of planning, including a review of the objectives of the planning process, legislation pertaining to planning operations, and methods of field and library investigation related to analysis and policy formulation in matters related to planning.

1. Urban Planning and Zoning. The Planning Process and the development of Comprehensive Plans as practiced in American communities. The legal foundations of zoning and subdivision regulations, and the implications of the comprehensive plan. The organization, role, and relationship of the planning commission, the zoning board, and the planning department in the community. Prerequisite: GEOG 556 or consent.

2. Regional Planning. Studies in the administration and coordination of planning programs at the regional level, e.g., transportation and communications, land use and conservation, drainage systems and wastewater treatment, residential and industrial development. The evolution and current status of planning methodologies are examined with emphasis on economic and environmental tradeoffs, and on problems of implementing regionally-oriented planning programs.

3. Public Lands and Parks. Specific programs designed relating to the preservation and/or development of government-controlled lands.

GEOG 570 Cities and Urban Systems 3-4 hrs.
Study of processes and forms of urban settlement highlighting problems relating to 1. political and geographical realities of urbanized regions; 2. factors in city growth (or decline); 3. the size and distribution of urban communities; and 4. land use and population patterns in contemporary cities. Activities are designed to provide the student with experience in the use of source materials and methods of analysis utilized in urban geography.

Open to Graduate Students Only

GEOG 620 Seminar in Physical Geography 2-3 hrs.
A review of current literature and recent developments in several disciplines which form the basis of physical geography. Since each seminar emphasizes different subject areas, such as landforms, soils, and vegetation, this seminar may be repeated. A final research project is required. Prerequisites: One of several advanced courses in physical geography, geology or biology, or consent of instructor.

GEOG 670 Seminar in Urban Geography and Planning 2-3 hrs.
A review of the current literature and recent methodological developments in the field of urban geography and planning. Prerequisite: GEOG 556 or 570.

Regional Geography

Open to Graduate Students Only

GEOG 510 Anglo American 3 hrs.
Review of the physical, cultural, and economic geography of the United States and Canada. Focus on regional problems and outlooks. Lectures, assigned readings, and periodic seminars. May not be taken for credit if student has received credit for GEOG 380.

GEOG 511 South America 3 hrs.
Regional study of the nations of South America with attention to the interrelationships of the physical and cultural environments. Historical background necessary for the interpretation of the present political, social, and economic conditions is included. May not be taken for credit if student has received credit for GEOG 381.

GEOG 512 Middle America 3 hrs.
Systematic consideration of the physical environment of Mexico, Central America, and the West Indies. A problems approach is utilized to reckon with the economic, social, and political trends of the region. May not be taken for credit if student has received credit for GEOG 382.

GEOG 513 Western and Southern Europe 3 hrs.
Examination from western Europe from a regional perspective. The environmental and historical backgrounds serve as a foundation for more intensive study of contemporary conditions, problems, and issues. May not be taken for credit if student has received credit for GEOG 383.

GEOG 516 The Pacific Realm 3 hrs.
Analysis of the human and physical geography of the Southwest Pacific, with concentration on Australia, New Zealand, and Polynesia. May not be taken for credit if student has received credit for GEOG 385.

GEOG 520 South Asia 3 hrs.
Survey of the physical, cultural, and economic geography of the Indian subcontinental region (India, Pakistan, Bangladesh, Sri Lanka and the countries of the Himalayas). Primary focus is placed on India with emphasis upon the characteristic spatial patterns and relationships found in the region. May not be taken for credit if the student has received credit for GEOG 390.

GEOG 609 Studies in Regional Geography 2-3 hrs.
An investigation of selected topics in physical and human geography of a region, e.g., Latin America, Anglo-America, Europe. Regional concentration will vary from semester to semester, with the region being indicated at time of enrollment. May also be offered in conjunction with field studies to various areas, and may be repeated for credit. Prerequisite: An appropriate introductory course at either the undergraduate or graduate level.

Geographic Methodology and Research

Open to Upperclass and Graduate Students

GEOG 557 Environmental Impact Assessment 3 hrs.
Alteration of the natural and human environment for perceived economic and social benefits often has significant adverse consequences. Recognition of this problem is reflected in federal, state, and local laws and regulations requiring environmental impact statements. The course provides an introduction to the analysis and preparation of environmental impact statements. Prerequisites: Senior standing and Geography 350 or permission.

GEOG 558 Field Geography 2-4 hrs.
The theory and application of geographic techniques and instruments of field investigations: collection and analysis of field data, presentation and preparation of materials. The course is based primarily on field observations. (One hour lecture and three hours laboratory.) Prerequisites: GEOG 265 or 375 and 582 or consent of instructor.

GEOG 557 Computerized Geodata Handling and Mapping 4 hrs.
Principles and procedures involved in structuring and using computerized geographic data systems (applicable to land use analysis, impact assessment, and urban and regional planning), and in representing these data by computer mapping methods. Equivalent applications of these methods will be made to both microcomputer and larger main-frame computer systems. Prerequisite: Senior or graduate standing.

GEOG 568 Quantitative Methodology 3 hrs.
Introduction to the application of quantitative concepts and methods in the analysis of
geographic problems. Emphasis is placed on data base management, computer applications of common numeric and statistical methods, and utility assessment of various research designs and strategies. Prerequisite: GEOG 567 or consent

GEOS 580 Advanced Cartography 4 hrs.
A review of current trends and philosophies of cartography. A combination of lectures, demonstrations, and independent projects provide the advanced cartography student with opportunities to practice state-of-the-art map design, multicolumn production, photoreproduction and computer-assisted mapping. It is recommended that GEOS 567 be taken before 580. Prerequisite: GEOS 375 or equivalent.

GEOS 582 Remote Sensing of the Environment 3 hrs.
The student will acquire proficiency in the fundamental techniques and skills of photogrammetry and photointerpretation during the first part of the course. The remainder of the semester will be spent in interpreting photos dealing with such topics as geomorphology, archaeology, vegetation and soils, water resources, rural and urban land use, as well as topics adapted to the interest and anticipated future work of the student.

GEOS 587 Independent Study 1-3 hrs.
Designed for highly qualified majors and graduate students who wish to study in depth some aspect of their field of specialization under a member of the departmental staff. Prerequisite: Written consent of departmental adviser and instructor.

Open to Graduate Students Only

GEOS 661 Geographic Research 4 hrs.
Problem formulation and research design are introduced in light of modern geographic thought and current practices. Other course emphasis is upon sources of geographic information, search strategies, and the written presentation of research materials. Graduate students in geography are urged to complete this course as an option as possible. Prerequisite: Consent of graduate adviser.

GEOS 665 Seminar in Geography 1-3 hrs.
Designed for the advanced student interested in analyzing problems related to various topics in geography. Prerequisite: Consent of instructor. May be repeated. 

GEOS 666 Professional Development Seminar 1 hr.
Students participate in selected activities related to professional development. These activities include critiques of professional presentations, participation in professional meetings, and presentations of papers to faculty and colleagues. This course cannot be repeated for credit. This course is graded on a Credit/No Credit basis.

GEOS 682 Advanced Remote Sensing 3 hrs.
This course focuses on the interactive modes of interpreting remotely sensed imagery, especially digital satellite data. Digitizing of conventionally interpreted data will be interfaced with computer generated data to establish geographic information systems. Individual projects will be carried out involving detailed fieldwork.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

GEOG 700 Master's Thesis 6 hrs.

GEOG 710 Independent Research 2-6 hrs.

GEOG 712 Professional Field Experience 2-12 hrs.

Geology (GEOL)
Straw, Chairperson; Professors Chase, Grace, Passero, Schmidt; Associate Professors Harrison, Kehler; Assistant Professors Barnes, Hampton.

Open to Upperclass and Graduate Students

GEOL 502 Problems in Geology and Earth Science 1-3 hrs.
Individual problems involving topical reading and/or research problems in earth sciences. May be repeated for credit. Prerequisite: Consent of instructor.

GEOL 512 Hydrogeology 3 hrs.
The study of surface and groundwater with special emphasis on its chemistry, movement, and relation to the geologic environment. Prerequisite: Senior standing.

GEOL 513 Wetlands Hydrology 3 hrs.
Introduction to hydrologic function of wetlands, wetlands classification, and the relationship between hydrology and soil and plants.Emphasis will be placed on the use of these parameters in wetlands delineation. Prerequisite: Senior standing.

GEOL 520 Economic Geology 3 hrs.
Origin, occurrence, and utilization of metallic and non-metallic mineral deposits, and mineral fuels. Three lectures a week. Prerequisite: GEOL 335 or consent of instructor.

GEOL 529 Summer Field Hydro 1 to 6 hrs.
The course will emphasize state-of-the-art techniques for sampling, monitoring, and evaluating groundwater systems and surface-groundwater interactions. Particular consideration will be given to contaminated systems, aquifer testing, and selected geophysical methods. This course will provide students with a variety of experience in applied hydrology. Prerequisite: GEOL 512.

GEOL 530 Plate Tectonics and Earth Structure 3 hrs.
Major tectonic features and internal structure of the earth in relation to plate tectonics, critical examination of the tenets of plate tectonics. Prerequisites: GEOL 131, 301, or 335.

GEOL 532 Geomorphology 3 hrs.
Detailed consideration of the earth's surficial processes including transformation of fluvial, glacial, mass-wasting,olian, and coastal landforms. Laboratory exercises involve interpretation of topographic maps, geologic maps, and air photographs. Prerequisite: GEOL 130.

GEOL 533 Sedimentation and Stratigraphy 4 hrs.
Processes, characteristics, and relationships among fluvial, deltaic, strand plain, lagoon, shelf, and slope terrigenous depositional systems. Laboratory includes textural analysis; sedimentary structures; paleocurrent analysis; electrical logs, subsurface maps, and application of statistical and computer methods to the solution of sedimentologic problems; and basin analysis. Course includes a 3-day field trip. Three lectures and one three-hour laboratory per week. Prerequisite: GEOL 131 and 335.

GEOL 536 Glacial Geology 3 hrs.
A study of the mechanics of glacial movement, processes of glacial erosion and deposition, and the distribution of glacial features in space and time. Special emphasis will be placed on the glacial geology of the Ohio area. Prerequisites: GEOL 131 and consent of instructor.

GEOL 539 Field Studies in Geology 1-8 hrs.
Field study of specific subjects in Geology. Subjects offered will be announced in advance and selected from the following: Regional Geomorphology, Field Mapping, Structural Geology, Petrography, Stratigraphy and Sedimentation, Environmental Geology, and other selected topics. It is recommended that the student should have Geology 100 or 130 and/or have the permission of the instructor before enrolling in this course. The course is normally taught the two weeks of summer prior to the fall term but may be offered at other times. Students planning to take this course should first check with the Earth Science adviser.

GEOL 544 Environmental Geology 3 hrs.
Geology related to human affairs and land-use planning. Includes engineering properties of earth materials, waste disposal systems, slope stability, floods, erosion and sedimentation, land subsidence, volcanic hazards, earthquakes, and uranium geology. Field trips required. Prerequisite: GEOL 130, 131, or consent.

GEOL 545 Carbonate and Evaporite Depositional Environments 3 hrs.
Processes, characteristics, and relationships of modern and ancient basinal carbonate and evaporite facies. Course includes a 11-day field trip (Spring Vacation) to investigate Holocene, Pleistocene, and Tertiary carbonate depositional environments and facies in Florida, and a 3-day trip to northern Indiana and Ohio to examine Silurian Platform carbonates. Student projects include logging, descriptive and interpretive analysis of cores and slabs at the mesoscopic level. Two lectures and one 3-hour laboratory per week. Prerequisites: GEOL 535, and consent.

GEOL 555 Clastic Depositional Systems 3 hrs.
Description and analysis of clastic depositional systems and discussion of the sediment they produce. Laboratory investigations include stratigraphic and seismic analysis. Prerequisite: GEOL 535 or consent of instructor.

GEOL 560 Introduction to Geophysics 3 hrs.
Introduction to geophysical exploration methods including seismic reflection and refraction, gravity, electric, and electro-magnetics. Prerequisites: PHYS 110-111 or 210-211, MATH 122, and GEOL 130.

GEOL 561 Reflection Seismology 3 hrs.
Reflection seismology and related techniques as applied to petroleum exploration and deep crustal exploration. Theoretical background, data collection, data processing and interpretation will be discussed. Prerequisites: GEOL 560, CS 306, and MATH 123.
GEOL 562 Shallow Exploration Geophysics
3 hrs.
Geophysical techniques (excluding electrical methods) used for shallow exploration: gravity, magnetic, seismic reflection and shallow seismic refraction. Theory, data collection, processing, and interpretation using analytical computer programs. Requisites: GEOL 560, CS 306, and MATH 123. GEOL 563 Electrical Methods
3 hrs.
Reactivity sounding and profiling, induced polarization, electromagnetic methods using natural and artificial fields. Two lectures and three-hour laboratory with field studies and laboratory exercises and problems. Requisites: GEOL 506, MATH 123, and PHYS 540. GEOL 564 Field Geophysics
3 hrs.
Field studies demonstrating the use of seismic refraction, gravity, and electromagnetic methods for glacial geology and groundwater problems in the Kalamazoo area. Course also includes 1-week trip to Michigan's Upper Peninsula to apply magnetic, self-potential, electromagnetic, and gravity methods in Precambrian terrain. Prerequisite: GEOL 560. Open to Graduate Students Only
GEOL 600 Hydrogeochemistry
3 hrs.
Geochemical origin and characteristics of surface and groundwater, equilibrium thermodynamics, the carbonate system, redox processes, ion exchange, and isotopes. Prerequisite: GEOL 512 or consent of instructor.
GEOL 605 Groundwater Modeling
3 hrs.
Study of groundwater flow and contaminant transport using analytical and numerical models. Requisites: GEOL 512, 600, Fortran or Basic, MATH 274, or consent of instructor. GEOL 610 Geochemistry
3 hrs.
An introduction to the basic principles and theories of geochemistry. Prerequisite: GEOL 440 or permission. GEOL 611 Mineral Analysis
3 hrs.
X-Ray diffraction and fluorescence techniques applied to mineralogical and petrological problems. Prerequisites: GEOL 335 or permission.
GEOL 615 Contaminant Hydrology
3 hrs.
Theory and field methods related to the transport of contaminants in groundwater. Includes theoretical considerations, case histories, law, analysis of problems, and preparation of hydrogeological reports. GEOL 630 Structural Analysis
3 hrs.
The theory and methods involved in the geometric, kinematic, and dynamic analysis of deformed rock bodies. All scales of observation are considered from hand specimens to large map areas. Prerequisites: GEOL 430 and consent. GEOL 634 Research in Geology and Earth Science
1-4 hrs.
Advanced readings or research in an area to be selected after consultation with a supervising staff member. May be repeated for credit (for no more than a total of six hours).
GEOL 640 Igneous and Metamorphic Petrology
4 hrs.
Advanced discussion of origins and positions of igneous and metamorphic rocks in light of recent experimental evidence and concepts of global tectonics. Prerequisite: GEOL 440 or equivalent. GEOL 646 Carbonate Petrology and Palaeoecology
3 hrs.
Identification, recognition, and analysis of carbonate rocks in hand specimen and thin section and environmental conditions under which they were formed; also, ecological relationships of organisms living in carbonate environments. GEOL 433 and 535, or consent of instructor.
GEOL 650 Topics in Geology and Earth Science
2-4 hrs.
An intensive study of specific subjects in the area of Earth Science as listed. Prerequisite: Consent of instructor. Subject to be offered during a semester or term will be announced in advance.
GEOL 655 Clastic Petrology and Basin Analysis
3 hrs.
Examination, analysis, and interpretation of clastic rocks in hand specimen and thin section and the distribution of sediments in basinal settings. GEOL 535 or consent of instructor.
Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.
GEOL 700 Master's Thesis
6 hrs.
Research leading to master's thesis. GEOL 710 Independent Research
2-6 hrs.
GEOL 712 Professional Field Experience
2-12 hrs.
History (HIST)
Davis, Chairperson; Professors Beech, Breisach, Brown, Carlson, Castel, Coridier, Dennison, Dooley, Ferriera, Gregory, Haight, Harner, Maier, Nahm, Porter, Schmitt, Associate Professors Burke, Hahn, Havira, Hawks, Houdek, Patterson, Rosu; Assistant Professors Norman, Stone, Xiong.
Open to Upperclass and Graduate Students
HIST 500 Studies in History
1-3 hrs.
Topics announced in Schedule of Classes. May be repeated under different topics.
HIST 510 Colloquium
1 hr.
Research presentations by department faculty, advanced graduate students and invited scholars. Specific topics may be listed in Schedule of Classes. May be repeated to a maximum of 3 hrs. Graded on a Credit/No Credit basis. HIST 515 Topics in Public History
1-3 hrs.
Selected topics in aspects of public history including museology, historic preservation and cultural resource management, historical administration, information science, and applied research. Topics listed in Schedule of Classes. May be repeated under different topics.
HIST 517 Topics in Economic and Social History
1-3 hrs.
Selected topics in the history of economic and social conditions and change such as the development of world trade and world economy, development and modernization, urbanization, social and political movements, demography and migration, family structure, etc. Topics announced in Schedule of Classes. May be repeated under different topics.
HIST 519 Topics in Intellectual and Cultural History
1-3 hrs.
Selected topics in the history of ideas, literary and artistic expression, intellectual and cultural character of various periods and civilizations, examination of historical conditions through philosophy and the arts, etc. Topics announced in Schedule of Classes. May be repeated under different topics.
HIST 530 Studies in Early American History
3 hrs.
Topics listed in Schedule of Classes. May be repeated under different topics.
HIST 535 Studies in Recent American History
3 hrs.
Topics listed in Schedule of Classes. May be repeated under different topics.
HIST 550 Studies in Medieval History
3 hrs.
May be crosslisted with MDVL 500. Topics listed in Schedule of Classes. May be repeated under different topics.
HIST 565 Studies in Medieval History
3 hrs.
Topics listed in Schedule of Classes. May be repeated under different topics.
HIST 590 Proseminar
3 hrs.
Research and writing on selected themes. Topics listed in Schedule of Classes. May be repeated under different topics.
HIST 591 Topics in Theory and Practice
1-3 hrs.
Selected theoretical, technical, and interpretive issues in the field of history: interaction with methodologies of other social science and humanities disciplines; innovative forms and techniques of documentation and data collection; major historical interpretations currently before the academic world and the public. Topics listed in Schedule of Classes. May be repeated under different topics.
HIST 592 Computers in Historical Research
3 hrs.
Computer applications to historical and related research projects including manuscript analysis techniques, text-oriented databases, simulations, etc. Survey of applications in closely related disciplines. Prerequisite: CS 105 or equivalent.
HIST 595 History Writing Workshop  
1-3 hrs. 
Practicum in the writing of history: editing and publishing; preparation of written materials for lay readers and audiences outside the discipline. May be repeated to a maximum of six semester hours.

HIST 596 Local History Workshop  
1-3 hrs. 
Practicum in research techniques for problems in local and small community history, including oral tradition, genealogy, and interdisciplinary method. May be repeated to a maximum of six semester hours.

Open to Graduate Students Only

HIST 600 Historical Method  
3 hrs. 
Introduction to the field of history and its recent development. Practice in the use of oral and written communication skills for conveying historical knowledge to various audiences. Survey of major journals and bibliographical tools for general research. Examination of interaction between historical techniques and those of related disciplines.

HIST 601 Historiography  
3 hrs. 
Study of the major figures, ideas, and developments in historiography. Students may conduct research in their fields of concentration.

HIST 605 Readings in Early United States History  
3 hrs. 
Intensive study of historiography. Interpretations, major works, serials, and databases in United States history from colonial times until the late nineteenth century.

HIST 606 Readings in Recent United States History  
3 hrs. 
Intensive study of historiography, interpretations, major works, serials, and databases in United States history from the late nineteenth century to the present.

HIST 612 Readings in Medieval History  
3 hrs. 
Intensive study of historiography, major works, serials, and databases in medieval history.

HIST 616 Readings in Modern European History  
3 hrs. 
Intensive study of historiography, major works, serials, and databases in European history from approximately 1750 to the present.

HIST 618 Readings in Global and Contemporary History  
3 hrs. 
Intensive study of historiography, interpretations, major works, serials, and databases dealing with issues in modern world history, such as colonialism, nationalism, international conflict and cooperation, economic integration, etc. Topics may be listed in Schedule of Classes. May be repeated under different topics.

HIST 625 Problems in Cultural Resource Management  
1-3 hrs. 
History and practice of various facets of administration, conservation, development and interpretation of cultural and historical sites, agencies and institutions. Topics may be listed in Schedule of Classes. May be repeated under different topics.

HIST 635 Research Techniques in Medieval History  
3 hrs. 
Introduction to the sources and methods used in the study of medieval Europe. Interpretation of written sources including narratives, chronicles, charters, early government records, etc., with emphasis on authentication, dating and localizing these materials. Survey of techniques for interpreting artifacts and material culture such as archaeology, numismatics, and epigraphy.

HIST 640 Museums Practicum  
3-6 hrs. 
Supervised field assignment with focus on a research project dealing with a specific aspect of museum or site administration such as registration, collections development, conservation, interpretation, etc. Registration requires prior approval of the Department Chair.

HIST 650 Special Projects  
1-3 hrs. 
Individualized experience in research and writing under direction of a faculty member. Registration requires prior approval of supervising faculty and the Department Chair. Prerequisite: HIST 600 and admission to candidacy for a graduate degree.

HIST 671 Seminar in Theory and Philosophy of History  
3 hrs. 
Advanced research. Topics may be announced in Schedule of Classes. May be repeated under different topics. Prerequisites: HIST 600 and 601.

HIST 672 Seminar in Local History Methodology  
3 hrs. 
Research design and execution organized around interdisciplinary methodology. Presentations and research supervision by faculty with interest in exhaustive, small-scale historical reconstruction in a variety of time periods and geographical settings such as American, medieval, African and non-Western traditional, etc.

HIST 675 Seminar in Early United States History  
3 hrs. 
Advanced research. May be repeated. Prerequisites: HIST 600 and 601; 605 or consent of instructor.

HIST 678 Seminar in Recent United States History  
3 hrs. 
Advanced research. May be repeated. Prerequisites: HIST 600 and 601; 608 or consent of instructor.

HIST 682 Seminar in Medieval History  
3 hrs. 
Advanced research. May be repeated. Prerequisites: HIST 600 and 601; 605 or 638 or consent of instructor.

HIST 686 Seminar in Modern European History  
3 hrs. 
Advanced research. Topics may be selected in Schedule of Classes. May be repeated under different topics. Prerequisites: HIST 600 and 601.

HIST 689 Seminar in Public History  
3 hrs. 
Advanced research. Topics may be selected in Schedule of Classes. May be repeated under different topics.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

HIST 700 Master's Thesis  
6 hrs.

HIST 710 Independent Research  
2-6 hrs.

HIST 712 Professional Field Experience  
2-12 hrs.

Languages and Linguistics

Krawutschke, Chairperson; Professors Benson, Cole, Ebling, Griffin, Haenicke, Palmer, Reihs, Associate Professors Bigelow, Fabels, Fulk, Gardiner, Hendriksen, Kissel, Miller, Muzniece, Teichert; Assistant Professors Denbow, Harris, Lehman-Srinivasan, Ntulila, Running Johnson, VanDeBerg.

Language Courses (LANG)

Open to Upperclass and Graduate Students

LANG 550 Independent Study in Classics  
1-3 hrs. 
Directed, individual study of a specific topic related to Classical languages, literature, and/or culture. Department approval required for admission. May be repeated for credit.

LANG 580 Foreign Language for Special Purposes  
1-12 hrs. 
The study of or practice in a specialized area in the field of foreign language and culture such as court interpreting, medical or engineering terminology, or public school administration. The content of this course may vary from semester to semester. Students may repeat the course for credit, provided the subject matter differs. Prerequisite: permission of Department.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

LANG 710 Independent Research  
2-6 hrs.

Language Teaching Courses

Open to Upperclass and Graduate Students

LANG 558 Modern Language Instruction (in French, German, Spanish, or other language)  
3 hrs. 
Required for modern language teaching majors and minors (but the hours may not be counted toward the minor). This course will acquaint prospective language teachers with various approaches and strategies involved in modern language teaching. Specifically, in a performance-oriented program, students will learn theory and practice related to teaching the listening, speaking, reading, and writing skills, as well as the culture component. Preferably, students should complete this course before beginning directed teaching. This course will be offered regularly. The comparable methods course for Latin is LAT 557, Teaching of Latin; for Latvian, LATV 515, Methods of Teaching Latvian.

Translation Courses (TRNS)

Open to Upperclass and Graduate Students

TRNS 510 Translation Seminar  
4 hrs. 
Intensive practice in translation, primarily of non-literary documents, into English. The
course will also include some practical work in lexicography, error analysis, translation quality assessment and general problem solving. Prerequisites: LING 105; ENGL 305, TRNS 310, FREN 316, 317, 325, 551, or GER 316, 317, 325, 552, or LATV 316, 317, 325, 551, or SPAN 316, 317, 325, 552.

TRNS 590 Translation Practicum
3-6 hrs.
Under the direction of a faculty adviser, a student will serve an internship in the translation department of a major company, work under the supervision of a professional translator or in a translation agency, complete a substantial and useful translation project on campus, or attend a series of translation workshops. Off-campus work will be evaluated jointly by institutions or individuals supervising the internship and the faculty adviser. On-campus projects will be evaluated by a panel of faculty members. Specific assignments will be arranged in consultation with the adviser during the semester preceding the one in which the student expects to enroll in 590. TRNS 590 may be taken in two consecutive semesters (16 contact hours per week, 3 credit hours per semester, a total of 6 credit hours) or in a single semester (32 contact hours per week, 6 credit hours). Prerequisite: TRNS 510.

French (FREN)

Open to Upperclass and Graduate Students
FREN 550 Independent Study in French
1-3 hrs.
Directed, individual study of a specific topic in a French literary or linguistic area. Departmental approval required for admission. Repeatable for credit. Prerequisite: A minimum grade point average of 3.0 in the major.

FREN 551 Advanced French Grammar and Composition
3 hrs.
Intensive review of French structure and practice in composition. Prerequisites: FREN 316 and 317 or equivalent.

FREN 552 Advanced French Conversation
3 hrs.
Intensive practice with spoken French. Prerequisite: FREN 316 and 317 or equivalent.

FREN 560 Studies in French Literature
3 hrs.
Topics of literary, cultural, or linguistic merit will be analyzed. Topics will vary from semester to semester. May be repeated for credit. Prerequisites: FREN 316, 317, 325, or permission of instructor.

German (GER)

Open to Upperclass and Graduate Students
GER 528 Survey of German Literature
3 hrs.
A comprehensive study of German literature from its beginning through Romanticism. Prerequisites: GER 316, 317, 322 or 325 or equivalent.

GER 529 Survey of German Literature
3 hrs.
A comprehensive study of German literature from German Realism to the present. Prerequisites: GER 316, 317, 322 or 325 or equivalent.

GER 550 Independent Study in German
1-3 hrs.
Directed, individual study of a specific topic in a German literary or linguistic area. Departmental approval is required for admission. Repeatable for credit. Prerequisite: One 500-level course in the major; a minimum grade point average of 3.0 in the major.

GER 552 Advanced German Composition
3 hrs.
Intensive practice in composition and stylics directed toward appreciation of literary and other written expression in German with work in free composition at an advanced level. Prerequisites: GER 316 and 317 or equivalent.

GER 553 Advanced German Conversation
3 hrs.
Intensive training in conversational German with emphasis on colloquial language and idioms. Prerequisites: GER 316 and 317 or equivalent.

GER 559 History of the German Language
3 hrs.
Survey of the development. Prerequisite: Six hours of 300-level German or above.

GER 560 Studies in German Literature
3 hrs.
Topic varies according to genre, author, or period and will be announced. Each of these courses carries separate credit, although all are listed under 560. Thus, a student may take any or all of the offerings at various times. Prerequisites: GER 316, 317, 322 or 325 or equivalent. Representative topics which may be treated in this area include:
- The Novel—Survey of the development with representative selections.
- Lyric Poetry—Survey of the development with significant selections.
- Nineteenth Century Drama—Primarily Kleist, Grillparzer, Hebbel, and Hauptmann.
- Twentieth Century Drama—Representative selections.

Latin (LAT)

Open to Upperclass and Graduate Students
LAT 500 Independent Study in Latin
1-3 hrs.
Directed, individual study of a specific topic or genre in a Latin literary or linguistic area; e.g., biography, bucolic poetry, comedy, history, or satire. Departmental approval required for admission. Repeatable for credit. Prerequisite: A minimum grade point average of 3.0 in the major.

LAT 577 Teaching of Latin
3 hrs.
The purpose of the course is to acquaint the prospective teacher with theory and practice appropriate to the Latin language, literature and culture in its classical context and as it relates to the modern world. Required of Latin teaching majors and minors.

LAT 560 Medieval Latin
3 hrs.
A study of the period 500-1500 A.D., when Classical Latin was evolving into new vernacular forms which would eventually become the modern Romance Languages. Prose and poetry readings include a variety of themes reflecting the intellectual, cultural and religious thinking of the times. Prerequisite: One of LAT 200, LAT 201, LAT 324 or equivalent or permission of the department.

Latvian (LATV)

Open to Upperclass and Graduate Students
LATV 515 Methods of Teaching Latvian
2 hrs.
Examination of different Latvian language teaching methods: principles, problems, current practice. Opportunities to tutor beginning Latvian students, engage in student teaching in the Kalamazoo Latvian School, and/or on work in language teaching materials. Prerequisite: LATV 201 or equivalent, or instructor's permission.

LATV 550 Independent Study in Latvian
1-3 hrs.
Directed individual study of a specific topic in a Latvian language, literature, or culture area. Department approval required for admission. Repeatable for credit. Prerequisite: Instructor's permission.

LATV 551 Advanced Latvian Grammar and Composition
3 hrs.
Intensive review of Latvian structure and practice in composition. Prerequisite: LATV 316 or equivalent.

LATV 560 Studies in Latvian Literature
3 hrs.
Topic varies according to genre, author, or period and will be announced. May be repeated for credit under a different topic. Prerequisite: LATV 325 or instructor's permission.

LATV 597 Seminar in Latvian Linguistics
2-4 hrs.
Each seminar will deal with a selected topic relating to Latvian linguistics, e.g.: the development of the Latvian literary language—from folk literature to the present-day idiom. May be repeated for credit with a different topic. Prerequisite: Instructor's permission.

Russian (RUSS)

Open to Upperclass and Graduate Students
RUSS 550 Independent Study in Russian
1-3 hrs.
Directed individual study of a specific topic in Russian language, literature, or culture. May be repeated for credit. Department and instructor approval required.

Spanish (SPAN)

Open to Upperclass and Graduate Students
SPAN 510 Studies in Hispanic Culture
3 hrs.
An intensive study of various aspects of Spanish and Spanish American culture. Emphasis is on cultural understanding as an avenue to increased proficiency in the Spanish language. Since specific topics will vary each semester, this course may be repeated for credit. Prerequisites: SPAN 316, 317, either 322 or 323, plus one additional course at the 300- or 500-level.

SPAN 526 Survey of Spanish Literature to the 18th Century
3 hrs.
A survey of Spanish literature from its origin to, and including, the seventeenth century. Prerequisites: SPAN 316, 317, and 325.

SPAN 527 Survey of Spanish Literature from the 18th Century to the Present
3 hrs.
A survey of Spanish literature from the eighteenth century to the present. Prerequisites: SPAN 316, 317, and 325.

SPAN 528 Survey of Spanish American Literature to Modernismo
3 hrs.
A survey of Spanish American literature from its origin to the era of Modernismo (late 19th century). Prerequisites: SPAN 316, 317, and 325.
SPAN 529 Survey of Spanish American Literature from Modernismo to the Present 3 hrs.
A survey of Spanish American literature from late 19th century to the present. Prerequisites: SPAN 316, 317, and 325.

SPAN 550 Independent Study in Spanish 1-3 hrs.
Directed, individual study of a specific topic in a Spanish literary or linguistic area. Departmental approval required for admission. Repeatable for credit. Prerequisite: One 500-level literature course in the major; a minimum grade-point average of 3.0 in the major.

SPAN 552 Advanced Spanish Grammar and Composition 3 hrs.
An advanced study of the intricacies and problems of Spanish grammar, syntax, and style with attention to improving written expression in Spanish at an advanced level. Prerequisites: Spanish 316, 317, and one additional 300-level course. At least three hours of 525, 527, 528, or 529 are recommended.

SPAN 553 Advanced Spanish Conversation 3 hrs.
Intensive practice to reinforce and expand the basic oral communication skills and to develop flexible and idiomatic oral expression. Prerequisites: Spanish 316, 317, and one additional 300-level course. At least three hours of 525, 527, 528, or 529 are recommended.

SPAN 560 Studies in Spanish Literature 3 hrs.
Topics vary according to genre, author, or period and will be announced. Each of these courses carries separate credit, although all are listed under 560. Thus, a student may take any or all of the offerings at various times. Prerequisite: Three hours of SPAN 525, 527, 528, or 529, or departmental permission. Representative topics which may be treated in this area include:
- Cervantes—Don Quijote and other works of Cervantes together with his life and thought.
- Seventeenth Century Theater—Main works of Lope de Vega through Calderon de la Barca.
- Nineteenth Century—The Romantic Movement.
- Nineteenth Century Novel—Development of the regional novel from Fernan Caballero through Blasco Ibanez.
- Generation of '98—Thought and works of typical representatives such as Unamuno, Azorin, Baroja, and A. Machado.
- Contemporary Theater—Evolution and analysis of the characteristics.
- Spanish-American Short Story—Significant short stories along with the cultural and social background.
- Contemporary Spanish-American Novel—The new Spanish-American novel along with the cultural and social background.

Open to Graduate Students Only

SPAN 600 Don Quijote 3 hrs.
An indepth study of Cervantes' masterpiece. Emphasis is on literary analysis, but attention will also be paid to Cervantes' language.

SPAN 610 Topics in Hispanic Culture 3 hrs.
The advanced study of selected aspects of Hispanic culture. Course varies according to topic and may be repeated with permission of adviser. Representative topics include: Non-Castilian Spanish Cultures; Galicia, Euskadi and Catalunya; The Way of St. James and Medieval Tradition; Contemporary Spanish Cinema; Women in Spanish Society; Hispanic Culture in the United States; Ideas and ideology in Contemporary Latin America; Spanish American Popular Culture.

SPAN 620 Topics in Spanish Literature 3 hrs.
The advanced study of selected aspects of Spanis

LING 651 Methods of Teaching English as a Second Language 3 hrs.
Study of the application of linguistics and other disciplines to the teaching of Standard American English to speakers of other languages, with emphasis on current methods and materials for instruction and testing.

LING 690 Seminar in Linguistics—Variable Topics 3 hrs.
Each seminar will deal with a selected topic related to English as a second language. Since content will vary from semester to semester, students are advised to check course descriptions in the Department office.

Open to Graduate Students Only—Please refer to The Graduate College section for course description

LING 710 Independent Research 2-6 hrs.

Mathematics and Statistics (MATH)


Open to Upperclass and Graduate Students

LING 500 Introduction to Linguistics 4 hrs.
An introduction to modern linguistic theory and to the application of that theory to linguistically-related disciplines.

LING 515 Methods of Teaching Critical Languages 2 hrs.
Study of the application of linguistics to the teaching of one or more "critical" languages. Emphasis will be on modern and traditional methods and materials for instruction and testing. Course work will include tutorial experience. May be repeated for credit for a different language. Prerequisite: LING 201 or equivalent.

LING 540 Generative Grammar 4 hrs.
An examination of the theories of Transformational Grammar and Generative Semantics, and a study of their origins, development, modifications, and applications. Prerequisite: LING 500 or equivalent.

LING 551 Psycholinguistics 4 hrs.
A study of linguistic systems as they connect language and thought—and relate competence to performance—in the acquisition, production, and perception of language.

LING 552 Sociolinguistics 4 hrs.
A systematic study of the linguistic correlates of social behavior and the influence of society on the nature of language.

LING 598 Readings in Linguistics 1-4 hrs.
An opportunity for advanced students with good scholastic records to pursue the independent study of a linguistic subject not specifically covered by any of the courses in the Linguistics program. Prerequisites: Permission of the instructor and chairperson.

Open to Graduate Students Only

LING 611 Methods of Teaching English as a Second Language 3 hrs.
Study of the application of linguistics and other disciplines to the teaching of Standard American English to speakers of other languages, with emphasis on current methods and materials for instruction and testing.

LING 612 Principles of Teaching English as a Second Language 3 hrs.
Study of the linguistic theory and historical development of teaching English to speakers of other languages, as well as an examination of second language acquisition and the various aspects of bilingualism. Prerequisite: An introductory course in linguistics.

LING 690 Seminar in Linguistics—Variable Topics 3 hrs.
Each seminar will deal with a selected topic related to English as a second language. Since content will vary from semester to semester, students are advised to check course descriptions in the Department office.

Open to Graduate Students Only—Please refer to The Graduate College section for course description

LING 710 Independent Research 2-6 hrs.

MATHEMATICS AND STATISTICS 67

LING 500 Introduction to Linguistics 4 hrs.
An introduction to modern linguistic theory and to the application of that theory to linguistically-related disciplines.

LING 515 Methods of Teaching Critical Languages 2 hrs.
Study of the application of linguistics to the teaching of one or more "critical" languages. Emphasis will be on modern and traditional methods and materials for instruction and testing. Course work will include tutorial experience. May be repeated for credit for a different language. Prerequisite: LING 201 or equivalent.

LING 540 Generative Grammar 4 hrs.
An examination of the theories of Transformational Grammar and Generative Semantics, and a study of their origins, development, modifications, and applications. Prerequisite: LING 500 or equivalent.

LING 551 Psycholinguistics 4 hrs.
A study of linguistic systems as they connect language and thought—and relate competence to performance—in the acquisition, production, and perception of language.

LING 552 Sociolinguistics 4 hrs.
A systematic study of the linguistic correlates of social behavior and the influence of society on the nature of language.

LING 598 Readings in Linguistics 1-4 hrs.
An opportunity for advanced students with good scholastic records to pursue the independent study of a linguistic subject not specifically covered by any of the courses in the Linguistics program. Prerequisites: Permission of the instructor and chairperson.

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Each seminar will deal with a selected topic related to English as a second language. Since content will vary from semester to semester, students are advised to check course descriptions in the Department office.

Open to Graduate Students Only—Please refer to The Graduate College section for course description

LING 710 Independent Research 2-6 hrs.

Mathematics and Statistics (MATH)


Open to Upperclass and Graduate Students

MATH 506 Scientific Programming 3 hrs.
An introduction to solving scientific and engineering problems on computers. The topics include root-finding, matrix calculations, numerical integration and the numerical solution of differential equations. The FORTRAN language and various library software packages will be used. Prerequisite: MATH 230 or 374, and CS 201 or 306.
MATH 507 Numerical Analysis I 3 hrs.
The analysis and use of numerical algorithms for the solution of nonlinear equations, systems of linear equations, interpolation, numerical differentiation and integration. Prerequisite: MATH 230, 272, and 274 or 374 and CS/MATH 506.

MATH 510 Applied Matrix Algebra 3 hrs.
An introduction to the study of methods to solve linear systems of equations, least squares approximation problems, and eigenvalue problems. Topics covered include the algebra of real and complex matrices with particular emphasis on LU-decompositions, QR-decompositions, singular value decompositions, generalized inverses, Hermitian symmetric matrices, position definite matrices and the Spectral Theorem. Applications from multivariate calculus will be discussed. Prerequisites: Either MATH 230 and MATH 272 or MATH 374.

MATH 530 Linear Algebra 3 hrs.
Properties of finite dimensional abstract vector spaces, linear maps, diagonalizability, and matrix algebra are studied. Prerequisite: MATH 330.

MATH 540 Advanced Geometry 3 hrs.
Topics to be selected from projective geometry, algebraic geometry, differential geometry, or non-Euclidean geometry. Prerequisite: Consent of instructor.

MATH 550 Teaching of Secondary Mathematics 3 hrs.
In this course consideration is given to curriculum problems and trends in secondary school mathematics and to specific problems of teaching mathematics effectively to secondary school students. Prerequisites: MATH 330 or MATH 340.

MATH 552 Teaching of Elementary Mathematics 3 hrs.
Consideration is given to curriculum problems and trends in elementary school mathematics and to specific problems of teaching mathematics effectively to elementary school children. Computer terminology and applications in elementary mathematics classrooms will be integral parts of this course. Prerequisite: MATH 265 or consent of instructor.

MATH 553 Participation in Elementary Mathematics Teaching 2 hrs.
Students will work cooperatively with an elementary school teacher in an elementary classroom in various aspects of helping children learn mathematics. The course will provide the prospective elementary teacher with an opportunity to work with small groups of young children and to observe them in mathematics learning. The student will be required to maintain a journal and to meet weekly with a staff member supervising the course. Graded on a Credit/No Credit basis. Prerequisite: MATH 552.

MATH 560 Applied Probability 3 hrs.
A first course in probability for upper division and graduate students interested in applications. Topics will include: probability spaces, expectation, moment generating functions, central limit theorem, special discrete and continuous distributions. Applications will include reliability and production problems, and Markov chain methods. Not recommended for students who have taken MATH 362 or 660. Prerequisite: MATH 272.

MATH 561 Applied Multivariate Statistical Methods 3 hrs.
An applied treatment of multivariate problems is presented. Classical procedures such as Hotelling's T-squared methods are discussed for the one and two sample problems and MANOVA for standard designs. Topics that will be accentuated are principal components, discriminant analysis, cluster analysis, and factor analysis. Emphasis will be on graphical methods and applications. Prerequisites: An introductory course in statistics and a course in linear algebra.

MATH 562 Statistical Analysis I 4 hrs.
The first course in the sequence MATH 562, 662 of applied statistics which combines both theory and applications. Topics include: elementary theory of estimation and hypothesis testing; the use of the normal, binomial, chi-square, F and t distributions in statistics problems; means and variances; simple linear regression; correlation; one-way and two-way analysis of variance, fixed effect models. Prerequisite: MATH 560 or 362.

MATH 563 Sample Survey Methods 3 hrs.
This course consists of a broad overview of the techniques of survey data collection and analysis and contains a minimum of theory. Topics may include: simple random, stratified, systematic, single-stage cluster, and two-stage cluster sampling; ratio and regression estimation; subpopulation analyses; problems of nonresponse; surveys of sensitive issues; minimization of survey costs; sample size determination. Real surveys are discussed and actual surveys are analyzed. Prerequisites: An introductory statistics course and consent of instructor.

MATH 564 Introduction to Statistical Computing 2 hrs.
An introduction to the use of statistical computer software. The emphasis will be on how to use existing software effectively. Statistical packages discussed will include MINITAB, SAS, SPSS, and BMDP. Statistical work treated will include: data entry, editing, statistical analysis of the one and two sample problems, analysis of variance, and regression analysis. Prerequisites: WMU's computer literacy requirement and an introductory statistics course.

MATH 565 Design of Experiments for Quality Improvement 3 hrs.
This course covers statistical methods useful for improving the quality of products and systems in an industrial setting. It provides a comprehensive set of tools to use in building better products and in reducing manufacturing and other costs. The focus will be on solving real engineering problems through case studies. Taguchi quality methodology will be discussed along with modifications from standard statistical practice. Topics will include planning an experiment, experimental strategy, Analysis of Variance concepts, factorial designs, orthogonal arrays, loss functions, signal-to-noise ratios, identifying significant factor effects, graphical methods, parameter design and tolerance design. Prerequisite: An introductory course in statistics.

MATH 566 Nonparametric Statistical Methods 3 hrs.
This course presents a broad overview of statistical methods commonly referred to as nonparametric or distribution-free methods. Topics include: inferences for proportions, contingency tables, goodness of fit problems, estimation and hypothesis testing, ranking methods, measures of rank correlation, efficiency. Emphasis will be on the application of nonparametric statistical methods to data from many different applications. Prerequisite: An introductory statistics course.

MATH 567 Statistical Design and Analysis of Experiments 4 hrs.
A course in experimental design and the analysis of variance with particular emphasis on industrial experiments. Topics include: completely randomized, randomized complete block, Latin square, and split-plot designs; orthogonal contrasts and multiple comparisons; factorial arrangement of treatments; confounding; fractional replication. This course is molded around the complete analysis of good applied problems. Prerequisite: An introductory statistics course.

MATH 568 Regression Analysis 3 hrs.
An applied course in regression analysis: simple and multiple linear regression; resolution of fit of a model, including residual analysis, precision of estimation, and tests of general hypotheses; model building; step-wise regression; use of indicator variables; non-linear regression. Prerequisite: An introductory statistics course.

MATH 570 Advanced Calculus 3 hrs.
Properties of real numbers, Cauchy sequences, series, limits, continuity, differentiation, Riemann integral, sequences and series of functions. Prerequisites: MATH 272 and 314. (330 recommended).

MATH 572 Vector Calculus and Complex Variables 4 hrs.
Functions of several variables, implicit and inverse functions, Jacobians, multiple integrals, Green's theorem, divergence, curl, the Laplacian, Stokes Theorem, analytic functions, Laurent expansions, residues, argument principle, and conformal mapping. Prerequisites: (MATH 230, 272 and 274) or 374.

MATH 574 Advanced Differential Equations 3 hrs.
Series solutions at ordinary and singular points of linear ordinary equations, Bessel and Legendre functions, self-adjoint boundary value problems, Fourier series, series of partial differential equations by separation of variables. Prerequisites: (MATH 230, 272 and 274) or 374.

MATH 580 Number Theory 3 hrs.
Diophantine equations, congruences, quadratic residues, and properties of number-theoretic functions. Prerequisite: MATH 330.

MATH 595 Seminar in Elementary Mathematics Education 1-3 hrs.
Current curriculum problems in the area of elementary mathematics education are identified and discussed. Students are required to identify a problem and give both an oral and written report on research in that area. Prerequisite: MATH 552.

MATH 599 Independent Study in Mathematics 1-3 hrs.
Advanced students with good scholastic records may elect to pursue independently the study of some topic having special interest for them. Topics are chosen and arrangements are made to suit the needs of each particular
Open to Graduate Students Only

MATH 600 Statistics for Public Administrators 3 hrs.
This course is designed to assist public administrators in understanding various statistical procedures which could be used to comprehend and interpret data sets related to public policy analysis. Topics covered in the course include: a review of basic statistics in the course include: a review of basic statistics in the context of policy analysis; and case studies used in analyzing policy data. Throughout the course, examples will be used from policy analysis and evaluation literature to illustrate the utility of the statistical procedures presented. Prerequisite: Elementary statistics or equivalent. (Cross-listed with PADM 691.)

MATH 602 Mathematical Modeling I 3 hrs.
This course considers the methodology of modeling a series of practical problems. The mathematical tools used may include dimensional analysis, optimization, differential and difference equations, graph theory and network flow theory. The practical problems may include population dynamics, economic theory of prices and production, scale models, scheduling problems, pollution, social group interaction, epidemics, and facility location. Prerequisite: MATH 574 or consent of instructor.

MATH 605 Optimization 3 hrs.
Optimization methods including nonlinear programming, calculus of variations, and integer programming will be covered. Network flow problems and dynamic programming may also be covered. Applications to problems in business and industry will be included. Prerequisites: MATH 123 and 406 or 608 or IEGM 610.

MATH 607 Numerical Analysis II 3 hrs.
The analysis and use of numerical algorithms for the solution of ordinary and partial differential equations, and approximation theory. Prerequisite: MATH 507.

MATH 608 Linear Programming 3 hrs.
Linear inequalities; convex geometry; optimization in linear systems; zero-sum games; applications. Prerequisite: An introductory course in linear algebra.

MATH 609 Studies in Applied Math 3 hrs.
Advanced work organized around topics related to the field of study indicated at the time the course is scheduled. Students may take this course more than once.

The courses 611 through 619 are primarily for teachers and ordinarily will not apply towards the Master of Arts in Mathematics.

MATH 611 Mathematical Applications 3 hrs.
An introduction to the philosophy of, machinery for, and methodology in applications of mathematics. Topics will be chosen from graph theory, linear algebra, numerical approximation, optimization and graphical linear programming, probability, and linear differential equations. Prerequisite: Consent of the adviser.

MATH 615 Intermediate Analysis 3 hrs.
This course will include the following topics: limits, continuity, differentiation, integration, applications. It will stress concepts rather than techniques. Prerequisite: Consent of adviser.

MATH 616 Survey of Algebra 3 hrs.
This course will discuss groups, rings, integral domains and fields, including such topics as homomorphisms and isomorphisms, subalgebras and ideals, with examples involving permutation groups, transformation groups, polynomial rings and finite fields. Prerequisite: Consent of adviser.

This course emphasizes the applications of computing technology to the teaching and learning of mathematics in grades 7-12. Particular attention is given to the role of technology in mathematical problem solving and concept development. Technology-oriented curriculum materials will be examined and developed. Prerequisite: Consent of adviser.

MATH 622 General Topology I 3 hrs.
Topics include: Separation axioms, continuity, compactness, connectedness, product and quotient spaces, metric spaces. Prerequisite: MATH 570 or permission of instructor.

MATH 623 General Topology II 3 hrs.
Topics include: Continuous functions, uniform spaces, function spaces, paracompactness. Prerequisite: MATH 622.

MATH 624 Algebraic Topology 3 hrs.
Topics will include simplicial complexes, homology and cohomology theories, including singular homology theory. Prerequisite: MATH 622.

MATH 629 Studies in Topology 3-4 hrs.
Advanced work organized around topics related to the field of study indicated in the above title. Students may take this course more than once.

MATH 630 Abstract Algebra I 3 hrs.
A general study of groups, rings, and modules. A specific study of finite groups, polynomial rings, and Euclidean domains. Prerequisite: MATH 630.

MATH 631 Abstract Algebra II 3 hrs.
A continuation of 630. Modules, structure theory of modules over principal ideal domains, applications to finitely generated abelian groups, rational and Jordan canonical forms of a linear transformation, bilinear and quadratic forms. Prerequisite: MATH 630.

MATH 632 Field Theory 3 hrs.
Algebraic and transcendental extensions of fields, Galois theory, and valued fields. Prerequisite: MATH 630.

MATH 637 Numerical Linear Algebra 3 hrs.
The analysis and use of numerical algorithms for solving problems from linear algebra, including matrix norms, singular value decompositions, Gaussian elimination, least square methods, eigenvalues and eigenvectors, and graphics. Prerequisites: MATH 510 or 530, and 506 or 507.

MATH 639 Studies in Geometry 3 hrs.
Advanced work organized around topics related to the field of study indicated in the above title. Students may take this course more than once.

MATH 640 Graph Theory I 4 hrs.
This course and MATH 641 cover the following topics: Fundamental concepts; eulerian graphs; adjacency and incidence matrices; trees, planar graphs; graph embeddings; connectivity; hamiltonian graphs; matchings; factorization; graphs and groups; Cayley color graphs; line graphs; the Reconstruction Problem; spectra of graphs; graph and map colorings; extremal graph theory; Ramsey theory. Prerequisite: Approval of adviser.

MATH 641 Graph Theory II 3 hrs.
Continuation of MATH 640. Prerequisite: MATH 640.

MATH 644 Graphs, Groups, and Surfaces 3 hrs.
Study of the interaction of graphs, groups, and surfaces. Topics covered include map-coloring problems, symmetrical maps, automorphism groups of graphs, Cayley groups of graphs, genus of graphs, genus of groups, generation of block designs, and applications to church bell ringing. Prerequisite: Consent of instructor.

MATH 645 Studies in Combinatorics 3 hrs.
Advanced work organized around topics related to the field of study indicated in the above title. Students may take this course more than once.

MATH 649 Studies in Combinatorics 3 hrs.
Advanced work organized around topics related to the field of study indicated in the above title. Students may take this course more than once.

The courses 651, 652, 653, and 654 are primarily for teachers and ordinarily will not apply towards the Master of Arts in Mathematics.

MATH 651 Studies in Teaching Elementary School Mathematics 3 hrs.
This is an advanced methods class devoted to analysis of current theoretical and research-based perspectives on mathematics teaching and learning and their implications for instructional practice and evaluation of student performance at the elementary school level. Explicit attention is given to the impact of technology on the teaching/learning process. Prerequisite: Consent of adviser.

MATH 652 Studies in Teaching Middle School Mathematics 3 hrs.
This is an advanced methods class devoted to analysis of current theoretical and research-based perspectives on mathematics teaching and learning and their implications for instructional practice and evaluation of student performance at the middle school level. Explicit attention is given to the impact of technology on the teaching/learning process. Prerequisite: Consent of adviser.

This is an advanced methods class devoted to analysis of current theoretical and research-based perspectives on mathematics teaching and learning and their implications for instructional practice and evaluation of student performance at the secondary school level. Explicit attention is given to the impact of technology on the teaching/learning process. Prerequisite: Consent of adviser.

This is an advanced methods class devoted to analysis of current theoretical and research-based perspectives on mathematics teaching and learning and their implications for instructional practice and evaluation of student performance at the secondary school level. Explicit attention is given to the impact of technology on the teaching/learning process. Prerequisite: Consent of adviser.
MATH 564 Curricular Studies in Secondary Mathematics 3 hrs.
This course includes an examination of curricular issues and trends in secondary school mathematics together with analysis of related research and experimental curricular materials. Special attention is given to the impact of computing technology on secondary school mathematics curricula. Prerequisite: Consent of adviser.

MATH 565 Teaching of College Mathematics 3 hrs.
In this course consideration is given to curriculum problems and trends in post-high school mathematics; research on specific problems of teaching mathematics effectively to college students will be emphasized. Prerequisite: Consent of adviser.

MATH 660 Statistical Inference I 4 hrs.
A first course in mathematical statistics. Topics include: distributions of statistics; asymptotic distribution theory; theories of estimation, functions of sufficient statistics; confidence intervals; theories of testing, uniformly most powerful tests; likelihood ratio tests; selected topics in statistics. Prerequisite: MATH 562.

MATH 661 Multivariate Statistical Analysis 3 hrs.
A theoretical treatment of multivariate statistical problems and techniques. Topics include: multivariate normal distribution; quadratic forms; multiple and partial correlation; sample correlation coefficients; Hotelling's T²-statistic; Wishart distribution; applications to tests of the mean vector and covariance matrix; principal components; factor analysis; cluster analysis; discriminant analysis. Prerequisite: MATH 663.

MATH 662 Applied Linear Models 3 hrs.
An advanced course in applied statistics. Linear models will be used to treat a wide range of regression and analysis of variance methods. Topics include: matrix review; multiple, curvilinear, non-linear, and stepwise regression; correlation; residual analysis; model building; use of the regression computer packages at WMU; use of indicator variables for analysis of variance and covariance models. Prerequisite: MATH 562.

MATH 663 Linear Models 3 hrs.
A theoretical study of the general linear model including random vectors; quadratic forms, multivariate normal distributions, least squares estimation, hypothesis testing for full and reduced models, generalized inverses. Prerequisites: MATH 660 and 662 and 510.

MATH 664 Design of Experiments I 3 hrs.
An applied course in the design and analysis of experiments. Topics include: general considerations in the design of an experiment; standard designs such as Latin square, balanced incomplete block, split plot, and nested; pooling of experiments; multiple comparison techniques; orthogonal contrasts and polynomials; factorial arrangement of treatments; fixed, random, and mixed models; confounded designs; fractional replication. Prerequisite: MATH 662.

MATH 665 Statistical Inference II 3 hrs.
Mathematical statistics is considered in a decision theoretic framework. The decision problem; loss and risk function; Bayes procedures; minimax procedures; admissibility; complete classes; sufficiency; hypothesis testing and estimation. Prerequisite: MATH 660.

MATH 666 Nonparametric Statistical Theory 3 hrs.
A theoretical study of nonparametric statistics and robust statistical procedures. Topics may include: order statistics, empirical cdf's, M-estimates, rank statistics, optimality considerations, asymptotic efficiency and scale-equivariant procedures. Prerequisites: MATH 673 and 660.

MATH 667 Introduction to Random Processes 3 hrs.
This course is a treatment of random sequences and Markov processes. Discrete and continuous Markov processes; transition and rate matrices; Chapman-Kolmogorov systems; transient and limiting behavior; examples and illustrations; random walks, birth- and-death processes, etc. Prerequisites: MATH 673, 510 or 530, and one probability course.

MATH 668 Categorical Data Analysis 3 hrs.
Statistical methods for discrete multivariate data and contingency tables will be discussed. The log linear model for two way and higher dimensional tables will be emphasized. Subtopics include: maximum likelihood estimates, likelihood ratio tests, partial fitting, model selection, goodness of fit, logistic models, incomplete tables, symmetry, marginal homogeneity, and conditional independence models. Prerequisite: MATH 662.

MATH 669 Studies in Probability and Statistics 3 hrs.
The subject matter for this course is variable. Advanced work is considered and organized around topics not usually considered in the other courses. Prerequisite: MATH 570 or approval of adviser.

MATH 673 Real Analysis 4 hrs.
Topology of n-dimensional space, continuity and differentiability of functions of one variable; Reimann-Stieltjes integral; convergence of sequences and series of functions; Fourier series; analysis of functions of several variables. Prerequisite: MATH 570 or approval of adviser.

MATH 676 Complex Analysis 3 hrs.
Topics include: Cauchy Theory, series expansion, power series, types of singularities, calculus of residues. Prerequisite: MATH 673.

MATH 677 Measure and Integration 3 hrs.
The basic theory of measure and integration, including such topics as Lebesgue measure, abstract measures, measurable functions, product measures, Lp spaces, Radon-Nikodym theorem. Prerequisite: MATH 673.

MATH 678 Introduction to Functional Analysis 3 hrs.
Metric spaces; category; compactness; Banach spaces; Hahn-Banach theorem; completely continuous operators; Hilbert spaces; self-adjoint operators; elementary spectral theory. Prerequisite: MATH 677.

MATH 679 Studies in Analysis 3 hrs.
Advanced work organized around topics related to the field of study indicated in the above title. Students may take this course more than once.

MATH 680 Topics in Statistical Computing 3 hrs.
Study of the computational algorithms used in solving statistical problems. Students will write their own FORTRAN routines as well as drivers and subroutines, employ mathematical and statistical packages. Problems covered include approximating probabilities and quantiles for selected distributions; Monte Carlo studies; least squares computational procedures for linear and nonlinear models such as QR decompositions and iteratively reweighted least squares, robust estimating procedures. Additional topics may include general linear models, nonlinear models, and multivariate problems. Prerequisites: CS 306 or CS 201, MATH 662 or MATH 568 and MATH 250.

MATH 681 Survival Data Analysis 3 hrs.
This course consists primarily of biostatistical methods used in pharmaceutical and medical research with particular application to cancer studies and toxicological animal studies. Some attention is given to related failure-time methods used in industry to test product reliability. Theoretical development of the statistical methods is discussed. Extensive data analyses are done using SAS (or comparable statistical packages). Topics include: censoring, Kaplan-Meier survival curves, life tables, two-sample non-parametric procedures for comparison of survival curves (Gehan, Cox-Mantel, log rank and generalized Wilcoxon), relative risk, odds ratio, the Mantel-Haenszel procedure, and parametric failure-time models (exponential, gamma, Weibull, and lognormal), logistic regression, and Cox’s proportional hazards model. Prerequisites: MATH 660 and MATH 662.

MATH 682 Time Series Analysis 3 hrs.
The theoretical development and practical use of seasonal and non-seasonal ARIMA (Auto-regressive Integrated Moving Average) Box-Jenkins time series models is presented. Identification of correct time series models, estimation of model parameters, and diagnostic checks of identified models will be covered. The uses of these models for forecasting future trends and assessing interventions will be examined. Extensive data analysis using SAS, MINITAB, and BIOMED statistical packages are included. Topics include: autocorrelation function, partial autocorrelation functions, Yule-Walker equations, differencing, stationarity, autocorrelation models, moving average models, seasonality, invertibility, and Box-Pierce tests. Prerequisite: MATH 660 and MATH 662.

MATH 683 Robust Statistical Analysis 3 hrs.
Robust statistical procedures for inference in location, linear and multivariate models are presented. This will include broad classes of robust estimates, including R-, M- and L-estimates of both regular and bounded influence types. Concepts such as breakdown point, influence function, and asymptotic theory are used to obtain properties of these procedures. Computational aspects of these estimates are discussed along with small sample properties and applications of these procedures. Prerequisite: MATH 660 and MATH 662.

MATH 684 Design of Experiments II 3 hrs.
This course is a continuation of Design of Experiments I. The additional topics include: univariate measurement designs, analysis of covariance designs, response surface designs, partially balanced incomplete block designs, mixture models, analysis of models with missing data using Types I, II, III, and IV SAS sums of squares, analysis of large experiments with many crossed and nested factors, and some Taguchi methods. Prerequisite: MATH 664.

MATH 689 Studies in Number Theory 3 hrs.
Advanced work organized around topics related to the field of study indicated in the title. Students may take this course more than once.
MATH 690 Seminar in Applied Mathematics
1-3 hrs.
MATH 691 Practicum in Statistical Consulting
1 hr.
Provides graduate students with the opportunity to participate as statistical consultants on real projects. The student consultants are involved with all aspects of the statistical consulting experience from data manipulation and analysis to the design of the statistical aspects of the project and from interaction and effective communication with a client to the production of a final written report on the statistical aspects of the project. May be taken for credit at most three times.
Prerequisites: MATH 682 (or concurrent enrollment) and at least one of MATH 563, 566, 567, or 568.

MATH 692 Seminar in Topology
1-3 hrs.
MATH 693 Seminar in Algebra
1-3 hrs.
MATH 694 Seminar in Graph Theory
1-3 hrs.
MATH 695 Seminar in Mathematics Education
1-4 hrs.
MATH 696 Seminar in Probability and Statistics
1-3 hrs.
MATH 697 Seminar in Analysis
1-3 hrs.
MATH 698 Statistical Consulting Internship
2-6 hrs.
The statistical consulting internship program provides a graduate student with the opportunity to work as a member of the staff in the Center for Statistical Services. The student gains considerable experience in all aspects of the consulting experience and the operation of a consulting center. Prerequisite: Consent of Adviser.
MATH 699 Reading and Research
1-6 hrs.
Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

MATH 712 Professional Field Experience
2-12 hrs.
MATH 725 Doctoral Research Seminar
2-6 hrs.
MATH 730 Doctoral Dissertation
15 hrs.
MATH 735 Graduate Research
2-10 hrs.

Medieval Studies (MDVL)
Otto Gruner, Director
The Medieval Institute of Western Michigan University offers an interdisciplinary program leading to the Master of Arts in Medieval Studies. Either as preparation for further doctoral work or for a terminal degree, the program provides students with a broad background in medieval and Renaissance history, languages, literatures, philosophy, religion, the arts, and in research methodology. Western Michigan University offers an academic environment appropriate for the study of the Middle Ages. The University library houses extensive holdings of books and periodicals in all areas of medieval studies, and the Institute of Cistercian Studies library contains unique collections of early manuscripts and rare books in the field of monastic and Renaissance history and thought. Western Michigan University is the host institution for the annual International Congress on Medieval Studies, and Medieval Institute Publications publishes various series of monographs and periodicals in the field of medieval studies.
The Teaching Faculty of the Medieval Institute are the following:
George T. Beech (History), Jerry Abramson (Art), Gary Bigelow (Spanish), Ernst A. Bresach (History), Norman E. Carlson (English), Nancy Cutbirth (English), Audrey Davidson (Music), Clifford Davidson (English), Stephanie Demetrakopoulos (English), David Ede (Religion), E. Rozanne Elder (History), Rand Johnson (Latin), Paul A. Johnston (English), Robert W. Felson (Spanish), Billie Fisher (Art, Kalamazoo College), Jeffrey B. Gardner (German), C. J. Giakoumakis (English), Frank Gross (Religion), Otto Gruner (Religion), Elise Jorgens (English), Johannes A. Kissel (German), Peter Krawutschke (German), Robert A. Palmater (Languages and Linguistics), Lucian Rosu (History), Kathleen Smith (French, Kalamazoo College), Thomas Seiler (English), Matthew Steel (Music), John H. Stroupe (English), Larry E. Syndergaard (English), Camille Vande Berg (French), John Wickstrom (History, Kalamazoo College), Cunri Xiong (History).

Medieval Institute
Open to Underclass and Graduate Students
MDVL 500 Interdisciplinary Studies in Medieval Culture
3 hrs.
An interdisciplinary course organized around selected topics in medieval and Renaissance studies. The focus may be in a specific period (The Twelfth Century), a religious movement (Monasticism), a political structure (Venice—A Renaissance city-state), or the social fabric (Medieval Man: Image and Reality). In each case faculty from several departments will approach the semester's topic from the perspective and with the methodological tools of their respective disciplines, such as art, history, literature, music, philosophy, political science, and religion. The overall aim of the course is to demonstrate to students why one needs to acquire a variety of disciplines to understand a single complex problem, and how to put traditional building blocks together in new ways. The course may be repeated for credit with a different topic.

MDVL 597 Directed Study
1-3 hrs.
Research on a selected topic in the field of medieval studies directed and supervised by a faculty member. Registration requires at least junior standing and approval by the Director of the Medieval Institute.

Open to Graduate Students Only
MDVL 600 Advanced Seminar in Medieval Studies
2-4 hrs.
A research seminar for advanced graduate students with the focus on research and the preparation of papers in highly specialized areas of medieval studies. The specific topic of each seminar will be announced in the Schedule of Classes. May be repeated for credit with a different topic.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

Open to Graduate Students Only
MDVL 700 Master's Thesis
6 hrs.
MDVL 710 Independent Research
2-8 hrs.
MDVL 712 Professional Field Experience
2-12 hrs.

Required Core Courses
ENGLISH
ENGL 530 Medieval Literature
4 hrs.
HISTORY
HIST 635 Research Techniques in Medieval History
3 hrs.
LATIN
LAT 560 Medieval Latin
3 hrs.
RELIGION
REL 500 Christian Theology to 1500
4 hrs.

Cognate Electives
ART
ART 583 History of Medieval Art
3 hrs.
ART 585 History of Renaissance Art
3 hrs.
HISTORY
HIST 550 Studies in Medieval History
3 hrs.
HIST 612 Readings in Medieval History
3 hrs.
HIST 682 Seminar in Medieval History
3 hrs.

ENGLISH
ENGL 510 Special Topics in Literature: Anglo-Saxon Literature
4 hrs.
ENGL 532 English Renaissance Literature
4 hrs.
ENGL 555 Studies in Major Writers: Chaucer, Dante, Milton, Spenser
4 hrs.
ENGL 642 Studies in Drama
3 hrs.
ENGL 652 Studies in Shakespeare: Tragedy
3 hrs.
ENGL 653 Studies in Shakespeare: Comedy
3 hrs.
RELIGION
REL 500 Historical Studies in Religion
3 hrs.
REL 620 Advanced Seminar in Comparative Religion
3 hrs.

MUSIC
MUS 585 Medieval Music
2 hrs.
MUS 586 Renaissance Music
2 hrs.

Philosophy (PHIL)
A. Falk, Chairperson; Professors Bach, Elfin, Pisaneschi, Pritchard, Sheridan; Associate Professors DiWorth, Pulaski;
Open to Underclass and Graduate Students

PHIL 520 Mathematical Logic
3 hrs.
Basic ideas in modern mathematical logic; fundamentals of propositional and quantificational calculi; basic features of formal languages and axiomatic theories; topics in metamathematics, e.g., the deduction theorem, consistency and completeness, and incompleteness. Prerequisites: MATH 310 or MATH 314 or permission of instructor.
PHIL 525 Decision Theory
4 hrs.
Can there be a formal theory of what it is to be rational in one’s beliefs and actions? This course is an introduction to decision theory, which claims to be just such a theory of rationality. Attention will be given to both its mathematical development and the issues it raises in the philosophy of science, the theory of knowledge, and action theory. No prerequisites. A working knowledge of high school algebra is assumed.

PHIL 534 Moral and Philosophical Foundations of Health Care
4 hrs.
In this course philosophical reflection and biological science are combined in a critical examination of the nature and purpose of the health sciences. Topics to be considered include: the aims of the health sciences; the interplay of fact and value in health care; competing images of humankind embedded in health science; patient autonomy, dignity, and medical paternalism. This is a cross-college interdisciplinary course which is team taught with faculty from the General Studies Science area.

PHIL 570 Philosophical Topics
1-4 hrs.
An examination of special philosophical topics. Topics to be listed in the Schedule of Classes.

PHIL 598 Readings in Philosophy
1-4 hrs.
Research on some selected period or topic under supervision of a member of the Philosophy faculty. Approval of instructor involved and chairperson of the department’s yindividualized courses must be secured in advance of registration.

Open to Graduate Students Only

PHIL 600 Colloquium
2-4 hrs.
A seminar in which several faculty involve the students in their current research. Topics may vary from term to term.

PHIL 610 Seminar in the History of Philosophy
4 hrs.
A close reading and discussion of selected classics written by major philosophers from the ancient, medieval, or modern period. Selections may vary from term to term.

PHIL 620 Seminar in Logic and Methodology
4 hrs.
The theory and practice of a disciplined mind. Topics may vary from term to term. They will be drawn from deductive and inductive logic, scientific methods, theories of rationality, and artificial intelligence. PHIL 320 or 520 may be set as prerequisite for topics presupposing knowledge of symbolic logic.

PHIL 630 Seminar in Ethics and Value Theory
4 hrs.
A study of theories of value and duty, with special emphasis on applications. Topics may vary from term to term.

PHIL 640 Seminar in the Philosophy of Life
4 hrs.
A selection of works by philosophers of the 19th and 20th centuries, emphasizing the understanding of the human condition. Topics may vary from term to term. Examples of topics: freedom, the nature of modernity, concepts of meaningfulness, science and religion, reconciling subjectivity and objectivity.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

PHIL 700 Master’s Thesis
6 hrs.

PHIL 710 Independent Research
2-6 hrs.

Physics (PHYS)

Tantis, Chairperson; Professors Bernstein, Hardie, Oppliger, Poel, Scharn, Soga, Tans; Associate Professors Balderson, Kaul, McGinn, Assistant Professors Chung, Kamber, Rosenthal.

Open to Upperclass and Graduate Students

PHYS 520 Analytical Mechanics
3 hrs.
The topics studied include the dynamics of a single particle and the motion of a system of interacting particles. Techniques of vector analysis are used frequently, and conservation laws are developed and applied. The Lagrangian formulation of mechanics is introduced. Prerequisite: Physics 207 and either MATH 274 or 374. The mathematics course may be taken concurrently.

PHYS 540 Electricity and Magnetism I
3 hrs. Winter
This is a theoretical course providing a thorough investigation of electric and magnetic fields. The applications of the theorems of Stokes and Gauss are emphasized, and Maxwell's equations are derived. Prerequisites: Physics 207 and either MATH 274 or 374, or consent of the instructor.

PHYS 541 Electricity and Magnetism II
3 hrs. This course is a continuation of 540 and is an elective for majors wishing advanced work in field theory. Maxwell's equations and their applications to topics such as time-dependent fields, wave guides, and radiation will form the principal topics of the course. Prerequisite: Physics 540.

PHYS 560 Quantum Mechanics
3 hrs. Winter
In this course the development of quantum mechanics is traced, and simple applications of the theory are discussed. Topics include cavity radiation, the photodeelectric effect, deBroglie waves, the Rutherford-Bohr atom, the uncertainty principle, the Schrodinger equation with solutions, the coupling of angular momenta, and perturbation theory. Prerequisite: Physics 207 and 520 or consent of the instructor.

PHYS 561 Quantum Physics
4 hrs. This course is the same as PHYS 560 except that a laboratory is included. Students may not receive credit for both PHYS 560 and PHYS 561. Prerequisite: PHYS 520 or consent of instructor.

PHYS 562 Atomic and Molecular Physics
3 hrs. This course continues the study of the applications of quantum mechanics. Topics include the helium atom, multielectron atoms, the Raman, Zeeman, and Stark effects, stimulated emission, transition rates, selection rules, the diatomic molecule, and molecular physics. Prerequisite: Physics 560 or consent of the instructor.

PHYS 563 Solid State Physics
3 hrs.
After an initial study of symmetry and crystal structure, quantum mechanics is used to describe the cohesion of solids, x-ray and neutron diffraction, the elasticity of solids, lattice vibrations, and the thermal and electrical properties of solids, with particular emphasis on metals. Prerequisite: Physics 560 or consent of the instructor.

PHYS 564 Nuclear and Particle Physics
3 hrs. Winter
This course covers such topics as properties of nuclei, collision theory, nuclear reactions, nuclear models, fundamental interactions, and classification techniques used in particle physics. Discussions of experimental methods as well as theoretical treatments using quantum mechanics are included. Prerequisite: Physics 560 or consent of the instructor.

PHYS 566 Advanced Laboratory
3 hrs. Winter
The objectives of this course are to provide the student with experience in the use of modern laboratory equipment and with a better understanding of several important physical phenomena. The student will perform experiments from a list covering three areas: atomic, solid-state, and nuclear physics. A portion of the semester may be devoted to studying a problem of personal interest to the student. The course consists of three, three-hour laboratory periods each week. Prerequisites: Physics 342 and Physics 560 (569 may be elected concurrently with 566).

PHYS 570 Relativity
3 hrs. This course is primarily devoted to the special theory of relativity. Topics include the Lorentz transformation, space-time diagrams, mechanics of systems of particles, collisions, electromagnetism, and conservation laws. An introduction to the general theory of relativity will also be given. Prerequisite: Physics 520 (569 may be taken concurrently).

PHYS 589 Selected Topics
1-4 hrs.
This course affords an opportunity for advanced students with good scholastic records in Physics to pursue independently the study of some subject of interest to them. Prerequisite: Consent of the instructor.

Open to Graduate Students Only

PHYS 610 Research Seminar
1 hr. This is a required course for the first-year graduate students and will be offered every winter semester. The course consists of faculty research talks and student talks (one by each student) on papers chosen by the students and approved by the faculty members. This course will be graded on a Credit/No Credit basis.

PHYS 615 Mathematical Physics
3 hrs.
This course provides the background needed for the application of mathematics to physical problems encountered in graduate physics courses. Relevant topics in group theory, complex variables, and functional analysis are included.

PHYS 622 Quantum Mechanics I
3 hrs.
This course is designed to provide a foundation of fundamental techniques for more advanced work in the physics and chemistry of atoms, molecules, nuclei, and solids. The Schroedinger-Hamilton equations and the operator theory of Dirac are applied to simple systems such as the one-electron atom and potential scattering.
PHYS 623 Quantum Mechanics II
3 hrs.
This course is a continuation of 622. It employs state-vector formulation to study several problems of general interest, such as time-dependent perturbation theory, systems of identical particles, and introductory relativistic quantum mechanics. Prerequisite: PHYS 622.

PHYS 624 Statistical Mechanics
3 hrs.
Statistical methods, employing ensemble theory, are used to study the equilibrium properties of systems having many degrees of freedom. Classical and quantum theories are developed and applied to selected problems of interest in physics and chemistry. The relationships between microscopic models and macroscopic properties are emphasized.

PHYS 630 Classical Mechanics
4 hrs.
Lagrange's equations are developed early in the course and are used in the analysis of both point-mass and rigid-body problems. The modifications of classical mechanics required by the theory of relativity are reviewed. The Hamilton equations of motion and Hamilton-Jacobi theory are introduced, and some of the analogies between classical and quantum mechanics are discussed.

PHYS 650 Relativistic Quantum Mechanics
3 hrs.
This course deals with the Dirac and Klein-Gordon equations, quantum electrodynamics, Feynman diagrams, and the properties of the strong and weak-electroweak interaction of elementary particles. Prerequisite: PHYS 623.

PHYS 662 Electricity and Magnetism I
4 hrs.
This course deals with the static electromagnetic field, its interaction with matter, time-varying fields, Maxwell's equations, wave propagation, wave guides, and simple radiating systems.

PHYS 663 Electricity and Magnetism II
4 hrs.
This course deals with the scattering of electromagnetic waves, plasma physics, special relativity, relativistic dynamics, collisions between charged particles, bremsstrahlung, and multipole fields. Prerequisite: PHYS 662.

PHYS 671 Nuclear Physics
3 hrs.
This course covers nuclear models, nuclear matter, electromagnetic properties, reactions, and scattering. Prerequisite: PHYS 623 or consent of instructor.

PHYS 672 Condensed Matter Physics
3 hrs.
This course includes both static and dynamic properties of condensed matter with particular emphasis on transport properties, optical properties, magnetism, and superconductivity. Prerequisites: PHYS 623 and 624 or consent of instructor.

PHYS 680 Research in Atomic Physics
1-6 hrs.
This course is available for students performing doctoral research in atomic physics. A student must have a research adviser to enroll in PHYS 680. This course may be taken more than once. Prerequisite: consent of adviser.

PHYS 681 Research in Nuclear Physics
1-6 hrs.
This course is available for students performing doctoral research in nuclear physics. A student must have a research adviser to enroll in PHYS 681. This course may be taken more than once. Prerequisite: consent of adviser.

PHYS 682 Research in Condensed Matter Physics
1-6 hrs.
This course is available for students performing doctoral research in condensed matter physics. A student must have a research adviser to enroll in PHYS 682. This course may be taken more than once. Prerequisite: consent of adviser.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

PHYS 700 Master's Thesis
6 hrs.

PHYS 710 Independent Research
2-6 hrs.

PHYS 730 Doctoral Dissertation
15 hrs.

PHYS 735 Graduate Research
2-10 hrs.

Political Science (PSCI)
Rossi, Chairperson; Professors Chandler, Chang, Dahllberg, Isaac, Kaufman, Kobrak, McAnaw, Renstrom, Ritchie, Robin, Rogers, Ziring; Associate Professors Datta-Sandhu, Houghton, Thompson, Assistant Professors Butterfield, Dalton.

Open to Undergraduate and Graduate Students

PSCI 504 Making of Public Policy in the U.S.
3 hrs.
A study of the formation of public policy at the local, state, and national levels with emphasis on the impact of decision processes upon policy outcomes.

PSCI 505 National Public Policy
4 hrs.
This seminar places primary attention on emerging trends and issues that will affect the political, economic and social character of American public life a decade or more ahead, and analyzes potential changes in existing public policies. Significant analyses and writings are required. Prerequisite: PSCI 304 or consent of instructor.

PSCI 506 Problems of American Government
3-4 hrs.
A critical examination of major problems facing national, state, or local government with emphasis upon contemporary efforts and studies designed to understand or solve such problems. Topics will vary from semester to semester and students may repeat the course.

PSCI 520 Constitutional Law
3 hrs.
Study of leading American constitutional principles as they have evolved through major decisions of the U.S. Supreme Court. Emphasis on judicial review, federalism, separation of powers, commerce, and taxation.

PSCI 522 Civil Liberties and Civil Rights
3 hrs.
An examination of Supreme Court responses to First Amendment, criminal procedure, and equal protection questions with particular emphasis on political, social, and policy-making aspects.

PSCI 526 Administrative Law and Public Regulation
3 hrs.
A study of the requirements for, and the limits on, the exercise of administrative powers by public officials charged with regulating significant aspects of the social and economic life of the nation. Special attention is paid to governmental regulation and the means of safeguarding individual rights through fair administrative procedures and judicial control over administrative determinations. Prerequisite: PSCI 200 or a course in Economics.

PSCI 530 Problems in Public Administration
3-4 hrs.
Consideration of issues and problems of current interest in the field of public administration. The course is intended to provide advanced work for undergraduates and to serve as an introduction to the field for graduate students without previous training in public administration.

PSCI 531 Administration in Local and Regional Governments
3 hrs.
The administrative organization, structure, procedures, and forms of local units of government are analyzed.

PSCI 532 The Bureaucracy
3 hrs.
The analysis of the role of public bureaucracies in the decision processes of government.

PSCI 533 Public Personnel Administration
3 hrs.
An examination of the components of the public personnel system: recruitment, advancement, salary, training, evaluation, human motivation, affirmative action, unionism and pension plans. Emphasis on the skills and techniques required of a good personnel manager.

PSCI 534 Administrative Theory
3 hrs.
A study of descriptive theories of organizational and administrative behavior relevant to government administrative agencies. Theories of complex formal organizations, decisional theories, and systems theories will be analyzed.

PSCI 535 The Politics of Governmental Budgeting and Finance
3 hrs.
A survey of the political process of governmental budgeting and finance. Budget systems including program planning and budgeting systems are studied. The politics of taxation and other governmental revenues including intergovernmental transfers are studied for their impact on public policy choices.

PSCI 536 Comparative Public Administration
3 hrs.
This course introduces students to a variety of public administration systems found in the contemporary world and includes a brief evolutionary history of these systems. Various theoretical models of administration and bureaucracy are compared with current practice in Western Europe, North America, the Soviet Union, and in contemporary Asian and African systems.

PSCI 541 Comparative Political Systems
3 hrs.
A study of the principal types of political systems. The course examines comparatively and theoretically government institutions, political processes, political behavior, and political development.

PSCI 542 Administration in Developing Countries
3 hrs.
A consideration of the relation of administrative structure and technique to the political, economic, and social problems of the developing countries. Special attention is given to the role of the bureaucracy in the political system and to the nature of, and obstacles to, administrative modernization.
PSCI 549 Problems of Foreign Political Systems
3-4 hrs.
Course will consider selected problems of the governments and political systems of Western and Eastern Europe, Asia, Africa, and Latin America. The specific problems, topics, and countries to be studied will be announced each semester. May be repeated.

PSCI 552 Studies in International Relations
3-4 hrs.
Examines selected topics within the field of international relations. Topics will vary and will be announced each semester. Course may be repeated.

PSCI 553 United Nations
3 hrs.
A study of the United Nations in action. Attention is focused on significant political, legal, and economic developments in the United Nations, its principal organs, and regional and specialized agencies. The course will include a seminar, and requires a term paper. May be repeated.

PSCI 555 International Law
3 hrs.
The theory, sources, development, and general principles of international law, and the relationship of law to the dynamics of international politics. Emphasizes the impact of international law on national politics. May be repeated.

PSCI 559 Research Methods
3 hrs.
Study of the formulation of research questions, the design of research, the methods of data collection, and the procedures for analyzing data concerning political institutions and behavior. May be repeated.

PSCI 560 Seminar: National Politics
3 hrs.
Research and study in selected topics in national politics. Topics will vary from semester to semester, and students may repeat the course.

PSCI 561 Seminar: State Politics
3 hrs.
Research and study of selected topics in state politics. Topics will vary from semester to semester, and students may repeat the course.

PSCI 562 Modern Democratic Theory
3 hrs.
The course consists of two parts. First, a consideration of traditional democratic theories, and the criticism of these theories emanating from modern elitists such as Amartya Sen, Michel, Pareto, and Ostrogorski. Second, an analysis of the attempts of contemporary economists, political scientists, and sociologists to meet these criticisms by revising democratic theory.

PSCI 563 Theories of Revolution
4 hrs.
Examines significant classical and contemporary theories of revolution with reference to both their analytical and normative implications.

PSCI 564 Introduction to Political Analysis
3 hrs.
A consideration of the approaches and methods used by contemporary political scientists with an emphasis on the application of scientific method to the study of politics. Includes applications of leading models of politics and the formulation of concepts, generalizations, and theories.

PSCI 567 Computer Applications for Political Scientists
3 hrs.
The uses of computer applications in applied problems in political science and public administration. Study of political science problems using existing software applications such as SPSS and DPL. The course includes computer exercises and a term project. Prerequisite: CS 105 or equivalent or consent of instructor.

PSCI 590 Research Methods
3 hrs.
Study of the formulation of research questions, the design of research, the methods of data collection, and the procedures for analyzing data concerning political institutions and behavior. May be repeated.

PSCI 591 Statistics for Political Scientists
3 hrs.
An introduction to statistical reasoning with particular reference to research on political institutions and behavior. This course will emphasize bivariate statistics, but will include a brief introduction to multivariate analysis. No mathematical prerequisite is required.

PSCI 598 Studies in Political Science
1-4 hrs.
An opportunity for advanced students with good scholastic records to pursue independently the study of some subject of interest to them. Subjects are chosen and arrangements made to suit the needs of individual students. Prerequisite: Approval of Department Chairperson and instructor.

Open to Graduate Students Only

PSCI 600 Seminar: National Politics
3 hrs.
Research and study in selected topics in national politics. Topics will vary from semester to semester, and students may repeat the course.

PSCI 601 Seminar: State Politics
3 hrs.
Research and study of selected topics in state politics. Topics will vary from semester to semester, and students may repeat the course.

PSCI 602 Seminar: Urban Politics
3 hrs.
Examination of the literature on American urban politics and application of this literature to the development or refinement of some theories of community political behavior. The city will be used as a laboratory for the advancement of theoretical and empirical knowledge of politics. May be repeated.

PSCI 610 American Political Institutions
3 hrs.
A systematic treatment of the characteristics of the coordinate branches of the American government, interest group and media influences, and the processes by which public policy is formulated and carried out.

PSCI 622 Seminar: The Judiciary
3 hrs.
Study and research of major topics of interest in the judicial process, judicial decision-making, judicial behavior, the judiciary as policy-maker, judicial systems, and public law. Topics will vary from semester to semester, and students may repeat the course.

PSCI 630 Seminar: Public Administration
1-3 hrs.
Study of selected topics in public administration. Subject matter will vary, and the course may be repeated. The number of hours for which the course is offered in any given semester will be listed in the Schedule of Classes.

PSCI 631 The Foundations of Public Administration
3 hrs.
This course is designed to introduce and review major developments in the field of public administration, to acquaint the student with the constitutional and legal basis of administration in public agencies, and to review the ethical and legal significance of accountability in the public service.

PSCI 633 The Political Environment of Public Administration
3 hrs.
This course examines the interaction between the administrative agency and the social, economic, and political forces which constitute its external environment. Emphasizes the sources of bureaucratic power, the nature of administrative and political elites, and the strategies which agencies pursue in seeking to survive and expand their programs. Explores the impact of the political system on administrative decision-making and agency responsiveness.

PSCI 637 Organization Development
3 hrs.
Organization Development (OD) is a planned, organization-wide attempt directed from the top to increase organizational effectiveness by encouraging certain behavior. Building on behavioral and humanistic theories of organizations, OD is concerned with human relations in the work group. The strategy is to make the organization work more effectively through having individuals become aware of what motivates others and through reduced tensions in the workplace.

PSCI 640 Seminar: Foreign Political Systems
3 hrs.
Study and research on major topics dealing with the political systems of selected countries. Independent research and seminar presentations for each student are stressed. The country to be studied may be located in Europe, Asia, Africa, or Latin America, and will be announced each semester. May be repeated.

PSCI 644 Seminar: Political Modernization
3 hrs.
Focusing on the developing areas and using an interdisciplinary approach, the process of political modernization is examined in selected countries or typically on a cross-national basis. The topic to be studied will be announced each semester. Each student will conduct independent research. May be repeated.

PSCI 645 National Political Systems and International Politics
3 hrs.
The course explores the internationships between national and international politics. Efforts are made to describe and explain variances and discontinuities between national policy and a country's international posture. Subjects to be explored focus on political culture, mechanisms for addressing popular demands, political movements, ideological/philosophical conflicts and external commitment.

PSCI 646 Seminar in Development Administration
3 hrs.
The seminar is devoted to research related to administration in developing areas. Topics may range from general subjects dealing with various aspects of bureaucracy in one or more countries to narrow problems at the level of a ministry of sub-ministry. The research experience and final papers will be shared with the other students in the seminar.

PSCI 650 Seminar: International Relations
3 hrs.
Study and research on a common topic of current international political, organizational, or legal significance. Individual papers and reports will be presented. May be repeated.

PSCI 660 Seminar: Political Thought
3 hrs.
An analysis of problems and subject matter considered by political philosophers that are significant to the social sciences. Various issues arising in political thought, certain periods in history, or regions of the world may be
considered. Subject will vary, and the course may be repeated.

PSCI 681 Principles of Politics 3 hrs.
A systematic introduction to the concepts which are crucial to an understanding of the political institutions and processes. The course is directed to the needs of the beginning graduate student.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

PSCI 700 Master’s Thesis 6 hrs.
PSCI 710 Independent Research 2-6 hrs.
PSCI 712 Professional Field Experience 2-12 hrs.

Psychology (PSY)
Michael, Acting Chairperson; Research Professor Ulrich; Professors Alessi, Green; Brethower, Farns, Fuqua, Hultema, Kent, Koronakos, Lyon, R. W. Malott, Poling, Robertson, Tsegaye-Spates; Associate Professors Nangle, Redmon; Assistant Professors Burnette, Dickinson, M. K. Malott.

Open to Underclass and Graduate Students

PSY 510 Advanced General Psychology 3 hrs.
Readings, lecture, and discussion designed to introduce students to modern behavior theory. Emphasis will be upon human behavior, both normal and abnormal, with a significant portion of the course devoted to the higher cognitive processes. Recommended as a cognate course in Psychology. Recommended prerequisite: One prior course in psychology.

PSY 512 Behavioral Pharmacology and Toxicology 3 hrs.
Topics range from the use of drugs to clarify behavioral principles to the use of behavioral preparations to discern pharmaceutical effects. Readings include summaries of pharmacological evidences and selected experimental reports concerning both the behavioral techniques and pharmaceutical problems in basic research. Prerequisite: 12 hours of Psychology, permission of instructor, or enrollment in SPADA program.

PSY 513 Research in Animal Behavior 3 hrs.
A review of the research literature in several areas of animal behavior. Particular emphasis will be placed on species-typical behaviors and their ecological significance, and forms of learning which are not easily explained by operant and respondent models.

PSY 517 Psychology of Learning for Teachers 3 hrs.
Designed to teach the principles of behavior and the application of these principles to teaching. Topics include the use of behavior principles in the development of objectives, selection and preparation of instructional material, classroom management and incentive motivation, behavior change, performance contracting and program evaluation. Practical application is stressed.

PSY 518 Stimulus Control and Perceptual Processes 3 hrs.
An examination of the literature surveying sensory and perceptual processes with an emphasis upon the research methodology in and theoretical interpretation of data from studies of stimulus control and discrimination in nonhuman organisms. Prerequisite: Twelve hours of Psychology or permission of Instructor.

PSY 519 Corrective and Remedial Teaching 3 hrs.
An introduction to and survey of various content skills, curriculum approaches, and special teaching techniques used in elementary school reading and mathematics instruction. Designed primarily for prospective school psychologists, focus is on academic skill content, sequencing of skill hierarchies, devising short term educational plans to teach specific skills, and evaluating the effectiveness of such plans. Graduate standing in psychology, education, or permission of instructor.

PSY 524 Human Sexuality 3 hrs.
Discussion of those human behaviors concerned with sex, sexuality, and reproduction. Consideration is given to the anatomical, physiological and psychological properties of sexual functioning in male and female. Emphasis is placed upon the sexual response cycle as described by Masters and Johnson. The course is not intended to provide therapy training.

PSY 528 Human Drug Use and Abuse 3 hrs.
This course provides a general overview of basic pharmacological principles, discusses the behavioral and physiological mechanisms of action of several classes of medicinal and recreational drugs, and surveys the factors through which to contribute to responsible and irresponsible drug intake. Although human drug use and abuse are the primary focus of the course, nonhuman research findings are emphasized where appropriate.

PSY 530 Statistics for the Behavioral and Health Sciences 3 hrs.
An introduction to basic statistical procedures and concepts. Topics include: measures of central tendency and variability, frequency distributions and graphic presentations, the normal curve, probability theory and the binomial, hypothesis testing, the t-test, chi square, correlation, regression and an introduction to analysis of variance.

PSY 535 Instrumentation and Computer Use in Psychology 3 hrs.
A survey of problems in response measurement in experimentation, Lecture and laboratory. May be repeated for credit.

PSY 542 Human Factors in Engineering 3 hrs.
A survey of research on the adaptation of equipment, products, and environment to human capacities. (Cross-listed with IEGM 542.)

PSY 560 Behavioral Medicine 3 hrs.
Application of behavioral technology to medical patients with emphasis on inpatient treatment. Sample topics include biofeedback, pain control, compliance with medical regimen, and issues related to working in a medical setting.

PSY 562 Management of Health Related Behaviors 3 hrs.
A behavior analysis approach to the management of behaviors directly and indirectly impacting health. Emphasis will be placed on outpatient, public health applications and preventive approaches to health maintenance.

PSY 570 A Behavior Analysis Approach to the Area of Retardation 3 hrs. Fall
Topics will include: historical background, assessment, treatment, and legal implications of treatment.

PSY 574 Experimental Social Psychology 3 hrs.
Methodology of research with groups, with emphasis upon design and application. Prerequisite: Permission of the instructor.

PSY 578 Research Practicum: Developmentally Disabled Population 3 hrs.
Supervised experience at the Croyden Avenue School which offers an educational program for the developmentally disabled. This course involves a variety of problems in behavior change and learning which can be studied at the school. The research problems are carefully selected to be beneficial to the client and to provide appropriate experience for the student. Data collection and report writing are stressed. Prerequisite: PSY 570 or concurrent enrollment.

PSY 595 History of Psychology 3 hrs.
The historical and philosophical foundations of contemporary psychology are examined. Approximately equal emphasis is placed upon theoretical and applied aspects of the evolution of the modern science. The origin and development of current behavioral approaches constitute a major focus.

PSY 597 Topical Studies in Psychology 1-4 hrs.
A survey and discussion of selected research topics of current interest. Topics may include both basic science and applied aspects of the discipline. Permission of Instructor. Courses may be repeated for credit, although the total number of credits may be limited by the degree program. Students should consult the program adviser.

PSY 598 Special Projects in Psychology 1-5 hrs.
This course provides the graduate student with the opportunity for independent research and/or research under the direction of a faculty member. Graduate standing and permission of instructor. May be repeated for credit, although the total number of hours in a degree program may not exceed five hours.

PSY 599 Practicum in Psychology 1-4 hrs.
Training in the application of the principles of psychology to a specific and restricted problem area in the discipline. The practicum application is often identified by the location of the research site or professional service agency published in the Schedule of Classes. Each one hour of credit requires 100 clock hours. May be repeated for credit, although number of credits may be limited by program requirements. Written permission must be obtained from the department.

Open to Graduate Students Only

PSY 601 An Introduction to Issues in Behavioral Assessment 1 hr.
This course is designed to provide information on the legal and ethical issues in assessment which serve as a framework for the evaluation of testing procedures. An overview of norm-referenced assessment instruments, traditional personality tests, and criterion-references tests, as well as supervised practice in direct observational assessment are included. This course is scheduled for the first five weeks of the semester in which it is offered.
As a detailed examination of research methodology and strategies, emphasizing the areas of measurement, reliability, and single organism research design. In addition, several areas of current research interest, as exemplified by the Journal of Applied Behavior Analysis, will be studied. Prerequisite: Previous course work in applied behavior analysis and previous or concurrent enrollment in PSY 530, 634, or equivalent.

PSY 608 Advanced Seminar in Applied Behavior Analysis 3 hrs.
An advanced course emphasizing: a) the continued examination of current research topics; and b) the development of professional research skills (planning and preparation, grantsmanship, dissemination, skill maintenance). Prerequisite: Previous enrollment in PSY 608 and permission of instructor.

PSY 610 Experimental Analysis of Behavior 3 hrs.
A survey of the major facts, concepts, principles, and methodology of respondent and operant research. The emphasis will be on nonhuman research, especially as described in the Journal of the Experimental Analysis of Behavior.

PSY 611 Current Research in Experimental Analysis 3 hrs.
A detailed study of the immediately preceding year's principal research in the analysis of behavior. The emphasis will be on nonhuman research, especially as described in Journal of the Experimental Analysis of Behavior.

PSY 612 Advanced Physiological Psychology 3 hrs.
A survey of the interrelationships of physiological and behavioral processes. Lecture and laboratory. Prerequisite: Permission of instructor.

PSY 614 Motivation and Emotion 3 hrs.
An introduction to the experimental analysis of psychological aspects of motives, incentives, and emotions. Prerequisite: Permission of instructor.

PSY 620 Analysis of Abnormal Behavior 3 hrs.
An advanced study of behavioral disorders as characterized by the standard classification systems, the DSM III and ICD-9-M, with respect to their etiology, prognosis and treatment.

PSY 624 Personality Theory 3 hrs.
Consideration and evaluation of the major theories of personality with emphasis on those theories having implications for counseling and therapy. The course includes an examination of experimental evidence and illustrative case studies.

PSY 634 Advanced Statistics 3 hrs.
Topics include statistical decision theory, one factor analysis of variance, multiple comparison procedures, factorial designs, randomized block designs, fixed, random and mixed models, and basic issues in experimental design. Prerequisite: PSY 530 or equivalent.

PSY 635 Correlation and Regression Analysis 3 hrs.
An advanced course covering simple and complex correlation and regression, analysis of covariance, and related topics. Prerequisite: PSY 634 or equivalent.

PSY 636 Experimental Design 3 hrs.
A study of true and quasi experimental designs, comparisons of single organism and group designs, consideration of artifacts and interpretation, and comparisons of statistical and non-statistical designs. Prerequisite: PSY 634 and 635.

PSY 637 Advanced Data Analysis 3 hrs.
Advanced procedures for the analysis of single subject and group experimental designs, including several aspects of time series and analysis of covariance. Prerequisite: PSY 634 and 635.

PSY 640 Industrial Psychology 3 hrs.
This course covers recent applications of behavior analytic strategies in organizational settings. Specific OB techniques are reviewed and analyzed in behavioral terms. The goal is to train students to solve problems in organizations using a variety of techniques applied in a functional manner. Prerequisite: PSY 360 and 510, or permission of instructor.

PSY 643 Personnel Selection and Placement 3 hrs.
A critical study of assessment techniques such as testing, weighted application blanks, and interviewing. Includes consideration of administrative procedures and the methods of measuring the functional adequacy of assessment methods. Prerequisite: A course in Statistics.

PSY 644 Personnel Training and Development 3 hrs.
The course emphasizes the principles of learning as well as techniques and administrative procedures used in the development of human resources at all levels.

PSY 645 Psychology of Work 3 hrs.
Emphasis is placed upon an investigation of worker attitudes, morale, motivation, supervisory styles, and social interaction as determinants of employees' productivity and job satisfaction with particular attention paid to the "problem employee."

PSY 650 Professional Ethics and Legal Issues 3 hrs.
A seminar devoted to topics of current as well as historical professional concern regarding professional application and research ethics. Topics include the American Psychological Association publications on professional ethics and the use of human subjects in research as well as APA Standards for Providers of Psychological Services, and the Michigan laws relating to the practice of psychology, the rules of the Board of Psychology, the concept of licensure, advertising to the public and psychology in the media.

The application of systems analysis concepts to the design of systems which yield behavioral measures of complex social situations.

PSY 662 Systems Analysis 3 hrs.
An advanced course stressing integration of behavior analysis and systems analysis applied to the design, creation, and management of human performance systems. The course operates much of the time as a simulated intervention with research staff taking on a variety or organizational roles. Students do analyses of systems in which they are involved and implement their systems designs within the course and in external settings. Prerequisite: PSY 651.

PSY 665 Seminar in School Psychology 3 hrs.
A seminar devoted to current professional practices in School Psychology. Focus is on studying various model systems for delivery of special services in the schools, as well as the various legal, ethical, and practical constraints on operation of such systems. Techniques of system analyses and synthesis are covered as well as consultation methods employed to implement or facilitate operation of new school programs.

PSY 666 Introduction to Clinical and Community Psychology 3 hrs.
A survey of the fields of Clinical and Community Psychology with emphasis upon the new roles of Clinical Psychologists and Community Psychologists. Recommended for beginning graduate students.

PSY 668 Psychotherapy: Theory and Methods 3 hrs.
This is a treatment course which reviews several theoretical approaches to, and problem solving strategies for, a variety of client disorders. The course concentrates on the stages of treatment, the issues involved in treatment and various techniques of treatment. Permission of Instructor.

PSY 672 Group Therapy 3 hrs.
Theory and application of problem solving interventional techniques in a group setting. Various treatment techniques for a variety of problems are practiced through role playing and modeling in a small group setting. Permission of Instructor.

PSY 683 Marital Therapy 3 hrs.
Theory and application of problem solving interventions for a variety of problems associated with couples. A social learning and strategic systems approach is emphasized. Prerequisite: Permission of Instructor.

PSY 686 Behavior Therapy 3 hrs.
This is a treatment course designed to familiarize the student with the methodologies, applications, theory and clinical literature of behavior therapy. Prerequisite: Permission of the Instructor.

PSY 687 Behavior Analysis and Behavior Modification 3 hrs.
This is a treatment course designed to familiarize the student with the methods,
applications, theory and clinical literature of behavior analysis and behavior modification. Training in community applications and token economies, skills acquisition, self-management, and behavior programming are also included. Prerequisite: Permission of Instructor.

**PSY 666 Family Therapy**
3 hrs.
This is a treatment course involving problem solving interventions for a variety of problems associated with family units. The specific intervention model emphasized in the course may vary with the instructor. Prerequisite: Permission of Instructor.

**PSY 667 Cognitive Behavior Therapy**
3 hrs.
A course designed to provide the clinical student with the theory and applications of a cognitive-behavioral approach. A variety of therapeutic interventions drawn from cognitive-based treatment models are examined both in terms of individual and group settings. Students are exposed to didactic discussions of the elements of different cognitive models as well as the practice of problem-solving techniques through supervised role-playing situations. Prerequisite: Permission of Instructor.

**PSY 668 Behavioral Assessment and Consultation**
3 hrs.
The course is intended to develop proficiencies in the assessment of behavior problems, using self-report, behavioral interviewing, direct observation techniques, and physical recording. Reliability and validity issues with respect to each assessment tool are covered. Behavioral consultation, an efficient alternative to one-to-one counseling in which therapist contact is primarily with the mediator rather than the client, is introduced. Students complete a large project, using assessment and consultation techniques learned in the course. Prerequisite: PSY 601, nine hours graduate credit in psychology, or permission of instructor.

**PSY 674 Verbal Behavior**
3 hrs.
The experimental analysis of language and verbal behavior, with an emphasis upon the analysis of language as presented in the writings of B. F. Skinner.

**PSY 675 Skinner's Recent Writings**
3 hrs.
A consideration of **About Behaviorism Beyond Freedom and Dignity** and **Consequences of Reinforcement**, especially as they consider issues of broad scientific, philosophic, and social significance. Prerequisite: Nine hours of graduate credit in Psychology or permission of Instructor.

**PSY 678 Behavior Analysis and Cognitive Psychology**
3 hrs.
The first third of the course will consider behavioral approaches to the kinds of issues that are the major focus of cognitive psychology: complex human learning, memory, thinking, problem solving, imagery, language, and the self. The remainder will survey and analyze the approach to these issues taken by various types of cognitive psychologists: developments from the field of verbal learning, information theory, psychology of language, linguistics, and the cognitive behaviorists. Prerequisite: Nine hours of graduate credit in Psychology or permission of Instructor.

**PSY 679 Radical Behaviorism and Behavior Modification**
3 hrs.
This course is intended to provide training in the theoretical analysis of various psychological events which include both behavioral and mental references. The course includes an in-depth analysis of the theoretical basis of the philosophic position identified as "radical behaviorism" as contrasted with other theoretical positions in Psychology. Prerequisite: Nine graduate hours in Psychology.

**PSY 681 Personality Assessment**
4 hrs.
Survey of the theory of personality assessment and the basic concepts of nonprojective measurement, with emphasis on the administration, scoring, and interpretation of various instruments for personality evaluation. The course includes, but is not limited to, the supervised practice in the administration of the MMPI, clinical analysis questionnaire, and observational rating scales. Prerequisites: PSY 601 or equivalent and graduate program status.

**PSY 682 Norm Reference Testing: Interpretation**
2 hrs.
A lecture course with an emphasis on basic psychometric concepts, related to the theory and interpretation of test results and psychological assessment reports. The selection of remedial educational programs related to these test results, as well as the recent issues in intelligence testing controversy are discussed. The course emphasizes the selection of standardized test batteries and assessment techniques, including but not limited to: Stanford-Binet Intelligence Scale (1972), McCarthy Scales of Children's Abilities (1972), Peabody Picture Vocabulary Test, Bayley Scales of Infant Development, ITPA, Columbia Mental Maturity Scale, WPPSI, WISC-R, and WAIS. Prerequisites: PSY 601 or equivalent and degree program status. Not open to students completing PSY 683.

**PSY 683 Norm Reference Testing: Interpretation and Administration**
4 hrs.
A combined lecture and laboratory in individual assessment. Lecture focuses on basic psychometric concepts directly related to test administration and interpretation, as well as behavioral concepts and operational analyses of performance on specific test items, development of written personalized educational programs from collected assessment data, and writing of clear and useable reports. Recent issues in the intelligence controversy are also covered. Laboratory focuses on supervised experience in administering, scoring, interpreting, and developing short term educational plans using selected batteries of standardized individual assessment techniques, including but not limited to: Stanford-Binet Intelligence Scale (1972), McCarthy Scales of Children's Abilities (1972), Peabody Picture Vocabulary Test, Bayley Scales of Infant Development, ITPA, Columbia Mental Maturity Scale, WPPSI, WISC-R, and WAIS. Prerequisites: PSY 601 and graduate standing in school or clinical psychology or permission of instructor. Not open to students completing PSY 682.

**PSY 684 Personality Assessment: Projectives**
3 hrs.
A study of, and supervised practice in, the administration, scoring, and interpretation of the Rorschach, revised Bender Gestalt, TAT, and other projective tests. The course emphasizes the selection and interpretation of an integrated projective test battery for clinical evaluations. Prerequisites: PSY 601, 681, and degree program status.

**PSY 686 Criticized Reference Assessment**
3 hrs.
A combined lecture and laboratory course covering theory and applications related to criterion or domain referenced behavioral assessment. Supervised experience in administering, scoring, and interpreting selected formal and informal criterion referenced assessment systems, as well as developing personalized intervention plans with the collected data. Focus is on academic and social behavior, including but not limited to: reading, language, mathematics, writing, spelling, fine and gross motor, self and social help skills. Formal systems include: SRA Diagnostic Aid; reading and math, Pupil Record of Educational Behavior, Bessie (basic educational skills inventory) Criterion Test of Basic Skills, Assessment of children's language competency, Basic Concept Inventory, Key Math, and Woodcock Reading Mastery Test. Prerequisites: Graduate standing in school psychology, education, or permission of instructor, PSY 519.

**PSY 690 College Teaching Seminar**
3 hrs.
Discussion and design of college instructional technology, especially recent developments and research. Topics considered are decision-making, source materials, behavioral objectives; course design and programming, testing and evaluation, remediation, and grading practices.

**PSY 691 College Teaching Practicum**
3 hrs.
Supervised practice in the instruction of Psychology at the undergraduate level. The student will be responsible for the design, execution, and evaluation of a college course section involving college students.

**PSY 696 Systematic Psychology**
3 hrs.
An intensive study of current theories in psychology with emphasis on the philosophy of science and the logic of system building.

**PSY 697 Advanced Topical Studies in Psychology**
2-4 hrs.
An in depth examination, discussion, and survey of selected research and/or professional topics. Permission of instructor. May be repeated for credit, although the total number of credits may be limited by the degree program. Students should consult the program advisor.

**PSY 699 Clinical Practicum in Psychology**
3 hrs.
Experience in a broad range of professional functions included in the practice of psychology under the supervision of a licensed psychologist. The experience includes, but is not limited to, psychotherapy, diagnostic testing and consultation. The experience involves not less than 500 clock hours (15 weeks) in an organized health care setting. Written permission must be obtained from the Departmental Clinical Committee. Prerequisites: PSY 683, 681, and advanced standing in clinical psychology.

**Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.**

**PSY 700 Master's Thesis**
6 hrs.

**PSY 710 Independent Research**
2-6 hrs.

**PSY 712 Professional Field Experience**
2-12 hrs.

**PSY 729 Specialist Project**
6 hrs.
PSY 725 Doctoral Research Seminar
2-6 hrs.
PSY 730 Doctoral Dissertation
15 hrs.
PSY 732 Doctoral Clinical Internship
1-4 hrs.
PSY 735 Graduate Research
2-10 hrs.

Public Administration (PADM)
Mortmore, Director; Professors DeShon, Grintzuh, Assistant Professors Dolan, Mayer.
PADM 530 Supervisory Skills for Administrators
3 hrs.
This course includes a consideration of the five most important functions of middle level managers and first line supervisors: decision-making, planning, organizing, leading, and controlling. In order to assist participants develop their supervisory skills, this course utilizes case studies, small group discussions, role playing, simulations, and other practical, skill building exercises.
PADM 531 Policy Leadership in Administrators
3 hrs.
The professional administrator, whether occupying a line or staff position, is increasingly called upon to play a leadership role in formulating policy options. Successful administrators therefore frequently serve as entrepreneurs. In this role they are responsible for designing and implementing solutions to problems. This course is designed to review policy leadership and to analyze the role of entrepreneurship in bringing policy options to the arena of organizational and public debate.
PADM 532 Program Planning and Proposal Writing
3 hrs.
This course seeks to build skill in program planning, program management, and proposal writing. The first part of this course will be devoted to the grantmanship process, including how to: formulate and prepare a project concept; prepare the project proposal; submit the project proposal; and follow-up after acceptance or rejection of the proposal. Emphasis will be placed upon the project proposal as an integral component of agency planning, program management, and assessment activities, from both grantor and grantee perspectives. In the second part of this course each participant will prepare a project proposal.
PADM 572 Computer Applications in Administration
3 hrs.
Administrators at all levels increasingly rely upon computers to perform the tasks for which they are responsible. Whether to prepare reports, access data, or communicate with others, administrators at all levels of the organizational hierarchy are expected to possess a certain minimum facility with this technology. In this introductory technical core course, MPA degree candidates will become proficient in the administrative uses of computers.
PADM 590 Applied Research Methods
3 hrs.
This course will stress the formulation of applied research questions; the design and utilization of various survey research methods and techniques; the essential distinctions between qualitative and quantitative research methods; the collection, manipulation, interpretation, and presentation of data; and the use of information thus obtained in the solution of policy problems confronting professional administrators.
PADM 591 Statistical Applications in Administration
3 hrs.
This course is an introduction to statistical reasoning as employed by professional administrators in the collection, manipulation, interpretation, and presentation of data utilized to analyze policy problems. The purpose is to develop a basic statistical competency with emphasis upon the use and interpretation of frequency distributions, sampling techniques, measures of central tendency, probability, variability, regression correlation, and various other applied quantitative measures.
PADM 598 Readings in Public Administration
1-3 hrs.
A program of independent study to provide the well qualified MPA candidate with an opportunity to explore in depth a topic or problem of interest under the guidance of a faculty member. The product of this effort may be an annotated bibliography, a bibliographic essay, or a major paper. Planning a topic for investigation is a joint responsibility of the candidate and supervising faculty. Approval is contingent upon the merits of the proposal. Prerequisite: Consent of both instructor and School Director.
PADM 599 Topics in Public Administration
1-4 hrs.
A variable topic course dealing with particular issues of interest and concern to students of public affairs and administration. Since content varies, students are advised to read course descriptions distributed by the School. The course may vary in the number of credit hours awarded and may last more or less than a semester's length.

Open to Graduate Students Only

PADM 601 Economic Analysis for Administrators
3 hrs.
This required technical core course will focus on those basic principles of applied economics which illuminate policy analysis and problems of resource allocation encountered by professional administrators. It is intended to provide participants with those tools of economic analysis required to address resource allocation and similar issues. Those who enroll in this course will be expected to apply the economic tools presented to policy analysis and policy implementation questions facing agencies by which they are employed.
PADM 623 Principles of Budgeting
3 hrs.
This required Technical Core course examines the budgeting process; emphasis will be given to the preparation phase of the budgeting cycle. Line item and alternative budgeting techniques—including zero base and program budgeting—will be considered. Sources of revenue will also be examined to determine their sufficiency, ease of collection, reliability, and public acceptability.
PADM 626 Administrative Law and Governmental Regulations
3 hrs.
This course examines how administrative laws and public regulations control and regulate the activities of local, state and federal government officials and the agencies by which they are employed. It will consider the requirements for, and limits on, the exercise of power by elected and appointed officials. Special attention is devoted to the development, adoption, and enforcement of administrative laws and government regulation.
PADM 630 Administrative Analysis
3 hrs.
This course deals with the problem of how to manage. It considers various communication and control mechanisms from the earliest days of scientific management through network analysis and general systems theory to modern techniques of reorganization management. It emphasizes practical applications of these theories, with particular reference to leadership. The goal of this course is to make the manager an effective leader of his or her organization.
PADM 631 Foundations of Public Administration
3 hrs.
This course is designed to introduce and review major ideas and developments in the field of administration, to consider what it means to be a thoroughly professional administrator, to evaluate some of the major duties, responsibilities, and functions of the professional administrator, and to examine some of the moral and ethical choices confronted by professional administrators.
PADM 633 The Political Environment of Public Administration
3 hrs.
Professional administrators must possess highly developed political as well as technical skills in order to insure that the agencies which they direct survive and grow. This course examines the interaction between administrative agencies and the social, economic, and political forces which constitute their internal and external environments. It emphasizes the sources of administrative power, the characteristics of administrative elites, and the strategies which professional administrators use to protect and expand their influence.
PADM 634 Professional Issues Workshop
1 hr.
All MPA degree candidates are required to participate in three workshops—on topics of their own choice—which ordinarily meet all day Friday and Saturday. These workshops are perceived as an innovative, flexible way to deal with a wide variety of interesting topics which are not easily dealt with within the traditional course format. Experienced practitioners and academic specialists are important contributors to such workshops, utilizing simulations, role playing, and small group exercises to build skill in dealing with those issues which constitute the focus of each workshop. Each two day workshop is valued at one semester hour and is graded in a Credit/No-Credit basis.
PADM 635 Project Paper Seminar
3 hrs.
This seminar is a capstone of the MPA degree program. It provides a forum within which each candidate identifies and provides a viable solution to some significant issue or problem confronting the organization by which the in-career candidate is employed or to which the pre-career student has been assigned as an intern. The Project Paper, which is the end product of this seminar, is addressed to appropriate agency officials and conforms to the standards of a thoroughly researched, fully documented, well organized, and clearly written paper. Open only to degree candidates who have completed no less than 30 semester hours of MPA credit.
PADM 636 The Exercise of Power in Organizations
3 hrs.
This course is designed to address the need of managers and supervisors to understand the power in organizations and
exercised by ideas, by individuals, and by groups. Utilizing specialized literature and case studies, this course will examine the anatomy of power and how it is exercised.

PADM 637 Organization Development 3 hrs.
This course is an introduction to the theories, models, and intervention modalities of Organization Development (OD). Topics to be explored and discussed include: the underlying organizational philosophy of OD; the OD view of persons in an organizational setting; the major subdivisions or schools of thought in this field; role playing in selected OD interventions; and specific applications of OD in organizational settings. The objective of this course is to develop competence in the application of OD practices in a variety of agency settings.

PADM 638 Organization Theory and Behavior 3 hrs.
This course has the following objectives: a) to familiarize participants with the basic concepts, models, and theories of organization; b) to develop a basic understanding of individual, group, and organization behavior; c) to provide a conceptual foundation upon which theoretical knowledge can be applied to organizational and management problems. In pursuit of these objectives the following subjects will be considered: theories of organization and management, individual behavior, group dynamics, organization change, organizational performance, efficiency, and effectiveness.

PADM 641 Corrections Administration in the Criminal Justice Context 3 hrs.
The goal of this broad survey course is to relate corrections to law enforcement, the courts, prosecution, and other sub-systems in the criminal justice field. It examines lines of communication between those related systems, as well as inherent conflicts and dependencies among them. Particular attention is given to emerging issues in the complex relationships among key actors in the criminal justice setting.

PADM 642 Administrative Practices in Corrections 3 hrs.
This course describes and analyzes the administration of corrections departments and facilities. Particular attention is given to emerging and innovative administrative practices. The course also examines techniques for maintaining effective communication with a broad array of external constituencies: The public, legislative bodies, organized labor, and others. Additional topics to be considered include headquarters-field relationships, agency-wide budgeting practices, efficient and effective corrections organization, policy formulation and implementation, the evaluation of outcomes and impacts on delivery of correctional services.

PADM 643 Administration of Correctional Facilities 3 hrs.
This course is designed to acquaint participants with administrative techniques unique to correctional institutions, both prisons and community-based alternatives. Effective management practices in Michigan and other states with expanding jail and prison populations are considered, including such specific issues as facilities and site planning, MICHSA requirements, management of troublesome inmates, and classification of inmates by security level. With respect to the management of community-based facilities, the most common forms of community corrections are discussed, as are the unique problems inherent in maintaining a positive working relationship with community officials and citizens.

PADM 670 Public Policy and Strategic Planning 3 hrs.
Public policy is examined as a process extending from policy formulation through implementation. Attention is directed both to strategic planning and to the political environment within which such planning occurs. The course reviews alternative models seeking to describe and explain planning and public policy making, and explores the role of agency leadership in making critical decisions.

PADM 671 The Public Good 3 hrs.
This course will introduce students to the problems associated with defining the public good and the public interest; the historical and philosophical contexts of moral reasoning; the ambiguity of the value side of the policymaker's life, and how to think constructively about moral dilemmas; how the administrator uses discretionary power; how personal moral codes relate to assumptions about professional ethics and standards.

PADM 672 Historical and Comparative Analysis of Public Policy 3 hrs.
This course will deal historically and comparatively with the substance of administrative practices and policy assumptions and applications.

PADM 673 Quantitative Public Policy Analysis 3 hrs.
This course will examine the principal quantitative methods of public policy analysis. The focus of the course will be on the use of quantitative stochastic techniques or tools employed to study policy issues. A majority of the analytic tools and techniques considered will be data- and problem-oriented.

PADM 674 Human Behavior in Public Organizations 3 hrs.
This course deals with the bases of organizational behavior, including conceptual material, empirical research, and applications. It examines such individual dimensions of organizational behavior as attitudes, values, perceptions, learning, personality, stress, and motivation. The course examines interpersonal influence and considers such dimensions of group dynamics as intragroup and intergroup behavior, group norms, cohesiveness, conformity, and groupthink. It concludes with consideration of such organizational processes as power, authority, politics, leadership, conflict, decision making, performance evaluation and behavioral elements of organizational communication.

PADM 675 Advanced Administrative Theory 3 hrs.
Students will assess current normative and descriptive theories of Public Administration, the variety of conceptual systems, operationalism and levels of organizational analysis, including the history of organization theory, the theory of bureaucracy, taxonomies, non-bureaucratic organizations, organization as a social issue, and tomorrow's organizations.

PADM 676 Cases in Public Policy Implementation 3 hrs.
This course will utilize a case study approach to public management problems. Students will be asked to weigh such factors as the following on a case-by-case basis: economic costs and benefits, political stakes, organizational processes, interpersonal relationships, legal requirements, ethical obligations, and technological constraints.

PADM 677 The Public Administrator 3 hrs.
This course will examine the following factors: expectation versus reality in the administrative world; the nature of administrative work; asserting authority; building commitment and motivation; building lateral relationships; gaining power; working the hierarchy; designing valid controls; initiating change; the skills of the project manager; the psychological matrix of leadership.

PADM 678 Program Evaluation 3 hrs.
Pressure to reduce the nature, size and scope of government has heightened interest in evaluating the impact of governmental activities. This course will focus on how to measure the effectiveness of agency programs.

PADM 679 Seminar: Current Issues in Health Service Management and Delivery 3 hrs.
This advanced seminar will consider current issues in the organization, finance, and delivery of health services. May be repeated for credit with a different topic.

PADM 680 Intellectual Foundations of Public Administration 3 hrs.
This course is designed to acquaint participants with the fundamental ideas of modern public administration. The material is presented both historically and topically, with special attention to the classic studies and the debates which have shaped the discipline. Participants are also introduced to the problems associated with defining the public good and the public interest; the ambiguity of the value side of the policymaker's life; and how personal moral codes relate to assumptions about professional ethics and standards.

PADM 681 Designing Policy and Policy Systems 3 hrs.
The focus of this course is three-fold. First, it provides the administrator a conceptual understanding of the policy making process and illustrates how quantitative models fit into that process. Building upon this base, the second part of this course focuses on the bureaucratic and political impediments to implementing policy analysis. Finally, it considers how administrators manage research and analysis at various stages of the policy-making process.

PADM 682 Administrative Decision Making 3 hrs.
This course will examine the organization as a system of linked sub-systems and analyze the elements of decision making as influenced by this environment. The impact of bureaucratics on communication and control patterns will be related to managerial processes. Attention will be devoted to the effort of a systemic decision process upon individual decisions and decision makers.

PADM 683 Seminar in Administrative Theory and Practice 3 hrs.
The historical evolution of management thought is reviewed with particular reference to classical, neoclassical, and contemporary approaches to organizational structure and managerial functions. This course also pays particular attention to management strategy as reflected in public and private sector case studies, and examines how managerial decisions are made within these constraints as economic costs and benefits, political stakes, organizational processes, interpersonal
Expenditure and revenue theory is examined here, with particular reference to alternative budgetary systems and how they are employed by state and local governments. The course looks at how the budget and financial statements can be used to determine the financial health of an organization and to detect unintended public policy outcomes such as budget cuts in one area that lead to increases in another. Finally, alternative budget revenue projections and expenditure patterns are examined as tools for implementing strategic goals.

PADM 685 Bureaucracy and Society 3 hrs.
Bureaucracy has become the predominant organizational form within the public sector in all advanced industrial societies today. This course explores the growth of bureaucracy, the expansion of its political role, goals, and objectives, and several alternative bureaucratic models, including the Weberian and Marxist approaches. Attention is also paid to the relationship of bureaucracy presently to power, to constituency groups, and to the people.

PADM 686 State Agency Administration 3 hrs.
This course examines the organization and administration of state government agencies, with special emphasis on the functions performed by major departments and their principal sub-units. Executive agencies in Michigan will serve as a basis for comparing and contrasting services provided by similar agencies in other states. Each course participant will be required to analyze the current status of services provided by a particular state agency and project service demand into the future. Course participants will develop a comprehensive understanding of administration in agencies of state government.

PADM 687 Legislative Relations for Public Administrators 3 hrs.
This course prepares participants to interact with policy making bodies: city councils, county commissions, or the state legislature. Participants will learn to estimate the possible impact upon their agency of legislation under consideration to assess the probable effects of proposed legislation upon their clientele, or to project the amount of revenue to be generated by a proposed tax, fine, or fee.

PADM 689 Seminar in Quantitative Policy Analysis 3 hrs.
This seminar is designed to enable a group of candidates to tackle a current, unsolved policy problem in state or local government. Such a problem will be identified prior to the course, and the collective task will be to complete a working paper utilizing quantitative analysis.

PADM 691 Statistics for Public Administrators 3 hrs.
This course is designed to assist public executives to better understand the various statistical procedures which are used to communicate and interpret data sets employed in public policy analysis. It will employ examples from the policy analysis and program evaluation literature to illustrate the utility of those statistical tools. Topics will include descriptive, difference, bivariate associational, and multivariate statistics.

PADM 693 Action Research Project 3 hrs.
This course will be taken twice. Each time it will follow a methodological sequence of other courses that discussed various research techniques used in the analysis and evaluation of public policy. Various projects will be undertaken by students on a team basis. These projects will allow for the specific application of the tools of analysis previously examined in the quantitative survey courses. Repeatable for credit.

PADM 694 Qualitative Research Methods 3 hrs.
In this seminar, participants will conduct and be instructed in research using qualitative designs such as comparative historical, case study, content analysis, observation and intensive interviewing. The course will emphasize the operationalization of qualitative concepts and the research potential of data sources such as census, archives, documents and any natural setting.

PADM 695 Research Design 3 hrs.
This course will include conceptual and model analysis, hypothesis testing, research literature, theory construction and individual research papers. Those papers may become the research design chapters for the students' dissertations.

PADM 698 Studies in Selected Public Policy Areas 3 hrs.
The students in this tutorial course will review the specialized literature in the substantive or functional area of particular interest to them. After surveying the literature generally, the student will write a paper that in a number of cases will become the literature review chapter in his or her doctoral dissertation.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

PADM 710 Independent Research 2-4 hrs.

PADM 730 Doctoral Dissertation 15 hrs.

Religion (REL)
Lawson, Chairperson; Professors Earhart, N. Falk, F. Gross, Grünler, Siebert; Associate Professor Ede; Assistant Professor Vasquez.

Open to Upperclass and Graduate Students REL 500 Historical Studies in Religion 2-4 hrs.
The topic to be announced in the Schedule of Classes. The content of the course will vary from semester to semester. Students may repeat the course for credit as long as the subject matter is different. Topics such as the following will be studied: Zen Buddhism; Buddhism; Taoism; Shinto; New Religions of Japan; Religion in Japanese Literature; Islam in the Modern World; Christian Theology to 1500; Renaissance and Reformation Theology.

REL 510 Morphological and Phenomenological Studies in Religion 2-4 hrs.
The topic to be announced in the Schedule of Classes. The content of the course will vary from semester to semester. Students may repeat the course for credit as long as the subject matter is different. Topics such as the following will be studied: Millennium, Utopia, and Revolution; Femininity as a Religious Form; Great Islamic Thinkers; the Hindu Yogas; the Occult Tradition.

REL 520 Methodological Studies in Religion 2-4 hrs.
The topic to be announced in the Schedule of Classes. The content of the course will vary from semester to semester. Students may repeat the course for credit as long as the subject matter is different. Topics such as the following will be studied: Scientific Issues in the Study of Religion; the Critical Theory; Myth and Symbol in Religion and Literature.

REL 521 The Teaching of Religion in the Public School 2 hrs.
This course focuses on methods and issues involved in the teaching of religion in the public school. Particular attention given to the problems of its constitutionality, the distinction between the academic study of religion and religious instruction, and the question of meaning. Various approaches to the teaching of religion are critically evaluated. Teaching methods appropriate to the level of instruction, availability, organization, selection, and use of materials will be discussed. Required of all students following a Secondary Education Curriculum which includes the academic study of religions as a minor.

REL 530 Constructive Studies in Religion 2-4 hrs.
The topic to be announced in the Schedule of Classes. The content of the course will vary from semester to semester. Students may repeat the course for credit as long as the subject matter is different. Topics such as the following will be studied: Religious Images of Man; Christian Humanism; the Structure of Religion.

REL 598 Readings in Religion 1-4 hrs.
Research on some selected period or topic under supervision of a member of the Religion faculty. Approval of instructor involved and Chairperson of the Department must be secured in advance of registration.

Open to Graduate Students Only REL 600 Classics in Comparative Religion 3 hrs.
A systematic study of the most important scholarly works in Comparative Religion. Special attention will be paid to the historical context in which these classics were produced, their role intellectual history, and their contributions to the humanities and the social sciences.

REL 610 Theory and Method in Comparative Religion 3 hrs.
An examination of the major theoretical options for understanding and explaining comparative religion in comparative perspective and the major methods employed by theorists in their development of such theoretical options. Particular attention will be paid to intellectualist, functionalist, symbolist, and structuralist method and theory.

REL 620 Advanced Seminar in Comparative Religion 3 hrs.
Advanced study in a major problem area of comparative research in the religions of humankind. May be repeated for credit when topics vary. Prerequisite: Consent of instructor.

Open to Graduate Students Only—Please refer to The Graduate College section for course description.

REL 700 Master's Thesis 6 hrs.
REL 710 Independent Research 2-6 hrs.
REL 712 Professional Field Experience 2-12 hrs.

Science Division (SCI)
Professor R. Poel
Open to Upperclass and Graduate Students
SCI 598 Readings in Science 1-4 hrs.
To be used by students seeking work in topics not otherwise available. The student is limited to not more than four hours in all reading courses and work must be completed under a member of the graduate faculty.

Open to Graduate Students Only
SCI 601 Problems in Science Education 1-4 hrs.
This independent study course allows students to study various problems in Science Education under the direction of a supervising faculty member. Individual or small groups of qualified students may be involved in these problem areas reflecting the current concerns of Science Education. The course is designed to meet the needs of students for first-hand experience in field or laboratory research, pilot projects testing major ideas or concepts, or developing learning materials or resources. The course may be repeated for up to 4 hours of credit.

SCI 610 Science for Elementary Teachers 2-3 hrs.
This course is designed specifically for elementary and middle (junior high) school teachers who have little or no science background. The course has no prerequisites and prospective teachers as well as experienced teachers are welcome. The objectives of the course are to acquaint teachers with the major concepts of science important at the K-6 level and the appropriate methods of teaching those concepts to children. Science activities and learning by doing will be stressed, and resources for teaching science will be examined.

SCI 620 Topics in Science Education 2-6 hrs.
This course will present, analyze, and evaluate methods and techniques of teaching science. Topics may include new approaches for teaching science, new science curriculum, laboratory practices, science education research, motivational techniques, and other methodological problems confronting science teachers. Course content may vary, and the course may be repeated for up to six hours of credit provided different topics are involved.

SCI 621 Topics in Science 2-6 hrs.
This course is designed to examine various science concepts and new developments of science of interest to science teachers. Each course will be subtitled, and the content will vary to reflect the various sciences, new developments and emphases, and the needs of the science teaching community. The course may be repeated for credit provided different topics are involved.

SCI 625 Environmental Science Seminar 2-4 hrs.
Analysis of case studies of environmental problems. Covers the scientific, social, and political problems involved in environmental action and will include experiences with management of energy and material resources. May be repeated for credit up to a maximum of six hours.

SCI 690 Science Education Seminar 2-4 hrs.
Designed to provide an integrating experience for students in the Science Education doctoral program. The topics covered in the seminar will vary from one semester to the next. May be repeated for credit.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.
SCI 710 Independent Research 2-6 hrs.
SCI 730 Doctoral Dissertation 15 hrs.
SCI 735 Graduate Research 2-10 hrs.

Social Science Division (SSCI)
Open to Upperclass and Graduate Students
SSCI 500 Data Processing for Behavioral Scientists 3 hrs.
An introduction to data processing for students of the behavioral sciences. Emphasis to be placed upon computer programming in one general purpose computer language and individual projects involving a behavioral problem selected by each student. In addition, there will be a survey of a number of computer techniques which show promise for research in the behavioral sciences. Solely for persons in the behavioral sciences. No special mathematical background required. Prerequisite: Consent of instructor.

Sociology (SOC)
Walker, Chairperson; Professors Brawer, Chaplin, Friday, Markle, Page-Robin, Petersen, Robin, VanValey, Wagenfeld, Associate Professors Carrinella-MacDonald, Kramer, Ross, Sonnad, Wait, Wienir; Assistant Professors MacDonald, Riley.

Open to Upperclass and Graduate Students
SOC 501 Social Systems Theory and Analysis 3 hrs.
An introduction to data processing for students of the behavioral sciences. Emphasis to be placed upon computer programming in one general purpose computer language and individual projects involving a behavioral problem selected by each student. In addition, there will be a survey of a number of computer techniques which show promise for research in the behavioral sciences. Solely for persons in the behavioral sciences. No special mathematical background required. Prerequisite: Consent of instructor.

An examination of a selected area of concern in social problems not intensively covered in other courses. The focus of this course will be substantive, as well as theoretical and methodological. Topics may include such areas as poverty, mental illness, narcotic addiction, alcoholism, aging, and international tensions. May be repeated for credit with a different topic. Prerequisite: SOC 200 or consent of instructor.

SOC 512 Child Abuse 3 hrs.
This course is an examination of child abuse in American society. Medical, psychological, educational, psychiatric, legal, and treatment perspectives are combined in a social analysis. The origins, family context, nature, extent, and social consequences of child abuse are discussed. Currently practiced social and legal solutions are presented, as well as possible social change required to respond to this phenomenon.

SOC 515 Sociology of Mental Disorder 3 hrs.
This course will be concerned with examining the historical evolution and contemporary meaning of concepts of mental health and mental disorder. This course will also consider the amount and kind of mental disorder in society, the structure of the mental health care delivery system, the nature of help-seeking for mental disorder, and sociological analysis of psychotherapy. Prerequisite: SOC 200, or Consent of Instructor.

SOC 520 Studies in Social Psychology: Variable Topics 3 hrs.
Further analysis of selected topics in social psychology not intensively covered in other courses. Specific topic will be designated in the course title when scheduled. May be repeated for credit with a different topic. Prerequisite: SOC 320.

SOC 521 Childhood Socialization 3 hrs.
An investigation of social development of the child from birth to adolescence. Course will focus on child’s interactions with parents and peers as these influence processes of learning, language acquisition, role-playing, the organization of knowledge, and development of self. Prerequisite: SOC 320 or Consent of Instructor.

SOC 522 Adolescent Socialization 3 hrs.
An investigation of social learning and personality development in adolescence. This course examines the effects of interaction patterns and group allegiances, social class membership, biological maturation, sex roles and self-awareness on adolescent behavior, personality development and orientations toward the adult world and adulthood. Prerequisite: SOC 320 or Consent of Instructor.

SOC 523 Contemporary Social Movements 3 hrs.
A study of the origins, growth, and effects in social psychology of social movements. Selected social movements including communism, fascism, the radical left, the radical right, women’s liberation, etc., will be analyzed. Prerequisite: SOC 200 or equivalent.

SOC 524 Adult Socialization 3 hrs.
Examination of processes of social learning and personality development from late adolescence through middle age. The course will focus on selection and performance of adult roles, issues of stability and change in adult identity, and the effects of role transitions and personal crises on adult development. Prerequisite: SOC 320 or Consent of Instructor.

SOC 528 Research Methods in Social Psychology 3 hrs.
An examination and comparison of major research strategies in social psychology as applied to several selected major topics within the field. Students will be expected to review, critique, and research within a selected area. Prerequisite: SOC 382 and 383 or equivalent.

SOC 531 Studies in Social Change: Designated Areas 3 hrs.
Analysis of social change in specific geographic or national areas designated in the course title as scheduled. Change is examined through perspectives from history, anthropology, and sociology. May be repeated for credit with a different area. Prerequisite: SOC 200.
SOC 540 Sociology of Medicine 3 hrs.
A comprehensive survey of concepts and research findings in the field of the sociology of medicine. Topics to be covered include: the distribution of illness in society, relationships between social stress and disease, illness as a social process, health care professionals, the sociology of health care delivery. Prerequisite: SOC 373 or graduate standing.

SOC 552 Sociology of Aging 3 hrs.
An examination of the process of aging in American society, with particular emphasis on the periods of late maturity and old age. Consideration will be given to theories of aging and the social implications of age grading, the meaning of work and retirement, and the status and roles of the aged. Prerequisite: Six hours of sociology, including SOC 200 or consent of instructor.

SOC 556 Social Stratification 3 hrs.
An analysis of the nature, causes, and consequences of class and status differences within societies. Stress is placed upon such concepts as mobility, class, status, and differential power. Conflict and functional theories of stratification are treated. Prerequisite: SOC 200 or consent of instructor.

SOC 560 Corporate and White-Collar Crime 3 hrs.
An intensive analysis of corporate and white-collar crime from a sociological perspective. Topics covered include: the problems involved in differentiating corporate and white-collar crime, an assessment of the costs of these crimes, a description of the nature, extent and distribution of these forms of criminal behavior, the etiology of corporate and white-collar crimes, and societal and legal reactions to these types of crime. Prerequisite: SOC 262.

SOC 561 Violence and the Violent Offender 3 hrs.
This course analyzes the nature and pattern of violence. It looks at the social, cultural and individual factors that increase the probabilities of violent behavior. Assault, murder, rape, robbery, mass murder, domestic violence, and war will be analyzed from cross-cultural perspectives. Causes, processes, and prevention will be discussed.

SOC 562 Victimization 3 hrs.
The study of crime victims, the probabilities of victimization, victim-offender relationships, the treatment of victims by the criminal justice system and the economic, social, and psychological impact of victimization. An analysis of coping strategies is discussed and the role of the victim in the criminal justice system is analyzed.

SOC 563 Organized Crime 3 hrs.
Review of the history and development of organized crime, the nature of its organized structure, the basis for its persistence in American society, its impact and pervasiveness, and the implications for the criminal justice system and society.

SOC 564 Juvenile Delinquency and the Community 3 hrs.
A study of juvenile delinquency as a social problem. Extent, causative factors, methods of treatment, and programs of prevention and control are covered. When feasible, community resource people are invited to participate. Prerequisite: SOC 200.

SOC 565 Community Corrections 3 hrs.
This course reviews the role of corrections in communities and the impact community based programs (e.g., half-way houses, work release, etc.) have on society and offenders. Organization and operation of different correctional structures are reviewed and policy perspectives are discussed. Prerequisite: SOC 465.

SOC 566 Advanced Criminology 3 hrs.
Advanced Criminology is a theoretically oriented course. Looking historically at the philosophical belief systems, classical and modern theories of crime are reviewed. Specific types of crimes such as property crime, violent personal crime, and corporate crime are discussed and interpreted within the theoretical paradigms reviewed. Prerequisite: SOC 262.

SOC 570 Studies in Social Institutions: Variable Topics 1-4 hrs.
An examination of a selected topic in the area of social organization or institutions. The focus of the course will be substantive, but theoretical and methodological concerns will also be covered. Possible topics could include work and leisure, occupations and professions, sociology of science, mass society, macro-sociology, arts, and others. May be repeated for credit with different topic. Prerequisite: SOC 200 or consent of instructor.

SOC 573 The Sociology of Political Behavior 3 hrs.
Systematic sociological theory and research applied to the study of political organization and behavior in the United States and in selected countries abroad. Such topics as political parties, voting, bureaucracy, and political ideology will be considered. Prerequisite: SOC 200 or consent of instructor.

SOC 574 Sociology of Religious Institutions 3 hrs.
A study of the social role of religious institutions and beliefs with particular reference to the United States. The course considers social factors affecting development of different types of religious institutions and the influence of religion on American society. Prerequisite: SOC 200 or equivalent.

SOC 575 Industrial Sociology 3 hrs.
The sociological study of industrial organizations and of the process of industrialization. The impact of technology and related factors on work organizations, the structure and operation of labor unions, and the changes occurring in industrial society are discussed. Prerequisite: SOC 200 or equivalent.

SOC 576 Sociology of School Organization 3 hrs.
Advanced studies of education as an institution, emphasizing interaction with other social institutions and analysis of internal organization. Attention is focused on the school and social change, schooling and the control of society, and schooling and stratification, as well as impediments to change, power and authority structures and the schools, the teaching profession, and student social structures. Prerequisite: Six hours of sociology or consent of instructor.

SOC 578 Sociology of Law 3 hrs.
An examination of legal organization, the legal profession, and legal norms in the United States and other western societies. Emphasis will be placed upon the relationship between the legal system and the society in which it functions. Prerequisite: SOC 200 or equivalent.

SOC 579 Female/Male Interaction 3 hrs.
Examines the variable of gender as it influences interaction between women and men. Topics include female-male stereotypes, interpersonal attraction, differences in female-male verbal and non-verbal codes, relational dialogues and patterns, and female-male interaction on the job. Cross-listed with COM 579.

SOC 581 Logic and Analysis of Social Research I 3 hrs.
This course is designed to provide grounding in basic univariate and bivariate descriptive and inferential statistics for social scientists. Prerequisite: SOC 382 and 383 or graduate standing.

SOC 585 Research Methodology: Variable Topics 1-4 hrs.
This course concentrates on specialized research techniques and topics such as sampling and survey design, interviewing, the use of sociological computer software, etc. May be repeated for credit with different topic. Prerequisite: Consent of Instructor.

SOC 590 The Family as a Social Institution 3 hrs.
The family viewed in historical and cross-cultural perspectives. A structural-functional analysis of the family system. Emphasis is placed on change and comparative analysis. Prerequisite: SOC 200 or equivalent.

SOC 592 Family Life Education and Counseling 3 hrs.
Provides the student with a working knowledge of the methods and materials appropriate in the school, the church, and other social situations for working with individuals and small groups who desire preparation for marriage and parenthood. Some attention will be given to the techniques for handling counseling opportunities arising out of these teaching situations. Prerequisite: SOC 200 or consent of instructor.

SOC 593 Marriage and Family in Middle and Later Years 3 hrs.
A systematic analysis of the marital and family system and interpersonal relationships of husbands and wives, and parents and children during middle age and the years of married life. Prerequisite: SOC 390 or equivalent, or consent of instructor.

SOC 596 Directed Individual Study 2-6 hrs.
A program of independent study (reading or research) to provide the unusually qualified sociology student with the opportunity to explore a topic or problem of interest, under the guidance of one of the faculty of the department. The initiative for planning the topic for investigation must come from the student. Approval is contingent upon the merit of the proposal. Maximum of four hours may be applied toward master's degree. Enrollment beyond the first semester may be either for the same topic or for a new topic. Prerequisite: Consent of instructor and the department chairperson.

Open to Graduate Students Only

SOC 601 Advanced General Sociology 3 hrs.
A comprehensive survey of trends in the major fields of sociology. Prerequisite: Open only to graduate students in sociology.

SOC 602 Classical Sociological Theory 3 hrs.
An intensive and critical study of major sociological theories developed in the 19th and early 20th centuries. The course will examine the logical structure of classical theories, patterns of influence among theorists, and the central issues raised in their works. Theories will
be examined with respect to both historical context and their influence on contemporary sociology.

SOC 603 Contemporary Sociological Theory
3 hrs.
An intensive and critical study of contemporary perspectives and theories in sociology. Theories which exemplify functionalist, conflict, and interpretive approaches will be examined. The course will examine the logical structure of contemporary theories and the relevance of contemporary theories to major substantive areas in sociology.

SOC 606 Studies in Sociological Theory: Variable Topics
3 hrs.
Advanced study and exploration, following seminar format, of topics of interest to faculty and students, for example: various role theory formulations and their usefulness in understanding social behavior, ethnomethodology, philosophy of science, experimental design, Marx, Weber, or other selected theorists. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

SOC 610 Deviance and Social Problems Theory
3 hrs.
An intensive and critical examination of the historical development and current status of the major theoretical orientations in the study of deviance and social problems theory.

SOC 611 Proseminar on Social Problems
3 hrs.
A comparative examination of the current state of knowledge in the major subfields of social problems. Emphasis will be placed on conceptual and methodological problems in the areas and the relationship of each of these areas to one another.

SOC 612 Applied Sociology
3 hrs.
Provides an overview of the development of applied sociology and an introduction to essential skills. Among the topics covered are proposal writing, budget preparation, systems analysis, presentation of data to clients, and the writing of research reports. Case study material will be used to introduce students to applied sociology in public, private, and non-profit settings.

SOC 614 Seminar in Ethnic Relations
3 hrs.
Advanced study of race and ethnic relations, problems, and trends. Prerequisites: SOC 314 or consent of instructor.

SOC 615 Patterns of Intercultural Adjustment
3 hrs.
A study of processes of intercultural adjustment involving different racial, national, and religious groups. The factors giving rise to present-day conflict situations are examined and special emphasis is given to techniques of adjustment through individual and community action. Prerequisite: SOC 200 or equivalent.

SOC 616 Studies in Social Problems: Designated Topics
3 hrs.
A detailed study of a social problem area through student reports and seminar discussion. Instructor will select specific topic. Course is intended to provide intensive joint study and exploration of significant sociological issues. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

SOC 617 Etiologies of Substance Abuse
3 hrs.
A study of various social and behavioral theories regarding the causation of alcohol and drug addiction. The findings of research will be examined as they tend to support or disconfirm these social and behavioral theories.

SOC 618 Seminar in Substance Abuse I
3 hrs.
An interdisciplinary seminar designed to reflect broadly conceived intervention strategies ranging from primary prevention to rehabilitation of the addict. The basic training in the principles of intervention and clinical practice will continue to be taught within the student's basic professional discipline. In part, the seminar will be used to elaborate upon the applications of these principles to the problems of substance abuse. This course is cross-listed with Biology, Counseling-Personnel, and Social Work. Graded on a Credit/No Credit basis.

SOC 619 Seminar in Substance Abuse II
3 hrs.
Continuation of SOC 618. This course is cross-listed with Biology, Counseling-Personnel, and Social Work. Graded on a Credit/No Credit basis.

SOC 625 Social Psychological Theory
3 hrs.
A study of major theoretical approaches in social psychology and their methodological and substantive implications. Prerequisite: SOC 320 or equivalent.

SOC 626 Advanced Social Psychology
3 hrs.
Advanced exploration of contemporary social psychology, with selected examples of theory and research to represent current work in socialization, small groups, and cognitive social psychology. Prerequisite: SOC 625.

SOC 628 Seminar in Social Psychology: Variable Topics
3 hrs.
An advanced seminar in some specialized aspect of social psychology. May be repeated for credit with a different topic. Prerequisite: SOC 625.

SOC 632 Studies in Comparative Sociology: Variable Topics
3 hrs.
Intensive analysis of selected topics using a comparative frame of reference. The seminar will focus on such topics as major theoretical perspectives, methodological issues, and interpretation of studies of such institutions as: educational systems, industrial systems, and family systems. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

SOC 640 Social Organization of the Health System
3 hrs.
An examination of traditional and emerging ways in which health care is organized. A major concern will be the politics of health and the role of various interest groups (professional associations, unions, consumer groups) in the formation of health policy. Among the topics to be considered are the development of American medicine, the relationships of organizational structure to effectiveness in health organizations, the social control of health care organizations, and the growth of medical bureaucracy. Prerequisite: SOC 540, or SOC 540 may be taken concurrently.

SOC 641 Social Psychology of Health and Illness
3 hrs.
An examination of the impact of disease or disability on the individual. Individual responses to disease and disability are examined in relation to cultural, social psychological and personality variables. Environmental stress and personality factors are considered as they relate to the onset of disease. Consideration is given to the relevance of social factors for health services planning and communication of health care professionals with patients and clients. Prerequisite: SOC 540, or SOC 540 may be taken concurrently.

SOC 642 Social Epidemiology
3 hrs.
An examination of the relationships between sociocultural and demographic variables and variations in the distribution of infectious and chronic diseases, mental disorders and substance abuse. Sources of epidemiological data and methods of research are studied and evaluated. Application to the planning of health services and the development of service systems are presented.

SOC 643 Seminar in Medical Sociology
3 hrs.
An advanced seminar in some specialized aspect of medical sociology. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

SOC 644 Epidemiology and Health Statistics
3 hrs.
The course will cover the basic principles of epidemiology and biostatistics. Topics to be considered include: the nature of the epidemiologic perspective, epidemic investigation, rates, screening, risk estimation, the design of epidemiologic investigations, measures of central tendency, basic inferential statistics, sampling, and hypothesis testing. Open only to Health Care Administration students, except by permission of instructor.

SOC 660 Seminar on Theories of Crime
3 hrs.
This course will deal with the most current theoretical developments in criminology, evaluating research related to the verification of theories and analysis of the objectives of theory, the requirements of theory, and the testing of theory. Prerequisite: SOC 566.

SOC 661 Seminar on Current Issues in Criminology
3 hrs.
This course will deal with the current debates and controversies in criminology, radical versus traditional perspectives, economic and white-collar crime as areas of research, the ethics of criminological research, environmental design and crime, and other contemporary issues emerging from current literature and conference debates.

SOC 662 Comparative Corrections
3 hrs.
Review and analysis of the philosophies of corrections in different societies, the implementation of penal measures and innovative and alternative strategies of social control in eastern and western Europe, Asia, and the United States.

SOC 663 Comparative Criminology
3 hrs.
An analysis in depth of crime as this phenomenon is viewed in Sweden, Germany, Poland, and other eastern and western European countries. Emphasis is placed on theoretical and etiological approaches in different societies, and the applicability and tests of theories in these societies. Prerequisite: SOC 566.

SOC 673 Formal Organization
3 hrs.
This course analyzes the nature of large-scale, formal organizations, concentrating on their structure, types of organizational goals, processes of control, authority and leadership, and the relationship of organizations to their social environment. Examples of organizations will be selected from different areas such as education, government, medicine, science, leisure, and industry. Prerequisite: SOC 200 or consent of instructor.
SOC 676 The School and the Community
3 hrs.
Analysis of the school as a social institution in the American community, including consideration of interaction between the school and other basic social institutions, and the sociological significance of community structures, processes and problems for school community relationships. Prerequisite: SOC 200 or equivalent.

SOC 680 Studies in Research Methodology: Variable Topics
3 hrs.
A seminar on advanced theoretical and methodological problems which are important to systematic research in sociology. Suggested specialized topics include: philosophy of the social sciences relationship between theory and research, and model building and testing. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

SOC 681 Advanced Multivariate Analysis I
3 hrs.
A study of the assumptions, logic, and application of current multivariate techniques of analysis such as regression analysis, path analysis, factor analysis, and canonical correlation. Prerequisite: SOC 682.

SOC 682 Logic and Analysis of Social Research II
3 hrs.
This course covers basic multivariate descriptive and inferential statistics for social scientists. Prerequisite: SOC 581.

SOC 683 Research Design and Data Collection I
3 hrs.
This course is designed to provide experience with the formulation of research problems, the choice of data gathering techniques and the development of research proposals. Students will learn to do sociological research by collecting documentary, observational, sample survey and experimental data. Advantages and disadvantages of the different data collection techniques will be assessed. Prerequisite: SOC 581 or consent of instructor.

SOC 684 Research Design and Data Collection II
3 hrs.
This course focuses on problems and issues in the design of research and the collection of sociological data. Emphasis will be placed on the critical evaluation of current research designs and the development of research design skills. Topics will include: the internal and external validity of research designs, measurement and scaling, the uses of qualitative and historical data, and philosophical and ethical issues raised by various research designs and procedures. Prerequisite: SOC 683.

SOC 685 Advanced Multivariate Analysis II: Variable Topics
3 hrs.
The study of advanced statistical techniques which are important to systematic research in sociology. Suggested specialized topics include: factor analysis, advanced non-parametric techniques, path coefficient analysis, and regression analysis. May be repeated for credit with a different topic. Prerequisite: SOC 681 or equivalent.

SOC 687 Evaluation Research I
3 hrs.
The basic purpose of this course is to familiarize students with the various research techniques for evaluating action agencies through a survey of the literature, study of evaluation models, and study of techniques and procedures used in evaluation. Prerequisite: SOC 682.

SOC 688 Practicum in Social Research
3 hrs.
A research seminar structured to provide practical experience in various phases of research related to the student’s major area of interest. Under faculty supervision, students will act as consultants to projects initiated by other agencies in the community or carry out their own supervised projects. May be repeated in different areas of concentration with permission of student’s doctoral committee. Prerequisite: SOC 682.

SOC 689 Evaluation Research II
3 hrs.
The purpose of this course is to provide an opportunity to conduct an actual evaluation study based on the techniques and procedures covered in SOC 687. The course will include discussion of each student’s evaluation findings. Prerequisite: SOC 687.

SOC 690 Computer Applications for Sociologists
3 hrs.
This class is designed to provide doctoral students in sociology with essential skills in the use of mainframe computers and microcomputers to perform such professional tasks as project design, interviewing, budgeting, and data analysis. Competence in using operating systems, word processing and SPSSX should be attained before enrolling for this class. Prerequisite: SSCI 500, CS 501, or equivalent.

SOC 694 Professional Writing for Sociologists
3 hrs.
This course will examine three forms of professional writing: Proposals for funded research, technical research reports, and scholarly journal articles. Students will receive extensive experience in writing, critiquing, and rewriting proposals, reports, and journal articles.

SOC 695 College Teaching Practicum in Sociology
3 hrs.
A practicum in the teaching of sociology in college. Students will attend assigned lectures and seminars, prepare a syllabus for a course in sociology, and deliver at least two supervised lectures to a sociology class. Prerequisite: Fifteen hours of graduate sociology courses and consent of instructor. Graded on a Credit/No Credit basis.

SOC 699 Master’s Essay
2 hrs.
An analytical and interpretative study under the supervision of the candidate’s master’s adviser and a second faculty member.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

SOC 700 Master’s Thesis
6 hrs.

SOC 710 Independent Research
2-6 hrs.

SOC 712 Professional Field Experience
2-12 hrs.

SOC 725 Doctoral Research Seminar
2-6 hrs.

SOC 730 Doctoral Dissertation
15 hrs.

SOC 735 Graduate Research
2-10 hrs.
Accountancy (ACTY)

ACTY 511 Advanced Accounting
3 hrs.
A study of entities and special transactions not covered in Financial Accounting I and II. Particular emphasis is given to partnership equity accounting, fund accounting, accounting by agencies and branches, business combinations, reporting by parent-subsidiary consolidated entities (including foreign subsidiaries). Prerequisites: ACTY 311 or equivalent.

ACTY 514 Institutional Accounting
3 hrs.
A comprehensive study of the recording of transactions by government units and the preparation of financial statements by fund entities. City government is the basic unit of study; however, school districts, universities, and hospitals are given brief coverage to illustrate the similarity in accounting for not-for-profit entities. Prerequisite: ACTY 211 or consent of instructor.

ACTY 516 Auditing
3 hrs.
The theory and practice of auditing business enterprises and government agencies. Topics include a review of professional pronouncements, internal control concepts, ethics, and discussion of audit objectives. Prerequisite: ACTY 311 or 313.

ACTY 518 Accounting Theory and Problems
3 hrs.
A study of financial accounting theory and practice. The course is organized around pronouncements of the Financial Accounting Standards Board and other authoritative bodies. Case studies are used to illustrate application of the concepts of such pronouncements. Prerequisite: Senior standing and accounting major.

ACTY 522 Cost Accounting—Concepts and Practice
3 hrs.
A study of the accounting methodology and concepts that have been developed to account for both product and period costs of a business enterprise. Includes product costing for job order and continuous process situations with related systems concepts, cost allocations among departments of an enterprise, joint and by-product costing, and standard costing as it relates to inventory pricing. Prerequisite: ACTY 322

ACTY 524 Studies in Tax Accounting
3 hrs.
Special studies related to tax problems of individuals, partnerships, and corporations. Emphasis is on federal taxation of corporations, trusts, and estates. Prerequisite: ACTY 324 or equivalent.

ACTY 598 Readings in Accounting
1-4 hrs.
Directed individual study of topics not otherwise treated in departmental courses. Prerequisite: Written consent of instructor.

ACTY 606 Advanced Financial Accounting
3 hrs.
An intensive study of asset valuation, liabilities, corporate capital, and the determination of income. Prerequisite: ACTY 211 or equivalent.

ACTY 607 Accounting Control and Analysis
3 hrs.
A study of management systems and techniques used for profit planning and control of a business firm. Organizational relationships and implications are examined in the development of operations controls, management controls, and strategic planning. This course is in the graduate business core, and is closed to students with credit in Cost Accounting 322 or its equivalent. Prerequisite: ACTY 211 or equivalent.

ACTY 608 Advanced Accounting
3 hrs.
A study of advanced accounting problems distinctive to corporate and partnership types of business organizations. Prerequisite: ACTY 606 or equivalent.

ACTY 610 Seminar in Financial Accounting Theory
3 hrs.
Intensive examination and study of the underlying postulates, concepts, and principles of accounting. Course may be repeated under different topics. Prerequisite: ACTY 608 or consent of instructor.

ACTY 617 Seminar in Advanced Auditing and Systems Concepts
3 hrs.
An advanced course which integrates auditing and systems concepts. Intensive examination of audit tools, audit theory and practice, management of the accounting information systems and EDP applications. Prerequisites: ACTY 313, ACTY 516, ACTY 607 or consent of instructor.

ACTY 622 Seminar in Management Accounting Concepts
3 hrs.
A study of advanced methods of cost measurement and control. Includes standard cost, budgetary control, profit-volume analysis, direct cost, return on employed capital, and quantitative methods. Prerequisite: ACTY 522 or equivalent.
ACTY 624 Seminar in Business Tax Planning
3 hrs.
An advanced course in business taxation involving the identification and analysis of tax problems. Income tax strategy is studied involving the timing of income, types of business organizations, and the various alternative tax treatments. Tax problems of corporate acquisitions, reorganizations, liquidations, estates and trusts, partnerships, and capital gains will also be included. Case studies will be used, and research in taxation will be emphasized. Prerequisite: ACTY 524 or equivalent.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

ACTY 700 Master's Thesis
6 hrs.

ACTY 710 Independent Research
2-6 hrs.

ACTY 712 Professional Field Experience
2-12 hrs.

Business Information Systems (BIS)
Rooney, Chairperson; Professors Athappilly, Bowman, Branchow, Jones, Moskovis, Targowski; Associate Professors Mascolini, Supnick; Assistant Professors Ghani, Halvas, Yaeger.

Open to Upperclass and Graduate Students

BIS 554 Topics in Business Communication
3 hrs.
An intensive study of a topic in business communication such as a communication system, business media, business publicity, and others. The topic will be announced in advance. May be repeated for credit.

BIS 555 Topics in Computer Information Systems
3 hrs.
Special topics appropriate to business applications such as data base management; structured concepts; networking; programming documentation and efficiency; planning, organizing, and directing management information systems. May be repeated for credit.

BIS 556 Office Management
3 hrs.
Procedures of office administration with an emphasis on supervisory patterns in development, appraisal, and management of human resources.

BIS 557 Topics in Administrative Systems
3 hrs.
Includes an intensive study of a selected topic in administrative systems such as communication audits, consumer relations, office systems, work measurement and simplification, forms control and design, and others. The topic will be announced in advance. May be repeated for credit.

BIS 560 Office Systems and Procedures
3 hrs.
A study of paperwork systems and procedures. Emphasis placed on office systems and the techniques of systems development including fact gathering and recording, work analysis, and office work simplification and measurement. Prerequisite: BIS 102.

BIS 564 Information Resource Management
3 hrs.
This seminar course provides an overview of the management of information systems resources. The student will gain an insight and understanding of the subject through study of the fundamentals of organizing, planning, controlling, and other significant management tasks that relate to management of information resources. Prerequisite: BIS 462.

BIS 596 Independent Study
1-4 hrs.
A directed independent project in an area of administrative systems, business communication, or computer information systems. Prerequisite: Consent of department chair.

BIS 598 Readings
1-4 hrs.
A series of direct readings in the area of administrative systems, business communication, or computer information systems. Prerequisite: Consent of department chair.

Open to Graduate Students Only

BIS 600 Seminar in Business Information Systems
3-4 hrs.
Intensive problem solving in the area of administrative systems, business communication, or computer information systems. May be repeated for credit.

BIS 602 Computer Information Systems
3 hrs.
The design, implementation, and use of computer information systems for decision making. Included are recent hardware and software developments, systems architecture, and system procedure techniques. Hands-on experience with mainframe and micro computers using a variety of statistical routines, PERT/CPM, VISICALC, word processing, and other software packages. Prerequisite: BIS 102 or equivalent.

BIS 685 Research in Business Education
3 hrs.
An examination and analysis of research in business education with emphasis on utilization of these findings in the upgrading of instruction. Research tools and methodology are also examined.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

BIS 700 Master's Thesis
6 hrs.

BIS 710 Independent Research
2-6 hrs.

BIS 712 Professional Field Experience
2-12 hrs.

Finance and Commercial Law (FCL)

Finance Area
Professors Edwards, Issa; Associate Professors Kennedy, Metwalli; Assistant Professors Balk, Burnie, D'Mello, Jones, Krishna-Swamy, Mangia, Scheu.

Open to Upperclass and Graduate Students

FCL 519 Security Analysis
3 hrs.
An analysis of stocks and bonds as investment vehicles. The course is designed as a sophisticated analysis of valuation techniques with a view towards aiding the student to bridge the gap between techniques used by the academician and the practitioner. Prerequisite: FCL 326.

FCL 521 International Finance
3 hrs.
A study of contemporary problems in international finance. The course examines the international money markets, working capital considerations, and capital budgeting problems as faced by the multinational corporation. Prerequisite: FCL 320 or equivalent or consent of instructor.

FCL 526 Group Insurance and Pensions
3 hrs.
By means of problems and cases this course analyzes in detail the following areas: group life and health insurance, business life and health insurance, insured pension plans, and estate and tax planning. Prerequisite: FCL 322.

FCL 527 Risk Management and Insurance
3 hrs.
This course covers the functions of risk management and the responsibilities of risk managers. The sources of risk information are examined, the business risks analyzed and the alternative methods of handling risks evaluated. Criteria for selection of proper insurance coverages and selection of carriers and intermediaries are reviewed. Prerequisite: FCL 321 or consent of instructor.

FCL 528 Insurance Company Management
3 hrs.
The topics studied by means of cases and problems in this course include multiple-line insurance operations, special problems in functional areas of industry operations, and personal and commercial risk surveys and analysis. Prerequisite: FCL 323.

FCL 598 Readings in Finance
1-4 hrs.
Directed individual study of bodies of knowledge not otherwise treated in departmental courses. Prerequisite: Written consent of instructor.

Open to Graduate Students Only

FCL 606 Financial Management
3 hrs.
Study of the principles and problems underlying the management of capital in the business firm. Stresses the financial officer's responsibilities. Skills are developed in the marshalling and interpreting of data for use in making and implementing capital expenditure policies, solving short-term and long-term financing problems, establishing dividend policies, and selecting and consolidating, and adapting to trends in financial markets. Techniques used include case analysis and problem solving. Demonstrates financial management's role in the total management effort. Prerequisite: FCL 320 or equivalent.

FCL 610 Financial Aspects of Higher Education
2-4 hrs.
A survey of the financial considerations in the administration of institutions of higher education. The topics covered include the management of short-term investments, the management of endowment funds, budgeting for operations and for capital projects, and the development and implementation of group insurance and pension programs. Prerequisite: Adviser's consent.

FCL 612 Health Care Financial Management
3 hrs.
This course deals with advanced financial management concepts affecting health care institutions. Working capital management, capital budgeting and reimbursement programs are examined. Prerequisite: FCL 320 or equivalent.
open to upperclass and graduate students

FCL 532 Real Estate Law 3 hrs.
The study of land ownership, sales agreements, including the legal duties of the real estate broker, mortgages, land contracts, leases, and condemnation and urban land development problems. Prerequisite: FCL 340.

FCL 552 International Business Law 3 hrs.
A study of national, regional and international laws which affect the conduct of international business. Examination of the legal regulations which promote or restrain trade or investment by international business firms. Prerequisite: FCL 340.

FCL 554 Government Regulation of Business 3 hrs.
This course examines the laws, rules and regulations on the federal, state and local levels which affect most business enterprises. Substantive laws affecting the firm's obligation to employees, stockholders and the public are examined as are the procedural laws affecting the regulation of the firm by public institutions. Prerequisite: FCL 340.

FCL 556 Marketing and Sales Law 3 hrs.
The course examines the law as it applies to the sale of goods, warranties affecting such sales and methods of financing those sales. Legal obligations imposed upon and risks assumed by the seller are emphasized. Prerequisite: FCL 340.

FCL 598 Readings in Commercial Law 1-4 hrs.
Directed individual study of topics in the areas of interest and competence. Prerequisite: Written permission of instructor.

Open to Graduate Students Only

FCL 607 Legal Controls of the Business Enterprise 3 hrs.
Reviews major legal problems encountered by business managers. The manager's role in dispute resolution, and the factors affecting the organization of business firms are reviewed. Problems in drafting and negotiating controls are examined. The administrative regulating process is discussed and various facets of product liability, antitrust and employment laws are studied. Prerequisite: FCL 340.

FCL 660 Health Law Administration 3 hrs.
The course provides an overview of the background and consequences for business of the laws governing collective relationships between employers and employees and their representatives. Special emphasis is given to the interpretation and evaluation of current legislation. Prerequisite: FCL 340.

FCL 661 Legal Problems of Health Care Organizations 3 hrs.
An analysis of the organization and structure of various health care entities. The health care reimbursement programs, legal malpractice and risk avoidance concepts will be discussed. Laws affecting the maintenance and disclosure of medical records and organizational certificate of need will be examined. Prerequisite: FCL 660 or consent of instructor.

MGMT 510 Multinational Management 3 hrs.
An examination of management strategy, controls, environmental influences of the multinational corporation with consideration of geographic factors. The management function abroad will be examined in light of the cultural assumptions underlying U.S. management and will deal with the necessary modification for effective operations in a cross-cultural environment.

MGMT 512 Women in Management: Male, Female and Organizational Perspectives 3 hrs.
A seminar dealing with the changing roles of women in business. Emphasis is given to the unique needs of women aspiring to managerial and professional ranks. Changes in attitudes and behaviors of women, men and organizations and the implications for change for traditional male-female relationships and organizational operations are explored. Prerequisite: Senior standing or permission of instructor.

MGMT 514 Entrepreneurship 3 hrs.
A senior or graduate elective for students interested in entrepreneurial careers. Primary attention given to managing a new or rapidly growing business. Alternative sources of capital are examined. Various growth strategies considered along with personal requirements for entrepreneurial success. Prerequisite: MGMT 300, FCL 340, MKTG 370 or department consent.

MGMT 540 Advanced Statistics 3 hrs.
A second course in statistics complete enough to be used with limited background. Includes probability theory, t, z, F and binomial probability distributions, hypothesis testing with sampling theory, and Type I, Type II errors.
Open to Graduate Students Only

MGMT 600 Seminar in Management (Topic) 3 hrs.
Intensive problem-solving in advanced management topics, including the preparation of a major staff report. Repeatable for different topics.

MGMT 604 Management Analysis and Practice 3 hrs.
A survey of the use of management theories and behavioral science knowledge to analyze human problems in management and to assist in designing and operating organizations more effectively. The course treats planning, organizing, directing and controlling, as well as motivation, leadership, and group behavior decision making and change strategies. Values, as they relate to the managerial process, will be considered.

MGMT 651 Analysis of Administrative Behavior 3 hrs.
Analysis of the contributions of management theory and of the behavioral sciences to modern administrative practices: group and individual behavior as related to and affected by the administrative process, lectures, cases, conferences. Not open to students having received credit for MGMT 451.

MGMT 653 Behavioral Science Applications for Managerial Effectiveness 3 hrs.
Models, methods, and applied technology relevant to the control of human performance in complex organizations. Emphasis on achieving human outputs such as productivity, satisfaction, learning, retention, decisions, problem solutions. Applied technologies could include selection, placement, job, and organizational analyses and evaluation.

MGMT 655 Organization Theory 3 hrs.
Theories, models, and applications relevant to the structure of complex organizations and their subunits. Emphasis on alternative designs, their causes and consequences.

MGMT 656 Behavior Analysis Applications 3 hrs.
Applications of behavior analysis and the principles of behaviorism to management problems in public and private organizations. Emphasis is placed on maintenance of performance reliability, effectiveness, and efficiency. Students will apply principles to the improvement of an existing organization. Prerequisite: Consent of instructor.

MGMT 661 Introduction to Management Science 3 hrs.
A systematic study and application of the scientific method to management decision-making. Introduction to techniques of linear programming, inventory theory, scheduling theory, and other optimizing decision models. For students who will take more specialized courses as well as those in other disciplines desiring a limited exposure to the field. Prerequisite: MGMT 200 or equivalent.

MGMT 664 Simulation 3 hrs.
A systematic study and application of the methodology of system simulation including system identification and description, model development, computer implementation, experimental design and validation. Special attention is given to model classification, especially deterministic vs. probabilistic and discrete vs. continuous, and how it relates to computer implementation and fields of application. Prerequisites: MGMT 360 or equivalent and BIS 602 or equivalent.

MGMT 665 Advanced Simulation 3 hrs.
Analysis, design, and implementation of computer-based simulation models. Emphasis on effective use of simulators for training system managers and workers. Prerequisite: MGMT 664.

MGMT 666 Inventory Management 3 hrs.
The theory of scheduling and inventory management, including both deterministic and probabilistic models beyond the introductory level. An intermediate course in management science. Prerequisite: MGMT 463 or equivalent.

MGMT 685 Advanced Management Practices 3 hrs.
Independent study of current trends and advanced problems in the organization and management of complex organizations. Prerequisite: Consent of department chairman. May be repeated for credit.

MGMT 689 Policy Formulation and Administration 3 hrs.
This course focuses on the job of the general manager in formulating short and long run strategy. Using cases drawn from actual situations, the course develops ways of (1) perceiving specific opportunities from an analysis of evolving environmental trends, (2) understanding company strengths and (3) integrating strengths and opportunities in setting strategy and detailed operating plans. This is an integrative capstone course in that the tools and skills learned in other core courses are needed to develop practical, company-wide general management decisions. Prerequisites: Completion of MBA core courses.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

MGMT 700 Master's Thesis 6 hrs.

MGMT 710 Independent Research 2-6 hrs.

MGMT 712 Professional Field Experience 2-12 hrs.

Marketing (MKTG)
Crow, Chairperson; Professors Belonax, Delene, Lindquist, Lugmani, Mayo, Guraaesi; Associate Professors Brogowicz, Lane; Assistant Professors Lee, Reck.

Open to Upperclass and Graduate Students

MGKT 571 Healthcare Marketing 3 hrs.
An analysis of the field of marketing and its application in the healthcare industry. Emphasis will be on the role and utilization of marketing by a range of healthcare providers from hospitals to agency and medical group services. Permission of Instructor.

MGKT 598 Readings in Marketing 1-3 hrs.
Directed individual study of bodies of knowledge not otherwise treated in departmental offerings. Prerequisite: Consent of instructor.

Open to Graduate Students Only

MGKT 607 Marketing Management 3 hrs.
Analysis of marketing activities from management point of view. Includes study of decision-making relative to competition, demand analysis, cost analysis, product analysis, product design, promotion, pricing, and channels of distribution. Prerequisite: MKTG 370.

MGKT 671 Quantitative Analysis of Marketing Decisions 3 hrs.
Applications of quantitative methods of marketing management utilizing analytical tools in the areas of product, price, distribution, promotion decisions, and other marketing-related problems. Required for all MBA marketing concentrations; may be waived for those having MKTG 471 or its equivalent.

MGKT 672 Analysis of Distribution Systems 3 hrs.
Organization, structure, and behavior of channels of distribution; focus on various distribution systems through which goods are marketed; cases and problems utilized. Prerequisite: MKTG 607.

MGKT 673 Product and Pricing Strategies 3 hrs.
In-depth consideration of product life cycle including addition, modification, deletion analysis, special attention to demand analysis, cost considerations, competitive actions, and governmental regulations. Prerequisite: MKTG 607.

MGKT 674 Promotional Strategy 3 hrs.
A decision-making course, taught using the case method, includes exposure to communications, promotional objectives, budget determination, personal selling resource management, reseller support, and promotional campaigns. Prerequisite: MKTG 607.

MGKT 676 Multinational Marketing Management 3 hrs.
Managerial analysis of the global marketing environment and evaluation of market entry strategies including exporting, licensing and direct investment; developing and assessing multinational product, pricing, promotional, and distribution strategies; critical discussion of contemporary international marketing issues.

MGKT 677 Buyer Behavior 3 hrs.
A decision-making course, taught using the case method; includes analysis of variables affecting buyer behavior. Course focuses on the consumer decision process and such influences on the process as culture, social status, economic condition, personality, the family, and mass communications. Prerequisite: MKTG 607.

MGKT 678 Seminar in Marketing 3 hrs.
Intensive problem solving in the primary business fields. Prerequisite: Consent of instructor.

MGKT 679 Market Programming 3 hrs.
Designed for special emphasis toward developing a total marketing strategy within an organization. Practical application of the marketing tools and techniques to a current problem originating in a business organization. Strongly recommended for all MBA marketing concentrations. Prerequisite: Consent of instructor.
Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

MKTG 700 Master's Thesis
6 hrs.

MKTG 710 Independent Research
2-6 hrs.

MKTG 712 Professional Field Experience
2-12 hrs.
Consumer Resources and Technology (CRT)

Coates, Chairperson; Professor Humbert; Associate Professors Dannison, Petersens, Steinhaus, Woloszyk; Assistant Professor Little.

Open To Upperclass and Graduate Students

CRT 500 Seminar in Distribution
3 hrs. Fall, Winter
An intensive study of problems related to distribution. This seminar is especially recommended for graduates in food and petroleum distribution.

CRT 522 Topics in Textiles/Apparel
1-3 hrs.
A study of the current issues impacting the textile/apparel industry. Students may elect up to 6 hours if topics vary. Topics to be announced. Prerequisite: CRT 220 or permission of instructor, and Junior Standing.

CRT 524 The Socio-Psychological Aspects of Clothing
3 hrs. Winter—Even Years
Study of dress and adornment as related to human behaviors. An interdisciplinary approach to clothing-related research and non-verbal communication, person perception, and group conformity.

CRT 565 Problems in Nutrition
3 hrs.
A discussion of current problems in nutrition. Not open to dietetics majors. Prerequisite: CRT 260 or equivalent.

CRT 590 Project/Problems in Consumer Resources and Technology
1-4 hrs. Fall, Winter, Spring, Summer
Directed independent project in specialized curricula within Consumer Resources and Technology. Prerequisite: Department approval.

CRT 598 Independent Study in Consumer Resources and Technology
1-6 hrs. Fall, Winter, Spring, Summer
Directed independent advanced study in subject matter area not otherwise treated in departmental courses. Department approval required prior to enrollment.

Open to Graduate Students Only

CRT 600 Clothing Techniques
2 hrs.
Meets the needs of the advanced student in clothing construction techniques.

CRT 602 Tailoring Techniques
2 hrs.
Specialized tailoring techniques in coats and suits. Problems in the use and performance of new textiles in clothing.

CRT 604 Studies in Textiles and Clothing
2 hrs.
An investigation of current literature and research within these fields as related to problems, design and/or technology. Can be repeated if topic is different to maximum of six hours.

CRT 610 Nutrition in the Life Cycle
2 hrs.
Concentrated study of nutritional needs throughout the life cycle. Emphasis on (1) maternal and child nutrition, (2) adolescent and young adult nutrition, and (3) aging and nutrition on a three-year rotation basis. Student can enroll for any stage or for each stage in subsequent semesters. Prerequisite: CRT 460 or 565.

CRT 614 Nutrient Metabolism I
2 hrs.
Study of the functions, requirements, and interrelationships in metabolism of energy, protein, carbohydrate, and lipids.

CRT 615 Nutrient Metabolism II
2 hrs.
Study of the functions, requirements, and interrelationships in metabolism of vitamins and minerals.

CRT 616 Consumer Education
2 hrs.
Marketing problems and consumer credit. Students work on individual problems which concern the buying of consumer goods.

CRT 618 Teaching of Specific Subjects in Consumer Resources and Technology
2-4 hrs.
Intensive study of teaching techniques unique to specialized subject matter offered in variety of curricula in consumer resources and technology.

CRT 622 Occupational Laboratory Experience
2-3 hrs.
A supervised experience program in a specific occupational area.

CRT 636 Teaching for Independent Living
4 hrs.
Provides a practical background and a basic understanding of skills and problems of the homebound and visually impaired.

CRT 648 Adult Education in Homemaking
2 hrs.
Influence of developmental needs of adults and changes in society affecting families in developing adult programs in homemaking education.

CRT 652 Family Life Education
3 hrs.
Current issues, trends, and methods in teaching family life education.

CRT 654 Housing
2 hrs.
Economic and social aspects of housing. Single, duplex, and multiple housing problems considered.
Counsels Education and Counseling Psychology (CECP)

Hovestad, Chairperson; Professors Belson, Betz, Carlson, Geisler, Trembly; Associate Professors Bullmer, Morns, Assistant Professors Bah, Hedstrom, See.

Open to Upperclass and Graduate Students
CECP 580 Principles of Counseling and Guidance 3 hrs.
The content of this introductory course focuses on the concepts underlying school guidance programs and related service delivery systems. Open to all students, but is not intended for counseling majors.

CECP 583 Workshops in Counselor Education and Counseling Psychology 1-4 hrs.
Workshops designed to enhance skill development related to Counselor Education and Counseling Psychology practices. Open to all students, but is not intended for counseling majors. May be repeated for credit.

Open to Counselor Education and Counseling Psychology Graduate Students Only (Graduate students from other programs may enroll by special permission.)
CECP 601 Research Methods 3 hrs.
The study of research designs and techniques utilized in the field of Counselor Education and Counseling Psychology. Students are expected to formulate and submit a research project in their area of specialization.

CECP 602 Group Dynamics and Procedures 3 hrs.
The study of group dynamics, i.e., the nature of groups and the laws affecting group development and process. An analysis of the various group procedures and the process associated with these procedures.

CECP 603 Tests and Measurement 3 hrs.
Designed to develop skills in analyzing, scoring, administering, and interpreting standardized tests. Students will examine selected aptitude, achievement, intelligence, personality and vocational instruments, as well as analyze their use in the student's area of specialization. Issues related to testing will be reviewed, including legal matters, ethical concerns, and use of tests with persons of varying social, economic, cultural, and ethnic backgrounds.

CECP 604 Counseling Techniques 3 hrs.
An introductory laboratory study of the concepts and skills required in interviewing and counseling. In addition to developing basic techniques and skills, special attention will be given to the impact of interview settings, interviewer/counselor attire, sex, ages of clients, and their social, economic, cultural, and ethnic backgrounds.

CECP 605 Professional Issues and Ethics 3 hrs.
Identification and discussion of issues in counseling, psychological services, and related programs will be the focus of this course. The study of ethical standards of relevant professional organizations. A presentation of case studies applicable to an understanding of current issues, multicultural concerns, legal decisions, and ethics in the field.
CECP 606 Basic Personality Processes
3 hrs.
Focuses on personality issues of particular importance to the student of counseling. Basic personality constructs and experimental investigations of personality dynamics will be surveyed, including stress and anxiety, coping and defense mechanisms, emotion, conflict and cognition. Various conceptualizations will be studied, including psycho-dynamic, interpersonal, phenomenological, cognitive and behavioral approaches.

CECP 610 Career Development: Theory and Practice
3 hrs.
Course content includes: (1) a study of the world of work as it impacts the psychological and sociological life of the individual; (2) an examination of career development theory, decision-making, and the application to counseling and psychotherapy; (3) the identification of informational resources related to career choice; and (4) an exploration of the needs and concerns of clients from a variety of cultural backgrounds.

CECP 611 Theories of Counseling
3 hrs.
The nature, rationale, development, research and use of theories in counseling are studied. Major points of view including the psychoanalytic, the cognitive, the behavioral the phenomenological, and the existential are studied and compared.

CECP 612 Counseling Practicum
4 hrs.
This course emphasizes practical work in the student's area of specialization. Counseling experiences are provided in a laboratory setting so that students can apply knowledge and skills acquired during previous studies. Each student, by participation and observation, will be expected to work with clients from differing social, economic, cultural, and ethnic backgrounds. Graded on a Credit/No Credit basis. Approved application required.

CECP 613 Field Practicum
2-6 hrs.
An on-site supervised field placement in a mental health, school, agency or university setting. Clock hours, semester hours of credit, nature of supervision and setting requirements are determined by program option. Graded on a Credit/No Credit basis. May be repeated.

CECP 621 Psychopathology: Classification and Treatment
3 hrs.
Basic concepts of history, current paradigms, and assessment of psychopathology with special emphasis on the APA diagnostic classification system and counseling/clinical approaches to treatment.

CECP 622 Psychoeducational Consultation
3 hrs.
A study of the process of consultation with emphasis upon methods, stages and strategies used with individuals, small groups and organizations. Consideration will be given to the consultant's role in psycho-educative education and primary prevention.

CECP 623 College Student Development
3 hrs.
Explores the nature and development of the post-secondary student pertaining to student personnel program administration. Theories of college student development, administrative strategies and techniques of program implementation are studied.

CECP 624 Program Evaluation in Student Affairs
2 hrs.
Methods and techniques appropriate for the student affairs administrator will be considered as they relate to: (1) assessment of student needs and (2) program evaluation.

CECP 625 Legal Issues in Student Personnel Services
2 hrs.
The law, as evidenced in constitutional provisions, legislative enactments, and court decisions, related to the administration of student personnel services will be major focus of the course. Institutional-governmental relations and issues of consumerism will be reviewed.

CECP 626 Administration of Student Personnel Services
3 hrs.
Emphasis will be upon administration/management aspects of student personnel services in post-secondary education. A general overview of administrative concerns will be provided. Primary focus of course content will relate to: (1) organizational models; (2) budgetary systems; (3) personnel practices; and (4) administrative tools and techniques.

CECP 627 Community Agency Counseling and Administration
3 hrs.
This course is designed to acquaint participants with a broad range of policies and procedures of administration and selected principles in program evaluation drawn from various organizational settings. The history, role and function of counselors and counseling psychologists will be analyzed. Evolving directions in the field of counselor education/counseling psychology will be considered.

CECP 629 Organization and Principles of Elementary School Guidance
3 hrs.
A thorough investigation of philosophical concepts and principles underlying counseling and pupil personnel programs in elementary schools. The history, organization, and administration of the program services are surveyed and practical application of concepts are required.

CECP 630 Organization and Principles of Secondary School Guidance
3 hrs.
Enables students to understand, apply, and formulate programs of guidance as they apply to secondary schools. In particular the history, philosophy, role, function, organization, administration, and preparation of guidance will be examined in depth so that the counselor in preparation will have the necessary skills to assume an entry level position in secondary education.

CECP 631 Seminar in Substance Abuse I
3 hrs.
An interdisciplinary seminar designed to reflect broadly conceived intervention strategies ranging from primary prevention to rehabilitation of the addict. The basic training in the principles of intervention and clinical practice will continue to be taught within the student's basic academic discipline. In part, the seminar will be used to elaborate upon the application of these principles to the problems of substance abuse. This course is cross-listed with Biology, Social Work, and Sociology. Graded on a Credit/No Credit basis.

CECP 632 Seminar in Substance Abuse II
3 hrs.
Continuation of CECP 631. This course is cross-listed with Biology, Social Work, and Sociology. Graded on a Credit/No Credit basis.

CECP 633 Student Affairs Services in Post-Secondary Education
4 hrs.
The introductory section of this course will include the history of post-secondary education in America. The second phase of the course content will focus on the student personnel services area: (1) historical perspectives; (2) philosophical foundation; (3) professional organizations; and (4) service delivery systems.

CECP 672 Use of Clinical Judgment in Assessment
3 hrs.
Clinical judgment in diagnosis and assessment is studied with the focus on sources of error that enter into the process of judging, diagnosing, and assessing. Opportunities for practicing the systematic use of behavioral observations and interviews are provided. Prerequisite: CECP 692 or permission of the instructor.

CECP 673 Marital and Sex Therapy
3 hrs.
The subject of human sexuality is examined from a variety of social, physiological, and cultural viewpoints. Various forms of sexual dysfunction are studied and examined for understanding of both physiological and psychological components and role of each in the dysfunction. Finally, there is in depth study of current approaches to therapy, as well as attention to other issues such as conjoint treatment of couples, resistance, sexual dysfunction in both partners, and sexual dysfunction and its relationship to marital discord. Prerequisite: CECP 692 or permission of instructor.

CECP 674 Psychological Development Theory
3 hrs.
The course examines psychological development from a number of perspectives including psychodynamic object-relations and social learning. The course is designed for counselors and counseling psychologists who wish to view their work in a developmental framework. Implications of developmental theory for counseling and psychotherapy are emphasized.

CECP 675 Counseling Theories and Practices
3 hrs.
This is an advanced course in counseling theory and practice. The course is concerned with theoretical aspects of the counseling relationship as well as the general practices of counseling. Prerequisites for the class include one formal exposure to counseling theory, supervised laboratory work, and experience in the field of counseling. The course is not designed to include practicum type experiences, but it is helpful if the participant is concurrently seeing clients on a paid or volunteer basis. Prerequisite: CECP 611 or 612 or equivalent.

CECP 686 Topical Seminars
1-4 hrs.
Seminars to study current topics relevant to counseling psychological services and related fields. For advanced graduate students with sufficient maturity and experience to engage in seminar-structured learning. Topics will be designated by professors offering the seminars. May be repeated for credit.

CECP 681 Supervision in Counseling and Psychotherapy
3 hrs.
The course is intended for practitioners and advanced graduate students who plan on assuming supervisory roles in counseling and psychotherapy. Attention will focus on models, techniques, roles and functions of supervision in a variety of organizational settings. Students will be expected to demonstrate supervisory style in the laboratory setting. Graded on a Credit/No Credit basis. Prerequisite: CECP 692, 693 or permission of the instructor.
CECP 692 Advanced Practicum in Counseling and Psychotherapy I 4 hrs.
An advanced practicum designed to increase the competency of experienced counselors and therapists. Staffing conference approach to the analysis of continuing cases presented by the participants will be combined with taped and live demonstrations of advanced techniques. In addition to four hours of group supervision sessions, students are also required to engage in counseling psychotherapy and individual supervision for six clock hours per week. Graded on a Credit/No Credit basis. Prerequisite: Permission of instructor.

CECP 712 Professional Field Experience 4 hrs.
A continuation of CECP 692. Graded on a Credit/No Credit basis. Prerequisite: CECP 692.

CECP 694 Vocational Development Theory 3 hrs.
An advanced course that involves the critical examination of existing theories of vocational development, the motivation to work and their application to the counseling therapeutic process. Research pertaining to vocational development and the world of work will be analyzed.

CECP 696 Practicum in Group Counseling 3 hrs.
Supervised practice in counseling with groups of varying types and ages. Staffing conferences of on-going groups will use audio and video tapes, content analysis, and other evaluative techniques. Prerequisite: Permission of instructor. Graded on a Credit/No Credit basis.

CECP 698 Readings in Counseling Education and Counseling Psychology 1-4 hrs.
Advanced students with good academic records may elect to pursue independently the study of a special topic. The topic chosen must be approved by the instructor involved and arrangements made with instructor's consent. May be selected more than once; total may not exceed four hours.

CECP 699 Dissertation Seminar 3 hrs.
Designed to orient students to the dissertation process. Students interested in beginning the dissertation process may take the course with the concurrence of their doctoral committee chairperson. Graded on a Credit/No Credit basis.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

CECP 710 Independent Research 2-6 hrs.

CECP 712 Professional Field Experience 2-12 hrs.

CECP 725 Doctoral Research Seminar 2-6 hrs.

CECP 730 Doctoral Dissertation 15 hrs.

CECP 732 Doctoral Clinical Internship 1-4 hrs.

CECP 735 Graduate Research 2-10 hrs.

Education and Professional Development (ED)


Open to Upperclass and Graduate Students

ED 500 In-Service Professional Development 1 hr.
This course develops specific professional skills related to current school responsibilities of teachers and other school personnel. May be repeated, but only three credit hours may be applied to graduate programs within the Department of Education and Professional Development. Topics included in a department program must be approved in advance by the program advisor. Graded on a Credit/No Credit basis.

ED 502 Curriculum Workshop 1-4 hrs.
Opportunity provided for teachers, supervisors, and administrators in selected school systems to develop programs of curriculum improvement. This may include short-term offers to resolve a particular curricular problem, as well as long-range curriculum studies. A wide variety of resources is used for instructional purposes, including several specialists, library and laboratory facilities, field trips, audiovisual materials, and the like. Each offering of 502 Curriculum Workshop will be given an appropriate subtitle, which will be listed on the student's official transcript. Students may earn up to three hours of credit for any given subtitle. No more than six hours of 502 may be applied toward a master's degree.

ED 504 Adult Development 3 hrs.
This course will provide an in-depth look at each age and stage in the life cycle. It will explore such problems as the changing role of parents and singles, the changing societal pressures on teachers, new adult life-styles, marital career changes, the changing roles of males and females, and unique health stresses. Emphasis will be placed on the identification of patterns of lifelong learning leading to a more fruitful and fulfilling life.

ED 505 The Adult Learner 3 hrs.
This course will provide an in-depth look at the learning adult from approximately age 22 to death with special emphasis on human variability, unique learning styles, and characteristics of the adult learner. Theories of adult learning, studies of intelligence and memory, learning capabilities, abilities, approach, and speed of learning will be considered. Motivation as prerequisite for high-level wellbeing and problem-solving will be studied.

ED 506 Teaching in Adult Education 3 hrs.
This course is designed to provide teachers with a knowledge of special situations incurred in the teaching of adults. Included also are techniques of interpersonal communication with adults, as well as a practical exercise in the designing of learning experiences for adults. Extensive use will be made of audiovisual media, experts in the field, and field observation in adult learning activities. The course should be helpful to administrators in planning inservice programs for their own staff.

ED 508 Seminar in Parent Education 1 hr.
Emphasis will be placed on cooperative problem-solving between parents and teachers of school-age children and youth. Problems considered will include such topics as grief and loss through death, divorce, or separation, special needs and contributions of multicultural parents; parents as resource persons and paraprofessionals in the schools; and problems identified by members of the seminar. Members of the seminar will report on the current literature available through libraries and community resources and work toward potential solutions of problems.

ED 509 Parent Education for Teachers of Young Children 3 hrs.
Presents a variety of techniques for teachers to use in working together with parents. Teachers will study child-rearing factors which parents most need to know. The course will help teachers develop their own record-keeping systems, ways of involving parents in their children's education, and ways of making meaningful reports to parents. The education of parents as aides is included.

ED 511 Developmental Reading Theory and Application 3 hrs.
Emphasizes the application of reading theory in the teaching of reading skills to special-needs students. Intensive study of the theory and practice of individualized reading, language-experience approaches, and basic reading materials will be made. Will focus on the actual use of materials with pupils to provide practical experiences in teaching on an individual and small-group basis. Efficiency of reading procedures will be studied through actual use with pupils. Prerequisite: ED 301 or 312 and permission of instructor.

ED 516 Professional Symposium in Reading 3 hrs.
This course is designed to be the initial course in the graduate program in reading. It is designed to present the basic concepts concerning the nature of the reading process and the teaching of reading. Emphasis will be placed on reading as a thinking process and on factors affecting reading performance. Special emphasis will be placed on child development; language development; concept development; physical, psychological, and environmental factors affecting the child's ability to read. In addition, the course will provide a brief overview of the delivery systems and procedures used in the U.S. to teach reading. This will involve an historical overview as well as current and potential future practices.

ED 517 Reading in the Content Areas 3 hrs.
Designed to acquaint elementary, middle school and high school teachers with reading strategies used in the process of reading to learn. Participants will consider the text factors which affect student learning, and develop and evaluate strategies and materials to enhance their students learning in specific content areas.

ED 521 Piaget and Young Children 3 hrs.
Examines significant contributions of Piaget to our understanding of young children's learning. Knowledge of how young children think will be applied to early childhood curriculum. Teachers will apply Piagetian tasks and be able to improve curriculum for young children with growing understanding of these children's minds.
ED 548 Audiovisual Media I
3 hrs.
An introduction to audiovisual media as effective means for achieving instructional and communication objectives using simple skills and equipment. Emphasizes evaluation, selection, production, and use of commercially available and locally produced instructional materials. Students are expected to participate in laboratory experiences in which they produce materials such as mounted and laminated pictures and displays, overhead projectors, audiotapes, and photographic prints and slides, and to demonstrate proficiency in the operation of audiovisual equipment. In addition to texts, each student should plan to spend $50 or more for supplies and have the use of a simple camera.

ED 549 Audiovisual Media II
3 hrs.
A parallel to ED 548 which emphasizes those simple media techniques which require more equipment or collaboration with one or more other people. Laboratory experiences may include production of a synchronized photographically recorded presentation, an edited audiotape, and a one-camera videotape presentation, design of printed handouts and brochures, computer graphics and design of a free-standing display. A systematic production planning process is emphasized, with consideration given to evaluating effectiveness of media. In addition to texts, each student should expect to spend $50 or more for supplies and should have the use of a versatile camera.

ED 550 Photography Workshop
1-3 hrs.
Intended to sharpen visual perception while improving technical skills, this laboratory course emphasizes photography as a creative and expressive medium of visual communication. Each student is expected to produce new photographs each week and to submit one or more mounted enlargements for group critique at each class meeting. Each student must have the use of appropriate equipment and should expect to spend $20 or more for supplies. Although no prerequisite is required, it is helpful to have had some experience with basic darkroom processes. May be repeated up to a total of six credits.

ED 597 Reading and Related Language Experiences
3 hrs.
A study of the current research in the many aspects of language which are involved in the process of effective reading.

ED 598 Selected Reading in Education
1-4 hrs.
Designed for highly qualified students who wish to study in depth some aspect of their field of specialization under a member of the departmental staff. Prerequisite: Written consent of departmental adviser and instructor.

Open to Graduate Students Only
ED 600 Fundamentals of Measurement and Evaluation in Education
3 hrs.
This course is designed to develop understandings and competencies in educational measurement and evaluation. Emphasis is placed on the application of research methods to evaluation, the interpretation of quantitative data in educational situations, and the application of basic evaluation models.

ED 601 Fundamentals of Educational Research
3 hrs.
This course is intended to develop an understanding of the major types of educational research and the interpretation of research results. Emphasis is placed on familiarity with sources of research, searching the research literature, and interpreting research reports. Each student is expected to design a valid research study.

ED 602 School Curriculum
3 hrs.
This course, designed for teachers and administrators at all levels, attempts to analyze the decision factors stemming from societal forces, psychological, cultural, and developmental needs and perceptions of learners, and internal structures of the disciplines as guidelines for a curriculum emerging from and serving a democratic society.

ED 603 Social and Philosophical Foundations
3 hrs.
A cultural approach to the development of American educational policy and practice in its broad social setting. Consideration is given to historical, economic, social, and philosophical factors which influence educational thought and practice. The need for historical perspective and sound analysis of conflicting points of view is emphasized in the interpretation of current educational issues and the alternative solutions of present educational problems.

ED 604 Psychological Foundations of Education
3 hrs.
An overview of the psychological forces that influence the learner in his/her educational setting with special emphasis on the nature and significance of human variability, development of self, measurement and evaluation, and a consideration and application of principles of learning in classroom situations.

ED 605 Teaching of Social Studies in the Elementary Schools
3 hrs.
This course is designed to help teachers understand and guide the learning of children in this field. Planning social studies experiences and ways of working with children in a classroom setting will be emphasized.

ED 606 Early Childhood Workshop: Learning and Curriculum
6 hrs.
This workshop promotes an understanding of how the young child learns; students will use these learning principles as bases for curriculum development. Students will construct materials and equipment and develop curriculum plans. Portions of the course can be designed to meet the individual needs of students. These will be taught by experts from appropriate fields within and outside of the University. Prerequisite: Admission to the master's program in Early Childhood Education.

ED 607 Research Methods in Early Childhood Education
3 hrs.
The purpose of this course is to acquaint the student with major types of research about young children, the steps involved in conducting such investigations, and the basic statistical concepts needed for understanding and designing research. Students will be required to present a research proposal.

ED 608 Seminar in Early Childhood Development
3 hrs.
The content of this seminar may vary each semester depending on the interests and needs of the students, but is invariably designed to provide an in-depth exploration of some facet of development in young children. Each student is expected to conduct a search of the literature on a specific topic. Topics may include child-rearing practices, sex-role identification, cognitive development, language acquisition, psychomotor development, and parent education.

ED 609 Early Childhood Education in Perspective
3 hrs.
A study of the history of the education of young children with emphasis on the philosophy, social settings, and people who have influenced the movement.

ED 610 Montessori Education
3 hrs.
This course is an introduction to the philosophy of Dr. Maria Montessori for teaching the child "for life" and its application to classroom practice. Students will become familiar with the life and work of Dr. Montessori and their influence on her philosophy of education. Students will study the techniques and the learning materials she developed and consider their universal applicability.

ED 611 Informal Approaches to Studying Young Children's Development
3 hrs.
The course helps teachers observe, evaluate, and guide young children's growth while developing their skill in informal observation techniques. Teachers will learn about their children from new perspectives, recognizing and meeting children's needs. Evaluation procedures will help account for children's psychological and social growth while creating classroom conditions to maximize this growth.

ED 612 Reading Techniques for the Elementary Classroom Teacher
3 hrs.
This course is designed to provide an in depth study of the nature of the methods and procedures used in teaching children to read. This course will provide opportunity for the production of original materials to be used in the classroom at the elementary level. Participation in classrooms will be required. Prerequisite: ED 516.

ED 613 Early Childhood Problems and the Teacher
3 hrs.
Deals with the concepts of discipline and questions of behavior. Teachers will acquire practical knowledge of research concerning children's social behavior and will review and apply systems for promoting prosocial behavior in their classrooms.

ED 615 Play and Young Children's Learning
3 hrs.
Students will develop understanding and appreciation of the nature of play in humankind, and of the relationship of play to humanity's artistic endeavor, invention, and problem-solving, and will look at play from historical and anthropological points of view. Emphasis will be placed on the stages of play in young children, and on the interactive relationship between play and young children's cognitive and affective development. Students will make practical application to their own curriculum for children.

ED 619 Clinical Studies in Reading
3 hrs.
This course is intended to provide the basic information needed in the examination of
persons with reading disorders. Interviewing techniques and examination procedures will be the basic content of the course. Emphasis will be placed on the physical, psychological, and sociological factors affecting reading performance. Students will be provided with a knowledge of both standardized and informal reading tests. Students will have the opportunity to construct, administer, score, and interpret both standardized and nonstandardized reading tests. Emphasis will be placed on producing a practical bibliography of measurement instruments and materials. Prerequisites: ED 312 or 322.

ED 620 Educational Therapy in Reading 3 hrs.
Laboratory application of knowledge gained concerning the psychological, sociological, and physiological factors affecting children's reading ability is stressed. The prevention, diagnosis, and treatment of reading problems is experienced through working with disabled readers. Students will become familiar with testing instruments, their use, administration, and interpretation. Students will also learn techniques of therapy and recognize those factors necessary for effective therapy. Prerequisites: ED 312 or 322 and 619.

ED 621 The Early Adolescent Learner 3 hrs.
Theoretical background and research related to the intellectual, emotional, perceptual, social, and personality development are presented and explored. Emphasis is placed upon problems teachers face with early adolescent learners and appropriate strategies for helping these students realize their potential.

ED 622 Middle School Curriculum 3 hrs.
This course examines the historical and philosophical foundations of middle level schools, effective organizational components, supporting research and current trends and issues affecting early adolescent schooling. An emphasis is placed upon how appropriate middle level schools strive to meet the developmental needs of young adolescents undergirds all topics. Prerequisite: ED 621.

ED 624 Middle School Methods and Materials 3 hrs.
This course presents instructional strategies designed to meet the developmental needs of young adolescents. It reflects the middle school philosophy by focusing on personal, social, and cognitive development. Students work in interdisciplinary teams on a group project. Other topics of concern to middle level educators are examined, including teaching responsibility, grading and evaluation, and whole brain learning. Prerequisites: ED 622 and 623.

ED 625 Reading in the Middle School 3 hrs.
The purpose of this course is to examine the methods and strategies for teaching reading at the middle/junior high school level. The primary focus will be on reading, comprehending and learning from texts. A secondary focus will be the examination of exemplary reading programs in the middle school.

ED 641 Instructional Development 3 hrs.
Intended for media specialists and experienced teachers, this course employs an accountability model for application of media research and teaching. Students will learn the major components of instruction. Students follow a systematic instructional development procedure from task analysis to evaluation, working together with their own students or as assistants and consultants to other professionals. Prerequisites: ED 548 or equivalent.

ED 642 Photographic Communication 3 hrs.
Explores uses of photography in the communication of ideas. Emphasis is placed on producing a practical bibliography of measurement instruments and materials. Prerequisite: ED 312 or 322.

ED 643 Practicum in Clinical Studies in Reading 3 hrs.
This course is intended to give students experience in employing both informal and formal standardized instruments and techniques necessary for the diagnosis and treatment of the disabled reader. The course emphasizes the use of various measurements pointing out their capabilities and limitations. Skills in interviewing, observing, diagnosing, planning treatment, and working with parents and school personnel are taught. Prerequisites: ED 619 and 620.

ED 646 Studies in Educational Technology 1-3 hrs.
Explores theory and innovative developments in educational technology and suggests practical, instructional applications. Such topics as the following may be considered: Design and Analysis of Individualized Instruction, Instructional Simulation and Gaming, Computer Applications in Instruction, and Diffusion and Adoption of Innovative Practices in Education. This course may be repeated for credit as different topics are offered. Prerequisite: ED 548 or equivalent experience.

ED 652 Language, Reading, and the Young Child 3 hrs.
The course focuses on language and the nature of the reading process and its development in a child from birth through the primary grades. Teachers will explore contemporary language and reading programs from this point of view. Deeper understanding of language-reading processes will enable teachers to arrive at more effective language development/reading programs for the children they teach.

ED 653 Practicum in Reading Therapy 3 hrs.
This course affords students the opportunity to build on competencies attained in ED 643. Reading therapy is offered on a one student to one clinician basis under the direction of a trained clinical therapist. The course serves as an instructional laboratory for working with pupils who have problems in reading and related areas. This course will provide graduate students practice in setting up prescriptive instructional objectives, selecting materials in terms of needs, and carefully designing instructional procedures for disabled readers. Prerequisites: ED 619, 620, 643.

ED 656 Organization and Administration of Reading Programs 3 hrs.
This course affords an opportunity for the individual to investigate the processes and procedures which may be employed in organizing and administering reading programs at the elementary and secondary levels. Emphasis is placed on the examination of existing programs and practices with a view toward improving reading education for all students. The course is intended to help students understand the development and management procedures of a reading program, kindergarten through adult basic education.

ED 670 School Climate and Discipline 3 hrs.
This course is designed for teachers and administrators who wish to develop a school or classroom climate which maximizes learning and minimizes discipline problems. Emphasizes new approaches to working successfully with problem students and classes.

ED 671 Structuring Classroom Dialogue 3 hrs.
This course is designed to assist the student in the development of his/her ability to conduct dialogue in a classroom as he/she prepares lessons, presents them to a small group of students, and is videotaped and critiqued with each presentation. Some ethnographic research methods are presented and applied during this course, specifically the use of fieldnotes, journals, and transcription as well as observation and self-observation methods. In addition, the course is designed to instruct the student about the ancient historical roots of dialogue, its transmission throughout the history of the western world, and the role that dialogue has played and continues to play in human interaction and learning. Students must be teaching or have access to a classroom for necessary application of course content.

ED 673 Education and Socialization 3 hrs.
This course centers on the systematic study of the socialization of students in schools. The course will focus on the role of the formal and hidden curricula, organizational structure, teachers and student peer groups in the process of socialization. It will also consider the impact of social class, race and gender on educational outcomes.

ED 675 Multicultural Education 3 hrs.
This course provides a foundation to examine the major ethnic groups that make up school populations in the U.S. Special attention will be given to the subject of prejudice with an analysis of how stereotypes about ethnic groups and women can be eliminated. The origins of racist theories will be studied. Strategies for resolving cross-cultural conflicts will be stressed.

ED 676 Teaching Thinking in the School 3 hrs.
This course investigates the issues involved in teaching thinking in classrooms. The focus is on the wide variety of current programs and materials and their underlying concepts. Students will learn to infuse or teach higher level thinking skills into the curriculum.

ED 677 Ethnography of Schooling 3 hrs.
This course is an in-depth exploration of the use of ethnography in the study of teaching and schooling. Participant observation, in-depth interviewing, and document analysis are the main data-gathering techniques studied. Students will design and execute a small-scale ethnographic study focused on an aspect of schooling. The course will be taught as a seminar where methodological issues, such as reliability and validity, will be discussed as they arise in the work of students. Ethnographic research on educational issues, with an emphasis on teaching, will be read concurrently.
ED 687 Improvement of Reading in Secondary Schools 3 hrs.
Designed to aid teachers in developing the reading abilities and skills of their students at the secondary level. Emphasis is placed on arms, materials, and procedures. Graduate students will become knowledgeable about the readability of textbooks and how to adjust work to range of ability. Opportunities for understanding and using standardized and informal instruments as measures of student progress will be afforded. Emphasis will be placed on the organization of course work for improving reading skills. Prerequisite: ED 312 or ED 322.

ED 693 Middle School Education Seminar 3 hrs.
This seminar serves as the capstone experience for the Teaching in the Middle School master’s program. It provides a forum for synthesizing and integrating the content of prior coursework, further examining current representation of middle level education issues. Students examine curricular issues with an emphasis on integrative approaches to organizing knowledge and then identify topics for study based on their professional interests and goals. These topics are explored along with a variety of middle level education issues and their policy implications. Students identify a culminating project and conduct a review of literature pertaining to the project. Projects are completed in ED 694.

ED 694 Middle School Project 3 hrs.
Students continue their investigation of middle level education issues identified in ED 693. The main focus of the course is the completion of the previously identified culminating project. Students work independently on their projects with periodic class sessions designed to discuss education issues and project progress. Students present their projects for critical review and analysis. Prerequisite: ED 693.

ED 695 Reading Seminar 3 hrs.
This course is designed to be the culminating course in each of the three streams in the master’s program in reading. Designed to provide opportunities for the teaching of reading skills and the integration of special topics in the field of reading. The purpose is to provide students with the opportunity to study topical current issues.

ED 697 Special Topics in Reading 1-3 hrs.
A variable credit course designed to provide a vehicle for the development and implementation of special topics in the field of reading. The purpose is to provide students with the opportunity to study topical current issues.

ED 698 Resolving Educational Problems in the Schools 1-6 hrs.
With variable topics and variable credit, this course is offered for in-service teachers, supervisors, and administrators who come together to solve school problems which they are encountering in the field. Problem-solving techniques, theoretical and evidential support for solutions, and workshops will be applied to actual school or classroom situations. The topic of the course will be stated in the Schedule of Classes each time the course is offered.

ED 699 Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

ED 700 Master’s Thesis 6 hrs.

ED 710 Independent Research 2-6 hrs.

ED 712 Professional Field Experience 2-12 hrs.

Educational Leadership (EDLD)

Advisors:

EDLD 600 Academy 1-4 hrs.
Topics of interest to professionals in the field of educational leadership are examined in academies offered by the Department. May be repeated. Total credits earned in academies applicable to degree programs not to exceed four hours. Graded on a Credit/No Credit basis.

EDLD 601 Workshop Seminar 1-4 hrs.
Specialized studies requiring integration of theory and practice with application of topics studied provided through site practices, e.g., personnel evaluation, use of personnel assessment techniques, evaluation of curriculum and instruction. May be repeated. Total credits not to exceed six hours.

EDLD 602 Educational Leadership 3 hrs.
Foundations and perspectives of leadership and career planning for leadership in educational programs and institutions.

EDLD 604 Contemporary Educational Scene 3 hrs.
Study and critical analysis of issues and trends influencing design, funding, and delivery of educational programs. Special emphasis on changes in societal expectations and values. Discussion of multicultural issues and needs of special populations and groups. Prerequisite: EDLD 602.

EDLD 608 Theories of Leadership 3 hrs.
Critical examination of principles of leadership theory construction, practice with and development of skills in evaluating contending theoretical perspectives regarding leadership. Prerequisite: Permission of adviser.

EDLD 620 Human Resource Development 3 hrs.
Examination of the function of human resource development (HRD) in organizations, with special emphasis on the role of the HRD practitioner. Includes critical analysis of elements and characteristics of successful HRD programs (e.g., staff development, in-service, training programs).

EDLD 621 Needs Assessment and Program Development 3 hrs.
Development of skills in identifying organizational needs related to training programs; design or development of a needs-based training program. Completion of EDLD 620 before enrollment in EDLD 621 is recommended.

EDLD 622 Training Skills Development 3 hrs.
Acquisition of skills for planning and delivery of instruction in training programs and presentations. Application and demonstration of skills required. Completion of ED 641, Instructional Development, before enrollment in EDLD 622 is recommended.

EDLD 623 Education and Training Project Management 3 hrs.
Examination of techniques for management of the costs, performance, and scheduling of education and training projects. Development of skills in planning and communicating project information.

EDLD 624 HRD Program Design and Evaluation 3 hrs.
This course provides conceptual, analytic, and design skills for persons whose professional role requires them to manage and design complex training and development programs in private and public organizations. Topics included are (1) an overview of the program design process in human resource development (HRD); (2) strategies for designing and managing HRD programs as change processes; (3) design of group learning experiences; (4) HRD program cost and cost/ effectiveness assessment, (5) strategies for follow-up support and evaluation of HRD programs. The course is intended for persons desiring to gain advanced HRD competencies; class activities include practice in design applications, critical analysis of popular HRD programs, lecture, and discussion of readings. Prerequisites: EDLD 620 and 621 or equivalent.

EDLD 629 Field Studies Seminar in Human Resource Development 3 hrs.
Application of principles and concepts acquired in other HRD courses to field settings. Participants are expected to demonstrate skills in consultation, project management, instructional design, and presentation. Regularly scheduled supervisory/ seminar sessions for feedback and analysis of performance. Prerequisite: Permission of adviser. Graded on a Credit/No Credit basis.

EDLD 640 Introduction to Research 3 hrs.
This course is designed to develop skills in the fundamentals of research design and the uses and interpretations of research findings. Each student is expected to prepare a review of literature and a design for a research study.

EDLD 641 Measurement Techniques in Education 3 hrs.
The criteria by which instruments are selected and developed serve as the central focus of this course. Information regarding the theory and practice of measurement and testing are applied to educational settings. Students are expected critically to evaluate instrumentation as well as develop a plan for the creation of an instrument. Prerequisite: EDLD 640.

EDLD 642 Program Evaluation 3 hrs.
Emphasis is on the theory of program evaluation, techniques used in program evaluation, and the standards of quality professional practice. Students are expected to apply the principles of evaluation to design problems. Prerequisite: EDLD 640.
EDLD 643 Personnel Evaluation
3 hrs.
Concepts and standards for design of personnel evaluation systems. Course requires design of a personnel evaluation system and an evaluation of the personnel evaluation system. Prerequisite: Permission of adviser.

EDLD 645 Research Design and Data Analysis I
3 hrs.
The study of the principles of research design and data analysis is pursued at both the conceptual and applied levels. Emphasis is on the development of the conceptual skills of design analysis and interpretation. Techniques of statistical analysis include the use of computer programs for data analysis. Prerequisite: EDLD 640.

EDLD 646 Research Design and Data Analysis II
3 hrs.
A continuation of the study of the principles of research design and data analysis techniques. Advanced skills in design and analysis are developed in addition to an examination of design issues in educational settings. Skills in the use of computer programs for data analysis are required. Prerequisite: EDLD 645.

EDLD 647 Survey Research Design and Analysis
3 hrs.
The principles and practices of survey research design and analysis are the focus of this course. Critical examination is made of the appropriate uses of survey research in response to educational issues. Students are expected to develop instrumentations used in survey research, to engage in the design of a survey research study in a field setting, and to critique survey studies and findings. Prerequisites: EDLD 640 and 645.

EDLD 648 Techniques of Naturalistic Inquiry
3 hrs.
A study of the philosophical and methodological foundations of naturalistic research in education. Students will develop skills in planning and conducting naturalistic studies in education. Standards for judging naturalistic inquiry will be studied and applied to selected naturalistic study reports. Prerequisite: EDLD 640.

EDLD 651 Advanced Applications of Measurement Methods
3 hrs.
Intensive study of applications of educational measurement theory and methodology to specific needs for instrumentation in education. Students will engage in development, validation, and application of new instruments for collecting educationally important data. Prerequisites: EDLD 646.

EDLD 652 Evaluation Practicum
1-6 hrs.
Planned field applications of principles of program evaluation. Approved application and permission of instructor required. May be repeated for credit to a maximum of six hours. Graded on a Credit/No Credit basis.

EDLD 655 Research Methodology Seminar
3 hrs.
A seminar for students seeking advanced theoretical understanding and skill development in educational research methodologies. New methodologies and current research dilemmas are the central focus of the seminar. Prerequisites: EDLD 646 and permission of adviser.

EDLD 656 Theories of Measurement Seminar
3 hrs.
A seminar for students seeking advanced theoretical understanding of the principles of measurement. Theories of instrument construction are presented, including classical test theory, item response theory, and generalizability theory. Application of statistical techniques to educational measurement theory is made. Prerequisites: EDLD 651.

EDLD 657 Evaluation Seminar
3 hrs.
An advanced seminar for the study of the principles and practical problems in the evaluation of educational programs and related research. Emphasis is on the development of the conceptual skills of design analysis and interpretation. Techniques of statistical analysis include the use of computer programs for data analysis. Prerequisite: EDLD 642.

EDLD 660 The Principalship
3 hrs.
Survey of tasks and functions of school administration and decision-making through use of simulations, case studies, and analytical exercises. Development of knowledge and skill related to tasks and functions of school building administration. Prerequisite: EDLD 602.

EDLD 661 School Law
3 hrs.
Study of federal and state constitutions, legislation, regulatory guidelines, and court decisions as related to operation of educational institutions and organizations. Development of awareness and knowledge of legal parameters related to education. Completion of EDLD 602 before enrollment in EDLD 661 is recommended.

EDLD 662 School Business Management
3 hrs.
Development of knowledge and skill in management of business operations in schools: budget planning, budget management, standardization, accounting, inventorying of equipment and supplies, use of standard budget forms, preparation of required reports. Prerequisite: EDLD 602.

EDLD 663 Personnel Administration
3 hrs.
Systematic study of personnel administration tasks and functions as applied to education and training. Subtopics include recruitment, selection, orientation, supervision, appraisal, and development of personnel. Emphasis placed on understanding of standards for legal and valid personnel administration practices. Effects of style and behaviors on employee satisfaction and/or productivity are studied. Prerequisites: EDLD 602 and 640.

EDLD 664 Curriculum Development
3 hrs.
Principles of curriculum design; study of value premises, practices, and skills necessary for organization and administration of the scope and sequence of curricular offerings in educational institutions. Study of the process of curriculum implementation and of forces which influence curriculum development. Prerequisites: EDLD 602 and 640.

EDLD 667 School Finance
3 hrs.
Intensive instruction and discussion of political and economic value premises involved in the funding and financing of schools. Critical examination of alternative models for design of public funding formula and practices for funding public schools. Consideration of patterns of fiscal resource development other than public funds as a means of financing public or private education. Completion of EDLD 662 before enrollment in EDLD 667 is recommended. Prerequisites: EDLD 602 and 640.

EDLD 673 Supervision
3 hrs.
Principles and practices of supervision of personnel are studied. Special attention is given to differing perspectives on the supervision function within organizational contexts. Prerequisites: EDLD 602 and 640.

EDLD 674 School Community Relations
3 hrs.
Thorough study of the school in interaction with communities served by the school. Consideration of internal and external "communities" and the relationships between and among the "communities" of the school as an organization. Role of communications in school-community relations; consideration of the balance of rights and responsibilities between schools and communities. Prerequisite: EDLD 602.

EDLD 680 The Superintendancy
3 hrs.
Examination of the line and staff roles involved in the "superintendancy" with emphasis on the role of the superintendent of schools as the chief executive officer in school and school-related organizations. Prerequisites: Master of Arts in Educational Leadership or equivalent and permission of adviser.

EDLD 681 Policy Development
3 hrs.
The content of this course includes examination of policy issues, purposes, functions, methods, and approaches for policy development. Critical review of development of policies for educational institutions. Prerequisites: Master of Arts in Educational Leadership or equivalent and permission of adviser.

EDLD 682 Computer Applications in Administration
3 hrs.
Study, design, and application of computer technologies in performance of administrative functions and tasks in educational organizations. Prerequisite: Permission of adviser.

EDLD 685 School Facilities Planning
3 hrs.
This course will provide a study in evaluation, design, and planning of the present and future facilities and equipment requirements for the school organization. Attention will be given to the educational program and stated philosophy of schools and to the present and future needs of the student and the learning environment respective to facilities development. Integration of technology in the planning and design of facilities will be addressed as well as the human physiological and psychological needs. Current state and Federal regulations will be reviewed as they relate to new facilities and to remodeling of current facilities. Prerequisites: EDLD 602 and 640.

EDLD 690 Professional Development Seminar
3 hrs.
Field-based and performance-based application of knowledge to major function/task areas of leadership in organizations with emphasis on schools as organizations. Emphasis on career planning and placement for persons enrolled. May be repeated. Total credits not to exceed six hours. Prerequisite: EDLD 602 or permission of instructor.

EDLD 695 Dissertation Seminar
3 hrs.
This seminar is designed for the doctoral student who has identified the topic for his/her dissertation research and will focus on the production and evaluation of proposals for the doctoral dissertation. Graded on a Credit/No Credit basis. Prerequisite: Approval of adviser.

EDLD 698 Readings in Educational Leadership
1-4 hrs.
Directed individual study of topics or bodies of knowledge not otherwise treated in department courses. A maximum of four hours earned in EDLD 698 is applicable on degree programs. Prerequisite: Permission of adviser.
Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

EDLD 700 Master’s Thesis 6 hrs.
EDLD 710 Independent Research 2-6 hrs.
EDLD 712 Professional Field Experience 2-12 hrs.
EDLD 720 Specialist Project 6 hrs.
EDLD 725 Doctoral Research Seminar 2-6 hrs.
EDLD 730 Doctoral Dissertation 15 hrs.
EDLD 735 Graduate Research 2-10 hrs.

Health, Physical Education, and Recreation (PEGR)

Zabik, Chairperson; Professors Cheatum, Ray; Associate Professors Dawson, Meyer; Assistant Professors Berkey, Cool, Gross, Holmes, Moss, Powell, Schreiber.

In depth study of selected topics in HPER. Format can include clinics, workshops, seminars, travel and/or mini-courses, and provide opportunity to acquire skills and teaching techniques. State, national, and international authorities or consultants may be involved. Topics include: Aesthetics of Sport; Nutrition and Fitness; Outdoor Education; Physical Fitness; Relaxation; Special Physical Education Activities; Therapeutic Recreation

Open to Upperclass and Graduate Students

PEGR 510 Modern Health for Teachers and Health Professionals 3 hrs.
The course, designed for teachers and health professionals who have need of current knowledge in health science, surveys topics such as mental health, nutrition, substance abuse, physical fitness, chronic diseases, and stress management. Consideration is given to psychological, sociological, and cultural factors that influence health improvement. Attention is given to special factors of health and illness of children and adolescents. This course is not open to Health Education majors and minors.

This course surveys the history, philosophy, and methods of health education. The philosophical basis and practices of health education are discussed in terms of needs and capacities of people and factors that influence their development and actualization. Emphasis is placed upon the promotion of health and prevention of disease, disability, and premature death. Curriculum development and teaching methods focus on content and strategies considered most effective in teaching disease prevention, health promotion, and self-actualization.

PEGR 514 Methods and Materials in Health Education 2 hrs.
Lectures and demonstrations with emphasis on effective health supervision of school children, principles and practices of health teaching in the various grades, and interrelation of this teaching with that of other subjects in the curriculum. Prerequisites: PEGR 314 and 315, or consent of instructor.

PEGR 516 Issues in Health Education 1-4 hrs.
Issues vary or occasionally repeat depending on the timeliness of the issue. Following are currently recommended themes. Students may register for 516 more than once but may not repeat the same issue. Issues include: Improving Health Behavior; Alcohol and Drug Education; Sexually Transmitted Diseases; Consumer Health; Cardiovascular Health; Stress Management; Bio Feedback; Patient Education; Health Careers; Parent Education; Wellness and Lifestyle; Safety and Health in the Industrial Setting

PEGR 520 Physical Activities for Exceptional Children 3 hrs.
Physical and recreational activities and games used in corrective, adaptive, and general physical education programs for special education children.

PEGR 521 Therapeutic Trends for Exceptional Children 3 hrs.
A study of past, present, and future trends in habilitation and rehabilitation programs for handicapped people.

PEGR 530 Practicum in Teaching and Coaching 1-2 hrs.
Demonstrations, participation, and evaluation on teaching and coaching fundamentals in selected sports. A graduate student may apply a maximum of four credits from 530 courses toward the master's degree program. Sports include: Archery; Badminton; Basketball; Football; Golf; Gymnastics; Ice Hockey; Judo; Karate; Soccer; Swimming; Track and Field; Volleyball; Wrestling; Yoga

PEGR 535 Principles and Problems of Coaching 2 hrs.
Various dimensions and forces affecting coaching are identified and explored, including educational implications of sport and coaching, characteristics of coaches and athletes, vital relationships, motivation, emotions, behavior, discipline, selecting and evaluating personnel, scientific principles and systems of training, the organization and planning of practices and total programs.

PEGR 540 Movement Education 2 hrs.
A concept in physical education which deals with the way children learn the basic principles of how their bodies move.

PEGR 545 Advanced Studies in Physical Education 2 hrs.
For administrative officers, as well as for teachers and directors of physical education. Includes a study of representative programs of physical education and a discussion of standards for evaluating such programs. Case studies examined.

PEGR 560 Administration of Physical Education 2 hrs.
Discusses administrative procedures and problems connected with athletic programs, including scheduling, facilities, personnel problems, school law and liability, eligibility, finance, safety, and the conduct of athletic events.

PEGR 572 Recreation for the Aging 2 hrs.
An overview of aging, especially as it relates to leisure pursuits and organized recreation.

PEGR 580 Studies in Athletic Training 1-2 hrs.
Listed with various topics. A lecture/demonstration course concerned with the prevention, diagnosis, and treatment of sports type injuries. Prerequisites: BMED 211, 240, PEPR 380.

PEGR 590 Exercise Physiology 2 hrs.
The mechanics of muscular contraction, nerve impulse conduction, oxygen exchange, and circulatory efficiency are discussed. Basic principles concerning the adaptation of the human body to stress in the form of strenuous physical exercise are applied to the training and conditioning of competitive athletes. Prerequisites: BMED 210, 240.

Accredits students with the theory, selection, construction, administration, interpretation of appropriate tests in the field. Class activity will include study and discussion of selected tests, application, scoring, interpretation, and construction of tests.

PEGR 595 Analysis of Movement in Sport 2 hrs.
The study of movement of muscles and the application of kinesiology to physical activity.

PEGR 596 Reading in Health, Physical Education, and Recreation 1-2 hrs.
Advanced students with good academic records may elect to pursue independently a program of readings in areas of special interest. Prerequisite: Approval of graduate director in Physical Education.

Open to Graduate Students Only

PEGR 630 Advanced Coaching 1-2 hrs.
Advanced theories of conditioning, training, practice organization, scouting, game and tournament planning, skill analysis and correction, defensive and offensive strategies, safety procedures, purchasing and care of equipment, public relations, and promotion specific to each sport. A graduate student may apply a maximum of eight hours credit from PEGR 530 and 630 combined toward the master’s degree program.

PEGR 641 Physical Education for Preschool, Elementary, and Middle School 2 hrs.
A study of the development needs of the child in terms of physical activity; the role of physical education in childhood education; the responsibility of the classroom teacher in this
Completion of 580 series or consent of instructor. Topics include:

- Sports Medicine: Applied Anatomy and Physiology
- Sports Trauma Assessment and Management
- Sports Trauma Modalities (2 hrs.)
- Administration of an Athletic Training Program
- Emergency Procedures and Orientation

PEGR 683 Sports Trauma Rehabilitation 2 hrs.
This course will offer comprehensive material regarding rehabilitation techniques for sports trauma. An historical, and perspective, including the most up-to-date techniques will be presented along with hands on experience. The scientific basis for the techniques will provide the main focus of the course.

PEGR 690 Research Procedures in Health, Physical Education, and Recreation 2 hrs.
Research procedures in health, physical education, and recreation; introduces principles of scientific inquiry, research methods applicable to these fields, evaluation of published research, and procedures for developing a research design.

PEGR 691 Psychological Foundations in HPERS 2 hrs.
An overview of the application of psychology to physical education and sport with special emphasis on transcendent experiences in sports and the consciousness of sports.

PEGR 692 Analytical Techniques in HPER 2 hrs.
An introduction to analytical methods of handling data in HPER. Prerequisite: PEGR 690.

PEGR 698 Advanced Studies in Exercise Science 2 hrs.
A series of advanced seminars dealing with specific topics in exercise science. Emphasis will be placed on in depth study of theories, problems, and issues with appropriate lectures and experiences leading toward the development of a research project or a master's thesis.

Open For Graduate Students Only—Please refer to The Graduate College section for course descriptions. (Prerequisite: Approval of graduate director in Physical Education.)

PEGR 700 Master's Thesis 6 hrs.

PEGR 710 Independent Research 2-6 hrs.

PEGR 712 Professional Field Experience 2-12 hrs.

Special Education (SPED)

Hannaford, Chairperson; Professors Nicolau, Patterson, Sellin; Associate Professors Harris, Icabone; Assistant Professors Bahr.

Open to Upperclass and Graduate Students

SPED 512 In-Service Professional Development 1-4 hrs.
This course is designed for teachers, counselors, psychologists, social workers, and others interested in studying selected aspects of special education at appropriate locations, such as state hospitals and special schools. A variety of instructional experiences is provided, including conferences. Credit for this course is not applicable toward a graduate degree in Special Education.

SPED 514 Introduction to Learning Disabilities 2 hrs.
This course focuses on basic knowledge in the area of learning disabilities. Historical perspectives, definitions, and major issues will be explored. Service delivery systems and evaluation procedures will be examined and evaluated. Prerequisite: Consent of department.

SPED 527 Exceptional Learners in Regular Elementary Programs 3 hrs.
This course is designed for prospective elementary teachers. Emphasis is placed on the types of exceptional learners found in elementary programs. Required adaptations and modifications, and available resources and services for these learners are stressed. Prerequisites: Consent of the department. Not acceptable for Special Education majors or for an Endorsement Program in Special Education.

SPED 529 Exceptional Learners in Regular Secondary Programs 3 hrs.
This course is designed for prospective secondary teachers. Emphasis is placed on the types of exceptional learners found in secondary programs. Required adaptations and modifications, and available resources and services for these learners are stressed. Prerequisites: Consent of the department. Not acceptable for Special Education majors or for an Endorsement Program in Special Education.

SPED 530 Education of Exceptional Persons 3 hrs.
This course deals primarily with the problems of individuals who are atypical in terms of their sensory, physical, mental, emotional, and learning characteristics. Emphasis is placed on developing an understanding of the psychological, sociological, multi-cultural, philosophical, legal, and educational aspects of each type of exceptionality, including education in the least Restrictive Environment. Prerequisite: Consent of department.

SPED 531 Classroom Practicum in Special Education 1 hr.
This course will provide the student with an opportunity to work within a classroom setting with a particular disability—EI, MI, POMI, VI—at the elementary or secondary level. It is intended to provide the student with an awareness of the nature and needs of these handicapped students and the role of the teacher in working with such students. Graded on a Credit/No Credit basis. Prerequisites: Consent of the department and concurrent enrollment in SPED 530.

SPED 533 Assessment and Prescription in Special Education 3 hrs.
The major focus of this course is the Clinical Teaching Model. Emphasis is placed on the relevance of assessment and prescription to the teaching of handicapped learners. Prerequisite: Consent of department.

SPED 534 Curriculum and Instruction in Special Education: Elementary 3 hrs.
The major focus of this course is the application of the Clinical Teaching Model to the education of mildly and moderately handicapped elementary and preadolescent students. Additional topics include: service delivery systems, roles of teachers and ancillary personnel, legal requirements, relevant issues confronting the field of elementary special education. The course is a continuation
of SPED 533 with focus on the elementary level. Prerequisite: Consent of department.

**SPED 535 Adapting Teaching Strategies for Exceptional Persons**

3 hrs.

This course consists of a combination of classroom and field-based experiences designed to integrate the philosophy and techniques of inquiry teaching into the Clinical Teaching Model. Students will be provided content and resources in science and mathematics for use with handicapped learners. Prerequisite: Consent of department.

**SPED 536 Curriculum and Instruction in Special Education: Secondary 3 hrs.**

The major focus of this course is the application of the Clinical Teaching Model to the education of mildly and moderately handicapped adolescents and young adults. Topics include understanding of handicapped adolescents and young adults; educational, curricular and instructional approaches, and interventions; and transition programming. Prerequisite: Consent of department.

**SPED 537 Technology in Special Education 3 hrs.**

This course is designed to provide specific information, exposure, and experience related to a variety of ways that current and emerging technologies may be used to improve the education of lives of handicapped learners. Prerequisite: Consent of department.

**SPED 538 Introduction to Classroom Management 3 hrs.**

This course deals with methods of managing classroom behavior and dealing with specific behavior problems. Classroom management strategies will be discussed and related to the establishment of a positive classroom climate. Diagnostic and prescriptive techniques will be applied to problems of aggression, conduct, withdrawal, hyperactivity, distractibility, and impulsivity. Prerequisite: Consent of department.

**SPED 539 Consultation and Communication in Special Education 3 hrs.**

This course will provide an introduction to consultation and communication skills needed by special educators as they work with other professionals and parents. Prerequisite: Consent of department.

**SPED 540 Introduction to Mental Retardation 2 hrs.**

This course provides an introduction to the field of mental retardation. Emphasis is placed on the interpretation of mental retardation in home, school, and community settings. Although primarily intended for those preparing to become teachers of the mentally retarded, it is also recommended for counselors, psychologists, social workers, and other allied professionals. Prerequisite: Consent of department.

**SPED 541 Program Practicum in Special Education: MR 1 hr.**

This course will provide the student with guided observations of school and community agencies serving the retarded. This course is intended to provide the student with an awareness of a continuum of special education placements and the role of non-school agencies serving retarded persons and their families. Prerequisite: Consent of department and concurrent enrollment in SPED 540.

**SPED 542 Introduction to the Severely Impaired 3 hrs.**

This course is designed to provide basic knowledge about severely impaired persons. The problems of severe impairments are examined in light of biomedical, legal, sociological, and educational perspectives. Special emphasis within the perspective of education includes information regarding management, assessment, instruction, and organization. Prerequisite: Consent of department.

**SPED 544 Educating the Severely Impaired 3 hrs.**

This course develops specific skills in the assessment, prescription, implementation, and evaluation of educational programs for the severely impaired. Course content focuses upon the areas of mobility, communication, sensorimotor development, self-help skills, cognition, and adaptive behavior. Prerequisite: Consent of department.

**SPED 545 Education of Moderately and Severely Retarded Persons 2 hrs.**

This course follows SPED 540 and focuses on understanding the ways in which teachers can organize curriculum and implement assessment and instruction to ensure maximum learning for students with mental retardation. Prerequisite: Consent of department.

**SPED 546 Teaching Practicum in Special Education: MR 1 hr.**

This course will provide the student with a structured assignment working with a retarded pupil. It is intended to enable the student to demonstrate skills in assessment and prescription, and to observe the implementation and evaluation of a tutorial plan of instruction for a severely retarded pupil. Prerequisite: Consent of department and concurrent enrollment in SPED 545.

**SPED 550 Introduction to the Orthopedically and Otherwise Health Impaired 2 hrs.**

This course provides an introduction to the field of the orthopedically and otherwise health impaired. Topics include the medical conditions leading to orthopedic impairment, and the educational, therapeutic, psycho-social, and vocational implications of these impairments. Prerequisite: Consent of department.

**SPED 551 Program Practicum in Special Education: POHI 1 hr.**

This course will provide the student with guided observations of school and community agencies serving the POHI population. This course is intended to provide the student with an awareness of a continuum of special education placements and the role of non-school agencies serving POHI individuals and their families. Prerequisite: Consent of department and concurrent enrollment in SPED 550.

**SPED 555 Education of Physically and Multiply Handicapped 2 hrs.**

This course focuses on the educational needs of physically and multiply disabled students and the implementation of educational programs through curriculum development and instructional adaptations. Special attention will be given to communication needs, self-care needs, and the life management needs of these students. In addition recreational and vocational programs will be explored. Prerequisite: Consent of department.

**SPED 556 Teaching Practicum in Special Education: POHI 1 hr.**

This course will provide the student with a structured assignment working with a physically and/or multiply impaired pupil. It is intended to enable the student to demonstrate skills in assessment and prescription and in the implementation and evaluation of a tutorial plan of instruction for a specific physically and/or multiply impaired pupil. Prerequisite: Consent of department and concurrent enrollment in SPED 555.

**SPED 570 Introduction to the Emotionally Disturbed 2 hrs.**

This course is intended to provide a basic foundation for understanding the condition of emotional impairment and appropriate educational and management provisions. Prerequisite: Consent of department.

**SPED 571 Program Practicum in Special Education: EI 1 hr.**

This course will provide the student with guided observations of school and community agencies serving the emotionally disturbed population. The course is intended to provide the student with an awareness of a continuum of special education placements and the role of non-school agencies serving emotionally disturbed persons and their families. Prerequisite: Consent of department and concurrent enrollment in SPED 570.

**SPED 575 Education of Emotionally Disturbed Persons 2 hrs.**

This course is to be taken following SPED 570 and focuses on understanding curriculum organization and the application of the Clinical Teaching model to instruction in order to assure maximal learning by students with emotional impairment. Prerequisite: Consent of department.

**SPED 576 Teaching Practicum in Special Education: EI 1 hr.**

This course will provide the student with a structured assignment working with an emotionally disturbed pupil. It is intended to enable the student to demonstrate skills in assessment and prescription, and in the implementation and evaluation of a tutorial plan of instruction for a specific emotionally impaired pupil. Prerequisite: Consent of department and concurrent enrollment in SPED 575.

**SPED 598 Readings in Special Education 1-4 hrs.**

This course is designed for advanced students interested in independent study. Topics chosen must be approved by the instructor and chair of the department. The course may be repeated for credit. Prerequisite: Consent of department.

**Open to Graduate Students Only**

**SPED 620 Advanced Assessment of the Exceptional Learner 2 hrs.**

This course is designed to provide graduate students in special education with advanced assessment techniques appropriate for mildly and moderately handicapped learners. Major emphases are the interpretation of norm-referenced and criterion-referenced tests. Topics such as non-discriminatory testing, multi-cultural considerations and selection of instruments will be discussed. Prerequisite: Consent of department.

**SPED 621 Curriculum Development for Exceptional Learners 2 hrs.**

This course is designed to provide experienced special education personnel with knowledge and skills in the conceptualization, construction, adaptation, and evaluation of curricula for handicapped learners in both self-contained and resource-type programs. Legal, social, cultural, financial, and theoretical forces that
impact on curricula will be discussed. Prerequisite: Consent of department.

SPED 622 Development and Assessment of Preprimary Exceptional Children 4 hrs.

This course is designed to provide teachers with an in-depth understanding of normal and abnormal developmental patterns of preprimary children (birth to 5 years of age) as related to mental subnormality, neurologic dysfunction, communication disorders, physical and sensory impairments, and emotional disturbance. Emphasis will be placed on developmental assessment and the collecting and reporting of diagnostic information. Prerequisite: Consent of department.

SPED 623 Curriculum and Methods for Preprimary Exceptional Children 4 hrs.

This course is designed to provide teachers with skills in translating diagnostic information into a meaningful educational plan for children from birth to 5 years of age. Emphasis will be placed on situation-specific teaching roles as well as curricular and methodologic strategies in preprimary special education. Prerequisite: Consent of department.

SPED 630 Clinical Practice in Special Education 3 hrs.

This course serves as a culminating, practical experience within the Master Clinical Teacher program. Students will apply the Clinical Teaching Model in practical situations with exceptional learners. In addition, students will demonstrate supervisory and interdisciplinary communication skills associated with a consultant role. This course is offered on a Credit/No Credit basis. Prerequisite: Consent of department.

SPED 633 Education of Gifted and Talented Children and Youth 2 hrs.

This course is designed for regular classroom teachers, administrators and other personnel. The characteristics of gifted and talented learners will be discussed. Personal, social, and multi-cultural factors which directly or indirectly influence the growth and development of these individuals will be considered. Attention will be given to methods and criteria used in identifying and programming for gifted, talented, and creative individuals. Prerequisite: Consent of department.

SPED 634 Advanced Theory and Practice in Learning Disabilities 2 hrs.

This course will examine several theoretical perspectives which attempt to explain why learning disabled children fail to learn. Under each perspective, selected theorists will be studied in terms of their specific theory and its application to the Clinical Teaching Model. Emphasis will be placed upon the treatment validity of the remediation methodology derived from each theory. Prerequisite: Consent of department.

SPED 635 Counseling Parents of Exceptional Children and Youth 3 hrs.

This course explores the dynamics of parents’ reactions to their exceptional children and youth. Techniques for helping parents deal with stressful situations in the home, school, and community are developed. Prerequisite: Consent of department.

SPED 636 Topical Seminar in Special Education 2 hrs.

This course is designed to provide a survey or in depth coverage of topics directly related to the education of exceptional children and youth. The course may be repeated for credit. Prerequisite: Consent of department.

SPED 637 Research and Evaluation Techniques in Special Education 4 hrs.

This course is designed to provide students with skills and knowledge of research and evaluation in the following areas: the role of research and evaluation in special education, the use of the scientific approach, research and evaluation designs, observation and measurement, statistical analysis, interpretation of research and evaluation reports, and research writing. Prerequisite: Consent of department.

SPED 638 The Application of Behavior Theory to Classroom Teaching 3 hrs.

This course examines the principles of behavior theory as related to academic and non-academic behaviors of exceptional children. General and specific methods for generating, strengthening, and maintaining desirable behavior, and methods for weakening undesirable behavior are presented. Prerequisite: Consent of department.

SPED 640 Organization and Administration of Special Classes and Services for the Handicapped Persons 2 hrs.

This course examines the principles and practices of organization and administration of special education programs at the state, intermediate and local levels. Prerequisite: Consent of department.

SPED 641 Supervision of Special Education Programs and Services 3 hrs.

This course is designed to provide the experienced special educator with specific knowledge and skills necessary for supervising personnel who are providing direct services to exceptional learners. Emphasis will be given to those procedures utilized in selecting personnel, identifying resources for program development and support, facilitating change in teacher behavior, and evaluating the effectiveness of program operations and personnel. Prerequisite: Consent of the department.

SPED 642 Developing Techniques for In-Service Training in Special Education 2 hrs.

This course is designed to inform students of the issues and problems involved in developing in-service education and to provide students an opportunity to design and present in-service programs for critique. Determining the needs of a given target population and an examination of delivery systems currently in use will be emphasized. Prerequisite: Consent of department.

SPED 643 Legal and Financial Aspects of Special Education 3 hrs.

The current legislative and financial bases for special education (national, state, and local levels) will be examined in relation to the development and modification of special education programs. The basic concept of budgeting of resources and expenditures will be discussed. Prerequisite: Consent of department.

SPED 650 Seminar on Special Education in Higher Education 3 hrs.

This course examines the structure of higher education and the roles a faculty member plays within a department, college, and a university (e.g., teaching competence, professional recognition, and service). In addition, current issues in higher education and teacher education will be examined. Prerequisite: Consent of department.

SPED 656 Advanced Educational Foundations of Special Education 3 hrs.

This course is provided for students who have acquired extensive professional preparation and broad experience in the education of exceptional persons. An in depth knowledge of etiologies and characteristics of exceptionalities will be developed. Attention will be given to historical, social, cultural, economic, and psychological factors which have influenced or may influence the roles, functions, and structure of public schools, institutions, and agencies, and the programs and services provided for exceptional learners. Prerequisite: Consent of department.

SPED 659 Application of Learning Theories to Educational Programming for Exceptional Learners 2 hrs.

This course will offer an overview of theories of learning as they apply to exceptional learners. An in depth analysis of selected theories will be conducted in order to compare and contrast the relationships of each to the development of long-term goals for handicapped learners. Prerequisite: Consent of department.

SPED 661 Consultation Skills for Special Education Personnel 2 hrs.

This course is designed to provide the student with those knowledge and skills related to the consultative role of the special educator. Emphasis will be on models of teacher consultation and the development of those interpersonal skills related to the consultative role. Prerequisite: Consent of department.

SPED 674 Directed Teaching in Special Education 3-6 hrs.

This course is a requisite for graduate students who are preparing to teach in special education and is preferably taken after directed teaching has been completed in a regular classroom. This course is graded on a Credit/No Credit basis and is cross-listed with ED 674.

SPED 675 Internship in College Teaching 3 hrs.

This course is designed specifically for students officially admitted to the doctoral program in Special Education. The student will be expected to evidence ability to plan and execute instructional tasks, develop and apply appropriate evaluative techniques, and interpret students' performances. Prerequisite: Consent of department.

SPED 688 Classroom Management 2 hrs.

This course deals with techniques for the physical, instructional, logistic, and behavioral management of classrooms. Various management strategies will be discussed and several will be focused upon in detail. Prerequisite: Consent of department.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

SPED 710 Independent Research 2-6 hrs.

SPED 712 Professional Field Experience 2-12 hrs.

SPED 730 Doctoral Dissertation 15 hrs.
Electrical Engineering (EE)

Professors Davis, VanderKooi, Associate Professors Gesink, Johnson, Mason, Mousavinezhad; Assistant Professors Abuelyaman, Geji, Severance, Yaprapak.

Open to Undergraduate and Graduate Students

EE 501 Introductory Power Systems (3-0) 3 hrs.
An introduction to electrical power systems for non-electrical engineering students. Prerequisites: EE 211, MATH 374.

EE 520 Solid-state Devices (3-0) 3 hrs.
Semiconductor materials and solid state devices, atomic structure, quantum mechanics, crystalline structures, transport phenomena, thermal effects and recombination. Devices include P-N junctions, tunnel diodes, IMPATI diodes, BJTs and JFETS. Prerequisites: EE 361, EE 221.

EE 530 Power System Analysis (3-0) 3 hrs.
Modern systems, control, optimization, network theories, matrix language, computer methods, steady state. Prerequisite: EE 430.

EE 550 Introduction to VLSI Design 4 hrs.
Gate array, standard cell and full custom integrated circuit design. Prerequisite: EE 350.

EE 555 Advanced Digital Signal Processing 3 hrs.
Discrete-time signals and systems, time and frequency domain representations. Structures of Discrete-time systems and Digital Filters, DFT and FFT methods of spectral analysis and estimation. Discrete Hilbert Transforms and multidimensional signal processing. Prerequisites: EE 455 or equivalent.

EE 560 Time-Varying Fields (3-0) 3 hrs.
Electrodynamics, Maxwell’s Equations, Boundary value problems and solutions of Helmholtz Equation in different coordinate systems. Green’s functions, transmission lines and waveguides. Introduction to perturbational and variational methods. Engineering EM Background needed for more advanced topics. Prerequisite: EE 361.

EE 561 Data Communications (3-0) 3 hrs.
Overview of digital communication systems and network; analysis of current standards, design techniques, routing procedures and protocols. Prerequisites: EE 355, EE 360.

EE 570 Digital Control System (3-0) 3 hrs.
State variable technique, controllability and observability, digital control system design with state or output feedback, maximum principle, optimal linear regulator—deterministic and stochastic state observers. Prerequisite: EE 371.

EE 595 Introduction to Advanced Topics (3-0) 3 hrs.
To introduce students to advanced topics in electrical engineering not included in other course offerings. May be taken more than once up to six hours.

Open to Graduate Students Only

EE 605 Microcomputer Systems (2-3) 3 hrs.
Analysis and design of microcomputer-based systems with emphasis on applications. Prerequisite: A computer programming course.

EE 610 Network Synthesis (3-0) 3 hrs.
Synthesis of active and passive networks. Prerequisite: EE 310.

EE 630 Power Systems Analysis II (3-0) 3 hrs.
Continuation of EE 530, with emphasis on transient analysis of power systems. Prerequisite: EE 530.

EE 640 Electronic Instruments (3-0) 3 hrs.
Analysis of instrumentation systems including basic instrumentation concepts, dynamic analysis of instruments, transducers, classical analog methods, digital methods and application. Prerequisites: EE 320, EE 371, EE 251.

EE 650 Advanced Computer Architecture (3-0) 3 hrs.
An introduction to the problems involved in designing and analyzing current machine architectures. Simulation and design automation of digital systems. The completion of a substantial design project is required. Prerequisites: EE 355, EE 357.

EE 660 Antenna Theory and Design (3-0) 3 hrs.

EE 661 Electrodynamics of Plasma (3-0) 3 hrs.
An introductory course in plasma fundamentals covering both gaseous and solid state plasmas. Topics covered in the course will be macroscopic properties of plasmas, thermodynamics and statistical mechanics of plasmas, plasma models, wave propagation and interaction in plasmas, kinetic equations of plasmas, transport phenomenon, and plasma stability. Prerequisite: EE 560.
Industrial Engineering (IE)

IE 507 Computer Integrated Manufacturing (3-0)
3 hrs.
Topics related to computer integrated manufacturing. Topics include computer process control, robotics, group technology, CNC, CAD, FMS. Hands-on experience with miniature computer controlled equipment will be included.
Prerequisite: Course in computer programming.

IE 508 Advanced Quality Management (3-0)
3 hrs.
Analysis and application of new concepts in the fields of quality control. Tests of significance, probability studies, and other uses of statistics as applied to quality control. Prerequisite: IE 316 or 329 or permission of instructor.

IE 516 Design of Experiments and Regression Analysis (3-0)
3 hrs.
Topics related to experimental design and regression analysis. Topics include randomized blocks, latin squares, factorials, multiple correlation and regression, and its application to response surfaces. Prerequisite: IE 261 or equivalent.

IE 542 Human Factors Engineering (2-3)
3 hrs.
A survey of research on the adaptation of equipment, products, and environment to human use. (Cross-listed with PSY 542.)

IE 557 Topics in Industrial Engineering (3-0)
3 hrs.
Group study of special topics in industrial engineering and technology. The specific topic will be shown in the course title when scheduled. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

Open to Graduate Students Only

IE 600 Concepts and Principles of Manufacturing Administration (3-0)
3 hrs.
To study the concepts of supervision with particular design for those who have had little or no previous academic orientation to the principles, concepts, and philosophy of industrial supervision.

IE 604 Facilities Planning and Design (3-0)
3 hrs.
An analytical approach to the planning and design of manufacturing facilities and material handling systems. Prerequisite: IE 404, 414, or permission of instructor.

IE 606 Capital Budgeting and Cost Analysis (3-0)
3 hrs.
Concepts, principles, and techniques of making decisions pertaining to the acquisition and retirement of capital goods by industry and government. Topics include time value of money, basic economic decision models, effect of taxation and depreciation on economic decision, and capital allocation.

IE 608 Reliability Engineering (3-0)
3 hrs.
The formulation of mathematical models for reliability allocation and redundancy. Topics include time dependent and time independent prediction measures for both maintained and non-maintained systems. Prerequisite: MATH 360 or 362.

IE 610 Linear Programming for Engineers (3-0)
3 hrs.
The formulation of linear mathematical models as applied to engineering problems. Solutions to linear programming problems are obtained by using appropriate algorithms. Sensitivity analysis techniques are presented, and the significance of changes in the model is studied. Prerequisite: MATH 123.

IE 611 Operations Research for Engineers (3-0)
3 hrs.
Concepts and techniques of operations research with emphasis on industrial applications. Topics include queuing theory, inventory models, Monte Carlo simulation, game theory, and dynamic programming. Linear programming is not included; see IE 610. Prerequisite: MATH 362.

IE 612 Productivity and Operations Management (3-0)
3 hrs.
Topics relating to the planning and control functions of manufacturing systems are presented. These topics include management of the production system, strategies of product design and process selection, design of production systems, plant location, shop floor control, purchasing, quality management, and productivity improvement. Prerequisite: IE 326 or equivalent.

IE 614 Project Management (3-0)
3 hrs.
To address the basic nature of managing projects and the advantages and disadvantages of this method of getting things done. The problems of selecting projects, initiating them, and operating and controlling them are discussed. The demands made on the project manager and the interaction with the parent organization are also presented.

IE 622 Industrial Supervision Seminar (3-0)
3 hrs.
An analysis of the writings, literature, and philosophy concerning line supervision and employee direction in manufacturing industries. Prerequisite: IE 600 or permission of instructor.

IE 630 Advanced Simulation Modeling and Analysis (3-0)
3 hrs.
Advanced topics in modeling of complex systems using both discrete and continuous simulation. Emphasis on the simulation of manufacturing systems. Prerequisite: IE 319 or equivalent.

IE 642 Ergonomics and Occupational Biomechanics (3-0)
3 hrs.
Topics related to work physiology and biomechanics. Topics include anthropometry, skeletal system and muscle, neuromuscular control system, biomechanics, respiratory system, circulatory systems, and metabolic system.

IE 657 Studies in Industrial Engineering (3-0)
3 hrs.
Advanced work organized around topics of current interest in engineering and technology. The specific topic will be shown in the course title when scheduled. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

IE 697 Problems in Industrial Engineering (3-0)
3 hrs.
Special problems of individual need or interest under the direction of a member of the graduate faculty. May be elected with approval of department chairperson and faculty member. Application must be submitted and approved prior to the election of the course.

Open to Graduate Students Only—Please refer to The Graduate College section for course description.

IE 700 Master's Thesis
6 hrs.
Mechanical Engineering (ME)

Professors Groper, Hamelink, Hennuy, Williams; Associate Professors Cho, Easwaran, Guichelaar, House, Sahin, Sharma, Schubert, VandenBrink; Assistant Professor Ari-Gur.

Open to Undergraduate and Graduate Students

ME 531 Energy Management (3-0)
3 hrs. Winter
Theory and application of industrial energy audits. Energy conservation and waste heat recovery. Prerequisite: ME 232 or consent.

ME 553 Advanced Product Design (3-0)
3 hrs. Winter
An engineering design project from concept to adoption. Static and dynamic analysis. Mechanical systems design and layout. Prerequisite: ME 360, 453.

ME 558 Mechanical Vibrations (3-0)
3 hrs. Winter
A study of the oscillatory motion of physical systems with emphasis on the effects of vibrations on the performance and safety of mechanical systems. Prerequisites: ME 258, MATH 374.

ME 559 Machine Dynamics (3-0)
3 hrs.
Static and dynamic force analysis of mechanism such as linkages, cams, and shafts, dynamics of reciprocating engines, balancing, spatial mechanisms. Prerequisites: ME 358.

ME 560 Engineering Analysis (3-0)
3 hrs. Fall
Application of vector analysis and differential equations to the solution of complex engineering problems. Prerequisite: ME 360 or equivalent.

ME 561 Finite Element Method (3-0)
3 hrs.
Weighted residual methods, finite element techniques in one-, two-, and three-dimensional problems of heat transfer, fluid flow, structures and elasticity, time dependant problems, higher order elements, non-linear problems. Prerequisites: MATH 506 or equivalent.

ME 562 Application of Numerical Methods in Engineering (3-0)
3 hrs.
Finite difference methods for initial value and boundary value problems; 20 finite differencing; and boundary element method applications to differential equations of heat transfer, fluid flow, and solid mechanics. Prerequisites: MATH 506 or equivalent.

ME 571 Gas Dynamic (3-0)
3 hrs.
Basic equations of compressible flow, isentropic relationships, normal and oblique shocks, Prandtl-Meyer expansion, Fanno Line and Rayleigh Line flow. Applications to nozzles, diffusers, supersonic wind tunnels, and linearized flows and method of characteristics. Prerequisites: ME 431, 432.

ME 572 Advanced Thermodynamics (3-0)
3 hrs.
Conditions of equilibrium, process and thermodynamic engines, the extremum principle, Maxwell relations, stability of thermodynamic systems, phase transitions, chemical thermodynamics, irreversible thermodynamics, and introduction to the statistical thermodynamics. Prerequisites: ME 431, 432.

ME 573 Engineering Materials (3-0)
3 hrs. Spring-odd yrs.
Material selection for resistance to both load and environment. Design parameters for material selection and various metal systems, corrosion, service failures and mechanical behavior or engineering alloys at high and low temperatures. Prerequisite: ME 250.

Open to Graduate Students Only

ME 630 Advanced Fluid Dynamics (3-0)
3 hrs.
Modern developments in fluid dynamics of compressible and incompressible fluid flow. Includes kinematics of fluid motion, laminar and turbulent flow in pipes, fluid machinery, and supersonic flow. Prerequisites: ME 356, 432, and MATH 374.

ME 631 Advanced Mechanical Engineering Laboratory (3-0)
3 hrs.
Experimental methods of design and verification in solid mechanics, dynamics and vibration. Course projects including planning, testing, computer simulations, and analysis of data, and project report preparation and presentation. Prerequisites: ME 437 or permission of instructor.

ME 632 Energy Resources and Conversion (3-0)
3 hrs. Fall
Availability and economic utilization of energy resources. Terrestrial and thermodynamic limitations. Energy conversion applications. Fission and fusion. Applications of solar, water, wind, and geothermal energy. Prerequisite: ME 232 or consent.

ME 653 Advance Control Systems (3-0)
3 hrs.
Digital control, analog controls, introduction to modern control, state variable analysis, system simulation techniques, optimal design, parameter sensitivity and stability analysis, robotics control applications. Prerequisite: ME 360.

ME 651 Advanced Strength of Materials, Elasticity and Plasticity (3-0)
3 hrs.
Torsion of non-circular cross sections, shear center, curved beams, beams on elastic foundations, flat plates, and an introduction to two-dimensional elasticity and plasticity. Prerequisites: ME 453.

ME 655 Advanced Materials Science (3-0)
3 hrs.
Engineering behavior of metals, ceramics, engineering resins and composite materials. Composition and temperature effects on micro and macroscopic properties. Failure mechanisms. Materials selection criteria. Prerequisites: ME 250 or 270, and 350.

ME 656 Mechanical Systems Synthesis (3-0)
3 hrs.
This course is devoted to three related topics: probabilistic methods applied to design, reliability evaluation of elements and systems, and system synthesis and optimization. A comparison of deterministic and probabilistic methods is made. Material properties distributions including probabilistic fracture mechanics are investigated. Loading distribution approximations are made using direct and Monte Carlo techniques. Series and parallel systems are evaluated using component reliabilities estimated through data analysis and case studies. Process conscious system synthesis with consideration of various optimization goals such as reliability, seller's cost, weight, etc. are considered. Prerequisites: ME 362, 453.

ME 671 Advanced Heat Transfer I—Conduction Heat Transfer (3-0)
3 hrs.
Fundamental aspects of conductive heat transfer applied to steady state and transient conditions. One-, two-, and three-dimensional conduction problems with exact and approximate solution techniques utilizing the computer are studied. Prerequisites: ME 431, 432.

ME 672 Advanced Heat Transfer II—Convection and Radiation Heat Transfer (3-0)
3 hrs.
Fundamentals of thermal radiation for black, gray, non-gray, diffuse, and specular surfaces. Gaseous radiation and special applications of thermal radiation including derivation and application of equations of mass, energy, and momentum transfer. Prerequisites: ME 431, 432.

ME 673 Power Plant Design (3-0)
3 hrs.
Theory and application of internal combustion engines, gas turbine power plants, steam turbine power plants, and other prime movers. Emphasis is on application of thermodynamic principles combined with open-ended design problems in power plant applications. Prerequisites: ME 431, 432.

ME 695 Advanced Topics in Mechanical Engineering: Variable Topics 1-4 hrs.
A specialized course dealing with some particular advanced area of Mechanical Engineering not included in other course offerings. May be repeated for credit with a different topic up to six credits. Prerequisite: Consent of instructor.

ME 697 Problems in Mechanical Engineering 1-8 hrs.
Fall, Winter, Spring, Summer
Special problems of individual need or interest under the direction of a member of the graduate faculty. May be elected with approval of department chairperson and faculty member. Application must be submitted and approved prior to the election of the course. May be repeated up to maximum of six hours.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

ME 700 Master's Thesis 6 hrs.

Paper and Printing Science and Engineering (PAPR)

Byte, Intern Chairperson; Professors Janes, Kline, Associate Professors Darling, Peterson, Assistant Professor Aravamudhan.

Open to Graduate Students Only

PAPR 600 Surface and Colloid Chemistry (3-0)
3 hrs.
Intermolecular forces are considered in detail to build a sound background for consideration of surface and colloid behavior of matter. The thermodynamics of interfaces and surfaces is covered in detail considering the topics of absorption, surface films, wetting, capillary penetration, and diffusion. Colloidal topics covered include areas such as ionic boundary layers, electrokinetic potential, swelling and shrinkage of gels, ion exchange, surface active agents, detergency, and retention of particles.
PAPR 620 Paper, Printing, and Ink (2-3) 3 hrs.
A detailed analysis of the interrelationships of paper and the printing process. Testing methods for printing smoothness, ink receptivity, picking, and runnability are the major areas of concentration. Printing problems and quality are also considered as they are influenced by paper, coating, ink, and press conditions and operations.

PAPR 640 Coating Rheology (2-3) 3 hrs.
The theories of flow of non-Newtonian liquids are discussed as they apply to pigmented coating systems. Further theories are formulated and evaluated in the lab to attempt to explain the behavior of coating under the shear conditions found in coating application systems.

PAPR 660 Mechanics and Optics of Paper and Fibers (2-3) 3 hrs.
The mechanics and optics of individual fibers and fiber networks will be considered from both theoretical and measurement standpoints. Stress-strain analysis, theory of elasticity and flow, statics, reflection, absorption, transmission, and light scattering of these systems will be covered.

PAPR 680 High Polymer Topics (3-0) 3 hrs.
The physical chemistry, engineering properties, and behavior of synthetic and natural polymers and their solutions are presented. Methods of characterization and significance of molecular parameters are included.

PAPR 690 Pulp and Paper Operations I (2-3) 3 hrs.
A study of unit operations integral to pulp and paper manufacturing. The interdependence, design and optimization of the unit processes are included. The pulp manufacturing and chemical recovery phases are emphasized.

PAPR 691 Pulp and Paper Operations II (2-3) 3 hrs.
Continuation of the study of the unit operations integral to pulp and paper manufacturing. The paper manufacturing phase is emphasized while completing the systematic study of unit operations used in the industry.

PAPR 695 Graduate Topics in Paper/Printing (1-4) 1-4 hrs.
A special course dealing in some particular subject of interest in pulp and paper and/or printing. May be repeated with different topics. Prerequisite: Permission of the instructor.

A study of the control of pulping and papermaking processes with emphasis on computer control strategies and the instrument systems unique to the paper industry. A unit operations and process modeling approach will be taken to familiarize the student with applications of these techniques to the paper industry.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

PAPR 700 Master’s Thesis 6 hrs.
PAPR 710 Independent Research 2-8 hrs.
PAPR 712 Professional Field Experience 2-12 hrs.
Art (ART)
Vander Weg, Chairperson; Professors Argyropoulos, Carney, DeLuca, Depeaux, Gammon, Keaveny, King, Link, Mergen, Rhodes, Rizzolo, Robbert; Associate Professors Grinwis, Harkness, Hennessy, Methaney, Nafte, Neu; Assistant Professors Abramson, Field.

Open to Upperclass and Graduate Students

ART 510 Drawing Workshop
1-6 hrs.
Continuation of ART 310. Prerequisite: ART 310. Repeatable for credit.

ART 520 Independent Study in Art History
2-3 hrs.
Problems in art history from ancient times to the present selected by the individual student in consultation with the instructor. Prerequisites: ART 220, 221, and a 500-level course in the area of interest; permission of department. Repeatable for credit.

ART 521 Topics in Art History: Variable Topics
3 hrs.
Investigation of changing topics in art history in class or seminar sessions by advanced students. Course title varies from term to term. Prerequisite: ART 220 and 221 or equivalent for Art majors. Repeatable for credit under a different title.

ART 530 Ceramics Workshop
1-6 hrs.
Advanced work in ceramics on an independent basis. Prerequisite: ART 330. Repeatable for credit.

ART 531 Sculpture Workshop
1-6 hrs.
Continuation of ART 331. The advanced student explores the expressive possibilities of his or her own individual sculptural direction, with bronze and aluminum casting related techniques. Prerequisite: ART 331. Repeatable for credit.

ART 535 Multi-Media Workshop
1-6 hrs.
Various forms of art that deviate from the conventional media, such as light, kinetic, and performance art. The student is expected to have a solid background in one of the traditional art forms, such as ceramics, painting, sculpture, printmaking, drawing, graphic design, metals, or textiles. Permission of instructor is required. Repeatable for credit.

ART 538 Jewelry and Metalsmithing Workshop
1-6 hrs.
Advanced work in jewelry design and metalsmithing. Students collaborate with the instructor to plan a suitable and particular direction for study. Prerequisite: ART 338. Repeatable for credit.

ART 540 Painting Workshop
1-6 hrs.
Continuation of ART 340. Prerequisite: ART 340. Repeatable for credit.

ART 541 Printmaking Workshop
1-6 hrs.
An advanced seminar for experienced graphic students; all printmaking media available; emphasis on development of personal concepts and refinement of methods appropriate to individual needs through research. Prerequisite: Any 300 level printmaking course. Repeatable for credit.

ART 542 Watercolor Workshop
1-6 hrs.
Continuation of advanced watercolor techniques with emphasis on experimentation. Prerequisites: ART 342. Repeatable for credit.

ART 544 Hand Papermaking
1-6 hrs.
Continuation of ART 244 and ART 344. Prerequisite: ART 344.

ART 545 Graphic Design
3 hrs.
Advanced work in graphic design. Prerequisite: ART 445 or equivalent experience. Repeatable for credit.

ART 548 Photography Workshop
1-6 hrs.
Professional development through research in advanced projects. Prerequisite: ART 348. Repeatable for credit.

ART 552 Preparation for Art Teaching
3 hrs.
A course designed to investigate: the current problems and issues on the social scene which affect teaching and learning in the visual arts at all levels of the public school; the creative person, product, process, and press (environment); the phenomena of perceptual learning; the actual construction of an operant art curriculum for the elementary, middle, and high school programs. Prerequisite: ART 452 and art major status.

ART 553 Independent Studies in Art Education
1-6 hrs.
An arranged elective course in which the student investigates and researches a problem, a project, or trends in art education. (Not to be taken in place of required art education courses.) Prerequisites: 252, 352, 452, 552, and permission of the art education chairperson. This course is open to graduate and non-degree level students.

ART 560 Arts Education for the Elementary Teacher
3 hrs.
A studio course designed for the elementary classroom teacher to provide experiences in qualitative elementary arts and integrated arts programming in the elementary public school. Repeatable for credit.
ART 581 History of Ancient Art
3 hrs.
Selected topics from the art and architecture of ancient Egypt, the ancient Near East, the Aegean proto-Greek, Classical and Hellenistic Greece, Etruria and Rome to the Early Christian period. Prerequisite: ART 220.

ART 583 History of Medieval Art
3 hrs.
Discussion of art and architecture from the decline of the Roman Empire through the Gothic Period (3rd-13th cent.). Prerequisite: ART 220.

ART 585 History of Renaissance Art
3 hrs.
The development of art through the early Renaissance to the Late Renaissance and Mannerism. Some of the major artists discussed are: Giotto, Donatello, da Vinci, Michelangelo, Titian, Van Eyck, Brueghel, and Durer. Prerequisite: ART 221.

ART 586 History of Baroque Art
3 hrs.
Art of the late 16th, 17th, and early 18th centuries. Major artists and architects discussed are: Caravaggio, the Carracci, Rembrandt, Rubens, Poussin, Velasquez, Bernini, Borromini and Neumann. Prerequisite: ART 221.

ART 587 History of American Art, Colonial to 1900
3 hrs.
Art in the United States from the Colonial Period to 1900. Emphasized are Federal and Georgian 18th Century styles; 19th Century Realism, Romanticism and Nativism; genesis and development of distinctly "American" consciousness and styles. Prerequisite: ART 221.

ART 588 History of 19th Century European Art
3 hrs.
Major developments, such as Neo-Classicism, Romanticism, Realism, Impressionism, and Post-Impressionism, are discussed. Key figures whose works lie at the roots of modern art are considered in relationship to their times. Prerequisite: ART 221.

ART 589 History of European Art: 1900-1945
3 hrs.
Emphasis is placed upon the roots of contemporary trends and the contributions of the individuals to new modes of presentation. Major developments including Fauvism, Cubism, Expressionism, and Surrealism are discussed. Prerequisite: ART 221.

ART 590 History of 20th Century Art: 1945 to Present
3 hrs.
Major trends in art since World War II are discussed. Included are Abstract Expressionism, pop and op art, the new realists, and conceptual art. Prerequisite: ART 221.

ART 591 History of Prints
3 hrs.
Major developments in printmaking, including origins of woodcut and engraving. Renaissance, renaissance baroque master etchers and engravers (Durer and Rembrandt). Lithography in the nineteenth century (Delacroix, Daumier, Toulouse-Lautrec). Twentieth century printmaking. Prerequisites: ART 220 and 221 for Art majors and minors; none for other students.

ART 592 20th Century Design History
3 hrs.
Major trends in design in the past 100 years, beginning with the arts and crafts movement through post modernism. Major developments include Art Nouveau, Art Deco and the Bauhaus. Art forms include architecture, interior design, graphics, illustration and crafts. Prerequisite: ART 221.

ART 593 History of American Art: 1900-1945
3 hrs.
Art of the United States and Canada from 1900 to present; Realism, introduction of European Modernism; Nativist and American Modernist traditions of the '20's, '30's, and '40's. Prerequisite: ART 221.

Open to Graduate Students Only

ART 610 Advanced Drawing
1-6 hrs.
Graduate level work in drawing. Prerequisite: ART 510 and official admission to an Art graduate program. Repeatable for credit.

ART 613 Graduating Presentation
2 hrs.
Preparation and presentation of graduating exhibition, portfolio, and oral examination with the assistance of the student's major adviser. Evaluated by a departmental reviewing committee. Prerequisite: Last year of graduate study.

ART 620 Independent Study in Art History
1-3 hrs.
Problems in art history from ancient times to the present selected by the individual student in consultation with the instructor. Prerequisites: ART 220, 221, and a 500-level course in the area of interest or the equivalent; permission of department. Repeatable for credit.

ART 625 Graduate Art Seminar
2 hrs.
A survey, investigation, discussion, and evaluation of selected topics in contemporary art and associated practicum activities. Topics for investigation may include: Exhibition Preparation in Galleries and Museums, the Artist and the Market, Technology and Computers in Art, Funding Artists and Art Programs, Artists and Society: The Audience and Formation of Taste, Moral Philosophy and Art. Graded on a Credit/No Credit basis. Prerequisite: Art major status.

ART 630 Advanced Ceramics
1-6 hrs.
Graduate level work in ceramics. Prerequisite: ART 530 and official admission to an Art graduate program. Repeatable for credit.

ART 631 Advanced Sculpture
1-6 hrs.
Graduate level work in sculpture. Prerequisite: ART 531 and official admission to an Art graduate program. Repeatable for credit.

ART 635 Advanced Multi-Media Art
1-6 hrs.
Graduate level work in Multi-Media Art. Prerequisite: ART 535. Repeatable for credit.

ART 640 Advanced Painting
1-6 hrs.
Graduate level work in painting. Prerequisite: ART 540 and official admission to an Art graduate program. Repeatable for credit.

ART 641 Print Workshop/Seminar
1-6 hrs.
Advanced research in development of personal concept, method, and uses of graphic processes. Emphasis on personal expression; exploration toward an individual and mature imagery. Prerequisite: ART 541 and official admission to an Art graduate program.

ART 642 Advanced Watercolor
1-6 hrs.
Graduate level work in watercolor. Prerequisite: ART 542 and official admission to an Art graduate program. Repeatable for credit.

ART 645 Advanced Graphic Design
1-6 hrs.
Graduate level work in graphic design. Prerequisite: ART 545 and official admission to an Art graduate program. Repeatable for credit.

ART 648 Advanced Photography
1-6 hrs.
Graduate level work in photography. Prerequisite: ART 548 and official equivalent experience and official admission to an Art graduate program. Repeatable for credit.

Dance (DANC)

Professors Cornish, Stillwell; Associate Professors Baas, Mills, Nelson, Thomas.

Open to Upperclass and Graduate Students

DANC 557 Special Studies in Dance
1-6 hrs.
A study of areas in dance not included in existing courses. Examples of possible topics include: pedagogy, repertory, Afro-American dance, pre-classique dance forms, and dance for the exceptional student. May be offered with a visiting instructor or artist-in-residence. Repeatable for credit up to 6 hrs. Prerequisite: Adviser consent.

DANC 560 Performance Variable
An experience in student or faculty choreographed dance works, in projects not encompassed in specific dance courses. Application with approval of dance faculty committee must be filed with the dance adviser one month prior to performance. Registration occurs after performance has been completed. Prerequisite: Adviser consent.

DANC 565 University Dance Theatre (UDT)
3 hrs.
UDT is a performing ensemble which provides master classes, residencies, lecture-demonstrations, and concerts in various dance styles in the region. Members must show proficiency in performance, improvisation, teaching, and public speaking. Members must concurrently enroll in at least one studio course at the 200 or 300 level. Prerequisite: ART 548 or equivalent experience. Repeatable for credit. Prerequisite: Audition or consent of company director.

DANC 588 Dance Production
2 hrs.
The study of the production aspects of dance including sound, lighting, costuming, make-up and stage management. Practical applications will include first-hand experience in creating tape colleges with special effects, designing lighting, costumes and make-up.

DANC 589 Dance Management
2 hrs.
Course covers front-of-house aspects of management and publicity, budget, programming, organization of elements involved in company management, and grantsmanship. Practical application of these principles will be evaluated wherever possible.

DANC 598 Readings in Dance
1-4 hrs.
Course covers a broad range of topics in dance, including theory, historical, sociological, and philosophical aspects of dance. Prerequisite: Approval application required.

DANC 599 Non-reading Independent Study in Dance
1-4 hrs.
Advanced students with good academic standing may elect to pursue independently a program of readings in areas of special interest. Prerequisite: Approved application required.
process. Topics are chosen and arrangements are made to suit the needs of each particular student. Prerequisite: Approval application required.

Music (MUS)

Professors Appel, Curtis-Smith, Davidson, Gibson, Humiston, Ivey, Jones, Kynesston, Osborne, Pappertop, Ricci, Sheldon, Suddendorf, Thalemy, Wilson, Zastrow, Zupko; Associate Professors McCarthy, O’Hearn, Pernigo, Pettcock, Wolfinbarger, Wong, Work, Zegree, Assistant Professors Gauthier, Moonert, Steel, Derry, R. Kniffic, T. Kniffic, Little, Scoce, Thornburg, Trent, Uchimura.

Open to Upperclass and Graduate Students

MUS 500 Applied Music
2 hrs. ($7)

Private lessons for the graduate student in a non-major area of performance.

MUS 501 Master Class
2 hrs.

The study of literature, performance practices, and techniques for a specified musical medium (instrument or voice). Individual performance assignments will be made appropriate to each student’s level of accomplishment. Class meetings may vary from small groups of students with common performance levels to meetings for the entire class for the purpose of dealing with materials and techniques common to all performers. May be repeated for credit.

MUS 514 Instrumental Chamber Music
1 hr.

Special ensembles formed to perform standard instrumental chamber music works. Ensembles may include a variety of combinations, e.g., string quartets, woodwind quartets, brass quintets, percussion ensembles, piano trios, etc. Credit will be given only if a sufficient rehearsal/performance schedule warrants.

MUS 515 Music Theatre Practicum
1 hr.

A production experience in music theatre. Each semester culminates in an opera or musical comedy production. Open to singers, actors, accompanists, instrumentalists, and persons interested in production techniques. Admission by audition or permission of the instructor. May be repeated for credit.

MUS 517 Collegium Musicum
1 hr.

Performance of early Western music. Open to all students of the University. Additional transcription, arranging, editing, and conducting of early music is required of enrolled Music History majors. Graduate students may count not more than two hours of this course for graduation. Membership by audition.

MUS 518 Improvisation
2 hrs.

A course in the fundamentals of instrumental improvisation. Assignments will be made in such areas as improvisation in the early music tradition, improvisation on given melodic, harmonic, and/or rhythmic materials, as well as “free” improvisations. Prerequisite: MUS 161.

MUS 530 Advanced Choral Conducting
2 hrs.

Supervised experience in conducting vocal groups. The student may be called upon to prepare an ensemble for public performance. Prerequisite: MUS 330.

MUS 531 Advanced Instrumental Conducting
2 hrs.

Supervised experience in conducting instrumental groups. The student may be called upon to prepare an ensemble for public performance. Prerequisite: MUS 331.

MUS 540 Elementary School Music
2 hrs.

Emphasizes the place of music in the day-to-day activities in the classroom. The fundamental musical skills are developed in order to assist the teacher to achieve these objectives.

MUS 542 Studies in Music Education
2 hrs.

Topic to be announced. Selection will be made from the following or similar topics: Music in the Humanities, Evaluation of Music Education Materials, and Curriculum Planning for Innovation in Music Education. This course may be repeated to an accumulation of not more than four credits.

MUS 544 Music Education Materials: Variable Topics
2 hrs.

A study of the theoretical bases for, and practice in, analyzing and evaluating music for use in music education programs. This course may be repeated for a maximum of four credits.

MUS 546 Computer Assisted Instruction in Music
3 hrs.

The primary goal of the course is to teach students who already program, some of the specific techniques used in developing original software for CAI in music. The main activity in the course will be programming, and one of the products of the course should be, for example, a program of sufficient sophistication as to at least potentially qualify it for publication. Prerequisite: CS 105 or 502 or consent of instructor.

MUS 555 Jazz Arranging
2 hrs.

Jazz Arranging is a study of the art of arranging for the jazz ensemble—both traditional and contemporary. The course will undertake a detailed study of instrument ranges, transpositions, and sound potential, and will cover voicings, scoring practices, calligraphy, and contemporary trends within the medium. Prerequisite: MUS 264 or MUS 264 concurrently.

MUS 556 Advanced Jazz Arranging
2 hrs.

A study and application of the art of arranging for the jazz ensemble, studio orchestra and show orchestra. The course will undertake a detailed study of scoring for winds, brass, strings, voices and percussion in relation to traditional and contemporary trends within the medium. Prerequisite: MUS 555 and MUS 264 or concurrent.

MUS 558 Jazz Improvisation I
2 hrs.

A study and directed application of the fundamentals of jazz improvisation including basic chord and scale construction and recognition, harmonic function, chord-scale relationships and basic blues and popular song forms. All students will be required to develop aural and performance skills relative to those theory skills. Prerequisite: MUS 161 with grade of C or better.

MUS 559 Jazz Improvisation II
2 hrs.

A study and directed application of advanced techniques of jazz improvisation including chord extension, voicing, inversions and substitutions, chord function and progressions and complex scales and their applications. All students will be required to develop aural and performance skills relative to those theory skills. Prerequisite: MUS 558 and MUS 218 Jazz Ensemble or concurrently.

MUS 560 Counterpoint
2 hrs.

A study of the contrapuntal techniques of the 18th, 19th, and 20th centuries. Written assignments are closely correlated with the contrapuntal styles of significant composers. Prerequisite: MUS 161 with a grade of C or better.

MUS 561 Counterpoint
2 hrs.

A continuation of MUS 560. Prerequisite: MUS 560.

MUS 564 Electronic Music Composition
2 hrs.

Original music composition with digital and analog synthesizers and computers. Creation of sound scores for concert performance, film, video, dance, theatre, or art installations. Includes the investigation of various types of sound synthesis, as well as the operation of studio sound mixers and multitrack recorders. In addition to the weekly seminar, the student will be assigned a number of hours weekly for independent work in the studio for the realization of the project, which will receive periodic guidance and criticism from the instructor. May be repeated for credit. Lab fee required ($30). Prerequisite: MUS 263 or permission of the instructor.

MUS 565 Seminar in Music Theory
2 hrs.

Research projects in music theory. Research methods and analytic discipline are stressed. Study will be focused in an area of the student’s need or interest. Prerequisite: MUS 261.

MUS 566 Musical Acoustics
3 hrs.

A course designed for the music student. Discussion as well as laboratory demonstration of such concepts as: simple harmonic systems; waves and wave propagation; complex vibrations; resonance, intensity and loudness levels; tone quality; frequency and pitch; intervals and scales; tuning and temperament; auditorium and room acoustics, psycho-acoustics. In addition, the instruments of the orchestra, the human voice, and recent developments in sound system components will be investigated. Prerequisite: MUS 161.

MUS 567 Orchestration
2 hrs.

A study of the characteristics of instruments, and of arranging for the various individual choirs, for combinations of choirs, and for full orchestra. Prerequisite: MUS 261.

MUS 568 Orchestration
2 hrs.

A continuation of MUS 567. Prerequisite: MUS 567.

MUS 570 Introduction to Musicology
3 hrs.

History, purposes, scope of musicology; leading historians, past and present; modern methods of research, with special emphasis on primary sources and bibliographic field.

MUS 571 Introduction to Musicology
3 hrs.

A continuation of MUS 570.

MUS 572 Baroque Music (1600-1750)
3 hrs.

A survey of the choral and instrumental music of the Baroque master such as J. S. Bach and G. F. Handel. Special attention to the development of style from monody through harmonic polyphony. Prerequisites: MUS 270 and 271.

MUS 573 Classical Music (1750-1800)
2 hrs.

Examination of the chief works of Mozart and Haydn, with intensive study of symphonic form
and the development of the classic opera. Prerequisites: MUS 270 and 271.

MUS 574 Romantic Music (1800-1910) 3 hrs.
Music of the important composers of the period including Beethoven, along with the historical, cultural, and political background of the era. Special attention is given to the development of Nationalism. Prerequisites: MUS 270 and 271.

MUS 575 Musicology and Research 2 hrs.
Presentation of musicological material in formal writing as well as informal classroom lecture; specific aspects of research with emphasis on selection and qualitative judgment of materials used.

MUS 576 Musicology and Research 2 hrs.
A continuation of MUS 575. Prerequisite: MUS 575.

MUS 577 Symphonic Literature 2 hrs.
A survey of music written for symphony orchestra during the Classic and Romantic periods.

MUS 578 Chamber Music Literature 2 hrs.
A survey of chamber music literature of the Classic and Romantic periods.

MUS 579 Operatic Literature 2 hrs.
A survey of opera from 1600 to the present.

MUS 580 Solo Literature: (topics) 2 hrs.
Solo literature for a specific medium (voice, piano, violin, etc.) will be studied from a theoretical, historical, and performance point of view. Topics to be announced. May be repeated for credit. Prerequisites: MUS 270 and 271.

MUS 581 Choral Music Literature 3 hrs.
A survey of choral music (mass, motet, anthem, cantata, oratorio) from the Renaissance through the Romantic period.

MUS 583 Jazz History and Literature 4 hrs.
A survey of the history of jazz including aspects of sociology and history as they relate to the art form of jazz. All periods in jazz history, from its earliest roots in Africa and the slave culture in the United States, up through the blues, dixieland, swing, bop, mainstream and the more eclectic period of jazz rock and free-form jazz will be explored. Important works will be examined from each period in order to grasp the essentials of a particular style. Prerequisite: MUS 558 or instructor's consent.

MUS 585 Medieval Music 2 hrs.
A survey of music in Western Europe from the end of Antiquity to the early 15th century. The major developments in style, theory, and notation will be explored within the context of the general cultural and political environment of the era. Problems of performance practice will receive special attention with emphasis on primary manuscript sources and scholarly performing editions. Prerequisites: MUS 270 and MUS 271.

MUS 586 Renaissance Music 2 hrs.
A survey of music in Western Europe from the early 15th century to the early 17th century. Developments in the major musical genres of the era will be examined with emphasis on a comparison of the Franco-Flemish tradition with the emerging national styles. Performance practice options will be explored. Prerequisites: MUS 270 and MUS 271.

MUS 590 Studies in Pedagogy 1-4 hrs.
Topics to be announced. Selection will be made from the following: Piano Pedagogy, Vocal Pedagogy, String Pedagogy, Brass Pedagogy, Woodwind Pedagogy, Pedagogy of Teaching Theory, or similar topics. May be repeated for credit. Prerequisite: 300 level applied voice or permission of instructor.

MUS 594 Electronic Media 2 hrs. ($30)
The purpose of this course is to expose the student to the equipment in various recording situations and its operations, as well as discussing the artistic use of this equipment. Although predominately a technique course, areas which meet the creative aspects of the final recording will be discussed (such as microphone placement, tasteful vs. inappropriate editing, etc.). In addition to the recording aspects, other electronic instruments used in performances will be surveyed, including synthesizers of various types (both keyboard and non-keyboard) and traditional electronic instruments (guitars, electronic organs, electronic organs, and various sound modification devices).

MUS 595 Workshops in Music Education 1-4 hrs.
Intensive, short-term courses that address the instructional and pedagogical issues found in today's schools, as well as issues of specific concern for current teachers in the field of music. Topics will be from all areas of music education. Prerequisite: adviser consent.

MUS 596 Multi-track Recording 2 hrs.
A course in the theory and techniques of multi-track recording and mixing. Students begin with an in-depth study of the mechanics of a multi-track recorder and the signal flow of a recording/mixing console. Microphone techniques as well as various approaches to room set-up are presented through reading assignments and studio demonstrations. Attention is given both to traditional techniques and the need for engineers to try new approaches to familiar circumstances. Students also study the most commonly used signal processors and how they might be used during recording of mixing for best results. Various listening assignments introduce students to the subtleties of mixing. A final project is required wherein each student must organize and execute a full 24-track production, from microphone selection through the final mix. Prerequisite: MUS 594 or instructor consent.

MUS 597 Projects in Music 2 hrs.
A program of independent study to provide the unusually qualified music student with the opportunity to explore a topic or problem of interest, under the guidance of one of the faculty of the department. The initiative for planning the project must come from the student and must be approved by the faculty member proposed to supervise the study. Prerequisite: Application approved by School of Music.

MUS 598 Readings in Music 1-4 hrs.
Graduate students may enroll in this course after consultation with the graduate adviser. Open to Graduate Students Only

MUS 600 Applied Music 1-4 hrs. ($7)
Private lessons for the graduate student in the major performance area. Includes conducting.

MUS 610 Introduction to Research in Music 3 hrs.
A course in the general methods and techniques of research in the field of music. Students will complete a comprehensive bibliography, an annotated bibliography, and a research paper in the area of concentration of their graduate program of study.

MUS 617 Opera Workshop 2 hrs.
A production experience in acting, singing, accompanying, and producing of musical theatre. The class is offered each semester and culminates in the performance of an opera or operatic scenes. Open to advanced singers, pianists, and persons interested in production techniques. Admission is by personal interview with the instructor.

MUS 640 Band Techniques and Organization 2 hrs.

MUS 641 Choral Techniques and Organization 2 hrs.
The study of choral activities in relation to organization, repertoire, style, theory, balance, blend, tone quality, phrasing, rehearsal technique, and conducting.

MUS 642 Philosophy of Music Education 2 hrs.
Designed to acquaint the student with aesthetic and pragmatic thinking regarding the nature and value of music, and to provide a rationale for curricular development and teacher behavior.

MUS 650 Seminar in Music Education 2 hrs.
Each participant will be expected to develop a project which is of interest to him or her, but each project will be subject to group discussion, review and analysis. The lectures and reading will deal with the entire field of music education.

MUS 662 Seminar in Composition 2 hrs.
The completion of an original composition of larger scope for any combination of acoustic instruments, and which may include multimedia. Seminars will include analysis of advanced contemporary works, discussion of current trends in music theory and practice, and reading assignments. May be repeated for credit. Prerequisite: MUS 362 or equivalent.

MUS 664 Form in Music 2 hrs.
A survey of the musical forms, large and small, used from the Baroque period to the present day. Analysis of both structure and texture of representative works of the various periods and styles.

MUS 666 The Teaching of Theory 2 hrs.
Analysis of various techniques, philosophies, and materials used in teaching theory and their relative strengths and weaknesses. Application of what we know about the learning processes to theory and the practical application of theory to all musical study.

MUS 670 Seminar in Musicology 1 hr.
Research projects from all areas of the history of music. Each student will present his or her findings both as a formally written paper and as a seminar report. Emphasis will be placed on writing style, manner of presentation, scholarship, and validity of conclusions.
**MUS 671 Seminar in Musicology**  
1 hr.  
A continuation of MUS 670.

**MUS 677 Contemporary Music**  
2 hrs.  
A survey of trends in European music and music of the Americas from about 1910 to the present day.

**MUS 679 Composers**  
2 hrs.  
An investigation of the life and works of a significant composer. The particular composer selected for study during a given semester will be indicated in the Schedule of Classes. The course may be repeated for credit when dealing with a different composer.

**MUS 680 Seminar in Music Therapy**  
2 hrs.  
A course designed to permit the student to explore selected areas of music therapy, i.e., therapeutic techniques, evaluation procedures, or role of music therapy in a variety of settings (hospital, school, community). A project is required, which will be subject to group analysis and discussion. The course may be repeated for credit.

**MUS 681 Research in Musical Behavior**  
2 hrs.  
Development and employment of research methods and techniques to the psychology of music and/or music education. Students enrolled in this course will be responsible for an experimental research project which, in the case of music education students, will satisfy the "terminal project" requirement (MUS 691) or, in the case of music therapy students, will provide the data basis for the required MUS 700, Master's Thesis. When this course is the culminating project for the master's degree, an oral examination on the project and related areas is an integral part of the requirements. Prerequisite: MUS 610 or ED 601.

**MUS 689 Music Teaching Practicum**  
2 hrs.  
A course for teaching assistants which provides for faculty instruction, observation, and supervision in the area of the teaching assignment. The course shall be taken during the first semester of appointment.

**MUS 690 Graduate Recital**  
2 hrs.  
Presentation of a full-length recital in the student's area of concentration (music performance or composition). When this course is the culminating project for the master's degree, an oral examination on the recital materials and related areas is an integral part of the requirement.

**MUS 691 Special Project in Music Education**  
2 hrs.  
A research project in the area of the teaching of music. The nature of the special project is to be determined in consultation with the Graduate Adviser and appropriate members of the graduate faculty. Projects must be approved prior to registration. When this course is the culminating project for the master's degree, an oral examination on the project and related areas is an integral part of the requirements. May be repeated for credit.

**Private Music Study—Open to Graduate Students Only**  
MUS 500 Applied Music  
1-2 hrs. ($7)  
Graduate students who are not majoring in music performance and who do not meet graduate performance level may register for this course. May be repeated for a total of not more than three credit hours.

**MUS 600 Applied Music**  
1-4 hrs. ($7)  
Qualified graduate students may study in applied music for a total of four semester hours per semester in the major performance area. Three or more credits requires 60 minutes per week of instruction and necessary practice. May be repeated for credit. Includes private conducting study.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

**MUS 700 Master's Thesis**  
6 hrs.

**MUS 710 Independent Research**  
2-6 hrs.

**MUS 712 Professional Field Experience**  
2-12 hrs.
Blind Rehabilitation (BLRH)

Wiener, Chairperson; Associate Professors LaDuke, P. Ponchilia, Weessies; Assistant Professors Guth, S. Ponchilia, Leja.

Open to Upperclass and Graduate Students

BLRH 501 Visual Impairment and Blindness: An Overview
2 hrs.

The purpose of this course is to provide basic information to graduate students and workers in health and human service professions so that they will be able to work more effectively with blind individuals. It is also intended for undergraduate students who may be interested in entering a career in blind rehabilitation and would like to further explore their interest. Tests and assignments will be different for the graduate and undergraduate students. The graduates will have additional readings and will be expected to conceptualize the relationship between their discipline and blindness services. An overview of visual impairment will be provided with both theoretical and practical components.

BLRH 584 Computer Technology for Visually Impaired Persons
2 hrs.

This course is designed to introduce the student to computer technology, as it relates to visually impaired persons. Students will learn the uses, parts, and operating commands of common adaptive computers, as well as the software used with them. In addition, the major adaptive forms of output including speech, braille and large print, will be investigated. Experimental aspects will be stressed. Students planning to enter this course should have the ability to touch type. Prerequisites: Computer literacy or instructor permission.

BLRH 587 Low Vision Evaluation and Training
1 hr.

Simulation of common visual impairments are experienced. Evaluation of visual function and training in the use of low vision aids to enhance visual efficiency through environmental manipulation—a hands-on approach. This course is to be part of core program for Orientation and Mobility and Rehabilitation Teaching degree students.

BLRH 588 The Dynamics of Blindness and Rehabilitation
2 hrs.

This course presents an overview of blindness and the blindness service delivery systems. The social, psychological, educational, recreational, and vocational effects on blind and on visually impaired adults are emphasized.

BLRH 589 Inter-Professional Seminar Regarding Blind Multi-Handicapped Persons
1 hr.

This course presents an interdisciplinary approach to the study of multi-handicapping conditions in which blindness is a common denominator.

BLRH 590 Physiology and Function of the Eye
2 hrs.

The anatomy, structure, and function of the eye, along with various eye diseases and malfunctions, are stressed in this course. The student is familiarized with various eye conditions, and their relationship to rehabilitation practice is emphasized.

BLRH 591 Braille and Other Communication Methods
2 hrs.

This course is designed to teach the braille literary code as it applies to Rehabilitation Teaching. Braille teaching methods are also presented.

BLRH 592 Education of the Blind and Partially Sighted
2 hrs.

This course provides an introduction to the ways in which blindness and visual impairment affect blind children, and an overview of the education systems serving them. History of education of visually handicapped children, the effects of a visual impairment on child development, educational assessment and planning and curriculum adaptation are explored.

BLRH 594 Principles of Orientation and Mobility
2-3 hrs.

This course covers an examination and application of the fundamental principles underlying the acquisition and interpretation of sensory information by severely visually impaired individuals.

BLRH 595 Introduction to Orientation and Mobility
4 hrs.

The content of this course relates to problems of non-visual orientation and mobility. Simulated experiences are provided which emphasize the sensory, conceptual, and performance levels needed for independent travel in a variety of environments.

BLRH 597 Introduction to Cletuentry
2 hrs.

This course deals with assessment and remediation of functional problems encountered by low vision persons. Emphasis is placed on optical, non-optical, and electronic aids which increase visual functioning. In addition, the nature and needs of low vision persons and the interprofessional nature of low vision services are stressed.

BLRH 598 Readings in Blind Rehabilitation
1-4 hrs.

This course is arranged on an individual basis to provide students an opportunity to pursue independently the study of special areas of interest in depth.

BLRH 599 Gerontology
2 hrs.

This course offers an overview of the demographic, economic, health, social and
psychological circumstances of the aging population in the United States, and the related service systems.

Open to Graduate Students Only

BLRH 601 Small "N" Research: Design and Analysis 3 hrs.
The purpose of this course is to provide students with a working knowledge of an experimental methodology for demonstrating control in social/behavioral research where more traditional experimental-control-group paradigms are not feasible or desirable. This approach is based on an experimental methodology for demonstrating control with single or small numbers of subjects which includes design, internal replication, measurement, reliability, and visual or statistical analysis.

BLRH 604 Issues in Independent Travel 1 hr.
This course is taken concurrently with Introduction to Orientation and Mobility. It presents theoretical content which facilitates effective teaching of independent travel skills to visually handicapped individuals. The topics of this course include development and use of spatial maps, use of the computer in mobility, conditions of travel, orientation to various environments, and types of guidance devices.

BLRH 605 Practice Issues in Orientation and Mobility 1 hr.
This course is taken concurrently with Practicum in Orientation and Mobility. It presents content essential for application of practice principles. The topics which are covered include ethical conduct, interviewing, empathic responding, teaching strategies, alternative learning theories, service delivery models, community agency resources, and certification.

BLRH 664 Principles of Rehabilitation Teaching 3 hrs.
This course is concerned with the development and the current status of rehabilitation teaching as an occupation, with particular emphasis upon the teaching methods and human interrelationships which are essential in instructing visually impaired adults in skills of independent living.

BLRH 690 Methods and Techniques of Teaching Braille and Other Areas of Communication. 2 hrs.
Adaptive communication methods used by visually handicapped persons and the techniques of teaching them are explored in this course. Specifically, braille, handwriting, listening and recording devices, typing, and computer technology are presented. This course also includes a supervised practical teaching experience with a visually handicapped person.

BLRH 691 Practicum in Rehabilitation Teaching 1 hr.
This course provides supervised teaching experiences with blind or visually impaired individuals in a variety of settings.

BLRH 695 Practicum in Orientation and Mobility 2 hrs.
This course provides supervised teaching experiences with blind or visually impaired individuals in a variety of settings.

BLRH 697 Clinical Practice in Low Vision 3 hrs.
The course will familiarize the student with current practice and resources in the administration of a comprehensive low vision service. Further, the course allows for a practicum to be taken in a low vision clinic where the student gains experience both in administration of the service, and in applied training methodologies with low vision clients. Prerequisites: BLRH 587 and 597.

BLRH 710 Independent Research 2-4 hrs.
This course requires the completion of a creditable research project related to blind rehabilitation, conducted with faculty guidance.

BLRH 712 Professional Field Experience 2-12 hrs.
This course requires a supervised internship experience in an organization that serves blind and visually impaired persons, during which the opportunity is provided for practical application of principles and methods in blind rehabilitation.

Health and Human Services (HHS)

HHS 511 The Health System and Its Environment 3 hrs.
This course provides a descriptive analysis of the organization of the health system. The student who participates can expect to gain an understanding of the structure of health services as well as the processes of operation of the service system, and the ways in which consumers make use of the system. The analysis focuses on the interplay of forces within the system as well as between the system and its environment.

HHS 512 Principles of Health Finance 3 hrs.
This course is an examination of the principles of finance as applied to health care management. The course will provide a basis for understanding the financial management function in a health care administration environment and on the use of financial information in health care management decision making. Prerequisite: ECON 517 or equivalent.

HHS 513 Special Studies in Health Care Organization and Delivery Variable
This course deals with intensive analysis of the organization, design, and delivery of health care services in specialized areas. The specialized areas cover long-term, mental health and mental retardation services, and group medical practice.

HHS 514 Basic Principles and Organization of Health Planning 3 hrs.
This course is an introduction to the principles and methods of planning in the health system. It includes a descriptive analysis of the significance of planning effective health care services, alternative planning frameworks, and technical approaches to the planning process. In addition the course surveys the history of planning in the health systems as well as the current structure arrangements for carrying out planning in the health arena both at the macro- and micro-levels.

HHS 515 Administrative Functions in the Health Care Setting 3 hrs.
This course focuses on the knowledge and skills necessary for the major administrative functions in health organizations. These include goal setting, decision making, personnel management, data processing, service design, and general principles of financial management.

HHS 530 Clinical Theory for Health and Human Services 1-4 hrs.
This course covers selected theories which form the foundation for health and human service practice in specialized areas. Students are expected to master the content as a basis for building foundation knowledge for clinical practice. Theory of environmental health, systems theory for the health setting, theories of substance abuse for nursing and medical practice, and community health theory are among the possible areas of study. The specific topics are announced with each semester offering. Prerequisite: Consent of instructor.

HHS 531 Introduction to Holistic Health Care 3 hrs.
The primary purpose of this course is to provide an introduction to the philosophies, theories, and concepts involved in holistic health care. It is meant to serve both as a general educational experience for persons wishing to become familiar with holism and as essential basic instruction for persons wishing to apply for admission to the graduate specialty program in Holistic Health Care. Prerequisite: Graduate status.

HHS 560 Clinical Practice in Selected Health and Human Service Areas 1-4 hrs.
This course covers variable topics in clinical health and human service practice. It is a skills development course which helps students to become proficient in specific techniques and procedures related to patient care in clinical service. Clinical applications of biofeedback, clinical practice in genetic counseling, the role of the health team in clinical practice, the patient and clinical laboratory services, basic clinical skills for the substance abuse setting, and community health education practice are among the possible areas of study. The specific areas are announced with each semester. Prerequisite: Consent of instructor.

HHS 561 Problem Solving in Health and Human Service Organizations 1-4 hrs.
This seminar covers variable topics relating to problem solving in health and human services. It is a skills development course which helps students to become proficient with theoretical constructs and specific procedures for application in the health and human services system. Technology for health planning, the health system and its environment, organization of health practice teams, and financial problem solving in the health agency are among the topics covered. The specific topics to be discussed are announced with each semester offering. Prerequisite: Consent of instructor.

HHS 570 Field Education 1-6 hrs.
This registration is designed to give the student a total learning experience during which the student can apply some of the knowledge and information obtained in the health and human services academic setting and further develop and refine his/her professional skills with the guidance and assistance of professionals currently working in the health and human service area. By permission of instructor.

HHS 598 Readings in Health and Human Services 1-4 hrs.
Individualized, independent study and reading under guidance of a faculty member. Initiative for planning topic for investigation and seeking the appropriate faculty member comes from the student, with consultation from the adviser. Prerequisite: Consent of instructor and Program Advisor.
HHS 650 Seminar in Holistic Methods, Part I
3 hrs.
The seminar is team taught and provides students with a broad overview of method which may be utilized in a holistic health care setting. Every one or two sessions a new faculty member representing a different sort of expertise or perspective will guide students through a different holistic method. The seminar provides a principal body of information and some personal experience in the methods which can be used therapeutically by a holistic health care practitioner regardless of the student’s principal disciplinary interest or training. Evaluation is by oral and written examinations. Prerequisite: HHS 531.

HHS 651 Seminar in Holistic Methods, Part II
3 hrs.
A continuation of HHS 650, providing an opportunity for exposure to additional holistic methods utilizing the same format and evaluation system as Part I of the seminar. Prerequisite: HHS 531.

HHS 662 Program Planning and Development in Gerontology
3 hrs.
This seminar in the gerontology graduate specialty program will focus on the process of program planning and development through meetings with national, state, and local funding agencies and meetings with service providers in various kinds of programs for older persons throughout the region. Prerequisite: Permission of Gerontology graduate specialty program adviser.

HHS 663 Ethical Issues in Human Service Professions
3 hrs.
This course provides knowledge about the contribution of ethics and moral values to the development of one’s professional competence. The course will cover ethical problems which exist at different levels of society: (a) in direct practice with clients and their families, (b) within human service agencies; and (c) state and national levels of socio-political policy debate. Consideration will be given to such issues as client rights and confidentiality, professional advocacy and liabilities, and distribution of scarce resources.

HHS 680 Multidisciplinary Seminar in Gerontology
3 hrs.
A multidisciplinary seminar in gerontology, drawing upon staff from various academic and professional departments on the campus as well as from practitioners in the community. Course work and readings will deal with various theoretical and practical aspects of gerontology including policy formulation and implementation with academic emphasis on the contributions of various academic fields to the understanding of aging.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

HHS 712 Professional Field Experience
2-12 hrs.

Open to Graduate Students Only

OT 530 Sensory Integration and the Child
3 hrs.
Study of theoretical principles and their application to evaluation and treatment of the child with sensory integrative dysfunction. Students will observe and participate in screening and evaluation of children, and they will design treatment plans for selected clients. Prerequisites: OT 335, 351, and 353, or OTR, RPT, or consent.

OT 597 Studies in Occupational Therapy
2-4 hrs.
Examines selected topics within the field of Occupational Therapy. Topics considered will vary from semester to semester. May be repeated for credit. Prerequisites: Advanced O.T. major or departmental permission.

Open to Graduate Students Only

OT 610 Professional Issues
3 hrs.
Current and emerging professional issues will be discussed. Students will take an active part in community decisions, the state, or national organizational and/or legislative processes related to the resolution of a specific issue. Students' potential for future professional leadership will be emphasized. Prerequisite: All required undergraduate course work except Fieldwork II (OT 453 may be taken concurrently).

OT 821 Introduction to Neurodevelopmental Treatment for Adults
3 hrs.
Foundations of neurophysiology and motor development are discussed. Opportunity is provided for application of neurodevelopmental theory, treatment principles and techniques to occupational therapy. Special attention is given to management problems of adults with hemiplegia. Prerequisites: OT 353, OT 453, OTR, or RPT; or consent of instructor.

OT 622 Application of Biofeedback in Occupational Therapy
3 hrs.
Basic principles of biofeedback and their application in occupational therapy. Students will design biofeedback programs for selected client problems. Prerequisite: OT 353, OT 453, OTR or RPT; or consent of instructor.

OT 633 Administration of Occupational Therapy
3 hrs.
This course utilizes the basic skills of administration (planning, organizing, directing, coordinating, and controlling) in the development of a model of practice for occupational therapy services. These services will be developed for an agency or institution that does not now offer occupational therapy services, or for an agency or institution whose occupational therapy services need to be expanded. In addition to the model of practice, the student will prepare a grant proposal that could be used to initiate funding for the model. Prerequisites: All required undergraduate course work except Fieldwork II (OT 453 may be taken concurrently).

OT 640 Theory in Occupational Therapy
3 hrs.
This course explores core concepts, models, and paradigms of the past, present, and future and their influence on education, research, administration, and practice of occupational therapy. Components of theory, formulation of theory, and the effect of theory development on occupational therapy will also be explored. Prerequisites: All required undergraduate course work except Fieldwork II (OT 453 may be taken concurrently).

OT 660 Research in Occupational Therapy
3 hrs.
The purpose of this course is to explore research in occupational therapy and related fields and develop each student’s research and writing skills as applied to occupational therapy. It will include review and critique of occupational therapy research, recognition and application of ethical practices, identification of researchable questions, principles of research design, participation in research and statistical analysis. Prerequisites: All required graduate course work except Fieldwork I and II.

Outlines for Graduate Students:

OT 661 Professional Issues
3 hrs.
This course explores topics relevant to new developments in environmental adaptations, treatment techniques, and/or innovations in the delivery of occupational therapy services. Prerequisites: All required undergraduate course work except Fieldwork II (OT 453 may be taken concurrently).

OT 697 Investigations in Occupational Therapy
1-3 hrs.
Independent study provided for the qualified occupational therapy student under the guidance of a departmental faculty member. Prerequisite: Consent of graduate coordinator and proposed faculty supervisor. May be repeated for credit.

Open to Graduate Students Only

OT 700 Master’s Thesis
6 hrs.
Prerequisite: OT 660

OT 710 Independent Research
2-6 hrs.
Prerequisite: OT 660

OT 712 Professional Field Experience
2-6 hrs.
Prerequisite: Consent

Social Work (SWRK)

Professors Flynn, Kramer, Lehnighner, McCaslin, Pawlik, Reid, Thompson, Winberg; Associate Professors Blakey, Cooney, Halseth, Lish, Mathews, Phillips, Reeser, Wertenb, Assistant Professors Gordon, Holmes, Jones, MacDonald, Morris.

Open to Graduate and Undergraduate Students

SWRK 512 Social Policy and Service Delivery in Selected Problem Areas
3 hrs.
Intensive study in selected fields of service, specializations, and social problem areas. Attention is focused on learning about the major social policy issues associated with the service or problem area. Specific topics will be announced each semester. Prerequisite: Senior or graduate student standing.

SWRK 513 Social Welfare and the Law
3 hrs.
The legal bases of organized social welfare and social work practice are examined through the study of selected examples of social legislation and judicial decisions, the legislative process, development of administrative regulations, and court organization. Illustrative case studies are used to demonstrate how social workers can manage within the restrictions and opportunities presented by legal institutions and practices in social and individual case situations. Prerequisite: Consent of instructor.
SWRK 562 Community Organization in Urban Areas
3 hrs.
Social welfare planning and social action methods are studied as approaches for preventing and resolving aspects of social problems. Emphasis is placed on the organizing of neighborhood and consumer groups in order to increase social interaction and influence social conditions. Prerequisite: Consent of instructor.

SWRK 563 Social Work Concepts in Rehabilitation
3 hrs.
Application of social work problem solving concepts to social psychological problems in the broad field of physical and mental rehabilitation. Both individualized services and programmatic implications are given consideration. Open to M.S.W. students and students from related professional departments, with consent of instructor.

SWRK 566 Social Services in Schools
3 hrs.
The role of the Social Worker in elementary and secondary schools and the necessary adaptations in the changes taking place in the educational scene are examined and evaluated. Problem solving approaches are given special attention within the structure and organization of the schools and their relationships with the surrounding community. The specific contributions of a school Social Worker as a helping person to the pupils, the school staff, and the homes by various interventive means are explored. Prerequisite: Consent of instructor.

SWRK 567 Institutional Correctional Social Work
3 hrs.
Social work treatment within a variety of institutional correctional settings. Prerequisite: Consent of instructor.

SWRK 568 Social Work in Non-Institutional Correctional Settings
3 hrs.
Social work treatment with probationers, parolees, and other non-institutional services. Prerequisite: Consent of instructor.

SWRK 569 Juvenile Justice
3 hrs.
The course deals with the processing of offenders through the juvenile justice system with concentration on the philosophy and functioning of juvenile courts. Personal and organizational factors that are associated with or that determine offenders' passage through the juvenile courts are examined. Prerequisite: Consent of instructor.

SWRK 572 Community Agency Resources
2 hrs.
A study of community agencies and resources for those concerned with family and personal problems. Emphasis is placed upon the availability of these resources and their effective use by business and industry, speech therapist, guidance counselors, teachers, etc. May not be used as credit toward the M.S.W. degree.

Open to Graduate Students Only
SWRK 610 Foundations of Social Welfare Policy
3 hrs.
This is the first course in the graduate program offered in the social welfare policy sequence of courses. Its general purpose is to introduce the subject area of social welfare policy as a central concern of social work. The goals of the course are to identify evolving socio-cultural bases of social welfare in America, to gain understanding of the substance of particular social policy areas, to learn to approach the study of social welfare policy within the context of analytic frameworks. While SWRK 610 places primary focus on the content of social welfare policy, other policy courses focus on specific areas on the development of policy practice skills.

SWRK 612 Social Policy and Service Delivery in Selected Problem Areas
3 hrs.
Intensive study of problem solving frameworks for the solution and management of selected social problems. Attention is focused on the roles of policy analysis and formulation, and service delivery in the problem-solving process. Specific topic will be announced each semester. May be repeated for credit. Prerequisite: Consent of instructor.

SWRK 630 Social Change and Community Analysis
3 hrs.
Social workers have a responsibility to promote social justice and to strive to abolish injustice. The course identifies and explores historical, theoretical, and ideological perspectives on social change issues. Social change is studied by analyzing the community at the local, national and international level and by exploring strategies for change at each level. Emphasis is placed on racism, sexism, and classism, and on social movements to alleviate these problems.

SWRK 631 Individual Growth and Development
3 hrs.
This course provides students with a framework for understanding the development of the individual across the life span. The theoretical approach taken is a bio-psycho-social view, with attention paid to object relations theory, cognitive theory, and social role concepts as they affect social work assessment, planning and interventions. Human growth and development are viewed in terms of epigenetic stages, each of which entails specific tasks and skills. Attention is paid to the implications of such aspects of human diversity as race, ethnicity, gender, sexual orientation, family structure and socioeconomic status. Prerequisite: Consent of instructor.

SWRK 633 Implications of Race and Culture in Social Work Practice
3 hrs.
This course will explore the social, psychological and structural implications of race and culture for social work practice. In order to relate social work practice to individuals and groups of different ethnic, cultural, and philosophical backgrounds, it is essential to: 1) gain knowledge about those differences; 2) understand our individual and collective reactions to those differences; and 3) discover ways in which those differences can be bridged within the context of social work practice.

SWRK 636 Theory and Practice of Group Treatment
3 hrs.
Focus of the seminar is on the theory and practice of social group work in clinical settings. Consideration is given to such issues as group dynamics, therapeutic factors, leadership, composition, direct and indirect intervention, and activities in social treatment. Prerequisite: SWRK 662.

SWRK 638 Psychopathology for Social Work Practice
3 hrs.
This course provides students with knowledge of psychopathology as an aspect of human functioning. Theoretical factors are identified. Primary focus is on the interaction between physiological, developmental, emotional, and social aspects of adolescent and child psychopathology from both descriptive and psychodynamic points of view. General implications for social work intervention, ethical and value issues, and relevant research will receive some consideration. Primary emphasis of particular course sections may vary between adults and children and adolescents. Prerequisite: SWRK 631 or consent of instructor.

SWRK 640 Research and Evaluation Methods in Social Work
3 hrs.
This course is designed to increase student knowledge of research and evaluation as a tool for social work practice. Students will acquire the basic skills and knowledge to utilize existing social research and evaluation for practice-related decision making as well as the capacity to carry out systematic methods of inquiry in practice. The implementation of these skills will enhance social service delivery and contribute to the knowledge base of the profession.

SWRK 643 Leadership and Management in Human Services
3 hrs.
This course provides students with knowledge, skills, and attitudes to assist them in building leadership practices with which to develop, support, and maintain effective service delivery in human service agencies. The course focuses on leadership styles; power, motivation, and conflict; task group skills; supervision; women and minorities in management; and values and ethics in leading human service organizations. Prerequisite: Enrollment in School of Social Work or consent of instructor.

SWRK 645 Information Systems, Budgeting and Computer Applications in Human Service Organizations
3 hrs.
The course is intended to introduce students to the concepts and skills of PERT, Flow Charting, Management Information Systems (MIS), budgeting and the application of computers in carrying out each of these activities within human service agencies. It is also intended to serve human service practitioners who are engaged in policy, planning, and administrative activities.

SWRK 661 Social Work Practice: Individuals and Families
3 hrs.
The course focuses on foundation level knowledge and skills necessary to help individuals and families. This includes engagement, assessment, contracting, problem-solving, and evaluation with attention to social work values, theoretical knowledge and practice conditions. Problem-solving in a bio-psycho-social framework and facilitation of client coping, competency and empowerment undergird this course. Prerequisite: SWRK 661 is taken concurrently with SWRK 671. Field Education in Social Work Practice, to facilitate interaction between field and classroom learning.

SWRK 662 Social Work Practice: Groups and Organizations
3 hrs.
The course focuses on knowledge skills related to social work practice with groups and organizations. Attention is paid to interpersonal, intrapersonal, and organizational levels of intervention. Practice skills in working with groups and organizations are developed. Prerequisite: SWRK 661; concurrent enrollment in SWRK 672.

SWRK 663 Seminar in Substance Abuse I
3 hrs.
An interdisciplinary seminar designed to reflect broadly conceived intervention strategies ranging from primary prevention to rehabilitation of the addict. The basic training in the principles of intervention and clinical practice will continue to be taught within the
SWRK 661 Field Education in Social Work Practice I 3 hrs.
This is the first of two field practice courses in the Foundation of the MSW curriculum. It consists of two units: 1) eight classroom sessions on communications skills; and 2) supervised field experience in social work agency. Graded on a Credit/No Credit basis. Prerequisite: Concurrent enrollment in SWRK 661.

SWRK 662 Field Education in Social Work Practice II 3 hrs.
This is the second of two field practice courses in the Foundation of the MSW curriculum. It consists of two units: 1) supervised field experience in a social work agency; and 2) two fieldwork seminars. Graded on a Credit/No Credit basis. Prerequisites: SWRK 661, SWRK 671, and concurrent enrollment in 662.

SWRK 676 Field Education in Social Work Practice 3 hrs.
Placement will be in an agency unit offering direct service experiences with some combination of individuals, families, and groups and additional experiences consistent with the student’s learning needs and agency service plans. Campus or field-based seminars may supplement the field experiences. Prerequisites: SWRK 666, and concurrent enrollment in SWRK 636 and/or SWRK 668 or consent of the instructor. Graded on a Credit/No Credit basis.

SWRK 677 Field Education in Social Planning and Administration 3 hrs.
Students are provided with direct experience in dealing with problems of community planning for human welfare, and in the administration of service delivery systems. Specialized field placement in social welfare organizations or special programs are arranged in accordance with student interests and abilities. Graded on a Credit/No Credit basis. Prerequisite: SWRK 666 or consent of instructor, concurrent with SWRK 667.

SWRK 678 Advanced Field Education in Social Treatment 3 hrs.
Continuation of SWRK 676. Students will remain in field placement and direct service experiences and other activities will continue. Campus or field-based seminars may supplement the field experience. Prerequisite: SWRK 676 and concurrent enrollment in SWRK 691, 692, 693, 694, or 695, or consent of the instructor. Graded on a Credit/No Credit basis.

SWRK 686 Applied Social Work Research 3 or 6 hrs.
The course provides students with an experience in the conceptualization of a research problem, the design of a methodology, the collection and analysis of data, and the development of a report of the findings. The research is designed to further the development of research and practice competence and to integrate learning from foundation and other courses. Graded on a Credit/No Credit basis. Prerequisite: SWRK 640.

SWRK 691 Advanced Social Treatment: At-Risk Individuals 3 hrs.
This course is designed to provide students in the Social Treatment concentration with an opportunity to deepen their knowledge of advanced clinical social work practice theory with its application to work with at-risk individuals. Special attention will be paid to interventions designed to promote the process of ego organization, or to repair malformations in development, based on an assessment of overall ego functioning in the social context. This course builds on SWRK 666, Seminar in Individual Treatment and SWRK 638, Psychopathology for Social Work Practice. It is designed to meet the requirements for the advanced practice course in Social Treatment. Prerequisites: SWRK 638, 666.

SWRK 692 Advanced Social Treatment: Children 3 hrs.
This course is designed to provide students in the Social Treatment concentration with an opportunity to deepen their knowledge of advanced clinical social work practice with children and their families in a variety of practice settings, e.g., child guidance, mental health, child welfare, school, corrections, and medical settings. This course builds on the content of SWRK 666, Seminar in Individual Treatment; SWRK 668, Social Treatment with Families; and SWRK 638, Psychopathology for Social Work Practice. It is designed to meet the requirement for the advanced practice course in Social Treatment. Prerequisites: SWRK 638, 666, 668.

SWRK 693 Advanced Social Treatment: Groups 3 hrs.
This is an advanced course for Social Treatment students that prepares them for therapeutic intervention in group treatment. The course will examine interpersonal relations, transference, counter-transference, communication, group processes, problem solving, authority and leadership in groups, and group development from both an affective and cognitive perspective. The course (approximately forty-five hours) will be experiential in nature with the student participating as a member of a small, face-to-face group. The course builds on the content of SWRK 636, Social Treatment with Groups. Prerequisites: SWRK 636, 666.

SWRK 694 Advanced Social Treatment: Industry 3 hrs.
Study of advanced treatment strategies and interventions to help individuals with vulnerabilities in self-esteem development, early structure formation, and ego development as manifested in the work context. Clinical strategies directed to client internal organization and identity formation will be examined. Prerequisites: SWRK 631, SWRK 666.
Communication is studied with reference to the scientific method, principles of measurement, instrumentation, and experimental techniques. Direct supervisory skills are covered in detail. Student participation is essential. Prerequisites: SWRK 661 or consent of instructor.

Special Seminars and Projects

Open to Upperclass and Graduate Students

SWRK 564 Special Studies in Social Welfare Practice
1-4 hrs.
Study of selected topics related to the theory and practice of social welfare activities and endeavors. Focus will be on roles of human service workers and methodologies utilized in these roles in a range of social welfare areas. Specific topics will be announced. Prerequisite: Consent of instructor.

SWRK 597 Teaching Apprenticeship in Selected Social Work Curriculum Areas
1-4 hrs.
The course focuses on the development of educational skills for social workers through faculty-directed participation in teaching activities in a selected social work course. Specific learning objectives and expectations for apprentices are arranged with participating faculty. This course may be taken a second time (1-4 credits, or a maximum of 8 total toward degree) by a student who wishes to increase teaching skills through applied practice in another social work area. Prerequisite: Consent of instructor.

SWRK 598 Readings in Social Welfare and Social Work
1-4 hrs.
Individual study in social welfare and social work topics which are not covered in the University’s graduate course offerings. Prerequisite: Consent of major adviser and proposed instructor.

Open to Graduate Students Only—Please refer to The Graduate College section for course description.

SWRK 710 Independent Research
2-6 hrs.

Speech Pathology and Audiology (SPPA)

Erickson, Chairperson; Professors Bate, Lohr; Associate Professors Boersma, Clark, Hanley, Hiltbrand, Lawton, Nelson, Oaks, Seelig, Sparks.

Open to Upperclass and Graduate Students

SPPA 500 Scientific Methods in Speech, Language, and Hearing
2 hrs.
Research in normal and disordered communication is studied with reference to the scientific method, principles of measurement, instrumentation, and experimental techniques. The course requires that either a laboratory or a clinical research proposal be formulated by each student.

SPPA 550 Advanced Speech and Hearing Science
2 hrs.
Theories of speech production, reception, and perception are considered in this course from the point of view of experimental phonetics and experimental audiology. Prerequisites: SPPA 204, 205, 206.

SPPA 551 Neuropathologies of Speech
2 hrs.
This course is concerned with selected communication disorders associated with neuropathologies. Prerequisites: SPPA 200, 203, 205.

SPPA 552 Communication Problems of the Aged
3 hrs.
This course acquaints the student with receptive and expressive communication problems common to older adults. Emphasis is on the clinical management of organic speech disorders and impaired auditory functions associated with aging.

SPPA 554 Speech and Hearing Therapy in the Schools
2 hrs.
Study of clinical work with speech and hearing handicapped children in the school setting. Prerequisite: SPPA 351, 353, 354, 358.

SPPA 555 Hearing Measurement
2 hrs.
This course acquaints the student with principles, theories, and methods of hearing measurement which provide the basis for clinical audiometric procedures.

SPPA 556 Rehabilitative Audiology
3 hrs.
Orientation to the clinical management of communication problems associated with auditory impairment.

SPPA 557 Educational Audiology
3 hrs.
This course deals with the educational, psychological, and vocational needs of the hearing impaired child and the parameters of educational programming.

SPPA 595 Oral Language Development and Dysfunction
2 hrs.
This course provides the student preparing to be a classroom or special teacher with information about the nature of oral language, its development, conditions associated with dysfunction, and the principles and methods of treatment for children with specific speech or language disorders. Not applicable toward the master’s degree in Speech Pathology and Audiology.

SPPA 597 Topics in Speech Pathology and Audiology
1-4 hrs.
Selected topics in speech pathology and audiology are systematically explored through critical analyses of literature and through individual study projects. Pedagogical and clinical topics, articulation disorders, language disorders, cleft palate, and stuttering are among the possible areas of study. Topics vary from semester to semester and are announced in advance. May be repeated.

SPPA 610 Diagnostic Audiology
4 hrs.
An advanced course dealing with batteries of audiological techniques used for assessing rehabilitative needs and for otologic diagnosis.

SPPA 611 Hearing Aids
3 hrs.
Components, characteristics, evaluation, selection, use, and maintenance of hearing aids are studied in detail.

SPPA 612 Pediatric Audiology
3 hrs.
This course deals with the identification, measurement, and management of hearing impairment in infants and young children.

SPPA 613 Industrial and Public Health Audiology
2 hrs.
A study of hearing conservation programs in industry, including noise measurement, damage-risk criteria, hearing measurement, and medico-legal problems; noise in communities; noise as a public health hazard; and hearing screening and deafness prevention programs.

SPPA 650 Seminar in Speech Pathology
1-4 hrs.
Selected topics in speech pathology are systematically explored through critical analyses of literature and through individual study projects. Pedagogical and clinical topics, articulation disorders, language disorders, cleft palate, and stuttering are among the possible areas of study. Topics vary from semester to semester and are announced in advance. May be repeated.

SPPA 651 Seminar in Speech and Hearing Science
2-4 hrs.
Selected topics in speech and hearing science are systematically explored through critical analyses of literature and through individual study projects. Instrumentation, procedures, and techniques employed in perceptual, physical and physiological analyses of normal speech and hearing are among the areas considered. Topics vary from semester to semester and are announced in advance. May be repeated.

SPPA 652 Seminar in Audiology
2-4 hrs.
Selected topics in audiology are systematically explored through critical analyses of literature and through individual study projects. Pedagogical and clinical topics, articulation disorders, residual hearing, and aural rehabilitation are among the possible areas of study. Topics vary from semester to semester and are announced in advance. May be repeated.

SPPA 653 Diagnosis and Appraisal I: Principles
3 hrs.
This course provides theoretical bases for the evaluation of speech, hearing, and language disorders.

SPPA 654 Diagnosis and Appraisal II: Procedures
2 hrs.
In this course the student gains experience with instrumentation, procedures, and techniques designed for the appraisal and diagnosis of communication disorders. One hour per week of participation in out-patient diagnostic examinations is required.

SPPA 655 Diagnosis and Appraisal III: Practicum
2 hrs.
In this registration students receive extensive experience in diagnostic examinations.
SPPA 657 Disordered Language Development
3 hrs.
Procedures and techniques for the identification, diagnosis, and clinical management of developmental disorders of language are explored intensively in this course.

SPPA 658 Theoretical Bases for Therapy
3 hrs.
In this course disorders of communication are examined in terms of servo-system, learning theory, and personality theory.

SPPA 659 Principles of Professional Practice
2 hrs.
Current professional and philosophical questions are studied with reference to the history of the development of the profession of speech pathology and audiology.

SPPA 660 Voice Disorders
3 hrs.
Organic and functional disorders of laryngeal and resonator origin are studied in depth.

SPPA 661 Articulation Disorders
2 hrs.
This course considers in detail the nature and treatment of functional misarticulations and of misarticulations associated with cleft palate.

SPPA 662 Stuttering
3 hrs.
Theories and therapies applicable to the understanding and clinical management of stuttering are studied in depth.

SPPA 663 Aphasia in Adults
3 hrs.
This course deals comprehensively with the identification and treatment of communication problems in the adult aphasic individual.

SPPA 670 Clinical Practicum
1-4 hrs.
Supervised clinical experience in the evaluation and/ or management of speech, language and/or hearing disorders.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

SPPA 700 Master's Thesis
6 hrs.

SPPA 710 Independent Research
2-6 hrs.

SPPA 712 Professional Field Experience
2-12 hrs.
Graduate Studies (GRAD)
Open to Graduate Students Only
A graduate student should register for 700-level courses in his or her instructor's department. If the appropriate 700-level course is not offered by that department, the student should seek permission to register for it as a Graduate College (GRAD) course. All 700-level courses are graded on a Credit/No Credit basis.

PLEASE NOTE: Students conducting research in any 700-level course that involves human or animal subjects must have prior approval of the research proposal by the appropriate University board, thus assuring compliance with the regulations for the protection of such subjects. For more information, call Research and Sponsored Programs, 387-3570.

GRAD 700 Master's Thesis
6 hrs.
Candidates for the master's degree may elect to write a thesis in their field of specialization under the supervision of a thesis committee. A student may elect this course in units of from two to six hours; however, the election must be made in no more than two units and within a calendar year. A Permission to Elect form (available in all departments) must be submitted to The Graduate College prior to registration. This form must be signed by: 1) the thesis adviser; 2) the department chairperson; 3) the Dissertation Assistant in The Graduate College. Graded on a Credit/No Credit basis.

GRAD 710 Independent Research
2-6 hrs.
Designed for highly qualified advanced graduate students, or small groups, who wish to pursue individual studies or projects under the direction of a member of the Graduate Faculty. A Permission to Elect form, signed by the student's graduate adviser and the faculty supervisor, must be submitted to The Graduate College prior to registration. Graded on a Credit/No Credit basis.

GRAD 712 Professional Field Experience
2-12 hrs.
Designed for superior graduate students who wish to pursue internships or apprenticeships in off-campus activities in industries or institutions. A Permission to Elect form, signed by the student's graduate adviser and the faculty supervisor, must be submitted to The Graduate College prior to registration. Graded on a Credit/No Credit basis.

GRAD 720 Specialist Project
6 hrs.
The Specialist Project is designed for the units offering the specialist degree. A student may elect this course in units of from two to six hours; however, the election must be made in no more than two units and within a calendar year. A Permission to Elect form (available in all departments) must be submitted to The Graduate College prior to registration. This form must be signed by: 1) the project adviser; 2) the department chairperson; 3) the Dissertation Assistant in The Graduate College. Graded on a Credit/No Credit basis.

GRAD 725 Doctoral Research Seminar
2-6 hrs.
Units offering doctoral programs may use this number to designate their research seminars. Such seminars may be taken more than once by the student. Permission of instructor is required. Graded on a Credit/No Credit basis.

GRAD 730 Doctoral Dissertation
15 hrs.
The doctoral dissertation is required in all doctoral programs and must reflect an appropriate creative effort on the part of the student. A Permission to Elect form (available in all departments) must be submitted to The Graduate College prior to registration. This form must be signed by: 1) the committee chairperson; 2) the department chairperson; 3) the Dissertation Assistant in The Graduate College. Registration for 730 will be in increments of 3 hours. Graded on a Credit/No Credit basis.

GRAD 732 Doctoral Clinical Internship
1-4 hrs.
Designed for doctoral students pursuing a program-required 2,000 clock-hour internship at an approved professional site. Enrollment is approved for students with the prerequisite academic preparation by the department committee supervising the area of the student's training. Permission of department is required. Graded on a Credit/No Credit basis.

GRAD 735 Graduate Research
2-10 hrs.
Units offering doctoral programs may use this number to designate research projects for their doctoral students. Such projects may be taken more than once by the student. Permission of instructor is required. Graded on a Credit/No Credit basis.
Section VI
The Graduate Faculty

Members
Abrahamson, Jerry, 1985, Assistant Professor of Art
B.A., California (Santa Barbara); M.A.; Ph.D., New York
Abusalyman, Eltayeb S., 1987, Assistant Professor of Electrical Engineering
B.S.E.E., Khartoom; M.S.E.E., Oregon State; Ph.D. (C.E.), Arizona
Ake, Yousef, 1958, Professor and Chair, Department of Mathematics and Statistics
B.S., M.S., Ph.D., Michigan State
Aleali, Raymond E., 1989, Associate Professor of Psychology
B.A., California State University, Northridge; M.A.; Ph.D., Western Michigan
Alie, Raymond E., 1988, Associate Professor of Management
B.A., M.A. College of William and Mary; Ed.D., Western Michigan
Anderson, Art E., 1986, Assistant Professor of Educational Leadership and Professional Development
A.B.Ed., Michigan; M.A.; Ph.D., Michigan State
Anderson, DeWayne, 1987, Assistant Professor of Education and Professional Development
B.A., Concordia College; M.A.T.; Ph.D., Michigan State
Apfel, William C., 1965, Professor of Music
B.S., B.M. Teachers of Indiana (Pa.); M.Mus., Indiana University
Aravamuthan, Ra|a G., 1982, Assistant Professor ofMarketing
B.S., Michigan State; Ph.D., John Hopkins University
Asher, Eston J., Jr., 1985, Associate Professor of Finance and Commercial Law
B.A., San Francisco State; Ph.D., California (Santa Barbara)
Baskerville, Walden, Jr., 1978, Associate Professor, Counseling Center
B.A., William Penn; M.A.; Ed.D., Western Michigan
Batch, C. Nicholas, 1972, Associate Professor of Finance and Commercial Law
B.A., San Francisco State; Ph.D., California (Santa Barbara)
Batch, C. Nicholas, 1972, Associate Professor of Finance and Commercial Law
B.A., William Penn; M.A.; Ed.D., Western Michigan
Wayne State
Bate, Harold L., 1964, Professor of Speech Pathology and Audiology
B.A., Butler, M.A.; Florida; Ph.D., Wisconsin
Batz, Henry H., 1975, Professor of Management
B.S.E.E., Princeton; M.S.E.E., M.B.A. Ph.D., Michigan State
Beach, George T., 1965, Professor of History
B.A., Michi:gan State; Ph.D., Johns Hopkins
Belonax, Joseph J., 1978, Associate Professor of Marketing
B.S., B.M.A., Northern Illinois; Ph.D., Nebraska
Belson, Beverley A., 1979, Professor of Counselor Education and Counseling Psychology and University Counseling
B.A., Northern Iowa; M.A., Syracuse; Ph.D., Michigan State
Bennes, Max E., 1964, Associate Professor of Consumer Resources and Technology
B.S., M.S., Ed.D., Michigan State
Benson, John William, 1974, Associate Professor of Spanish
B.A. Williamette; M.A.; Ph.D., Wisconsin
Berkley, Debra, 1985, Assistant Professor of Health, Physical Education, and Recreation
B.S., Slippery Rock State College; M.Ed.; Ed.D., West Virginia
Bent, Donald C., 1962, Professor of Chemistry
B.S., Ph.D., Ohio State
Bershad, Margaret M., 1990, Assistant Professor of Community Health Services
B.S., M.A., Western Michigan
Bertsch, Robert B., 1956, Professor of Physics
B.S., M.A.; Ph.D., Duke University
Betz, Robert L., 1961, Professor of Counselor Education and Counseling Psychology
B.A., Albion, M.S.; Illinois; Ph.D., Michigan State
Beving, Leonard J., 1970, Professor of Biological Sciences
B.A., M.A.; Ph.D., California (Berkeley)
Bergen, Gary E., 1978, Associate Professor of Spanish
B.A., Franklin and Marshall; M.A.; Ph.D., Pittsburgh
Blakey, Thomas J., 1979, Associate Professor of Social Work
B.A., Notre Dame; M.S.W.; M.A.; Ph.D., Michigan
Blaikie, Robert L., 1968, Associate Professor of Mathematics
B.A., Kutztown State College of Pennsylvania; M.A.; Ph.D., Pennsylvania State
Boats, Alfred, 1985, Associate Professor of Computer Science
B.S., Western Michigan; M.S.; Ph.D., Michigan State
Boersma, Susan K., 1974, Associate Professor of Speech Pathology and Audiology
B.S., Northern Illinois; M.A., Michigan State
Boothroyd, Gregory W., 1970, Professor, Counseling Center
B.A., M.A., Western Michigan; Ph.D. Michigan
Bosco, James J., 1965, Professor of Education and Professional Development
B.Ed., Duquesne; M.Ed., Pittsburgh; Ed.D., Columbia
Boughner, Robert, 1967, Associate Professor of Industrial Engineering
B.S.I.E., Wayne State; M.B.A., Western Michigan; P.E.; CMfgt
Bozeman, Joel, 1975, Professor of Business Information Systems
B.A., M.A.; Ph.D., University of Illinois
Bredfield, Lelia, 1983, Assistant Professor, Counseling Center
B.S., M.A., Ph.D., Cornell
Bruner, Bernice, 1971, Professor of Business Information Systems
B.A., College of St. Francis; M.S.; Ed.D., Northern Illinois
Brashear, Robert M., 1969, Assistant Professor of Education and Professional Development
B.S., M.S., Thomas Edison State Junior College; Southwestern Seminary; M.Ed., Texas Christian; Ph.D., Texas
Brewer, Milton J., 1960, Professor of Sociology
B.A., Harvard; Ph.D., Columbia
Breidbach, Ernst, A., 1957, Professor of History
B.A., M.A.; University of Gottingen; Dr. rer. oec. Wirtschaftsuniversitat, Vienna
Bretherer, Date, 1977, Associate Professor of Psychology
B.A., Kansas; A.M.; Harvard; Ph.D., Michigan
Breuer, Richard, 1959, Professor of Biological Sciences
B.A., Southern Illinois; M.S.; Ph.D., Illinois
Brinkerhoff, Robert, 1978, Professor of Educational Leadership
B.A.; Colgate; M.A.; Ed.D., Virginia
Brogowicz, Andrew Allen, 1979, Associate Professor of Marketing
B.S.B.A., M.B.A.; Wayne State; Ph.D., Michigan State
Brown, Alan S., 1955, Professor of History
B.A., M.A.; Ph.D., Michigan
Brown, Donald J., 1960, Professor of Chemistry
B.A., Ph.D., Syracuse
Browning, Christine A., 1988, Assistant Professor of Mathematics
B.S.; M.A.; Ph.D., Ohio State
Buckley, Joseph T., 1970, Professor of Mathematics
B.S., Boston College; Ph.D., Indiana
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B.S.B.A., Washington; A.M.; Michigan; Ed.D., Indiana
Bunda, Mary Anne, 1974, Professor of Educational Leadership
B.A., Ed., Loyola University of Chicago; Ph.D., University of Illinois at Urbana
Burke, Richard T., 1964, Associate Professor of History and Vice President for Regional Education and Economic Development
B.A., M.A., Boston; Ph.D., Northwestern
Burnette, Michael, 1989, Assistant Professor of Psychology
B.A., Clemson; M.S.; Ph.D., Georgia
Burnie, David W., 1987, Assistant Professor of Finance and Commercial Law
B.A., Kellogg; M.B.A.; Windsor, Ph.D., Syracuse
Burns, James W., 1968, Professor of Education and Professional Development
B.S., Central Connecticut; M.Ed.; Ed.D., Pennsylvania State
Bush, Mary Ann, 1974, Associate Professor of Occupational Therapy
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Associate Members

Beachler, Cindy R., 1990, Adjunct Instructor of Speech Pathology and Audiology
B.S., M.S., Purdue

Campau, John, 1987, Director of Western Sound Studio, School of Music
B. M. Berklee

Carlson, Andrew R., 1990, Adjunct Associate Professor of History
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Chapel, Joe R., 1965, Associate Professor of Education and Professional Development
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Chydziale, Patricia, 1996, Associate Professor of Health, Physical Education and Recreation
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Dannion, Charles R., 1984, Adjunct Instructor in Consumer Resources and Technology
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Forrest, J. Patrick, 1992, Assistant Professor of Accountancy
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Morris, William C., 1965, Associate Professor of Accountancy

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Murphy, John M., 1962, Assistant Professor of English
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Neubig, Robert D., 1967, Professor of Accountancy
B.S., M.B.A., Ph.D., Ohio State; C.P.A., States of New York and Ohio

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B.A., B.S., Massachusetts (Amherst); M.A., Ph.D., Arizona

Puleaski, Richard G., 1966, Associate Professor of Philosophy
B.A., Holst University

Rakovlita, Richard F., 1957, Associate Professor of Health, Physical Education and Recreation
B.S., Illinois; M.A., Western Michigan

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Schlack, Lawrence B., 1981, Adjunct Associate Professor of Educational Leadership
B.A. Michigan State; M.A., Ph.D., Michigan

Schubert, Richard C., 1989, Associate Professor of Mechanical Engineering
B.S.M.E., Illinois; M.S.M.E., Wayne State

Scovil, Mary, 1983, Assistant Professor of Music
B.M., Western Michigan; M.M., Michigan State

Sechler, Robert E., 1959, Associate Professor of Mathematics
B.A., Albion; M.S., Michigan State

Sheppard, Nick T., 1987, Adjunct Associate Professor of Speech Pathology and Audiology
B.S., Kentucky; M.S., Massachusetts Institute of Technology; Ph.D., Iowa

Sheppard, John D., 1965, Associate Professor of Accountancy
B.S., M.A., Ph.D., Missouri

Smith, Vernon K., 1988, Adjunct Associate Professor of Economics
B.A., Anderson College; M.A., Ph.D., Michigan State

Smith, William K., 1967, Assistant Professor of Library and Information Science and Assistant Director of Archives and Regional History Collections
B.A., M.A. Sp.A., Western Michigan

Spiegelman, Robert G., 1984, Adjunct Professor of Economics
B.S. California (Berkeley); Ph.D., Columbia

Tocca, John E., 1990, Adjunct Assistant Professor of Speech and Pathology and Audiology
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Thorburn, Scott, 1989, Assistant Professor of Music
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Trent, Sharon, 1989, Assistant Professor of Music
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Turner, Walter W., 1963, Associate Professor of Mathematics
B.S., M.S., Ph.D., Michigan State

Uchimura, Bruce, 1987, Assistant Professor of Music
B.M. The Juilliard School of Music; M.M., Cleveland Institute of Music

Unwin, Jay P., 1969, Adjunct Associate Professor of Paper and Printing Science and Engineering
B.S., Washington; M.S., Montana State

Warner, Candie H., 1983, Assistant Professor of Speech Pathology and Audiology
B.S., North Dakota State; M.A. Western Michigan

Watson, Archie E., 1970, Assistant Professor of Education and Professional Development
B.A. M.A., Michigan State

Westrate, Bruce, 1990, Adjunct Assistant Professor of History
B.A., M.A., Ph.D., Michigan

Woffinberger, Steve, 1986, Associate Professor of Music
B.M., Evangel; M.M., D.M.A. Dallas, Texas

Wyman, Robert F., 1964, Associate Professor of Health, Physical Education and Recreation
B.S. M.Ed., Wayne State
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Industrial Engineering, 27, 103
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