Western Michigan University Graduate Catalog 1994-1996

Western Michigan University

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The Graduate College
Kalamazoo, Michigan
49008-3899
Telephone: 616/387-3570

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 80,277 and of Kalamazoo County is 223,400.

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

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1994-96 Calendar

Fall Semester, 1994
August 29, Monday
Advising Day
August 30, Tuesday
Classes Begin
September 5, Monday
Labor Day Recess
See Class Schedule
Final Day to Add Classes
See Class Schedule
Final Day to Drop Classes
September 11, Thursday
Applications due for December Graduation
October 21, Friday
Classes Dismissed 2 p.m., Friday only
(Laboratories excepted)
October 22, Saturday
Homecoming (Saturday classes will meet)
November 1, Tuesday
Applications due for December Graduation
November 18, Friday
Approved Theses, Projects, and Dissertations Due in the Graduate College for December Graduation
November 23, Wednesday
Thanksgiving Recess Begins at Noon
November 28, Monday
Classes Resume
December 1-16
Final Examination Week
December 17, Saturday
Semester Ends—Commencement

Winter Semester, 1995
January 2, Monday
Classes Begin
See Class Schedule
Final Day to Add Classes
See Class Schedule
Final Day to Drop Classes
February 15, Wednesday
Applications for Fellowships and Associateships
February 27, Thursday
Applications due for April Graduation
March 1, Wednesday
Applications due for April Graduation
March 6, Monday
Classes Resume
April 14, Friday
Recess All Day
April 17-21
Final Examination Week
April 22, Saturday
Semester Ends—Commencement
May 1, Monday
Applications due for June Graduation

Spring Session, 1995
May 1, Monday
Classes Begin
See Class Schedule
Final Day to Add Classes
See Class Schedule
Final Day to Drop Classes
May 26, Friday
Approved Theses, Projects and Dissertations Due in The Graduate College for June Graduation
May 29, Monday
Memorial Day Recess

Summer Session, 1995
June 21, Wednesday
Session Ends
June 24, Saturday
Commencement

Fall Semester, 1995
August 28, Monday
Advising Day
August 29, Tuesday
Classes Begin
See Class Schedule
Final Day to Add Classes
See Class Schedule
Final Day to Drop Classes
September 4, Monday
Labor Day Recess
October 19, Friday
Classes Dismissed 2 p.m., Friday only
(Laboratories excepted)
October 20, Saturday
Homecoming (Saturday classes will meet)
November 1, Wednesday
Applications due for December Graduation
November 17, Friday
Approved Theses, Projects, and Dissertations Due in The Graduate College for December Graduation
November 22, Wednesday
Thanksgiving Recess Begins at Noon
November 27, Monday
Classes Resume
December 11-15
Final Examination Week
December 16, Saturday
Semester Ends—Commencement

Winter Semester 1996
January 2, Tuesday
Classes Begin
See Class Schedule
Final Day to Add Classes
See Class Schedule
Final Day to Drop Classes
February 15, Thursday
Applications for Fellowships and Associateships
February 26, Monday
Semester Recess
March 1, Friday
Applications due for April Graduation
March 4, Monday
Classes Resume
March 22, Friday
Approved Theses, Projects and Dissertations Due in The Graduate College for April Graduation
April 5, Friday
Recess (All Day)
April 8, Monday
Classes Resume
April 15-19
Final Exam Week
April 20, Saturday
Semester Ends—Commencement

Spring Session, 1996
April 29, Monday
Classes Begin
See Class Schedule
Final Day to Add Classes
See Class Schedule
Final Day to Drop Classes
May 1, Wednesday
Applications Due For June Graduation
May 24, Friday
Approved Theses, Projects and Dissertations Due in The Graduate College for June Graduation
May 27, Monday
Memorial Day Recess
June 19, Wednesday
Session Ends
June 22, Saturday
Commencement

Summer Session, 1996
July 1, Monday
Classes Begin
Applications Due for Commencement*
Applications for Graduate Admission Due For Fall Semester
See Class Schedule
Final Day to Add Classes
See Class Schedule
Final Day to Drop Classes
July 4, Thursday
Independence Day Recess
July 26, Friday
Approved Theses, Projects, and Dissertations Due in The Graduate College for August Graduation
August 21, Wednesday
Session Ends—NO COMMENCEMENT EXERCISES

*For master's students only; specialist and doctoral students must apply a semester in advance.
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 1993, was 26,555, with 6,538 enrolled in eighty-one 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 sixty 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, 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, Geography, History, Home Economics, Mathematics, Mathematics Education, Medieval Studies, Orientation and Mobility, Philosophy, Physics, Political Science, Psychology, Rehabilitation Teaching, Sociology, Spanish, Speech Pathology and Audiology, Teaching of Geography, and Teaching of Music. 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, Manufacturing Science, 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 (in Creative Writing and in Art), 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 eighteen departments. 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 Applied Economics, Biological Sciences, Computer Science, Educational Leadership, English, Geology, Industrial Engineering, History, Mathematics, Mathematics Education, Mechanical Engineering, Physics, Political Science, Psychology, Science Education, Sociology, and Statistics. The Doctor of Public Administration is also offered.

Western Michigan University has identified five major goals to guide its development during the decade of the 1990s:

1. Offer instructional programs of academic excellence reflecting the high quality of the faculty and students, the depth and breadth of the curriculum and co-curriculum emphasizing personal growth and development, the enhanced facilities and learning resources, and the continuing assessment of learning and the learning process.

2. Increase the graduate enrollment, expand external support for research, facilitate scholarship and creative activity, and reward professional accomplishments of faculty, staff, and students.

3. Assist regional and state economic development through on- and off-campus instruction, applied research centers, and technical assistance to business, industry, government, and the schools.

4. Meet the needs of the citizenry by providing leadership and sponsorship of and participation in cultural events and civic activities.

5. Increase the diversity of the student body, faculty, and staff and enhance the multicultural nature of the University community.

Founded in 1903 as a normal school for preparing elementary and secondary school teachers and designated in 1957 as the state's fourth public university, Western Michigan University has earned recognition by the Michigan Legislature as a graduate-intensive university and by the Carnegie Foundation for the Advancement of Teaching as a Doctoral I University. The University shares with other high-standards institutions and the mission to discover, disseminate, extend, and preserve knowledge and culture. In fulfilling this responsibility, University instructional programs strive to increase students' capacity for intellectual growth and achievement, instill a commitment to learning and service to society, and meet the needs of an increasingly diverse student population. The University's research mission requires the faculty and students to create new knowledge and to address social needs and concerns. The University serves the region as a major information and technology resource and plays a critical role in cultural, social, and economic development and enrichment. The University strives for excellence in its endeavors and continually evaluates its efforts to assure that objective.

Western Michigan University offers a full array of undergraduate programs in the fine arts, humanities, social and natural sciences, and the professions; master's programs through each of its department and schools; and doctoral programs in selected fields. The colleges share the University's traditional commitment to the preparation of teachers. Education programs provide students the opportunity to gain academic knowledge and develop the ability to apply that knowledge based on considered ethical choices, and
seek to produce graduates who will think critically, communicate effectively, and participate meaningfully in a rapidly changing world. The general education program emphasizes a diverse cultural and ethnic heritage and the importance of a global perspective. Academic major programs require students to master a field of inquiry, discipline, or profession sufficient to an understanding of its methods, subject matter, and future in service to society.

Western Michigan University has distinctive strengths in its graduate and professional programs based on strong foundations in liberal and general education. The University has attracted and retains an outstanding faculty, and several of its departments have achieved national and international recognition. Faculty and program quality together provide a basis for responding positively to the challenges and opportunities of the future.

The University's commitment to the discovery and dissemination of new knowledge and insight facilitates and rewards faculty and student research, scholarship, and creative activity. The University extends its resources to the community through fine arts programming, on-site delivery of educational programs, student service and internship, assistance, health-related clinical services, technology transfer, technical support, and applied research programs. The University deliberately seeks student, staff, and faculty populations characterized by a diversity that reflects society at large and meets student needs through cultural, academic, and financial support and enrichment programs designed to promote student persistence, independence, and success. The University provides students a balanced educational experience, including co-curricular activities that contribute to personal growth and help to develop leadership skills. Student organizations, campus residence hall life, artistic events, multicultural programs, intercollegiate athletics, and intramural activities together with formal academic endeavor constitute the University environment. Western Michigan University fosters and develops ethical behavior among administrators, faculty, staff, and students. Faculty and student governance structures rest upon the principles of academic freedom and professional ethics consistent with the responsibilities of an academic community.


Section I
General Policies and Procedures

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.

A foreign student must apply for admission by March 15 for the Fall Semester, and September 15 for the Winter Semester.

It is advisable to apply well before the 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.

If a student does not enroll during the year following admission or during the year following the last enrollment, the student's admission status is cancelled, and thereafter the student must complete an Admission Application Form and be admitted anew by the appropriate program admission body.

Admission Application Fee
A non-refundable application fee of $25 must accompany each application for admission.

Admission Procedures
Admission to a graduate program is secured through the following steps:
1. Request an "Application for Admission" from the Office of Admissions and Orientation.
2. Return the completed "Application for Admission" and the $25 application fee before the published admission dates.
3. Have two official transcripts from each postsecondary institution you have ever attended, except Western Michigan University, sent directly to: Office of Admissions and Orientation, Graduate Admissions, Western Michigan University Kalamazoo, MI 49008-5120. Application and transcripts are due 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 of the graduate dean.

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 to pursue. Acceptance to a definite program of study leading to a degree is dependent upon the endorsement of the department or unit in which the student intends to study and of the graduate dean. 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, and by securing departmental approval. Students admitted on probation are not permitted to use in their degree program more than nine semester hours of credit earned as a probationary student.
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 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 dean approve the credit. PTG status is not available to students with dual enrollment. A non-refundable application fee of $25 must accompany the Permission To Take Classes form.

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 dean. 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 English Language Assessment Battery (MELAB) (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 as one 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 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.

Such students will be issued an ID entitling them to the use of libraries and other academic facilities. The ID, however, does not make available to the student the use of non-academic facilities such as Health Services.

Eligibility Of Faculty For Graduate Study
Western Michigan University faculty members holding tenure track appointments and all University research faculty 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 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 the University.

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 institute 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 the experiences sought are unique or not available at the home institution; the officers of the host 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, available in the Registrar's Office and in advising offices, should be consulted for details regarding the time and place of graduate classes. A student is encouraged to register via the online registration system 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 is subject to the following regulations:

1. The academic unit which offers a graduate program shall determine if an equivalency examination may be used to obtain credit for a particular 500 or 600 level course in that academic unit.
2. All equivalency examinations will be administered and graded by fewer than two faculty members from the academic unit offering the particular course.
3. All credit by examination shall be graded "Credit" or "No Credit." "Credit" will be posted on the transcript as "Credit earned by examination" without letter grade or honor points. Students who do not achieve a sufficient score to receive "Credit" will have no entry made on their transcripts.
4. Credit by examination can be used to meet all other University graduation requirements except the residency requirement.
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 is acceptable in accordance with the current policies of The Graduate College governing the transfer of credit.

Examinations fees shall be assessed by the academic unit. It is expected that students will pay the examination fee in advance of taking the examination.

Course Numbering System
Two levels of graduate courses are offered: (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 is 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 advisor's and graduate dean'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 advisor 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 advisor and the graduate dean prior to registering for these courses and then earns a grade of "B" or better. These courses can be considered undergraduate credit which is not computed into the graduate point-hour ratio. The tuition fee for these courses is the same as that 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 is subject to the following regulations:

1. The academic unit which offers a graduate program shall determine if an equivalency examination may be used to obtain credit for a particular 500 or 600 level course in that academic unit.
2. All equivalency examinations will be administered and graded by fewer than two faculty members from the academic unit offering the particular course.
3. All credit by examination shall be graded "Credit" or "No Credit." "Credit" will be posted on the transcript as "Credit earned by examination" without letter grade or honor points. Students who do not achieve a sufficient score to receive "Credit" will have no entry made on their transcripts.
4. Credit by examination can be used to meet all other University graduation requirements except the residency requirement.
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 is acceptable in accordance with the current policies of The Graduate College governing the transfer of credit.

Examinations fees shall be assessed by the academic unit. It is expected that students will pay the examination fee in advance of taking the examination.
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 "B" or better.
2. The advisor and the graduate dean approves the credits for transfer.
3. The student’s advisor 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.

Transfer credit will be recorded on the Western Michigan University transcript as "Credit" (CR) only and will not be calculated into the honor points earned and the grade point average at Western Michigan University.

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 the other usual requirements for a master's degree.

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 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 normally a student comes 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 having 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 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.

Student Fees

The following is the 1994-95 tuition fee schedule used for graduate study on campus:

Resident:
- $15.50 per credit hour for non-credit courses
- $307.45 per credit hour for graduate credit courses

Non-Resident:
- $307.75 per credit hour for graduate credit courses

The fee for graduate study in courses offered off-campus through the Division of Continuing Education is $158.00 per graduate credit hour.

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.

Other fees:
- Admission application fee, $25.00
- Enrollment fee per semester, $35.00 (less than seven hours of registration) or $219.00 (seven or more hours of registration) for on-campus enrollment only
- Late Registration Fee, $50.00
- Graduation fee (assessed when the application for graduation is submitted to Bursar’s office), $30.00
- Publication of doctoral dissertation, $55.00
- Publication of master’s thesis and specialist project, $45.00
- Student government assessment, $8.00 each semester
- Transcript fee, $3.00

Student fees are subject to change by the Board of Trustees.

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 without an official student withdrawal 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 study 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 Registrar’s Office.

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.

<table>
<thead>
<tr>
<th>Grade Definition Per Credit Hour</th>
<th>Honor Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.0</td>
</tr>
<tr>
<td>Outstanding</td>
<td>Exceptional</td>
</tr>
<tr>
<td>B</td>
<td>3.5</td>
</tr>
<tr>
<td>Very good</td>
<td>Extraordinary</td>
</tr>
<tr>
<td>CB</td>
<td>3.0</td>
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<td>X—Unofficial Withdrawal</td>
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The symbol "X" is used to indicate that a student has never attended class or has discontinued attendance and does not qualify for the grade of "I." The "X" will be converted to a student’s honor-point ratio as hours attempted with zero honor points.

I—Incomplete: This is a temporary grade given for work which is passing in quality but lacking in quantity to meet course objectives. It is assigned when an instructor, in consultation with a student, concludes that extenuating circumstances prevent the completion of course requirements. Incompletes, except those given in Master’s Thesis 700, Specialist Project 720, and Doctoral Dissertation 725 courses, must directly be related to them or identified by departments, which are not removed within one calendar year will convert to an "X"—Unofficial Withdrawal.

W—Withdrawal: A grade of "W" is given in a course when a student officially withdraws from that course or from the University before the mid-point of the semester or session.
Probation Removed: When the conditions passed, "INC" when incomplete, and "NC" when failed.

Probation: If a student's overall grade point average fails to reach 3.0 (3.25) at the end of an enrollment period of Probation, or whose academic unit admission body status must be granted by the program or academic unit admission body in order for the student to register. The appeal must be initiated and the decision made by the program or unit prior to the subsequent semester's last day to add classes.

Dismissed students must apply for readmission through the normal admission process. The student will send a Reimbursement Application and fee payment to the Admissions Office which, in turn, will forward the student's Readmission Application and records folder to the program or academic unit admission body for decision on readmission.

Graduation Procedures
Application for graduation must be made no later than seven weeks before the anticipated graduation date. Students who fail to meet the degree requirements for graduation resulting from failed courses, from incomplete work, or for any reason must be applied for by sending a resume and responsibility or has control, responsibility rests with the student to reapply for the next semester. Awards are made on the basis of scholarship and leadership potential.

Doctoral Associateships of $9,050 for two semesters are offered to students enrolled in the following doctoral degree programs: Biological Sciences, Computer Science, Counselor Education and Counseling Psychology, Economics, Educational Leadership, English, History, Industrial Engineering, Mathematics, Mechanical Engineering, Physics, Political Science, Psychology, Science Education, Special Education, Sociology, and Statistics.

Doctoral Associateships of $9,050 for two semesters are offered to students admitted to degree programs. They are awarded to U.S. citizens from minority groups on the basis of scholarship and need. Participation in the professional activities of a department is required.

Multi-cultural Assistantships and Martin Luther King/Cesar Chavez/Rosa Parks Fellowships are also available for qualified minorities. Inquiries should be sent to The Graduate College.

Teaching and Research Assistantships at a minimum of $7,350 for two semesters of full-time appointment are available in many departments of the University. Inquiries should be sent to the chairperson of the department.

Service assistantships up to $7,350 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.

Fellowships, Associateships, Assistantships

Academic Standards
All graduate students, PG and degree candidates, must earn an overall grade point average of at least 3.0 (3.25) to satisfy University requirements. The academic standards policy is intended to encourage satisfactory progress toward that end.

1. Good Standing: A student is in good standing whenever his/her overall grade point average is at least 3.0 (3.25) for specialist and doctoral students.

2. Warning: Whenever the grade point average in any enrollment period is less than 3.0 (3.25), but the overall grade point average is 3.0 (3.25) or above, the student will be warned.

3. Probation: If a student's overall grade point average falls below 3.0 (3.25), the student will be placed on probation for one semester.

4. Continued on Probation: If the overall grade point average increases .01 or better during the semester of Probation, although still below 3.0 (3.25) overall, the student may be Continued on Probation for one additional enrollment period at the discretion of the department housing the student's program.

5. Probation Removal: When the conditions of Good Standing are restored, Probation will be removed.

6. Dismissal: The student who fails to increase his/her overall grade point average .01 or better at the end of an enrollment period of Probation, or whose overall grade point average fails to reach 3.0 (3.25) at the end of an enrollment period of Continued on Probation, will be dismissed from the University. Exceptions may be granted only by the academic unit's or program's admission body, and only through the unit's or program's appeal process. Students who have been dismissed from Western Michigan University are expected to remain out at least one full fifteen-week semester (spring and summer sessions together are equivalent to one full fifteen-week semester).

Appeal Procedure
Upon appeal by the student, the program or academic unit admission body will determine whether to grant Continued on Probation status. Continued on Probation status must be granted by the program or academic unit admission body in order for the student to register. The appeal must be initiated and the decision made by the program or unit prior to the subsequent semester's last day to add classes.

Dismissed students must apply for readmission through the normal admission process. The student will send a Reimbursement Application and fee payment to the Admissions Office which, in turn, will forward the student's Readmission Application and records folder to the program or academic unit admission body for decision on readmission.

Graduation Procedures
Application for graduation must be made no later than seven weeks before the anticipated graduation date.

Summer Session
Apply by April 1, but not later than July 1.

Fall Semester
Apply by January 1, but not later than November 1.

Winter Semester
Apply by September 1, but not later than March 1.

Spring Session
Apply by January 1, but not later than May 1.

All work taken either on or off the campus must be completed by graduation day.

Students who fail to meet the degree requirements for graduation resulting from failed courses, from incomplete work, or for any reason must be applied for by sending a resume and responsibility or has control, responsibility rests with the student to reapply for the next regular graduating class following completion of his/her academic record. Under no circumstances will any student be graduated with a class if his/her academic record does not show complete fulfillment of all requirements within thirty days after the established commencement date.

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.

Policies Governing Graduate Appointees

Definitions
A graduate appointee is a student enrolled in a program leading to a graduate degree who receives a University-administered salary and stipend which is not less than one-half of the...
10 GENERAL POLICIES AND PROCEDURES

2. Service Requirement

for that particular type of appointment.

the primary intent of the awarder—as

as part of service connected with a

( ) 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 to the performance of each

faculty member.

The kinds of service required of Graduate

Assistants (T.A.s) consists of activities
directly related to students in the

teaching enterprise.

The service of Graduate Research

Assistants (R.A.s) consists of research

activities under the supervision of a

fellowship.

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) Assistantships awarded to outstanding students in

departmental 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 payment for services.

3. Service Requirement

The kinds of service required of Graduate

Assistants may vary among departments,

each department determining its own range of

applicable opportunities subject to

administrative review. Whatever kinds of

service are expected, however, a full

assistantship carries any employment contents of twenty hours of service per week or its

equivalent. Equivalency is calculated on the

basis of the value assigned by a
department to the performance of each

particular service.

4. Stipends and Salaries

The amount of the stipend is set by the

donor with the concurrence of the Provost

and Vice President for Academic Affairs.

The minimum salary and stipend for

time full-time Assistants in each type of

appointment is established by the Provost

and Vice President for Academic Affairs.

Fractional awards are made for

fractional appointments.

5. Affirmative Action

This policy is based on the University’s Affirmative Action and Title IX policies.

6. Professional Development

Grants range to a maximum of $600.

Applications for research or travel grants may be secured from 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 may, at the discretion of the University, be granted partial or full tuition remission. Any such remission will be identified in the appointment letter and on the

appointment form.

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 same 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 vehicle on campus. Application may be made to the Public

Safety Annex for parking privileges in
designated lots.

e. Campus Bookstore: Graduate appointees will be accorded discount

privileges on purchases at the Western

Michigan University Bookstore in the

same manner and degree as faculty

and staff members. Discount will be
given for current semester only by

showing the ID and validation card at

the service desk.

f. University facilities: Graduate appointees will be accorded the use of

University facilities (e.g., student

offices, research facilities, etc.)

authorized by the director of the

facilities on the same basis that they are

authorized for part-time faculty.

Graduate Student Research Fund

The Graduate College has established a

Graduate Student Research Fund to

courage 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 and equipment

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.
programs. The criteria are set by federal and state Departments of Education and are subject to periodic revision.

Applicant procedures for both the federal academic and state College Work-Study Program, the Federal Perkins Loan Program, the Federal Direct Stafford Loan Program, the Michigan State Direct Student Loan Program, the Michigan Adult Part-Time Grant Program, and for the WMU Nontraditional Student Scholarship:

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 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 in 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 unemployable 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 grace period.

General Policies and Procedures

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 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 may be provided for students who are unable to find full-time employment.

Michigan Adult Part-Time Grant Program
Graduate students taking undergraduate courses toward their teacher certification may apply for this award of up to $600 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 deadline for application for fall semester is August 1; for the winter semester, the deadline is December 12.

Non-Need Based Opportunities

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 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.

Federal Direct Stafford Loan Program (Subsidized and Unsubsidized)
The federal government guarantees loans made by Western Michigan University to graduate students. The loan maximum is $8,500 every nine months or for each classification. A cumulative maximum of $73,000 may be borrowed including both subsidized and unsubsidized undergraduate and graduate loans. The maximum graduate loan is $20,000. The interest rate for first-time borrowers in 1987 is 8 percent. For those who were new borrowers as of October 1, 1992, or thereafter, the interest rate is the 91-day T-Bill rate plus 3.1 percent. The interest rate is capped at 9 percent. "Unsubsidized" Direct Stafford Loans are exactly the same as "subsidized" loan only the student does not demonstrate need. The student must pay on the principal/interest. If the student chooses, may defer repayment but the interest accrues. The cumulative maximum of $73,000 includes both subsidized and unsubsidized loans.

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 in 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, and
   - 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 may be provided for students who are unable to find full-time employment.

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Non-Need Based Opportunities

Description of Programs

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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 in 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, and
   - 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.
long-term fixed-rate loan (15.95 percent) and a variable-rate line of credit 4.5 percent above the prime rate. For information, call toll free 800-258-3540 or write: The Tuition Plan 57 Regional Drive Concord, New Hampshire 03301.

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
Exchange Scholarships
The Office of International Affairs administers international exchange scholarships awarded in a competitive process annually to qualified students for study in foreign universities in Asia and Europe. The Office also administers the K-S International Endowment Fund, which assists international students in their graduate studies at Western Michigan University. Contact the Office of International Affairs, 2090 Friedman Hall, for information and application forms.

University of Tübingen Exchange Scholarships
These scholarships enable two WMU students to study in Tübingen, Germany, for an academic year beginning in October. Includes tuition and housing.

Free University of Berlin Exchange Scholarships
These scholarships enable two WMU students 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. This award includes tuition, housing, and stipend.

University of Paderborn Exchange Scholarships
These scholarships enable two or more WMU students to study at the University of Paderborn in the city of Paderborn, Germany, for an academic year beginning in October. Includes tuition, housing, and stipend.

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.

Ryu-Rikkyo University International Student Assistance Scholarship
This scholarship covers tuition for one WMU student to study for an academic year at Rikkyo University, Tokyo, Japan. 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
The Student Employment Referral Service actively recruits employment opportunities for Western students. Employment is available in and around Kalamazoo during the fall and winter, internships and summer jobs are available throughout the United States.

Interested students should visit A-100 Ellsworth Hall to view current job listings. Students may also register with the service for telephone referral of available employment. Students must provide a local phone number, class schedule, and employment interests. Campus employment is available at the beginning of each semester, with students generally keeping jobs throughout the school year. Student Employment Referral Service also monitors placement of students in Work Study programs.

Individual advising is available for students seeking internships, co-operative education, or career related part-time jobs. Students may also attend internship information workshops or review active internship directories for employment openings.

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

The area 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 1-800-827-1000.

Changes in enrollment or current address must be reported immediately to the Academic Records Office. Any change in dependents should be sent 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. A complete record of all classes taken and grades received is maintained in the Academic Records Office. A student copy of this record is available upon request with proper identification. Student 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 and doctoral degree students and of all classes taken for continued certification. Students who fall below these standards must seek the appropriate counseling from the Director of Records before certification can be made. The grade point average is recalculated after 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. Incomplete grades in graduate courses more than one year old will be counted as "E" grades in considering eligibility for certification to the VA.

4. Students are certified on the basis of attendance and academic progress toward degrees by course enrollment. Serious over-payment of benefits 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 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.

Western Michigan University accords all the rights under the law to its students. No one outside the institution shall have access to, nor will the institution disclose any information from, students’ education records without the written consent of the student or his or her parent or eligible student, or (if not personally individually or collectively, acting in the students’ educational interest) 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, Office of Student Financial Aid, and the Office of Admissions).

At its discretion, the institution may provide Directory information in accordance with the provisions of the Act to include: student name, address, telephone, 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 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 their education records, to have a hearing if the outcome of the challenge is unsatisfactory, and to submit explanatory statements for inclusion 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 academic, 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 may be made at the students’ expense at the prevailing rate of ten cents per page. Education records do not include records of instructional, administrative, and supervisory personnel—which are the sole possession of the maker and are not accessible or revealed.
to any individual except a temporary service, law enforcement unit, student health records, employment records, or alumni records. Health records, however, may be reviewed by physicians of the student's 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 educational 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. It is 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 policies of confidentiality and were used only for the purposes for which they were collected.

Students who believe that their education records contain information that is inaccurate or misleading, or is otherwise in violation of their privacy or other right may discuss their problems informally with the person in charge of the records involved. If the decisions in agreement with the students' requests, the appropriate records will be amended. If not, the students will be notified within a reasonable period of time that the records will not be amended and will also be informed of their right to a formal hearing by the Registrar. Students may then request a formal hearing. The request must be made in writing to the Registrar who, within ten days after receiving the request, will inform the student of the date, place, and the time of the hearing. Students may present evidence relevant to the issues raised and may be assisted or represented at the hearings by one or more persons of their choice, including attorneys, at the students' expense. The hearing officer who will adjudicate such challenges will be the Registrar, or a person designated by the Registrar, who does not have a direct interest in the outcome of the hearing.

Decisions of the hearing officer will be final, but will be based solely on the evidence presented at the hearing, will consist of written statements summarizing the evidence and stating the reasons for the decisions, and will be delivered to all parties concerned. The educational records will be corrected or amended in accordance with the decisions of the hearing officer, if the decisions are in favor of the student. If the decisions are unsatisfactory to the student, the student may place with the educational records statements commenting on the information in the records or statements setting forth any reasons for disagreeing with the decisions of the hearing officer. The statements will be placed in the educational records, maintained as part of the student's records, and released whenever the records in question are disclosed.

Revisions and clarifications will be published as experience with the law and the institution's policy warrants.

**Sexual Harassment and Sexism**

Western Michigan University is committed to an environment which encourages fair, humane, and beneficial treatment of all faculty, staff, and students. In accordance with that fundamental objective, the University has a continuing commitment to assure equal opportunity and to oppose discrimination because of race, sex, sexual orientation, age, religion, national origin, or handicap.

Therefore, in that same perspective, neither sexual harassment nor sexism will be tolerated at Western Michigan University. It is expected that each member of the University community will consider himself/herself responsible for the proper observance of this policy.

**DEFINITIONS**

Sexual Harassment: Sexual harassment is defined as unwelcome sexual conduct which is related to any condition of employment or evaluation of student performance. This definition is intended to provide more than overtures toward actual sexual relations. It applies as well to repeated or unwarranted sex-related statements, unwelcome touching, sexually oriented comments and/or graphics. All persons should be sensitive to situations that may affect or cause the recipient discomfort or humiliation or may display a condescending sex-based attitude towards the recipient. If the conduct is illegal under both state and federal law. In some cases, it may be subject also to prosecution under the criminal sexual conduct act. Conduct will be defined as unwelcome whenever any or all of three of the following conditions exist:

1. The sex-related situations are unwelcome by the recipient.
2. A special or implied connection with employment or student status is involved.
3. The sexual harassment continues after the recipient has made it clear that the conduct is unwelcome.

**Note:** In cases of overt physical sexual conduct, a blatant threat if sexual favors are not given, or promised reward in exchange for sexual favors, no notice that the conduct is unwelcome shall be necessary, and a finding of sexual harassment may be based on a single occurrence.

Sexism: Sexism is defined as the perception and treatment of any individual, not as an individual, but as a member of a category based on sex. Whether expressed in overt or subtle form, such harassment, jokes or materials, sexism in the classroom or workplace is unacceptable at the University, and its elimination shall be the responsibility of the entire University community. Depending upon the seriousness of the misconduct, informal corrective action may be adequate.

**COMPLAINT PROCEDURE**

Sexual harassment and sexism constitute acts of misconduct. Therefore, whenever such acts are reported and confirmed, prompt disciplinary action will be taken, up to and including discharge. However, to enable the University to act through these formal procedures, employees and students are encouraged to report such incidents. Students and faculty should report such conduct to the Affirmative Action Office, 387-8688.

**RECOGNIZING SEXUAL HARASSMENT AND SEXISM**

Sexism and sexual harassment can take the form of:

- Derogatory jokes or comments based on sex.
- The use of graphics or other materials degrading persons based on their sex.
- Unwelcome touching or ogling.
- Overt advances.
- Coercion, with the promise of reward.
- Threats, with the promise of punishment; and
- Physical assault.

Sexism and sexual harassment are prohibited at Western Michigan University.

The University's policy on harassment and sexism states: "Sexual harassment and sexism constitute acts of misconduct. Therefore, whenever such acts are reported and confirmed, prompt disciplinary action will be taken, up to and including discharge."

**YOU COULD BE A VICTIM**

Who are the victims? Anyone, male or female, young or old, can be the victim of sexual harassment from someone of the opposite, or even the same sex. But most often, women are harassed by men.

Any woman can be the target of harassment, but two groups are the most vulnerable: women entering male-dominated fields of study, and women from minority groups. Both of these types of women may feel uncomfortable and out of place in their environments. This discomfort, finds them easy prey.

**TAKING ACTION AGAINST THE SEXUAL HARASSER**

If you are being harassed, take action to stop it. The University will support you.

**Sexism**

- Say no. Make it loud and clear. A harasser does not expect confrontation.
- Keep records of all incidents and confrontations.
- Find witnesses or others who will back up your claim.
- Get support from a friend, counselor, professor, or anyone else you trust. Make sure you don't keep it bottled up inside, the more help you get, the faster the harasser will stop.

**President's Statement on Racial and Ethnic Harmony**

Western Michigan University is firmly committed to the principles of racial equality and nondiscrimination. On its campus, students, faculty, and staff of many races and ethnic backgrounds live and work together day by day in offices, classrooms, and residence halls. This racial and ethnic mix brings richness and diversity to the cultural, intellectual, and personal dimensions of campus life. The University benefits from this diversity and seeks to enhance it.

All members of the University are expected to contribute to an atmosphere of racial and ethnic harmony on campus, displaying tolerance for cultural differences and courtesy and civility in discourse with students, faculty, and staff of diverse backgrounds. Toward that end, there is no room for any derogatory comments of a racial nature, be they in the form of slurs, posters, songs, jokes, graffiti, or the like.

Most members of the campus community need not be reminded of the institutional position in this regard. The very few who need the admonition must realize that the University will take the strongest possible action, including dismissal, against those who through racist acts bring discord to this campus.

**Discrimination: Complaints and Grievance Procedure**

Western Michigan University, in accordance with the law, prohibits discrimination in the provision of all student instruction, activities, and programs. Discrimination is prohibited based on race, color, religion, national origin, sex, sexual orientation, age, handicap, height, weight, or marital status shall not be tolerated in the determination of eligibility, participation, or grading for any courses or program.
establishes the right of the student to have the benefits of the University without unreasonable interference by law.

Students who have inquiries about the University's Anti-Discrimination Policy or about anti-discrimination laws, including Title IX and §504, may contact the Affirmative Action Officer, 274 Waveland Hall (387-8658) at the University of Michigan, Ann Arbor, Michigan 48109-1048.

The Affirmative Action Officer will receive and investigate complaints of prohibited discrimination filed with him/her by students and may undertake to resolve the students in resolving their concerns. The complaint, an oral allegation or charge against the University, an employee(s) or agent, stating prohibited discrimination has occurred, must be filed with the Affirmative Action Officer or professor, instructor, or program director within fourteen (14) calendar days of events or knowledge of events giving rise to the complaint. A complaint must be filed by the student and discussed with the Affirmative Action Officer before any formal grievance can be initiated. The Affirmative Action Officer will make reports and recommendations to the complaining student and to the academic dean or program director concerned. In the event the student's complaint is resolved satisfactorily, the student may file a formal written grievance.

A formal written grievance is defined as a written allegation by a student(s) that there has been a violation of the University's Anti-Discrimination Policy or a discriminatory application of official University policies, procedures, rules, or regulations regarding student rights or privileges.

Any student(s) who wants to file such a grievance should contact the Affirmative Action Officer, 274 Waveland Hall (387-8658). The grievance must be filed with the Affirmative Action Department on an official University Grievance Form and be signed by the student(s) involved. The grievance must be timely, state all facts relevant to the protested events, indicate when the incident(s) occurred, and specify the discriminatory acts and policies, rules, or regulations involved. The Affirmative Action Department will serve as an intermediary for written grievances and is to receive copies of all grievance correspondence. Any student(s) filing a written grievance may choose to have a representative present at any step in the Grievance Procedure, provided the Affirmative Action Department is given at least twenty-four (24) hours notice prior to the concerned meeting.

Step 1: Departmental Level

A formal grievance must be filed with the Affirmative Action Department no later than thirty (30) calendar days after the event or events being grieved took place. The Affirmative Action Department will then forward the grievance to the Step 1 representative, who will be the Department Head or any other person designated by the appropriate Vice President. The representative will respond to the grievance. The Step 1 representative must provide a written answer within fourteen (14) calendar days after receiving the formal grievance.

Step 2: Appeal to the Vice Presidential Level

If the grievance is not resolved at Step 1, the student may appeal to the appropriate Vice President within seven (7) calendar days after receiving the departmental representative's written answer. The student must file the appeal with the Affirmative Action Department, using an official University appeal form. The Affirmative Action Department will, in turn, notify the departmental representative and the appropriate Vice President of the student's appeal. The appropriate Vice President or his/her designee receiving the appeal will review and resolve the grievance. This review must be held within fourteen (14) calendar days after the appropriate Vice President or his/her designee hearing the appeal receives the grievance from the Affirmative Action Department. Within seven (7) calendar days after this meeting, the appropriate Vice President or his/her designee hearing the appeal will communicate an answer in writing to the involved parties.

Step 3: Appeals to the Presidential Level

If the grievance has not been resolved at Step 2, it may be appealed to the University President. The Affirmative Action Department must receive the appeal within seven (7) calendar days after the grievant receives the Step 2 answer. The President, at his/her discretion, will decide the grievance personally or will designate a representative to conduct a hearing or investigation of the grievance, report findings and recommend a decision. The President or his/her designee will make the final grievance decision and communicate it to the appropriate parties.

In addition to filing a grievance with the University's Affirmative Action Department, the student may file a complaint directly with the Office of Civil Rights, U.S. Department of Education or pursue avenues of complaint resolution.

Student Academic Rights and Responsibilities

Western Michigan University defines the issues of academic evaluation, academic honesty, conduct in academic research and academic policy application as matters of academic conduct. The following policies and procedures apply to matters of student academic conduct.

1. Student Performance will be evaluated solely on the basis of the student's performance in the course of study for which they are enrolled.
2. Students are protected against prejudiced or capricious academic evaluation.
3. Students are free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion and interpretation, but they are responsible for learning the content of the course of study for which they are enrolled.
4. Students will be informed by the faculty about course requirements, evaluation procedures, and the academic criteria to be used in each class. This information will be provided in writing at the beginning of the semester or sufficiently in advance of activity. Students will be expected to study for the examinations and other graded material made available to them with an explanation of the grading criteria. Faculty will retain all such materials not returned to the student for at least one full semester (or through spring plus summer sessions) after the course was given. Faculty are not required to return such material to the student but must provide reasonable access.

Academic Honesty

If a student is uncertain about an issue of academic honesty, he/she should consult the faculty member to resolve questions or to provide information prior to the submission of the academic exercise.

Violations of academic honesty include but are not limited to:

Cheating

Definition

Cheating is intentionally using or attempting to use unauthorized information, data, notes, study aids or other devices or materials in any academic exercise.

Clarification

1. Students completing any examination are prohibited from looking at another student's examination and from using external aids (for example, books, notes, calculators, conversation with others) unless specifically allowed in advance by the faculty member.

Fabrication, Falsification and Forgery

Definition

Fabrication is the intentional invention and unauthorized alteration of any information or citation in an academic exercise. Falsification is a matter of altering information, while fabrication is a matter of inventing or counterfeiting information for use in any academic exercise or University record.

Forgery is defined as the act to imitate or counterfeit documents, signatures, and the like.

Clarification

1. "Invented" information shall not be used in any laboratory experiment, report of results or academic exercise. It would be improper, for example, to analyze one sample in an experiment and then "invent" data based on that single experiment for several more required analyses.

2. Students shall acknowledge the actual source from which cited information was obtained. For example, a student shall not take a quotation from a book review and then indicate that the quotation was obtained from the book itself.

3. Falsification of University records includes altering or forging any University document and/or record, including identification material issued or used by the University.

Multiple Submission

Definition

Multiple submission is the submission of substantial portions of the same work (including oral reports) for credit in two courses without the faculty member's permission; making revisions in a credit paper or report (including oral presentations) and submitting it again as if it were new work.

Different aspects of the same work may receive separate credit; e.g., a report in a history may receive credit for its content in a history course and for the quality of presentation in a speech course.

Plagiarism

Definition

Plagiarism is intentionally, knowingly, or carelessly presenting the work of another as...
one's own (i.e., without proper acknowledgement of the source). The sole exception to the requirement of acknowledging sources is when the ideas, information, etc. are common knowledge. Instructors should provide clarification about the nature of plagiarism.

**Clarification**

1. **Direct Quotation** Every direct quotation must be identified by quotation marks or appropriate indentation and must be properly acknowledged, in the text by citation or in a footnote or endnote.

2. **Paraphrase** Prompt acknowledgement is required when a source paraphrased or summarized, in whole or in part, in one's own words. To acknowledge a paraphrase properly, one might state, "To paraphrase Locke's comment,..." and then conclude with a footnote or endnote identifying the exact reference.

3. **Borrowed facts** Information gained in reading or research which is not common knowledge must be acknowledged.

4. **Common knowledge** Common knowledge includes generally known facts such as the names of leaders of prominent nations, basic scientific laws, etc. Materials which add only to a general understanding of the subject may be acknowledged in the bibliography and need not be footnoted or endnoted.

5. **Footnotes and endnotes** One footnote or endnote is usually enough to acknowledge indebtedness when a number of connected sentences are drawn from one source. When direct quotations are used, however, quotation marks must be inserted and acknowledgement made. Similarly, when a passage is paraphrased, acknowledgement is required.

6. **Faculty members** are responsible for informing students concerning appropriate formats for handling quotations, footnotes, endnotes, and bibliographic references.

**Complicity**

**Definition**

Complicity is intentionally or knowingly helping, conspiring to help another to commit an act of academic dishonesty.

**Clarification**

Examples of complicity include knowingly allowing another to copy from one's paper during an examination or test; distributing test questions or substantive information about the materials to be tested before the scheduled exercise; collaborating on academic work knowing that the collaboration will not be reported; taking an examination or test for another student, or signing another's name on an academic exercise.

(\textit{NOTE:} Collaboration and sharing information are characteristics of academic communities. These become violations when they involve dishonesty. Faculty members should make clear to students expectations about collaboration and information sharing. Students should seek clarification when in doubt.)

**Computer Misuse**

**Definition**

Computer misuse is disruptive or illegal use of computer resources.

**Clarification**

1. A student shall access, copy, examine, modify, utilize, or destroy any computer equipment, hardware, software, or file that is not specifically intended for his/her own personal use.

2. Disruptive or illegal use of computer resources includes, but is not limited to: violating copyrights held on software or animal subjects and the use of recombinant DNA, radioactive material, and chemical or biological hazards.

3. **Failure to Report Fraud** Concealing or otherwise failing to report known misconduct or breaches of research or artistic ethics.

**Research Board Requirements**

Misconduct in research includes failure to comply with requirements of the conduct of research and creative activities, e.g., the protection of human subjects, the welfare of laboratory animals and biosafety. Allegations in these areas may be brought by Human Subjects Institutional Review Board, the Institutional Animal Care and Use Committee and the Institutional Biosafety Committee.

**Academic Policy and Status**

Academic policy includes any decision affecting a student's academic status other than academic evaluation, academic honesty, or conduct in research. Examples of other academic policy and status matters include but are not limited to rulings on program admission, the application of program or University requirements or related academic policy approved through the faculty governance system.

**Academic Conduct Violation: Consequences and Appeals**

The student may request assistance from the University ombudsman at any point during the appeals procedure. The contact may be for the purpose of clarifying procedures, obtaining information, or requesting assistance through an informal resolution.

**Consequences**

A description of every violation of standards for academic honesty, conduct in research, University academic policy, or other academic status matters cannot be included in this policy statement. When the academic rules and guidelines set forth in this policy are violated, consequences may vary according to circumstances since particular cases may involve very different situations. Faculty members may take those actions they deem appropriate; these may include 1) a failing grade for the work involved, or 2) failure in the course. Faculty may recommend actions to responsible academic supervisors, and the supervisors may, with or without faculty recommendation, take action involving 1) removal from the program, and/or 2) other sanctions up to and including academic dismissal from the University. The faculty member or academic supervisor will file a memo with the registrar, indicating the violation and sanction involved. Before the memo will be placed in the student's official academic file, the registrar shall provide an opportunity for the student to discuss the matter with him/her.

**Appeals**

1. **Grade Appeals** Students may appeal grading decisions under the "Academic Grade Appeals Procedure" detailed below.

2. **All Other Appeals** All other actions may be appealed under "General Academic Appeals Procedure." In cases where a grade and another sanction is recommended, the General Academic Appeals Procedure will be used.
Academic Grade Appeals Procedure

1. Whenever a student believes he/she has a grievance regarding a grade, he/she shall first arrange a meeting with the faculty member who will explain the reasons for the grade and, if warranted, recommend a change.

2. The student must initiate contact with the faculty member involved or in his/her absence the appropriate unit chair/director within 90 days of the end of the semester for which the grade was assigned. Failure to act within the ninety-day time period will disqualify the student from further consideration of the matter.

3. If the student believes that he/she has not received a satisfactory resolution of the grievance from the faculty member he/she shall then meet with the academic unit chair/director, who may effect a satisfactory resolution.

4. If the student remains dissatisfied after meeting with the academic unit chair/director, the student may meet with the University ombudsman for an appeal. The function of the ombudsman in this situation is to collect information from the student, academic unit chair/director, and the faculty member. The University ombudsman may make a decision that: (a) the student’s grievance is unwarranted and should not be considered further; (b) the student’s grievance is warranted and the ombudsman will attempt to arrange a resolution agreeable to the faculty member and the student; or (c) the student’s grievance is warranted, but a resolution cannot be reached, and the grade grievance will then be referred to the Academic Fairness Committee.

5. The Academic Fairness Committee is appointed by and reports directly to the University President from a roster of faculty recommended by the Faculty Senate Executive Board and students recommended by the Western Student Association and the Graduate Student Advisory Committee. The Committee consists of four faculty, three undergraduate students, and three graduate students, with the chair appointed by the University President.

6. When a case is presented to the Academic Fairness Committee, the chair will call the committee into session within 30 days of the referral. The Committee shall investigate the case, make sure that all interested parties have a full opportunity to present their positions. The Committee may decide upon: (a) no grade change, (b) a change of letter grade, (c) credit/no credit, or (d) any other grade change, (b) a change of letter grade, (c) change in independent of the appeals procedure (Sect. VI, A-G). In such instances, the faculty member shall be consulted.

General Academic Appeals Procedure

Students may appeal charges of or sanctions for violations of the academic rules and guidelines concerning academic honesty, conduct in research, or applications of an academic policy using the following procedures.

1. A student who disagrees with the charge or decision shall first meet with the faculty member or person bringing the charge or making the decision within 90 days of receiving notification of the action.

2. If the disagreement between the student and the faculty member or other academic official is not resolved, a student may appeal in writing to the next administrative level (e.g., academic unit) within 14 calendar days of receiving notice of the first review. If the academic unit has approved procedures in place for considering such appeals, the chair/director shall refer the appeal to that process. If the academic unit has not established procedures, the chair/director shall consider the appeal.

3. If no resolution is reached and the student wishes to appeal the decision, the student may appeal in writing to the college dean within 14 calendar days of receiving notice of the unit’s decision. In cases such as dismissal from an academic program or from the University, the college dean shall refer the student’s appeal to the Academic Review Board under procedures outlined below. The College Academic Review Board will make a recommendation to the dean within 30 days.

College Academic Review Board: Each college (excluding the Honors College and the Graduate College) will establish a College Review Board consisting of five members, three faculty and two students. The three faculty members are elected by the college at large for one nonrenewable four-year term. One undergraduate student and one graduate student who are candidates for degree programs in the college are appointed by the Western Student Association and the Graduate Student Advisory Committee, respectively for one renewable two-year term. Terms run from September 1 to August 31 of each calendar year. The dean may accept the College Review Board’s recommendation or may forward the Review Board’s recommendation and his/her alternate recommendation to the provost. In a case involving a graduate student, the college dean will consult with the dean of the Graduate College before issuing a decision.

4. If the student wishes to appeal the decision of the dean or the College review Board, he/she may request in writing a review by the provost within 14 calendar days of receiving notification of the college level review. The provost’s decision will be final except for written appeal to the president, when academic dismissal from the University is the recommended penalty.

5. Students may appeal charges of academic dishonesty made by the registrar, Office of Admissions, the Graduate College or other units not in an academic college structure first to the director of that unit, and then to the provost. The provost’s decision will be final.

6. At each review level in the appeals process, the reviewer shall investigate the appeal, making sure that all interested parties have a full opportunity to present their position. The review will be able to recommend: (a) support for the initial charge and/or sanction; (b) modification of the initial charge and/or sanction; (c) no support of the initial charge and/or sanction. Records must be maintained at each review level.

7. If a student fails to appeal to the next step within any of the time limits specified in this policy, the prior action will be considered final.

8. Throughout the appeals process, a student may select one representative to provide assistance during all proceedings. However, the student must advise the review officer or body, in writing, and identify the representative when requesting an appeal.

Student Conduct

Rules and regulations in the Student Code covering student conduct are developed by the Division of Student Affairs and reviewed by the Admissions, Financial Aid and Student Affairs Council composed of the deans of student affairs, administration, and students. The policies, when approved by the Board of Trustees, are published in The Student Code. Rules and regulations appearing in this code are developed under the philosophy reflected in this statement.

Western Michigan University is committed to maintaining an environment which protects the rights of students to freely pursue academic inquiry and personal expression while encouraging them to develop critical judgment, civility, and self-discipline. The Dean of Students has overall responsibility for student conduct and discipline. When infractions of rules and regulations occur, students will be referred to the Office of Student Judicial Affairs for disposition.

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, answers your question or helps you locate someone who can assist you, explains the University’s policies and procedures and how they may affect you, follows up with you and others at the University to make sure your concern is resolved, and recommends changes to 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 most 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.
The Physical Sciences Library, formerly known as Archives and Regional History Collections, is part of the Waldo (Main) Library. This library has been expanded and modernized since its completion in 1991. It now contains over 92,000 volumes and extensive microform collections, annual reports from businesses and industries, and many periodical and serial titles in the field of business and economics.

The Music and Dance Library is located in the Dorothy U. Dalton Center. In addition to a collection of some 36,000 books and scores, and extensive music periodicals and serials, this branch has a collection of 12,700 sound recordings, and excellent listening facilities.

The Physical Sciences Library located on the third floor of Rood Hall, contains 73,800 items in the fields of mathematics, astronomy, physics, and geology and has subscriptions to about 600 periodical and serial titles.

The Education Library in Sangren Hall has some 54,000 bibliographic items and receives over 600 periodical and serial titles.

The University Libraries have extensive collections of microform editions of selected items as the Human Relations Area File, the Early English Books printed in Great Britain from 1475-1700, and the ERIC documents. Microprint editions of selected United Nations documents and official records are also available. A collection of about 1,200 incunabula contains such items as the Human Relations Area File, the American Periodical Series, Early American Newspapers of the 18th and 19th centuries, Early Printed Books printed in Great Britain from 1475-1700, and the ERIC documents (documents in educational 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. The Medieval period, holdings which help support the programs of the University's Medieval Institute. The collection also includes rare books, manuscripts, and incunabula, most of which are on indefinite loan to Western from the Abbey of Gethsemani. Over 900 of the some 9,000 items in this collection are rare items of special interest to medieval scholars from all over the world.

4. A Randall Frazier Memorial Collection, honoring a notable alumnus, has a wealth of material on the history and culture of Black America.

5. The C. Adams Ecological Collection consists of the personal collection of books and papers of the pioneer American ecologist, Charles Christopher Adams.

6. The Wendell B. Wood 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 1920-1933.

7. The Maps and Atlases Room contains the second largest academic map collection in the State of Michigan and the third largest map collection in the state.

8. A strong business collection of more than 92,000 items and extensive microform collections, annual reports from businesses and industries, and many periodical and serial titles in the field of business and economics.

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WMU Residence Halls

Twenty-two residence halls attract over 6,000 students each fall and winter semester. By the bus line. Call (616) 387-3360 for more information. Enjoy the unstructured lifestyle and the locked entry to each co-ed floor. Students single rooms to single graduate students and common area kitchens, study, laundry, bath on campus. Offers unfurnished, inexpensive Spindler Hall admitted to Western Michigan University, are renewable each term. You may submit an the popularity of the WMU Apartments. The WMU Apartments are home to many single and graduate students. Common interests among the residents support the interaction and neighborhood feeling in each of the three apartment communities. Residents typically find a niche within their community quickly and often form friendships which last well beyond graduation.

There are one- and two-bedroom, furnished and unfurnished apartments available, which rent for approximately 25 percent less than area off-campus apartments. One apartment community has been completely renovated and is fully air-conditioned. Rental fees include utilities, trash removal, cable television, regular maintenance and University parking. A computer jack is located in each apartment for residents who wish to have access to the services provided by the WMU mainframe computer. Residents may also purchase a campus-wide dining plan which offers continuous "all-you-can-eat" dining services. All apartments are convenient to classes, libraries, computer labs, recreational facilities and campus activities. On-site laundry facilities are also convenient to residents. Parents rely on "Kids' Club," a popular after-school program, and the recreational and child care programs which are located throughout the system. Families with young children often exchange child-care services with neighbors.

Early application is recommended due to the popularity of the WMU Apartments. The complexes are open year-round, but leases are renewable each term. You may submit an application even before you are officially admitted to Western Michigan University, since the application date is the basis for assignment. Contact the WMU Apartment Office for more information (616) 387-2175, 1-800-882-9819 or FAX (616) 387-4740.

Spindler Hall

Spindler Hall, located just east of main campus, offers unfurnished, inexpensive single rooms to single graduate students and non-traditional students. Residents share common area kitchens, study, laundry, bath and recreation rooms. Cable television and utility service is included in rent. Spindler Hall has secure, but bus friendly entrance as well as locked entry to each co-ed floor. Students enjoy the unstructured lifestyle and the beautiful, histrionic building. Spindler Hall has plenty of convenient parking and is right on the bus line. Call (616) 387-3360 for more details.

WMU Residence Halls

The Sindecuse Health Center

The Sindecuse Health Center is a student-oriented medical facility which 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. Our entire staff works as a team to assist you with your health care needs.

MEDICAL SERVICES

The Health Center provides evaluation and treatment for a wide variety of illnesses and injuries in addition to preventive health care. Medical specialties include primary practice, internal medicine, gynecology, psychiatry, dermatology, nutrition assessment, and sports medicine. In addition, Health Center physicians and physician assistants can refer students to other medical specialists in the Kalamazoo area whenever indicated. All information and Health Center records are strictly confidential. Student signature is required for release.

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 Sindecuse Health Center medical staff. You may pay for pharmacy items by cash, check, MasterCard, Visa, Discover Card, or you may bill your student account. Many major insurance cards for prescription coverage are also accepted.

LABORATORY SERVICES

The center's full-service laboratory performs most standard diagnostic tests. These are often evaluated while you wait so that you receive prompt treatment, saving you both time and money. Electrocardiograms are also available.

X-RAY SERVICES

The radiology department performs all general diagnostic x-rays. All x-rays are developed for immediate interpretation by Sindecuse Health Center clinicians and are further interpreted by a radiologist.

ALLERGY INJECTIONS

Students requesting allergy injections must provide their antigen and injection schedule to Health Center staff. No appointment is needed. Check with the Health Center for times injections are given.

IMMUNIZATIONS

Several serious diseases, including measles, mumps, German measles, tetanus, diphtheria, and hepatitis B, are all vaccine preventable. You should be immunized to protect yourself and the University community. The Sindecuse Health Center offers all immunization updates and immunizations required for overseas travel. Appointments for immunizations are required.

TUBERCULOSIS TESTING

Routine tuberculosis testing, required for some classes and Employment, is also available. No appointment necessary. Check with the Health Center for times TB testing is performed.

HIV TESTING

HIV testing is available to all students. For more information, call 387-4HIV.
SPORTS MEDICINE CLINIC
The Sports Medicine Clinic provides comprehensive diagnosis and treatment of injuries as well as physical therapy services. The clinic is staffed by a physical therapist, two certified athletic trainers, a sports medicine specialist, and a podiatrist consultant.

URGENT CARE
The Health Center’s urgent care clinic is designed for sudden injuries or illness. No appointment is necessary.

APPOINTMENT INFORMATION
Students are encouraged to choose a physician assistant with whom they feel comfortable and request this clinician when scheduling appointments. Appointments may be scheduled by calling 387-3290, 8:00 a.m. to 5:00 p.m., Monday through Friday.

If you have an appointment, go directly to your clinician’s office. Plan to arrive ten minutes early for your appointment and plan on your visit lasting at least an hour. If you have prescription drug coverage through outside insurance, bring that identification card and information with you.

If you cannot keep your appointment, let the Sindecuse Health Center know so that your time may be used to help another student. There is a charge for not canceling an appointment.

SINDECUSE HEALTH CENTER HOURS
Appointments Monday - Wednesday and Friday, 8:00 to 11:30 a.m. and 1:00 to 4:30 p.m.; Thursday, 9:00 to 11:30 a.m. and 1:00 to 4:30 p.m.

Urgent Care Clinic Monday - Friday, 8:00 to 5:00 p.m.; Saturday, 9:00 - 11:30 a.m. (except summer session and during break weeks).

PARKING
While visiting the Sindecuse Health Center, parking is available in one of the designated Health Center parking spaces in student Lot No. 40. You may get a one and one-half hour parking permit in the Lobby. Short-term parking is available in the semi-circle drive while you receive your permit.

STUDENT HEALTH FEE
All Western Michigan University students enrolled for seven or more credit hours per semester (fall or spring) are assessed a Student Health Fee as part of the enrollment fee. This entitles students to use all Health Center services (including those offered in the Sports Medicine Clinic) for a minimal charge. Part-time students, non-enrolled, and spouses of WMU students, must pay the Student health Fee on their first professional visit of the semester/session. Eligibility for use of the Health Center extends from the first day of the applicable semester/session for which the fee has been paid to the first day of the next semester/session. Students remain eligible to be seen at the Health Center one semester or two sessions after graduation. Fee schedules are available at the Sindecuse Health Center.

The Student Health Fee benefits apply only to services rendered in the Sindecuse Health Center. This includes visits to hospital emergency rooms, immediate care centers, medical specialists outside the Health Center, and transportation by ambulance if not covered by the fee. Lab and x-ray services requested by clinicians outside the University can also be provided by the Health Center.

Charges for Health Center services may be paid by cash, check, MasterCard, Visa, or Discover Card; however, we request that all fees under $1 be paid in cash. You may also charge your health care costs against your student account. 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 health insurance that covers medical, surgical, and hospitalization expenses which are not covered by the Student Health Fee. It is important to verify the services included in any insurance policy you purchase. Be sure to carry the insurance identification card with you at all times.

If you are not presently covered by a major medical insurance program, consider the student insurance plan offered through Western. This plan is provided at reduced rates to students and their dependents. Brochures are available at the Health Center or by calling 387-3266.

MANDATORY HOSPITAL, MEDICAL, AND SURGICAL INSURANCE
All international students are required to carry health insurance if health care coverage is not provided by their program. 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 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 weekdays from 8 a.m. to 11:30 a.m. on Mondays, Tuesdays, and Fridays (1 p.m. to 4:30 p.m. on Wednesdays; 9 a.m. to 11:30 a.m. on Thursdays) or by calling 387-3266.

STUDENT HEALTH ADVISORY BOARD
The Student Health Advisory Board (SHAB) is designed to bring a diverse group of students together to help plan ways in which Sindecuse Health Center can offer high-quality health services at the lowest possible cost for students. Its members become involved in the planning, service delivery, and funding allocation decisions of the Health Center and participate in continuing quality improvement activities. All students enrolled in the Michigan University are eligible to serve on the SHAB as a representative of a Registered Student Organization or in an at-large position. Any student wishing more information regarding membership is asked to contact University Wellness Programs, Sindecuse Health Center, at 387-3263.

UNIVERSITY WELLNESS PROGRAMS, SINDECUSE HEALTH CENTER
You, more than anyone else, are 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 office of University Wellness Programs, Sindecuse Health Center, offers a wide range of programs, consultations, and materials to help students know toward understanding, maintaining, and enhancing their current and future health. The following resources are offered as a Student Health Fee benefit:

- A Health Promotion Resource Center located in the Sindecuse Health Center front lobby.
- Skill development for building healthy love relationships and making healthy sexual choices (single-session programs and educational materials).

Information on a variety of sexual health concerns.
- Anonymous HIV Counseling and Testing (minimal fee).
- Nutrition counseling for healthful eating, vegetarian food planning, weight management, eating disorders, sports nutrition, and diet therapy for medical concerns.
- Single-session workshops for learning more about vegetarian food planning and reducing dietary fat.
- A five-week holistic approach to long-term weight management focused on skill-building for eating and nutrition management, stress management, increased physical activity, and building a healthy relationship to food.
- Cholesterol screening, scheduled by appointment (minimal fee).
- Stress management skill-building including time management, creative problems solving, changing negative thinking styles, relationship building, relaxation, and honest communication (group programs, personal manuals).
- Stop smoking skills (options include a seven-session group behavior change and recovery program, personal self-help manuals, a take home video, and nicotine patches).
- Self-esteem building programs and materials.
- Blood pressure screening and education.
- American Heart Association Adult CPR certification (minimal fee).

University Wellness Programs can also design programs to meet special group needs. Achieving and maintaining optimal health involves appropriate utilization of preventive health care services and commitment to the creation of a healthy lifestyle. Physical, emotional, and spiritual well-being depend on how willing you are to invest in yourself and your quality of life both now and in the future.

Call 387-3263 for more information.

IMPORTANT PHONE NUMBERS
Appointments ........................................ 387-3290
Information ........................................ 387-3266
Pharmacy ........................................... 387-3301
Health Promotion/Health Information .................. 387-3263
Sports Medicine Clinic .......................... 387-3248
HIV Antibody Testing .............................. 387-4111

Career Services
Assistance in total job search planning is offered free of charge by Career Services to all 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.

Student Volunteer Services
Student Volunteer Services (SVS) is dedicated to furthering the student community service movement on campus and to enhancing the traditional classroom education through experiential service-learning opportunities. The mission of Student Volunteer Services is to foster awareness and understanding of the...
challenges facing our society and to encourage student involvement in addressing these needs through community service and social action. The SVS, SVS, students have access to volunteer opportunities in over 150 community and campus organizations. The SVS staff will assist you in determining where your interests and individual needs meet the needs of our community. Individual volunteer opportunities and one-time group projects are available in a variety of interest areas including friendship, socialization, leisure and physical health care, friendship, and model services, recreation, education, cultural arts and sciences, financial/legal/government services, handicapped services, advocacy, natural resources, and media/public relations. Individual volunteer opportunities typically require a two to four hour weekly commitment, one-time group projects vary from three to eight hours.

Service projects coordinated by SVS include Alternative Spring Break, Into the Streets, a Service Week, and the Volunteer Opportunities Fair. Presentations are offered throughout the academic year and include information on service sites, volunteer positions, and how to get involved. Students are encouraged to visit our office located in the Lee Honors College. Telephone (616) 387-3230.

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 counseling, academic counseling, educational goals. Psychological counseling services 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 subcommittee of catalogs and bulletins from other American colleges and universities.

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

4. Training and Internship Programs: To provide training opportunities for graduate students from the Department of Counseling Education and Counseling Psychology, 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. The Counseling Center attempts to serve as many students as possible within certain limitations. Graduate students unable to use the Counseling Center services during regular hours may request to make arrangements for Thursday evening appointments by calling the Center office, (616) 387-1850.

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 all of these tests are also available in the Testing Office. This department serves as the regional office for the Miller Analogy 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 information 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 in Weaikd Hall, Room 28.

The office hours are 8:00 a.m. - 5:00 p.m., Monday through Friday.

Career English Language Center for International Students (CELCS)

The Career English Language Center for International Students (CELCS) provides intensive English as a Second Language instruction for those prospective students who need further training in English in order to qualify for admission to the University. Most students in the CELCS program must be enrolled full-time, part-time study is not permitted for students entering the U.S. on an F-1 visa.

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 CELCS terms per year. Fall and winter terms are 15 weeks each, while spring and summer terms are each seven weeks. A progress report that evaluates the student’s capabilities in English will be 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 CELCS for admission to the CELCS program. Admission to CELCS 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 49006. Telephone: (616) 387-4806. Fax: (616) 387-4806.

Office of International Student Services

Western Michigan University has long recognized the value of international education. Over the last number of years, the number 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, counseling, 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 may be seeking admission to Western Michigan University should contact the Office of International Student Services for an application form and instructions. To qualify for admission, the 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 1-20 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 two examinations preferred by the University are the Test of English as a Foreign Language (TOEFL) and 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 500 must be achieved in the TOEFL examination for most programs. For the MELAB exam, an "adjusted 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. The Office of International Affairs, established in 1981, provides leadership and administration for the international involvement of the University.

The mandate of the office is to administer, orchestrate, and encourage the development of WMU’s international programs and activities to work on a cooperative basis with all the colleges and departments of the University.
Under the direction of the Executive Director of International Affairs, the responsibilities of the office include the initiation and maintenance of linkages with foreign universities and agencies as well as American universities and agencies operating abroad. The office administers the University’s foreign study programs, faculty and student exchanges, field courses and seminars abroad, and study tours. It assists in the recruitment of foreign students, and aids faculty and administrators in developing technical assistance projects and in preparing proposals for funding international projects from off campus sources. The office also sponsors conferences and symposia on international issues, provides small grants for professional international travel of faculty, and assists with applications for international fellowships for faculty and students. For further information contact the Office of International Affairs, 2090 Friedmann Hall, Western Michigan University, Kalamazoo, Michigan 49008. Telephone (616) 387-3951. FAX (616) 387-3982.

Foreign Study

Students who are interested in studying or working abroad should contact the Foreign Study Coordinator, Office of International Affairs. Assistance in selecting an appropriate program, as well as extensive resources about foreign study opportunities are available. Financial aid, International Student Identity Card, Youth Hostel Pass, and some volunteer and work abroad information is available. For further information contact the Foreign Study Coordinator, 2090 Friedmann Hall, Telephone (616) 387-5890.

Vehicle Registration

All students are eligible to park a motor vehicle on University property; however, they must first register their motor vehicle, motorcycle, and/or mopeds with WMU Parking Services (located in the Public Safety Annex) and pay a registration fee. Detailed information concerning parking regulations, parking permits, and parking violations can be obtained by visiting the Public Safety Annex located in the 2300 block of West Michigan Avenue, across from Faunce Student Services Building, or by calling (616) 387-4600. After business hours, contact the WMU Police Department, located at 511 Monroe Street, or call (616) 387-5555.

Publications

Western Herald, WMU’s student newspaper, is published Mondays through Thursdays during the fall and winter semesters, Mondays and Thursdays during the spring session, and Wednesdays during the summer session. The Western Herald is made available to students partially 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 cooperation with the Office of Alumni Relations. The Westerner is published three 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 dean.
6. Admitted graduate students have active admission status one year from the time of admission, as well as one year from the date of last enrollment. If a student does not enroll during the year following admission or during the year following the last enrollment, the student's admission status is cancelled, and thereafter the student must complete an Admission application form and be admitted anew by the appropriate program admission body before registration may occur.

Graduation

1. A Graduate Student Permanent Program should be submitted to the Records Office during the first semester or session of enrollment. A program of study may include a maximum of four hours of credit in 596 (Readings) courses.
2. Diploma Application: A diploma application must be submitted by November 1 for the December Commencement, by March 1 for the April Commencement, by May 1 for the June Commencement, and by July 1 for the August Commencement. The University has no commencement ceremony in August.
3. 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.
4. 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.

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 advisor and the graduation dean approve the credits for transfer.
   Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university. Transfer credit will be recorded on the Western Michigan University transcript as "Credit" (CR) only and will not be calculated into the honor points earned and the grade point average at Western Michigan 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.

Research Subject Protection

Students conducting research involving 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, 387-8270.

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 the student is informed about the regulations pertaining to the preparation of the manuscript and to requirements for research involving regulated subjects and hazardous materials. A master's thesis is six credits. It may be registered for in increments of one (1) to six (6). Following a student's first enrollment in 700, the student will enroll in 700 in each semester/session continuously until all thesis requirements are completed satisfactorily and approved by the appropriate bodies. A student unable to complete the thesis within the first six hours of registration will be required to continue to enroll in 700, however, only six hours of 700 will count toward meeting the program requirements for the degree.

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 Certificate Program

A Graduate Certificate Program is a fifteen to twenty-one hour, normally, aggregate of cohesive, topical graduate level courses. Students may pursue a Graduate Certificate Program separately or in conjunction with a graduate degree program.

To signify that a student has satisfactorily completed an approved curriculum in a Graduate Certificate Program, a certificate is awarded; however, the certificate is not an award of license, accreditation, or certification to render professional services.

Regular admission to the unit offering the Graduate Certificate Program is required. A student must complete the requirements of the Graduate Certificate Program with a "B" or better average within a six-year period. The Graduate Certificate Programs offered by Western Michigan University are described on pages 45 and 46.

Anthropology

Advisor:
Michael Nasseneye
Room 124, Moore Hall

The Master of Arts in Anthropology is designed to provide the students with a basic understanding of the major theories and methods of the discipline as a whole. Students have the opportunity to specialize in one of the three subdisciplines of anthropology: archaeology, cultural anthropology or biological anthropology. Graduate seminars are available on such specialized topics as: Development Anthropology, Gender, Ethnicity, Archaeological Theory and method (Processual and Post-Processual), Great Lakes, Eastern U. S. African Historical Archaeology, Osteology, Forensic Anthropology, Paleoanthropology. In addition to coursework, students are encouraged to pursue original and independent research. The M.A. program in anthropology prepares graduates for Ph.D. programs in anthropology or other related disciplines, as well as establishing the foundation for careers in Cultural Resources Management, education, industry, government or non-profit organizations.

Admission requirements

1. Students should have completed a major or minor in Anthropology. Other students will be considered but may be required to enroll in undergraduate prerequisite coursework.
2. Accumulation of a grade point average of at least 3.0 during the final two years of undergraduate work.
3. 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 Advisor.
4. Each applicant must submit to the graduate advisor a one-page statement outlining his or her career goals and interests in anthropology.

Program requirements

1. Complete at least thirty semester hours in anthropology. Cognate courses may be substituted with approval from the department advisor.
2. ANTH 601, 602, and 603, are required.
3. Pass a comprehensive written examination on the field of Anthropology.
4. Complete an acceptable Master's Thesis (6 hrs.).

Art

Advisor:
Patrice Opel, 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 the MFA program: Graphic Design, Painting/Watercolor, Photography, Printmaking, and Sculpture. The Department of Art provides graduate 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.

Western Michigan University is an accredited member of the National Association of Schools of Art and Design. The MFA program requirements meet or exceed the recommendations of the College Art Association of America.

Admission requirements for both programs

1. An undergraduate degree with a major in art or its equivalent.
2. A completed application for admission.
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 Arts In Art

Art Practice emphasis requires a minimum thirty credit hours, for students interested in advanced study in art practice for professional reasons.

Program requirements

1. Twelve hours in one area of concentration.
2. Six hours in advanced art history.
3. Two hours in ART 625, Graduate Seminar.
4. A review of all art work by a graduate committee at the ends of the first and second semesters to determine continuation in program.
5. Two hours in ART 613, Graduating Presentation. This course includes a final exhibition and oral presentation which must be approved by a departmental committee before the M.A. degree is granted.
6. Eight additional hours, five in art or art history.
Master Of Fine Arts

The sixty-hour 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. Eighteen hours in electives, of which fifteen 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 at the ends of the first and second semesters to determine continuation in program.
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
Advisor:
Elwood Ehrle
Room 151, Wood Hall

MASTER'S PROGRAM
The Master of Science in Biological Sciences enhances students' ability to plan, carry out, analyze, and report original research. Course work increases students' scientific preparation and supports their research. Through the advice of the students' major advisor, efforts are made to choose courses to meet individual needs and interests. The degree may serve as preparation for continued graduate or professional study or for positions in the private or public sector. Thesis and non-thesis options are offered.

Admission Requirements
To be admitted to the Biological Sciences program, both the Department and the graduate dean must endorse the students' application. Applications can be obtained from the Department of Biological Sciences, (616) 387-5626. Applications are reviewed based on the following criteria, although no one criterion is sufficient to guarantee admission or dictate denial of admission:
1. Earn a baccalaureate degree from an accredited college or university.
2. A grade point average of 3.0 or greater in all undergraduate courses.
3. Take any prerequisite courses as necessary in biology, chemistry, physics, and mathematics.
4. Submit three letters of recommendation.
5. Have a major advisor appointed in the student's major area of specialization. If a major advisor is not available in the area of specialization, the student may not be admitted to the program.

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 in Section I, General Policies and Procedures, of this Graduate College Catalog.

Program requirements
Thesis option—The Master of Science in Biological Sciences requires 33 hours of work including preparing and defending a thesis in an oral examination, and presenting research results at a departmental seminar or at a state or national scientific meeting. Non-thesis option—The Master of Science in Biological Sciences requires 33 hours of work, including presenting research results at a departmental seminar or at a state or national scientific meeting, defending research results in an oral examination, and preparing a manuscript suitable for publication in a refereed journal. Students should note that awarding of the master's degree is not contingent upon submission of the approved manuscript for publication.

Required Courses (14 hrs.)
There are 6 graduate core courses: BIOS 611, BIOS 612, BIOS 613, BIOS 614, BIOS 615 and BIOS 616. Master's students are required to take 4 of these 6. In addition each student is required to take 2 hours of BIOS 606 Biological Science Colloquium.

Elective Courses (13 hrs.)
Because of the course variations possible within the program, these courses are selected with the advice and approval of the student's advisory committee. Electives are selected from Biological Sciences or approved cognate courses.

Research Requirement (6 hrs.)
BIOS 700 Master's Thesis (6 hrs.) Thesis Option.
BIOS 710 Independent Research (6 hrs.) Non-Thesis Option.

Admission requirements for this program are that the student should have completed successfully an undergraduate program with a major in mathematics or physics and a minor in biology or biomedical sciences, or a major in biology or biomedical sciences and a minor in mathematics or statistics, or the equivalent. Specific course deficiencies 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 (BIOL 301), genetics (BIOMED 250 or BIOL 302), physiology (BIOMED 350 or BIOL 333 or BIOL 527), microbiology (BIOMED 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 272), differential equations (MATH 274), elementary 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).

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 availability of internships. (Admission to the program is limited by the number of internship opportunities available.)
   b. A promising student may be admitted to the program without meeting the Admission Requirements and be required to complete this work as extra program requirements.
2. 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).
3. Biology or Biomedical Science Component (6 credit hours): Two approved 500-level biomedical science courses. These courses are chosen to fit a student's individual interest.
4. Elective 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 662.
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 the 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 challenging 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**

**Advisor:**
Michele M. Moe, Admissions Officer
Lowell E. Crow, Associate Dean
David Vallenga, Dean

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 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 Low Vision or Gerontology.

**Rehabilitation Teaching**

**Advisor:**
Susan Ponchillia,
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, simulated 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 Low Vision or Gerontology.

**Business**

**Advisor:**
Michele 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 Business 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 western Michigan. 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 function 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. Students admitted on a Permission to Take Classes status are not allowed to enroll in graduate business courses.

**Program requirements**

The MBA degree program requires, in addition to the prerequisites, a minimum of thirty-three hours of coursework, or twenty-seven hours and a Master's Thesis (6 hrs.) in a program approved by the student's graduate advisor. A minimum of thirty hours must be taken in 600 or higher level courses. The program consists of prerequisites, MBA core courses, and an area of concentration. A 3.0 overall graduate grade point average is required for graduation. A 3.0 average is also required for all courses required for the MBA degree.

1. **Prerequisites**: In order to provide students with the background of knowledge in business and administration required by the American Assembly of Collegiate Schools of Business, study in the areas of Accounting, Economics, Finance, Business Information Systems, Law, Management, Marketing, and Statistics is required. This requirement may be satisfied by waiver (in case of prior completion of appropriate undergraduate courses, the WMU BBA core courses, or the equivalent); by examination; or by taking Introduction to Information Processing 102; Principles of Accounting 210, 211; Principles of Economics 201, 202, Business Finance 320, Legal Environment 340; Management Fundamentals 300, Marketing 370, and Business Statistics, Math 216. A minimum grade of ‘C’ is required in all prerequisites.

2. **MBA Core**: The core consists of Applied Economics for Management 600, Computer Information Systems 602, Legal Controls 607, Accounting Control and Analysis 607, Financial Management 608, Marketing Management 607, and Policy Formulation and Administration 699. MBA students with undergraduate majors/minors in Business Administration areas will be advised about proper upper-level discipline substitutes for core courses with the prior approval of their area advisors.

3. **MBA Concentration**: An area of concentration may be selected from Economics, Finance, General Business, Management, Marketing, or Paper Science. Usually this concentration consists of three to five courses in an area (in addition to the MBA core). However, at least fifteen hours of credit must be taken outside the area of concentration.

**Master of Science In Accountancy**

**Advisors:**
Jerry G. Kreuze
Gale E. Newell
William R. Welke

The Master of Science in Accountancy requires a minimum of thirty hours graduate work, at least fifteen hours to be in accounting. The program prepares the student for professional careers in industry, commerce, finance, government, and public accounting. A graduate from the Haworth College of Business with a Master of Science in Accountancy will be qualified to take many of the professional certification exams. Since the qualifying rules differ by state, and are subject to change, the student is responsible for determining if additional criteria need to be met for a specific exam or state. Knowledge and understanding of the theory, literature, controversial concepts, and professional practice of accounting are developed. The student's understanding of the relationship of accounting to other fields in business and to other disciplines is also stressed. Course work will be selected from the areas of Financial Accounting, Cost and Managerial Accounting, Auditing, Taxation, Not-for-Profit, Systems, and Accounting Theory.

**Admission requirements**

Admission to the program is obtained through the Admissions Committee of the Department of Accountancy. The following criteria are used in the evaluation of applications: The applicant must have an undergraduate degree and an acceptable academic record as 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**


**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 hours outside the Department of Accountancy.
Master of Science In Business

The Master of Science in Business program permits students to specialize in a specific area of business such as Administrative Systems, Finance, Management, or Marketing. The program is designed primarily to permit exceptional students to work on individualized programs, generally in preparation for further academic studies. It is a departmental program and specific admissions and course requirements are determined by the department.

Admission Requirements

Applicants or recent graduate students who enroll at the University on a Departmental (GMAT) prior to consideration for admission to academic studies. It is a departmental program requiring a passing score on the Graduate Management Admission Test (GMAT), prior to consideration for admission to this program, and also meet undergraduate point-hour ratio requirements specified by the department. Students admitted to the University on a Permission to Take Classes (PTC) status are not allowed to enroll in graduate business courses.

Program Requirements

1. Prerequisites: These include coursework or the equivalent in Accounting, Economics, Finance, Law, Management, Marketing, and Statistics. Additional prerequisites may be specified by the department depending on the particular program (e.g., preparation in mathematics, behavioral sciences, computer programming, etc.).

2. A departmental concentration of a minimum of twenty-one semester hours, including the satisfactory completion of a research methodology course, and a Master's Thesis (6 hrs.) or a major research project assigned by the department.

3. A 3.0 overall graduate grade point average is required for graduation. A 3.0 grade average is also required for all courses required for the MSB program.

Career and Technical Education

Advisor: Linda Dannison, Room 3018 Kohrmann Hall

The Department of Consumer Resources and Technology offers the Master of Arts in Career and Technical Education. This thirty-hour degree program includes coursework that will strengthen students' abilities to teach in career and technical education and to assist in developing and implementing new programs or curricula. The program is flexible to provide advanced techniques for teachers, and career preparation for administrators, supervisors, counselors, and coordinators, and for any other specialist positions in the career and technical education areas of marketing education, business education, home economics, and technology education.

Admission Requirements

This program is designed for bachelor’s graduates in marketing education, business education, home economics, industrial arts, industrial education, or career and technical education, plus professional preparation in teacher education, including director or supervised student teaching.

Program Requirements

Courses of at least thirty graduate credit hours, selected in consultation with a program advisor. The program of study will consist of

3-6 hrs. of professional education courses, 15-18 hrs. of core courses, and 3-12 hrs. of electives.

Chemistry

Advisors:
Ralph Steinhaus,
Room 335, McCracken Hall
Don Brown,
Room 4100, McCracken Hall

The Master of Arts in Chemistry is planned to provide a broad background in the various fields of chemistry with concentration in one. Entrance requirements include taking an entrance examination covering the fields of Analytical, Organic, and Physical Chemistry. The entrance examinations are scheduled during the week preceding each semester and the spring session. New students, unless entering with an acknowledged deficiency, are required to take all three examinations before they start classes. Students who fail an entrance examination are required to attend the corresponding undergraduate course, if available, and/or repeat the entrance examination if so advised. Entitlement in a 600-level Chemistry course is not permitted unless the appropriate entrance examination has been passed. The student is required to elect twenty hours in the field of Chemistry, including the Master's Thesis. The Chemistry hours may be more than twenty depending on the student's background. The remaining hours up to at least thirty hours may be in a related field or fields. The course sequence will include (if not previously elected):

1. CHEM 505, Chemical Literature.
2. CHEM 506, Chemical Laboratory Safety.
3. CHEM 520, Instrumental Methods in Chemistry.
4. CHEM 510, Inorganic Chemistry or CHEM 550, Biochemistry I, or CHEM 552, Biochemistry I with Laboratory.
5. CHEM 601, Graduate Seminar. (Attendance required every semester.)
6. Three 600-level courses from three different divisions (Analytical, Biochemistry, Inorganic, Organic, and Physical), including one course in the division of the Master's Thesis.
7. CHEM 700, Master's Thesis (6 hrs.)

The requirement for any of the above 500-level courses is waived if the student has taken a corresponding course as an undergraduate. The student is required to pass a final oral examination administered by the student's graduate committee. The student is also required, as part of the graduate training in chemistry, to attend departmental seminars, colloquia, and symposia, and to participate in research within the department.

Communication

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

Master of Arts in Communication

The Master of Arts in Communication has two options: Option A—Interpersonal Communication, and Option B—Organizational Communication. The Option in Interpersonal Communication is designed for students interested in improving their knowledge and ability in interpersonal communication with potential application in a variety of human service professions. The 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 Advisor based on a student's needs, interests, and professional objectives.

Admission Requirements

The primary criteria for admission are based upon answers to the following questions: Does the applicant have a clear understanding of his/her professional objectives? Will the graduate curriculum and staff provide a satisfactory educational experience for him/her? Undergraduate records, letters of recommendation, evidence of 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.

OPTIO A—INTERPERSONAL COMMUNICATION

The Master of Arts in Interpersonal Communication is planned to provide a program for students who desire a terminal degree or who wish to qualify for further graduate work. Students will receive an emphasis in interpersonal communication, with the option of a thesis. A thesis is recommended for those considering further graduate work in communication. Elective credit may include course work in interpersonal, organizational, or mass communication, and up to 6 hours of graduate credit from another department.

Program Requirements

1. COM 601 Introduction to Graduate Study in Communication 3 hrs.
2. Interpersonal Communication Core 15 hrs.
   All of these courses are required:
   COM 602 Communication Research Methods 3 hrs.
   COM 674 Theories of Interpersonal Communication 3 hrs.
   COM 681 Group Communication Processes 3 hrs.
   Select 2 courses from the following:
   COM 600 Listening 3 hrs.
   COM 670 Seminar in Interpersonal Communication 3 hrs.
   An approved statistics course* 3 hrs.
   A. Nonverbal Communication 3 hrs.
   B. Personality and Communication 3 hrs.
   C. Family Communication 3 hrs.
   D. Health Communication 3 hrs.
   E. Female/Male Interaction 3 hrs.
   F. Intercultural Communication 3 hrs.
   or any other approved COM 670 seminar*
   COM 671 Cognition and Emotion 3 hrs.
   An approved statistics course* 3 hrs.
   COM 700 Master's Thesis 6 hrs.
5. Electives 6 -15 hrs.
   Electives to complete the 33 hours may include up to 6 cognate hours from other departments, selected in consultation with the Graduate Advisor.

   Total 33 hours

*See the Graduate Advisor for the list of approved courses. Each semester the student is enrolled, he/she must consult with the Graduate Advisor.
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 also is designed for those currently in the field of organizational communication—that is, 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 contacts among those 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 regulating the flow of messages to and from the organization in its relationships with other organizations.

Course work combines communication theory and social scientific methods in the exploration of how information is exchanged among its members, and a knowledge of those individuals and groups concerned with maintaining ineffective organizations. This program also is designed for those considering further graduate work in communication. Elective credit may include coursework in interpersonal, organizational, or mass communication, and up to 6 hours of graduate credit from another department.

Program Requirements

1. COM 601 Introduction to Graduate Study in Communication ............... 3 hrs.
2. Organizational Communication Core .......... 12 hrs.
   These courses are required: COM 602 Communication Research Methods ........ 3
   COM 682 Organizational Communication .................. 3
   Select 2 courses from the following: COM 673 Conflict Management .......... 3
   COM 680 Seminar in Organizational Communication
      A. Organizational Communication Ethics .......... 3
      B. Communication and Organizational Culture ........ 3
      C. Communication and Organizational Transformation ........ 3
      or any other approved COM 680 Seminar.*
   COM 685 Special Topics in Organizational Communication
      A. Communication, Training and Development ........ 3
      B. Communication for Managers .................. 3
      C. Public Relations for Managers .................. 3
      or any other approved COM 685 Special Topics.*
   COM 683 Power and Leadership in Org. Communication ........ 3
   An approved statistics course* ........ 3
   COM 700 Master’s Thesis ..................... 6
   Electives to complete the 33 hours may include up to 6 cognate hours from other departments, selected in consultation with the Graduate Advisor.
   Total ..................................... 33 hours

*See the Graduate Advisor for a list of approved courses. Each semester the student is enrolled, he/she must consult with the Graduate Advisor.

Comparative Religion

Advisors: E. Thomas Lawson, Chairperson; H. Byron Earhart, David Ede, Nancy Felt, Francis Grooss, Otto Grindler, Timothy Light, Rudolf Siebert, Irene Vasquez

The Master of Arts in Comparative Religion is designed to provide students with a strong foundation of knowledge of at least two religious traditions, the principal classical works in the field of Comparative Religion, and the central issues of theory and method that underlie the discipline of the study of religion.

Admission Requirements

1. The completion of a baccalaureate degree from an accredited institution.
2. The submission of a letter of intent stating specific areas of interest and academic and professional goals.
3. Two letters of recommendation from persons able to evaluate the applicant’s potential for graduate study.
4. An approved statistics course*

Program Requirements

The Master’s program offers two options: Option I requires a thesis and is intended for those students who plan to pursue doctoral studies. Option II does not require the preparation of a thesis.

The requirements for the degree are as follows:

Option I
1. A total of at least 27 hours of course work, including nine hours of approved core courses (REL 600, 610, 620) and 18 hours of electives chosen from approved courses.
2. Preparation of a Master’s thesis (6 hours) under the direction of a thesis advisor.
3. Demonstrated reading proficiency in one foreign language.

Option II
1. A total of at least 33 hours of course work including 9 hours of approved core courses (REL 600, 610, 620) and 24 hours of approved electives.
2. Comprehensive examination in the student’s area of concentration.

Computer Science

Advisor: Alfred Boals

The Master of Science in Computer Science 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 course work 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 from the following: CS 111, 112, 223, 224, 331, 342, and EE 100 (or their equivalents). 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 (6 hours).
2. Additional approved electives chosen from CS 518, 520, 525, 527, 620, 543, 554, 555, 581, 582, 585, 599, 603, 620, 625, 626, 627, 628, 632, 633, 643, 655, 660, 661, 672, 679, 680, 681, 682, 710, MATH 507, 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.) With the approval of an advisor, a student may elect to write a master’s thesis, in which case the student will register for 6 credits of work in CS 700.

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


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

The Master of Arts programs in Counselor Education and Counseling Psychology is offered in four options:
1. Counseling Psychology
2. Community Agency Counseling** with specialties in gerontology, substance abuse, holistic health, and marriage and family therapy.
3. Pupil Personnel Services**
   a. Counseling in Elementary Education***
   b. Counseling in Secondary Education****
   c. Career Development Specialist***
4. Student Personnel Services, Post Secondary Education
   a. Administration of Student Personnel Services
   b. Counseling in Post-Secondary Education**
   * Leads to Michigan limited license as a psychologist.
   ** Leads to Michigan license as a counselor.
   *** Leads to endorsement as a counselor on a current, valid Michigan Teaching certificate.
5. The Master of Development Administration
   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 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 536, Comparative Public Administration; PSCI 542, Administration in Developing Countries; PSCI 632, Public Budgeting in Developing Countries; PSCI 646, Seminar, Development Administration, and ECON 588 or 688, Economic Development.
      b. Electives or Skills. Two courses in PSCI 572, Computer Applications; PSCI 590, Research Methods, PSCI 591, Statistics; PSCI 690, Comparative Research Methods, or PSCI 691, Quantitative Methods.
      e. Electives. Two courses from among at least two dozen in twelve different Departments.
   All elective courses may be selected by the student with the approval of the Graduate Advisor.

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.

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   e. Electives. Two courses from among at least two dozen in twelve different Departments.
   All elective courses may be selected by the student with the approval of the Graduate Advisor.

Earth Science
Advisors:
W. Thomas Straw
Room 1183, Rood Hall
The Master of Science degree program in Earth Science is interdisciplinary with geology as a core. Two options are available.

Earth Science Teaching
The Master of Science in Earth Science (Teaching) is designed to provide students with a foundation in the fields of astronomy, geology, meteorology, and oceanography. Graduates of the program are employed in

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   e. Electives. Two courses from among at least two dozen in twelve different Departments.
   All elective courses may be selected by the student with the approval of the Graduate Advisor.

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teaching in secondary schools and junior colleges.

Admission requirements
Students should have completed an undergraduate major in earth science or its equivalent and one semester each of college chemistry and physics. Deficiencies in undergraduate preparation must be completed before admission to candidacy (see general degree requirements). Students planning to teach in secondary schools should complete certification requirements.

Program requirements
1. A minimum of thirty hours of graduate credit in earth science or related disciplines with consent of graduate advisor.
2. Students are expected to attend Departmental seminars and are required to give one presentation. 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 advisor, 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.

Program requirements
1. A minimum of thirty-five hours is required for the degree.
2. 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 seven 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 6075, 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 WMU or at another university.

Two tracks for the M.A. program are offered: An Applied Economics track and a Traditional/Research track.

The applied Economics track is designed for those who expect to pursue a career in business or government and prefer a course of study leading to a terminal degree that emphasizes applications of economics to the problems of these areas. The program may include a professional internship with a local firm or non-profit institution.

The Traditional/Research track is for those who have the objective of further graduate study at WMU or at another institution leading to a doctorate, or who desire a strong theoretical/research orientation leading to research-oriented business or government jobs. The degree is awarded on the basis of the satisfactory completion of thirty-three hours in a planned program prepared in consultation with a graduate advisor. The required classes are: Economic Statistics, 622; Introduction to Mathematical Economics, 604; Introduction to Econometrics, 619; Applied Economics for Management, 600; Applied Economics, 602; Advanced Price Theory, 603; National Income Analysis, 662; Professional Field Experience, 712.

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The applied Economics track is designed for those who expect to pursue a career in business or government and prefer a course of study leading to a terminal degree that emphasizes applications of economics to the problems of these areas. The program may include a professional internship with a local firm or non-profit institution. The degree is awarded on the basis of the satisfactory completion of thirty-three hours in a planned program prepared in consultation with a graduate advisor. The required classes are: Economic Statistics, 622; Introduction to Mathematical Economics, 604; Introduction to Econometrics, 619; Applied Economics for Management, 600; Applied Economics, 602; Advanced Price Theory, 603; National Income Analysis, 662; Professional Field Experience, 712.

The Traditional/Research track is for those who have the objective of further graduate study at WMU or at another institution leading to a doctorate, or who desire a strong theoretical/research orientation leading to research-oriented business or government jobs. The degree is awarded on the basis of the satisfactory completion of either thirty hours including the master's thesis (6 hours) or thirty-three hours in a planned program prepared in consultation with a graduate advisor. The required classes are: Economic Statistics, 622; Introduction to Mathematical Economics, 604; Introduction to Econometrics, 619; Advanced Price Theory, 603; National Income Analysis, 662. Students may concentrate in any of the following fields: economic theory, banking and monetary theory, industrial organization and public policy, international economics, economic development, public finance, econometrics and mathematical economics, managerial economics, and human resources.

Admission requirements
1. Satisfactory completion of a minimum of twelve undergraduate hours in economics or in equivalents approved by the graduate advisor.
2. Satisfactory completion of intermediate level courses in microeconomic and macroeconomic theory. Students not meeting this requirement will be admitted with reservations and be required to complete satisfactorily ECON 403 and 406.
3. Satisfactory completion of at least one course in Calculus.

Program requirements for the Traditional/Research track:
1. The satisfactory completion of either thirty 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 advisor.
2. At least an overall "B" average in the Economics courses that the student takes in an advisor-approved program of study.
4. Pass comprehensive examination.

Program requirements for the Applied Economics track:
1. The satisfactory completion of thirty-three hours in a planned program prepared in consultation with the graduate advisor.
2. At least an overall "B" average in the Economics courses that the student takes in an advisor-approved program of study.
4. Pass comprehensive examination.

Education And Professional Development

2112 Sangren

Information regarding graduate degree programs may be obtained from the departmental office, 2112 Sangren. Students with a bachelor's degree seeking initial teacher certification are required to contact the Office of Admissions and Advising (2504 Sangren) for counseling.

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. Possession of a valid Michigan Teaching Certificate or equivalent at the appropriate level for all programs. Exceptions may be granted by the advisors in Early Childhood Education (ECE) and in Reading (RDG).

Applicants with grade point averages below 3.0 may be granted probationary status and allowed to establish eligibility for regular admission by completing six to twelve 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 program, the academic criteria above should be considered as minimum standards.

Upon admission each student is assigned an advisor 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 of 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 advisor.
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 advisor.
Early Childhood Education
Advisors: Ariel Anderson, Suzanne Davis, Andrea Smith
2112 Sangren

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 an Early Childhood Specialist Endorsement. Individualized programs help to prepare candidates for their personal career goals in public schools or in a variety of other settings.

Program requirements
1. Thirty-six hours of graduate work are required as a minimum for graduation. Each candidate's program will include a core of courses (ED 606, 607, 608, and 609). Each candidate's program beyond the candidate's entering group, 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 advisor 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
Advisors: Jim Burns, Joe Chapel, Ron Crowell, Janet Dynak, Jeannine Jacobson, Paul Wilson.
3514 Sangren

Graduate programs in reading at Western Michigan University prepare educators in various leadership roles. 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 and college instructors, as well as 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 treatment experience.

Program requirements
Thirty-six hours of graduate work are required as a minimum for graduation. These may be selected from the following:
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—Twenty-one hours

Twelve-one 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 advisor.
3. Related Cognates—Six hours selected from courses outside the College of Education which have been approved by the advisor.

Teaching In The Elementary School
Advisors: DeWayne Anderson, Paul Farber, Richard Harring, George Miller, Lynn Nations-Johnson
2112 Sangren

The Master of Arts in Teaching in the Elementary School is intended to prepare teachers for superior classroom performance. The program provides opportunities for candidates to explore their roles as teachers in a rapidly changing society and to continue to develop their skills in working with young elementary school children. The program affords great flexibility and can be individualized, with the aid and consent of the candidate's advisor, 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:
   a. ED 600, Fundamentals of Measurement and Evaluation in Education, or ED 601, Fundamentals of Educational Research, or ED 677, Ethnography of Schooling
   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
Advisors: Jeanne Jacobson, Lynn Nations-Johnson, Tom Ray
2112 Sangren

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 an understanding of the teaching/learning process or, conversely, for those limited in their subject-matter background to strengthen that area.

Program requirements
Thirty-six semester hours of required courses are selected with the advisor's advice and approval in the general categories of the learner (6 hrs.), the school (18 hrs.), teaching practice (9 hrs.), subject matter concentration (9 hrs.), and a culminating middle grades seminar and project (6 hrs.).

Educational Leadership
Advisors: Patricia F. First, Chair, Zoe Bailey, Robert O. Brinkerhoff, Mary Anne Bunds, David J. Cowden, Patrick M. Jenlink, Ulris Smidchens, Eugene W. Thompson, Charles C. Warfield.
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 several areas of concentration, in addition to the general degree: human resource development, educational evaluation, measurement, and research design, and degrees which lead to endorsement for certification as elementary or secondary principals. Chief school business officials, central office administrators, and directors of special education (substitutions allowed for Directors of Special Education), and school district superintendents. At Western Michigan University the latter 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.

Persons who wish to apply to the Educational Leadership master's program must apply directly to the Admissions Office. Applicants who need advice or information prior to admission are urged to contact the Educational Leadership office. Satisfactory completion of courses prior to admission to a Department program does not guarantee admission to the program.

Program Requirements for Concentration Areas
General Degree: This degree is designed for graduate students who desire to develop and enhance their leadership skills and further their subject-matter background in the concentration areas unnecessary. The program requires a minimum of 30 credit hours. Required courses are EDLD 602, Educational Leadership and EDLD 640, Introduction to Research. In addition, the student and the advisor develop a program of study with 6 credit hours in courses that address human and interpersonal relations, 6 credit hours that address skills and knowledge in leadership, 9 credit hours that address the student's career, professional, or research interests, and 3 credit hours that address strengths needed by the student to achieve the student's leadership goals.

Elementary/Secondary Principal: A program of study leading to a master's degree with endorsement as a building principal consists of a minimum of 33 credit hours and includes the following required courses: EDLD 602, Educational Leadership; EDLD 640, Introduction to Research; EDLD 681, School Law; EDLD 682, School Business Management; EDLD 664, Curriculum Development; EDLD 665, Elementary Administrator or EDLD 670, Secondary Administrator (according to emphasis selected); EDLD 673, Supervision; and EDLD 674, School Community Relations. In addition, 9 credit hours of electives which add to the student's skills will be chosen with the advisor's approval. Contact the Teacher Certification Officer at Western Michigan University for information on compliance for certification for the State of Michigan as a building principal.
Central Office Administrator: A program of study leading to a master's degree with endorsement as a central office administrator consists of a minimum of 36 credit hours and includes the following required courses: EDLD 602, Educational Leadership; EDLD 640, Introduction to Research, EDLD 665, Elementary Administration, ET 675, Secondary Administration; EDLD 661, School Law; EDLD 662, School Business Management; EDLD 664, Curriculum Development, EDLD 672, School Finance, EDLD 673, Supervision, EDLD 674, School Community Relations, and EDLD 680, The Superintendent. In addition, 6 credit hours, outside of the Educational Leadership Department, will be elected with advisor approval. Persons desiring endorsement as Directors of Special Education may substitute some of these required EDLD courses with SPED courses. Contact either the Special Education or Educational Leadership office for particulars. Contact the Teacher Certification Officer at Western Michigan University for complete information on compliance for certification for the State of Michigan as a central office administrator.

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 664, Personnel Administration, EDLD 666, Curriculum Development; EDLD 675, School Finance, and EDLD 682, Computer Applications in Administration. In addition 9 credit hours are selected, with advisor approval, from courses designed to complement and strengthen skills acquired in technical skills needed to work. Students interested in this option must complete this degree program in 3 years. At least twenty hours of the major must be in courses in literature; no more than fifteen of the thirty should be at the graduate level. A student's Graduate Student Permanent Program Form must be approved by the department's Graduate Program Coordinator and the graduate dean.

Electrical Engineering
Graduate Program Coordinator: S. Hossein Mousavinezhad, Room 3050 Kohrman Hall

The Department of Electrical Engineering offers a graduate program leading to a Master of Science in Engineering (Electrical). The program has two options—a coursework option and a thesis option—and 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 computer engineering, control systems, real-time embedded systems, electromagnetics, and digital signal processing.

Admission requirements
Applicants must:
1. Satisfy the general admission requirements of The Graduate College.
2. Possess a Bachelor of Science degree in Electrical Engineering from an ABET accredited program in the U.S. or a reputable overseas school as certified by the WMU office of International Student Services.
3. Have a grade point average of 3.0 or better (A=4) in the last 2 years of undergraduate work.
4. Submit GRE scores for the General Test.
5. Have completed undergraduate courses in computer-aided design, computer-aided manufacturing, properties of materials, metrology, quality control, manufacturing processes, statics, and strength of materials. Where a candidate's background is deficient, foundation courses will be required.

Program requirements
The program consists of core and two options—a coursework option and a thesis option

Core requirements
1. Eighteen (18) hours of approved electrical engineering courses.
2. Six (6) hours of approved mathematically-oriented graduate courses.

Coursework option requirements
1. Three (3) hours of additional electrical engineering graduate courses approved by the Graduate Program Coordinator.
2. Six (6) hours of additional graduate courses approved by the Department from the following disciplines: electrical, industrial, or mechanical engineering, mathematics, computer science, physics, or philosophy

Thesis option requirements
1. Six (6) hours of EE 700 (Master's Thesis).

The thesis option is open to selected students interested in research or project work. Students interested in this option must petition the department chair and each student's thesis committee must be approved by the department chair and the Graduate College.

A minimum of fifteen (15) hours should consist of courses at the 600-level or higher. A student's Graduate Student Permanent Program Form must be approved by the department's Graduate Program Coordinator and the graduate dean.

Engineering Technology
Advisor: Pnina Ari-Gur, Room 2043 Kohrman Hall

The Department of Engineering Technology offers a graduate program leading to a Master of Science in Manufacturing Science. The program is designed to provide advanced competencies in the areas of computer-aided manufacturing, computer-aided design and analysis, and integrated processing of polymers, metals, and composite materials. This program is designed for decision-makers in manufacturing engineering, engineering graphics and design, process engineering, quality assurance, and tooling design.

Admission requirements
Applicants must:
1. Possess a baccalaureate degree with a major in a technical field such as engineering or technology.
2. Show evidence of competency in mathematics through the calculus level and statistics, two semesters of physics and one semester chemistry with laboratories, and computer programming.
3. Possess a grade point average of 3.0 or better during the last two years of undergraduate work.
4. Submit GRE scores for the General Test.
5. Have completed undergraduate courses in computer-aided design, computer-aided manufacturing, properties of materials, metrology, quality control, manufacturing processes, statics, and strength of materials. Where a candidate's background is deficient, foundation courses will be required.

Program requirements
The Master of Science in Manufacturing Science requires a minimum of thirty-one (31) hours: twelve hours of core courses, nine hours of electives, and six hours of thesis. Where a candidate's background is deficient, foundation courses will be required.

Electrical Engineering
Graduate Program Coordinator: Seamus Cooney, Room 618, Sprau Tower

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 and a writing sample appropriate to the proposed area of study. At least twenty hours of the major must be in courses in literature; no more than fifteen of the thirty should be at the freshman-sophomore level. Students should consult with the advisor at the earliest
opportunity concerning their programs of study.

Required courses in the program are ENGL 615, Literary Criticism; ENGL 630, Research and Writing; ENGL 640, The Nature of Poetry; and ENGL 690, Scholarships and Writing in the Profession (Capstone Project).

All other courses in the student's program are selected by the student and the graduate advisor to complete a coherent thirty-three 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 advisor.

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 and should present a sample of their expository writing.

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 advisor 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 advisor.

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 forms needed to apply for admission to it, write to the department's graduate advisor.

Master of Arts in Spanish

Advisor: Gary Bigelow Room 512, 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 half 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 advisor.
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 Graduate College or to the department's graduate advisor. Assistantships may be available for qualified applicants.

Master Of Arts In Teaching Of Geography

Advisors: George Vulich Room 322, Wood Hall Joseph Stotlman Room 330, Wood Hall

The 34-hour Master of Arts in the Teaching of Geography is designed to improve the classroom teacher's competencies. There are two major objectives: to provide elementary and secondary teachers with a graduate degree option which combines the content of geography and related disciplines with professional development, and to provide elementary and secondary teachers with the skills and knowledge necessary for providing educationally sound learning experiences for their students.

Admission requirements
1. Successful completion ("C" or better) of (GEOG 375) Principles of Cartography or approved equivalent.

Admission requirements
Experience indicates that geography majors/minors, or social/biological 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 105, 205, 265).
2. Successful completion ("C" 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. Environmental and Resource Analysis
   c. Geographic Techniques
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).
1. Completion of GEOG 460, Concepts and Strategies in the Teaching of Geography, or an approved equivalent 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 500- and 600-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 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
Advisor: 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-six quarter 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 advisor. Areas of specialization in the Geology Department include Sedimentary Geology-Paleontological, 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 GEOL 660 for seminar.
3. A copy of the Graduate Record Examination score in Geology must be submitted 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
Advisor: 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
1. Substantial undergraduate course work in history and related social sciences and humanities. (Students with strong academic records but deficient in undergraduate course work in history may be admitted with a stipulation to complete appropriate undergraduate courses.)
2. Graduate Record Examination (GRE) general aptitude test scores.
3. Three letters of recommendation.
4. A brief essay concerning applicant’s academic and professional objectives.
5. Students whose native language is other than English must achieve a TOEFL score of 600 or above, or otherwise demonstrate a command of English judged adequate by the department to pursue graduate study in the discipline.

Program requirements
All students in the program are required to complete the core:
HIST 510 Colloquium ........ 1 hr.
HIST 600 Historical Method .. 3 hrs.
HIST 601 Historiography .... 3 hrs.
Three options for completing the degree are available:
Thesis Option (31 hrs.): designed for students who anticipate doctoral studies in history, or other subsequent graduate study, and/or careers in research. Requirements:
1. Core: HIST 510, 600, 601.
2. At least one research seminar (HIST 670, 675-688).
3. At least three courses (including two at the 600-level) in theory, research, or applications drawn from HIST 590-596, 625-650, 672 or 689.
4. Up to 12 hrs. of course work may be taken outside the department in an advisor-approved program of study.
5. Comprehensive examination: a course-based written and oral examination following completion of at least 24 hrs. of course work including required core courses and a research seminar.

Public History Option (40 hrs.): designed for students entering or continuing in public history professions. Requirements:
1. Core: HIST 510, 600, 601.
2. At least one research seminar (HIST 670, 675-688).
3. At least three courses (including two at the 600-level) drawn from HIST 590-596, 625-650, 672 or 689.
4. Up to 12 hrs. of course work may be taken outside the department in an advisor-approved program of study.
5. An internship/field experience (HIST 640 or 712, 6 hrs.)
6. Comprehensive examination: a course-based written and oral examination following completion of at least 24 hrs. of course work including required core courses and a research seminar.

Home Economics
Advisor: Linda Ormsby, Department of Consumer Resources and Technology, Room 3016, Kohman Hall
Master Of Arts In Home Economics
The graduate program 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 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 those 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 advisor.
3. Complete a minimum of ten hours at the graduate level in allied areas, planned in consultation with departmental graduate advisor. Assistantships may be available to those wishing to pursue fulltime graduate study.

Industrial Engineering

Coordinators, Graduate Programs
David Lyth, 2016 Kohrman Hall
Richard Munsterman, 2007 Kohrman Hall and Grand Rapids Regional Center

The Department of Industrial Engineering offers graduate programs in Engineering (Industrial) and in Engineering Management. Also, in cooperation 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)

Advisor: Richard Munsterman, 2007 Kohrman Hall and 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.
4. Where the student's background is found deficient, foundation courses will be required. Students with a baccalaureate degree in Industrial Engineering will typically not be required to take any prerequisite classes.

Program requirements
Thesis and non-thesis options are available. The requirements for each one are presented below:

1. Thesis Option
   a. An approved integrated program with a minimum of 36 hours of graduate work distributed as follows:
      18 hours of core requirements
      6 hours of IE 700, Master's Thesis
      6 hours of electives
   b. A written thesis which meets the Graduate College requirements and an oral examination in defense of the thesis.

2. Non-thesis Option
   a. An approved integrated program with a minimum of 36 hours of graduate work distributed as follows:
      18 hours of core requirements
      15 hours of electives, at least 6 of which will be from the Department of Industrial Engineering
      IE 697, with a written report and presentation, or an approved 600-level IE elective
   b. A 3.0 overall grade point average will be required for all graduate courses on the student's permanent program.

Core requirements 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 516 Design of Industrial Experiments I
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 and Operations 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 the Program Advisor 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

Advisors: David Lyth, 2016 Kohrman Hall
Richard Munsterman, 2007 Kohrman Hall and 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 biological sciences. For other majors, 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 18 hours of required core courses and 12 hours of electives as follows:
   a. Required core of six courses (18 hours): IE 507, Computer Integrated Manufacturing
      IE 508, Advanced Quality Management
      IE 600, Concepts and Principles of Engineering Management
      IE 606, Capital Budgeting and Cost Analysis
      IE 612, Productivity and Operations Management
      IE 614, Project Management
   b. A minimum of 12 hours to be selected from graduate courses available in the Department of Industrial Engineering, or any other department within the University. Among the electives is IE 697, with a written report and presentation. The elected courses must be compatible with the overall program and the career objectives of the student, and must be approved by the Program Advisor prior to registration.
2. 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

Advisors: Frank Wolf, 2017 Kohrman Hall
Abdolazim Houshyar, 2011 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
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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 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;
   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.

3. Eight hours of courses cognate to the student’s undergraduate degree.

4. 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.

5. A 3.0 overall grade point average will be required for all graduate courses on the student’s permanent program.

Mathematics

Chairman, Graduate Committee
Yousef Alavi,
Room 3303, Everett Tower

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

Master Of Arts In Mathematics

Advisors:
Arthur Stoddart, Anthony Gioia, Thomas Richardson,
Room 3319, Everett Tower

The Master of Arts in mathematics extends the student’s knowledge in areas of algebra, real and complex analysis, applied mathematics, combinatorics, geometry, number theory, statistics, and topology. The program permits specialization in preparing for advanced study, and provides essential training for teachers of mathematics and students seeking employment in industry.

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 complete 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;
   e. One of the following: MATH 677, Measure and Integration; or MATH 676, Complex Analysis I;
   f. An approved graduate level sequence.

2. Complete nine semester hours of approved electives, usually selected from:
   a. MATH 530, Linear Algebra
   b. MATH 580, Number Theory
   c. MATH 611, Mathematical Applications
   d. MATH 615, Intermediate Analysis
   e. MATH 616, Survey of Algebra
   f. MATH 649, Studies in Geometry

3. Complete six semester hours of approved electives, usually selected from:
   a. MATH 619, Computer Methods in Secondary Mathematics
   b. MATH 653, Studies in Teaching
   c. MATH 654, Curriculum Studies in Secondary Mathematics
   d. MATH 695, Seminar in Mathematics Education

4. In meeting these program requirements an effort is made to select courses that deal with concepts and skills related to 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 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 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).

Master Of Arts In Mathematics Education

Advisors:
Christian Hirach, Robert Lein
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 curriculum 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 530, Linear Algebra
   b. MATH 580, Number Theory
   c. MATH 611, Mathematical Applications
   d. MATH 615, Intermediate Analysis
   e. MATH 616, Survey of Algebra
   f. MATH 649, Studies in Geometry

2. Complete six semester hours of approved electives, usually selected from:
   a. MATH 619, Computer Methods in Secondary Mathematics
   b. MATH 653, Studies in Teaching
   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. MATH 530, Linear Algebra
   b. MATH 580, Number Theory
   c. MATH 611, Mathematical Applications
   d. MATH 615, Intermediate Analysis
   e. MATH 616, Survey of Algebra
   f. MATH 649, Studies in Geometry

4. In meeting these program requirements an effort is made to select courses that deal with concepts and skills related to 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 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 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).

Master of Science In Applied Mathematics

Advisors:
Dennis Pence, Rey Treiman
Room 3319, Everett Tower

The Master of Science in Applied Mathematics emphasizes a broadly based study of the mathematical sciences, including statistics, differential equations, mathematical 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 Department of Mathematics and Statistics approved project on an applied problem. Financial assistance are to be selected from the following courses. These 6 hours were previously taken as an undergraduate. With the approval of the advisor, a student may substitute approved electives listed below for any of the specified courses which were previously taken as an undergraduate. Mathematics MATH 507 Numerical Analysis I MATH 510 Applied Matrix Algebra MATH 562 Statistical Analysis I MATH 574 Ordinary Differential Equations MATH 602 Mathematical Modeling (MATH 607 Numerical Analysis II OR MATH 637 Numerical Linear Algebra) (MATH 608 Linear Programming OR IE 610 Linear Programming for Engineers) MATH 662 Applied Linear Models MATH 690 Applied Mathematics Seminar (1 hr.) 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 Program requirements 1. Complete the following 26 semester hours of specified courses: MATH 507 Numerical Analysis I MATH 510 Applied Matrix Algebra MATH 562 Statistical Analysis I MATH 574 Ordinary Differential Equations MATH 602 Mathematical Modeling (MATH 607 Numerical Analysis II OR MATH 637 Numerical Linear Algebra) With the approval of the advisor, a student may substitute approved electives listed below for any of the specified courses which were previously taken as an undergraduate. These 6 hours are from the above selected courses. Mathematics MATH 566 Nonparametric Statistical Methods MATH 572 Complex Variables MATH 605 Optimization (MATH 607 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 678 Complex Analysis *MATH 690 Applied Mathematics Seminar (1 hr.) *MATH 699 /712 Reading and Research/Field Experience 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. Computer Science CS 527 Theory of Computer Graphics CS 631 Advanced Data Structures CS 632 Analysis of Algorithms Mechanical Engineering Advisors: Clifton Ealy, Dennis Pence, John Petro, Jay Tremain 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 multivariable calculus and differential equations, courses in linear algebra, modern algebra, probability, advanced calculus, numerical analysis, knowledge of the programming languages FORTRAN and Pascal, and a course in data structures. The courses at WMU which satisfy the admission requirements are MATH 122, 123, 272, 274 (or 230 and 274) or 374, 330, (362 or 560), 570, 507, and CS 111, (201 or 306), 112, (alternately CS 351 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: MATH 510 Applied Matrix Algebra OR MATH 530 Linear Algebra MATH 562 Statistical Analysis I MATH 602 Mathematical Modeling OR MATH 605 Optimization OR MATH 608 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 With the approval of the advisor, a student may substitute approved electives for any of the specified courses which were previously taken as an undergraduate. 2. Complete at least 9 semester hours from the following: Mathematics MATH 602 Mathematical Modeling OR MATH 605 Optimization OR MATH 608 Linear Programming *MATH 690 Applied Mathematics Seminar (1 hr.) *MATH 699 Studies in Applied Mathematics *These courses may be repeated for credit. 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). 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 Advisor: Jerry Hamelink 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 scheduling 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 after they have satisfactorily completed the necessary undergraduate prerequisite courses prescribed by the department’s graduate advisor. 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
36 MASTER'S DEGREE PROGRAMS AND REQUIREMENTS

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 advisor.

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
Advisor: Otto Gründler
The Medieval Institute, Walwood Hall

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-D. option)
1. A total of at least 36 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 faculty member.
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 16 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:
David Sheldon, 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 six (6) 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 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/literature, 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 interests and, at the same time, will realize the full value and depth of the University’s graduate offerings. The student’s needs are determined by an evaluation of the results of Preliminary Examinations and a review of the first 6-10 semester hours of course work taken. After this evaluation and review, the graduate advisor 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. The performance preliminary examination will determine if the student will be permitted to pursue this major area of concentration.

Sight-reading may be requested. Vocal majors must demonstrate piano skills and a proficiency in French, German, and Italian diction. Deficiency 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 (not necessarily limited to music) to make a total of at least 30 semester hours. Must include a 600-level music theory and a 600-level music history course, unless already required in the program.

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),
   Culuminating option (choose a, b, or c):
   1a) MUS 691, Special Project in Music (2) or MUS 651, Research in Music Education (2) or
   1b) MUS 700, Master’s Thesis (6) or
   1c) eight (8) hours of pre-approved graduate courses, including written comprehensive exam.
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 30-36 semester hours. Must include a 600-level music theory and a 600-level music history course, unless already required in the program.

("Every student is required to register for one of these culminating projects, each of which includes an oral exam. For students anticipating doctoral studies, a thesis is strongly recommended.

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 apply to the required undergraduate courses, including the six-month internships 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 (6); MUS 712, Professional Field Experience (2)*.

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, Counselor Education and Counseling Psychology, Mathematics and Statistics, Occupational Therapy, Psychology, Sociology, Special Education, Speech Pathology and Audiology, Education and Professional Development (6-9).

(*The student must have completed the six-month internship required for R.M.T. certification prior to enrolling in MUS 700, Master's Thesis, and MUS 712, Professional Field Experience.)

Master Of Arts In Teaching Of Music

The School of Music and the Department of Education and Professional Development offer a Master of Arts degree program in the Teaching of Music. The purpose of the degree program is to offer course work in music and teacher education which will enhance the teacher's teaching abilities in general, and more especially in the area of music. This degree program is accredited by the National Association of Schools of Music. A minimum of thirty semester hours of credit are required to complete this degree.

Admission requirements

A Bachelor of Arts or Science degree, or equivalent, with a major in music, and a teaching certificate are required for admission. Students are admitted on the basis of transcripts, which must include at least forty semester hours of acceptable work in music. Exceptions to admission requirements may be granted if competency can be demonstrated 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 musicianship. Preliminary Examinations will be administered in the areas of music history/literature and music theory.

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 graduate offerings. The student's needs are determined by an evaluation of the results of Preliminary Examinations and a review of the first 6-10 semester hours of coursework taken. After this evaluation and review, the graduate advisor 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. Program requirements include:

1. Nine hours from the Education core courses: ED 602, School Curriculum (3); ED 603, Social and Philosophical Foundations (3); ED 604, Psychological Foundations of Education (3).
2. Twelve hours from Music Education courses: MUS 610, Introduction to Research in Music (3); MUS 642, Philosophy of Music Education (2); MUS 650, Seminar in Music Therapy (3); Elective in Music Education (2), Culminating option (choose a or b) a) MUS 691, Special Project in Music (2) with oral exam or MUS 681, Research in Musical Behavior (2) with oral exam, or b) eight (8) hours of pre-approved graduate courses, including written comprehensive exam.
3. Four hours in applied music, music therapy, or music history/literature.
4. Six hours of electives, selected in consultation with the graduate advisor.

Occupational Therapy

Advisors:

Cindee O. Peterson
Room 169, Wood Hall

The Occupational Therapy Department offers two graduate programs which lead to the Master of Science Degree: The graduate professional program (entry level) for non-therapists and the graduate degree in an area other than occupational therapy and the graduate program for certified therapists (advanced level).

The Graduate-Professional Program

(Master of Science — Entry Level)

This entry-level program for non-therapists is designed to prepare the student to treat clients with various disabilities, and to be eligible for certification as an occupational therapist after successful completion of the Master of Science. This twenty-eight month program of combined academic and clinic education is intended for the student who has a baccalaureate degree in an area of study other than occupational therapy. It consists of seventy-three semester credit hours with forty-three semester hours of professional undergraduate courses and thirty semester hours of graduate courses. The program is accredited by the American Council for Occupational Therapy Education. Graduates are eligible to take the American Occupational Therapy Certification Board Examination and are eligible to apply for licensure/registration in those states regulating the practice of occupational therapy.

The Professional Curriculum

The professional curriculum uses a holistic and integrated approach in developing those characteristics identified for our graduated student. Essential to our educational philosophy is the developmental sequencing of content and learning experiences related to professionalism, personal environment, and the occupational therapy process. The implementation of this philosophy into course design results in the inclusion of most learning objectives into several courses in a simple to complex pattern. We believe that this design maximizes the development of clinical reasoning skills.

Admission requirements

To be eligible for regular admission to this program, each applicant must present evidence of the following criteria:
1. An earned bachelor's degree from an accredited college or university.
2. A cumulative grade point average of 3.0 or better in the most recent 60 hours of undergraduate and graduate academic coursework.
3. Scores on the Graduate Record Examination - General (Aptitude) Test

Because admission is considered competitive, the academic criteria listed above should be considered as minimum standards.

Prerequisite Coursework

The following four courses are required prerequisites for enrollment in the professional occupational therapy courses:

1. Human Growth and Development through the Life Span
2. Abnormal Psychology
3. Human Physiology with lab
4. Human Anatomy or Mammalian Anatomy with lab

Admission Procedure

To apply, the applicant must complete both the University Application for Admission, including the GRE scores and official transcripts, and the departmental application. The early consideration date (deadline) for receiving all applications is March 1 of each year. Full-time study commences in the fall semester. Selection is based upon an equal weighting combination of cumulative grade point average, Graduate Record Examination scores, and space availability.

Program requirements

1. The graduate professional program consists of seventy-three semester hours in the following areas:
   a. Completion of forty-three hours of professional occupational therapy education, including six months of full-time fieldwork. This forty-three semester hour sequence of undergraduate professional education is designed to prepare the student to treat clients with various disabilities, and to be eligible for certification.
   b. Completion of thirty semester hours of graduate courses which include the following:

The student must manifest emotional and developing complex clinical problem-solving skills. The courses are not designed to stand alone, but to build upon the knowledge base therapists. The second semester centers on pathology, dysfunction, and activity analysis.

An overall grade point average of at least 3.0 (A=4.0) is required in the graduate program. No undergraduate credit is computed into the graduate grade point average. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another institution.

Please read the WMU Graduate College Bulletin for information on other requirements for the completion of a master's degree.

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

**Sequence of Courses**

Courses in the professional program are completed in a sequential pattern toward developing complex clinical problem-solving skills. The courses are not designed to stand alone, but to build upon the knowledge base from previous semesters.

The prerequisite and pre-professional courses build a solid knowledge base in the biological and behavioral sciences. The first semester centers on human function, pathophysiology, dysfunction, and activity analysis. Students also learn the history of the profession and current practice roles of therapists. The second semester centers on developing skill in the role of activity in occupational therapy treatment, formal assessments used by therapists, an introduction to treatment theory and techniques used, and constructing appropriate treatment plans. The third session centers on additional treatment techniques used in therapy, and a clinical treatment experience with clients in our on-campus occupational therapy clinic. The fourth session is a professional program centers on a clinical treatment experience with clients in clinical programs in the Kalamazoo area. In addition the student will enroll in the graduate research course to develop research and writing skills as applied to Occupational Therapy.

The following fall and winter semesters are devoted fully to the graduate component designed to enhance growth in professional leadership. The next enrollment period, the summer session, the student enrolls in OT 660. The fall semester of the professional program centers on a clinical experience with clients in clinical programs in the Kalamazoo area. In addition the student will enroll in the graduate research course to develop research and writing skills as applied to Occupational Therapy.

The thirty-nine credit hours of the professional program are required.

**The Graduate Post Professional Program**

**Master of Science — Advanced Level**

This graduate post professional program is designed for those who have completed all required departmental courses and prerequisites with a grade of "C" or better. Subsequent courses cannot be taken until prerequisites are completed successfully.

1. Students who fail a course in the Department of Occupational Therapy or related fields selected with advice and consent of the graduate coordinator.

2. Electives

3. The thirty-hour graduate component is designed to enhance growth in professional leadership potential by developing skills in administration, program development, theories of practice, professional issue resolution and research.

An overall grade point average of at least 3.0 (A=4.0) is required in the graduate program. No undergraduate credit is computed into the grade point average. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another institution.

Please read the WMU Graduate College Bulletin for information on other requirements for the completion of a master's degree.

**Admission Requirements**

To be eligible for regular admission to this program, each applicant must present evidence of the following criteria:

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

2. A cumulative grade point average of 3.0 or better. (By policy of the Graduate College, students admitted with less than a 3.0 GPA are admitted on probation.)

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

4. Certified as an Occupational Therapist.

Because admission is considered competitive, the academic criteria listed above should be considered as minimum standards.

**Admission Procedure**

To apply, the applicant must complete both University Application for Admission, including the GRE scores and official transcripts, and the departmental application. The equal consideration date (deadline) for receiving all applications is March 1 of each year. Full-time study commences in the fall semester. Selection is based upon an equal weighting combination of cumulative grade point average, Graduate Record Examination scores and space available.

**Program Requirements**

The graduate program for certified occupational therapists requires the satisfactory completion of thirty semester hours of graduate courses which include the following:

<table>
<thead>
<tr>
<th>Course Sequence</th>
<th>Credits</th>
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<tbody>
<tr>
<td>OT 610</td>
<td>3</td>
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<tr>
<td>OT 633</td>
<td>3</td>
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<tr>
<td>OT 640</td>
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<td>OT 660</td>
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<tr>
<td>OT 686</td>
<td>3</td>
</tr>
<tr>
<td>OT 700</td>
<td>3</td>
</tr>
</tbody>
</table>

An overall grade point average of at least 3.0 (A=4.0) is required for graduation from the graduate program. Students will complete all required professional courses with a grade of "C" or better. Subsequent courses cannot be taken until prerequisites are completed successfully. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by any credits earned at another university.

Please read the WMU Graduate College Bulletin for information on other requirements for the completion of a master's degree.

**Course Sequence**

The thirty-nine credit hours of the professional program are required. The program is designed to build skills in program development, administration, and consultation (OT 633); advanced treatment theory (OT 640); research (OT 660); and professionalism (OT 700).

The nine hours of required cognate courses allow the student to develop advanced skills in occupational therapy-related fields, or areas of special interest. The program may be completed on either a full-time or part-time basis. The full-time student may complete the program in 10 months with courses beginning in the summer session. Part-time enrollment is possible.

**Paper Science and Engineering**

Advisors: Raja G. Aravamuthan 2011 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, paper, and printing science and engineering. The department has leadership in the areas of pulping and bleaching, recycling and deinking, paper testing, and printing, and it is internationally recognized in the fields of paper coating and coating technology. Its laboratories and equipment are the most advanced in any similar academic institution featuring a semicommercial-sized thermomechanical pulper, complete recycled fiber pilot plant, papermachine, coater, and printing presses.
Programming requirements
1. A minimum of fifteen (maximum of twenty) hours of undergraduate courses in the applicant's degree program.
2. A minimum of six (maximum of nine) hours of graduate courses in the applicant's degree program.
3. A minimum of thirty (maximum of forty) hours of coursework in the applicant's degree program.
4. A minimum of two (maximum of three) hours of research in the applicant's degree program.

Admission requirements
1. A minimum of fifteen (maximum of twenty) hours of coursework in the applicant's degree program.
2. A minimum of six (maximum of nine) hours of graduate courses in the applicant's degree program.
3. A minimum of thirty (maximum of forty) hours of coursework in the applicant's degree program.
4. A minimum of two (maximum of three) hours of research in the applicant's degree program.

Physical Education
Advisors:
- Robert J. Bensley
- Room 4024-5 Gary Center
- Debra S. Berkley
- Room 4024-20 Gary Center
- Jody Blylinsky
- Room 4027-5 Gary Center
- Billee Ann Chestnut
- Room 4024-16 Gary Center
- Ray Cool
- Room 4024-19 Gary Center
- Mary Dawson
- Room 4024-9 Gary Center
- Marlene Fraunke
- Room 4024-6 Gary Center
- Patricia Frye
- Room 4024-10 Gary Center
- William C. Gross
- Room 4024-4 Gary Center
- Ruth Ann Meyer
- Room 4024-22 Gary Center
- Robert Moss
- Room 4024-8 Gary Center
- Roger Zabik
- Room 4021 Gary Center

Program requirements
- Each graduate student is expected to show competence in at least three professional areas: 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 691. The Master of Arts degree program leading to the Master of Arts degree program.
  2. PEGR 692, required and (2) one course from PEGR 645, or PEGR 691. The Master of Arts degree program.
  3. PEGR 710, Independent Research, which the student writes. A faculty committee will assess the student's work.

Thesis option
- The student must complete a minimum of twenty 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 substantial research paper. A faculty committee will assess the student's work.

The Department of Physics offers a graduate program leading to the Master of Arts degree program. The objective of this 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. Thirty semester hours of graduate credit are required. An additional requirement is either to pass the Doctoral Qualifying Examination at the master's degree level or to complete a Master's Thesis. Participation in research may occur in one of the three areas:

1. Theoretical physics—for example, classical liquids, nuclear structure, nuclear reactions, and condensed matter.
2. Experimental physics—for example, atomic physics, nuclear physics, condensed matter physics, and materials analysis with accelerated ions. Equipment available for experimental research include a six million-volt EN tandem Van de Graaff accelerator, and associated electronics and computers.
3. Computer and instrumentation physics, including the use of VAX and MicroVAX computers and assorted microprocessor-based computers.

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 work in mathematics at the appropriate level). Prospective students are recommended to take the GRE General Test and Physics Subject Test. The departmental graduate advisor will provide assistance to students seeking admission to this program and will recommend ways of 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 610, Quantum Mechanics 622, 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 advisor.
2. Either successful completion of the Doctoral Qualifying Examination at the master's degree level or satisfactory completion by the Master's Thesis (6 hours of PHY 700).
3. Additional hours from Physics, Computer Science, Electrical Engineering, or other departments, with the consent of the graduate advisor. The thesis may be either theoretical or experimental in nature and is accomplished under the guidance of a committee of the graduate student and 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 area of physics chosen by the student and approved by the committee. The committee may require an oral defense of the thesis before approving it for submission to The Graduate College. Graduate students are expected to attend the Physics Colloquium, which constitute a program for graduate students and Physics staff members, presented by members of the WMI Physics faculty 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 topics of general interest in physics and related fields. The physics courses available for graduate study are listed elsewhere in this catalog.

Political Science

Graduate Director:
Alan C. Issad, 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 The Graduate College, a 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 must have completed at least thirty-six hours of graduate credit, 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 director, 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 694, Teaching Political Science; PSCI 696, Research and Professional Skills; and either PSCI 662, Political Philosophy I, or PSCI 663, Political Philosophy II, or PSCI 695, The Nature of Political Inquiry and Analysis.
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 the written approval of the graduate director, 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 694, Teaching Political Science; PSCI 696, Research and Professional Skills; and either PSCI 662, Political Philosophy I, or PSCI 663, Political Philosophy II, or PSCI 695, The Nature of Political Inquiry and Analysis.
3. Pass written and oral field examinations on the student's political science program.

Psychology

Malcolm Robertson, Graduate Training Chairperson
Linda Rowen, Program Secretary
Room 255, Wood Hall
The Psychology Department offers course work leading to a terminal Master of Arts in two areas of concentration: Behavior Analysis and Industrial/Organizational Psychology. The Department has a strong behavioral orientation, which influences the content of its programs. The master's program is designed primarily for the student with a bachelor's degree in psychology or a 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.

Graduate students may take a personal appointment to a faculty advisor and two faculty sponsors in an apprenticeship role. These arrangements facilitate the development of a personalized program to accommodate the academic and professional interests of the student and to utilize the full range of research and other 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 contained therein as they apply to academic endeavors, professional service and research activities conducted in partial fulfillment of 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's 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.

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. Four 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 1.

Advisors:
Richard Malott, Behavior Analysis
C. Richard Spates, Clinical
Bradley Hultema, Industrial/Organizational
Howard Farris, School Psychology

Program requirements
Behavior Analysis: The Behavior Analysis Program requires thirty-six credit hours, including PSY 634, Advanced Statistics (3 hours); PSY 608, Research Methods in Applied Behavior Analysis (3 hours); PSY 651, Applied Behavioral Analysis; A Systems Approach (3 hours) or PSY 665, Behavioral Approaches to Treatment; PSY 650, Professional issues in Psychology (3 hours); PSY 610, Conditioning and Learning (3 hours); six hours from PSY 670, Basic Behavioral Processes and Their Applications, PSY 674, Verbal Behavior, and PSY 676, Skinner’s Writings, 9 hours from related topics, and PSY 700, Master’s Thesis (6 hours) or PSY 697, Behavior Analysis M.A. Project (6 hours). The program prepares students for doctoral study or for work with individuals and organizations in developmental disabilities, mental illness, substance abuse, community mental health, education, government, business, and industry.

Behavior Analysis: Specialization Track: Developmental Disabilities

The thirty-six hours of the general behavior analysis curriculum should include the following: PSY 657 Behavior Analysis M.A. Project or PSY 700 M.A. Thesis and PSY 599 Practicum must be in areas deemed by the student’s M.A. Committee to be relevant to developmental disabilities, PSY 570 Introduction to Mental Retardation, PSY 666 Analysis and Treatment of Developmental Disabilities, PSY 651 Systems Analysis, and PSY 665 Behavioral Approaches to Treatment.

Limited license advisory note: Behavior analysis students wishing to qualify for a Limited License to Practice as a psychologist in the State of Michigan are advised that the General Rules of the Board of Psychology of Michigan’s Department of Licensing and Regulation lists the following requirements for a Rule 7 limited license at the M.A. Level:

1. one course in assessment
2. one course in treatment
3. a 500-hour practicum under supervision of a licensed psychologist
4. 2000 hours of supervised post-M.A. experience

Thus, behavior-analysis students may need to take two or more extra courses to meet these additional requirements. Students interested in qualifying for a limited license are encouraged to consult the pre-program licensing law and the Board of Psychology for further details.

Clinical Psychology: No terminal Master of Arts is offered by the Department. A master’s degree in this area is offered only as part of the Doctor of Philosophy. See separate 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/organizational research applications (6 hrs.). Six elective hours may be selected from within psychology or from a discipline related 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 advisor for the industrial/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. 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 methodology for applying them directly with clients within educational settings. Study is focused on learning characteristics of mainstream and exceptional children, as well as the careful analyses 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 for doctoral training in School Psychology.

Public Administration
Advisor: Susan B. Nannan, School of Public Affairs and Administration
Walwood Hall

The multi-disciplinary graduate program in Public Administration, leading to a Master of Public Administration (MPA) degree, is designed to provide advanced professional education for in-career public employees and pre-professional training for recent college graduates. The program content emphasizes administration of local, regional, and state government agencies, health care agencies, and other public and voluntary agencies. This program helps students to develop further their special talents, skills, and experience while acquiring the knowledge appropriate for administrative leadership positions in public and nonprofit organizations.

Reflecting the multi-disciplinary nature of this professional field, the School of Public Affairs and Administration draws upon the diverse talents of the faculty in several colleges and numerous departments throughout Western Michigan University. The School offers a comprehensive grounding in public administration principles and practice, and a substantial degree of specialization within the 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 contingent upon previous academic accomplishments, a history of professional success in increasingly responsible positions in career-oriented fields, appropriate career aspirations, and other factors that will be used when individuals are considered for admission.

Program requirements
The MPA curriculum provides the student with a foundation in the principles of public administration, addresses the practical responsibilities of the public manager, and encourages reflection on the task of administrative leadership. The 39 credit hour program has three components: The Professional Core, the Technical Core, and the Area of Concentration. Pre-cadet students also complete a six credit hour internship. The curriculum assumes that candidates already have basic computer literacy skills and a working knowledge of the American political process at national, state, and local levels.

Professional Core (15 Credit Hours) The Professional Core provides a theoretical base and integrative experiences designed to expand the perspectives of public and nonprofit managers.

PADM 631 Foundations of Public Administration
PADM 633 The Public Environment of Public Administration
PADM 634 Professional Issues Workshops
PADM 635 Project Paper Seminar
PADM 638 Organizational Theory and Behavior (or appropriate substitute)

The courses, seminars, and workshops in the Professional Core are devoted to the development of an in-depth understanding of the discipline of public and nonprofit sector administration and related leadership issues. In the Professional Core, faculty members and students address the key distinctions between public and private sector administration, the political context of agency leadership, and the important historical and contemporary literature of public administration. As a part of the Professional Core, MPA students take three one credit hour professional issues workshops on topics such as professional ethics, time management, team building, dispute resolution, outcomes assessment, and strategic planning. The Professional Core culminates in the Project Paper Seminar in which students synthesize what they have learned in the MPA program by applying their new knowledge to an analysis of a significant administrative problem in their place of employment or professional field experience/internship.

The Technical Core (12-15 Credit Hours) The purpose of the Technical Core is to provide students with the opportunity to build advanced skills in four core areas of administrative practice: statistical applications, legal procedures and reasoning, economic analysis, and budgeting. By enhancing these critical management skills, public administrators become more effective managers of agency resources during a time of rapid organizational change. The Technical Core consists of these courses (or appropriate substitutes).

PADM 622 Applied Research Methods
PADM 626 Administrative Law and Government Rules
PADM 628 Statistical Applications in Administration

Students admitted to the Health Care Administration concentration may substitute...
certain health administration courses in the Technical Core with the approval of their MPA advisor. For example, a course in health law can be used as a substitute for administrative law. See course options in the School’s student handbook for appropriate substitutes.

Area of Concentration (9-12 Credit Hours)
The third component of the MPA is the Area of Concentration. An important professional development component of the MPA, the Area of Concentration allows students to tailor the program to their specific needs and interests. MPA students select a three or four course concentration (9-12 hours) which focuses on their particular professional and personal goals and career objectives.

Students may select from course lists developed for frequently chosen concentrations or design their own concentration from a wide variety of courses offered by SPAA or by other departments in the University. Courses selected for the concentration are frequently offered by other departments. As a result, a student should work closely with their advisor to plan out a complete program. If WMU does not offer a graduate course that the student would like to include in their concentration, an advisor can approve up to six hours of transfer credit for appropriate courses from another graduate institution.

The most commonly selected areas of concentration are Health Care Administration, Corrections Administration, and Local Government Administration.

Science Education
Advisor:
Kamlesh Sharma, 337 Moore Hall

The Department Science Studies of the College of Arts and Sciences offers a graduate program leading to the Master of Arts in Science Education. The program is designed for students beginning their work toward a Doctor of Philosophy in Science Education as well as secondary school science teachers (well-prepared elementary teachers may qualify) who wish to expand their preparation in the sciences and to enhance their teaching skills.

Admission requirements
The minimum admission requirements to this degree program are: (1) an undergraduate major in a science education, (2) teacher certification. Students lacking the above may be admitted provisionally, however, satisfactory completion of necessary undergraduate science and/or education courses will be needed before enrollment in the required graduate courses. These requirements are in addition to the general admission requirements of the Graduate College.

Program requirements
The program consists of a minimum of thirty semester hours of graduate work. Each student’s program is planned in consultation with the advisor and consists of the following:

1. Fifteen semester hours of graduate level science, to include a course in the history and philosophy of science,
2. Nine semester hours of science education, (SCI 610, 616, and SCI 616,
3. Six semester hours of thesis, GRAD 700, Master’s Thesis

The thesis or project is completed under the direction of a major advisor and a thesis or project committee. The major advisor is selected by the student, and the committee is selected by the student in consultation with the major advisor. It is anticipated that teachers working in the program will choose to do a project involving their classrooms. Students planning on further graduate study may pursue a thesis; the thesis might be preliminary work on a doctoral dissertation. The thesis or project topics must be approved by the committee. The committees and topics are subject to the approval of the deans of the College of Arts and Sciences and The Graduate College.

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 constructed as an integrated and sequential set of conceptual and practicum educational experiences. In preparing students for practice, the School recognizes a variety of theoretical paradigms and values and welcomes the challenge and benefits of intellectual and philosophical diversity. It supports students in their personal synthesis of these paradigms and values. In addition, the School stresses development and dissemination of social work knowledge and practice skills.

The graduate program prepares students for specialized and advanced levels of practice. It also incorporates a foundation curriculum, built on a liberal arts base. The foundation has two goals: to provide students with the knowledge, values, and skills leading to an informed perspective on the profession of social work and its service delivery systems, and to prepare students for entry into the concentration.

There are two methods concentrations in the graduate program, one being Social Treatment and the other Policy, Planning, and Administration. Concentrations build on the foundation curriculum and are the vehicles through which students learn the specific advanced skills of their chosen area.

The Social Treatment concentration prepares students to become informed practitioners and leaders in working with individuals, families, and groups. Practice courses in the concentration are designed to provide expert competencies in social treatment. Such competencies include the ability to assess situations, carry out appropriate interventions, and evaluate one’s own practice framework, strategies, and results when working with clients.

The Policy, Planning, and Administration concentration has four essential components: organizational leadership and management, program planning, analytic tools and technology, and policy practice. The desired outcome of the PP&A concentration is the empowerment of practitioners to facilitate changes in organizational, community, and social structures and processes that contribute to a just distribution of opportunities and resources. In addition, the College of Health and Human Services offers opportunity for participation in social work related specialty programs. Included are Alcohol and Drug Abuse (SPADA), Gerontology, Holistic Health Care, and Policy, Planning, and Administration.
The admission requirements for this program are the same as for Option I above.

**Program requirements**
1. Complete 40-42 graduate credit hours: twelve hours in disciplinary 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 advisor 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. Kercher 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 Herris, George Haus, Donna Iacobone, Abraham Nicolaou, Elizabeth Whitten
Department office is located in Room 3506, Sangren Hall.

The Master of Arts program in Special Education is based on an Information Literacy Model. Students gain skill in locating, organizing, critically evaluating, using and disseminating information; effectively using the ever-expanding information base to solve problems in the field of special education; and producing new information related to the field. Competencies in Information literacy are acquired via completion of a 12 semester hour core of courses.

**Master Teacher Option**
This option is designed for persons who have special education certification and who plan to remain directly involved with students with disabilities in an instructional capacity or who plan to continue to pursue advanced graduate preparation beyond the master’s degree. Additional special education teaching endorsements that can be earned through this option are: Autistically Impaired, Emotionally Impaired, Learning Disabled, Mentally Impaired, and Visually Impaired.

**Prerequisites:**
1. Michigan Teaching Certificate or equivalent
2. Endorsement in at least one area of Special Education
3. Admission by Department of Special Education

**Clinical Teacher Option**
This option is available to certified teachers seeking a master’s degree and an initial endorsement in one of the following areas of special education: Emotionally Impaired, Learning Disabled, Mentally Impaired, or Visually Impaired.
Speech Pathology And Audiology

Advisors:
Harold L. Bate
Room 203, Speech and Hearing Center
Michael J. Clark
Room 202, Speech and Hearing Center
Robert L. Erickson
Room 240, Speech and Hearing Center
John M. Hanley
Room 235, Speech and Hearing Center
Gary D. Lawson
Room 224, Speech and Hearing Center

The master's degree program in Speech Pathology and Audiology, which is accredited by the Educational Standards Board of the American Speech-Language-Hearing Association (ASHA), provides academic and practicum experiences basic to the development of clinical competence in the evaluation and treatment of language, speech, and hearing disorders. Students may emphasize Speech-Language Pathology or Audiology or both during graduate study and in any case are generally expected to meet the standards for certification of clinical competence by ASHA. The master's degree program consists of a minimum of fifty-seven (audiology) or fifty-seven (speech-language pathology) credit hours. Supervised clinical practice is required during every term of full-time registration and for at least two assignments to off-campus practicum sites, in addition to regular evaluation and therapy responsibilities in the Charles Van Riper Language, Speech and Hearing Clinic. Admission requirements

Students are admitted only in the Fall semester. Admission decisions are announced on March 15, April 30, and July 15; applicants are advised to complete the application process as early as possible. Not every applicant who meets minimum admission requirements can be admitted; the department reserves discretion in admission of the most highly qualified applicants. Specific admission requirements are outlined below:

1. A point-hour ratio of at least 3.0 in the last sixty credit hours of undergraduate study or equivalent undergraduate course sequence, in Speech-Language Pathology and Audiology. The student who has not completed these requirements as an undergraduate will need to do so before enrolling in departmental graduate courses.
   a. Undergraduate preparation must include at least fifteen semester hours (or equivalent) in courses that provide information on basic human communication processes. There should be at least one course in phonetics, one course in speech and language development, and one course in the science of speech and hearing.
   b. Undergraduate preparation must also include at least twelve semester hours (or equivalent) in courses which provide basic information on speech, language, and hearing disorders.
   c. Accumulation of a point-hour ratio of at least 3.00 in all undergraduate speech pathology and audiology course work.
   d. Completion of at least twelve semester hours (or equivalent) of basic science coursework, including courses in (a) biological and physical science, (b) mathematics, and (c) behavioral and social science. The student who has not completed this coursework as an undergraduate will need to do so as a graduate student in order to meet ASHA standards for clinical certification.
   e. Submission of scores on the General Section of the Graduate Record Examination.
   f. Evidence of personal and professional qualifications considered necessary for successful professional practice, as reflected in:
      a. Three letters of recommendation from individuals able to comment on the applicant's academic and practical achievements and potential for successful graduate work.
      b. Responses to a departmental questionnaire-application.

Program requirements

Specific program requirements are as follows:

1. Completion of a core of required graduate courses specified by the department. The usual sequence of courses takes one calendar year plus two semesters (six terms of enrollment).

2. ASHA certification requirements are normally a part of the master's degree program. The student must complete at least 350 hours of supervised clinical practice and at least 300 hours at the graduate level. (The student who enters the graduate program with very few undergraduate clinical hours may anticipate some extension in program duration.) Under certain circumstances a student may have reason to seek the master's degree without qualifying for ASHA clinical certification; students interested in such an arrangement must consult with their graduate advisors.

3. The student must manifest emotional and behavioral characteristics which, in the judgment of the departmental faculty, will support development of his/her professional competence. Behavior to the contrary may lead to dismissal from the program.

4. As an option, a Master's thesis (six hours) or one or more independent research registrations may be applied toward degree requirements by students who demonstrate research aptitude and interest. Students anticipating study toward a doctoral degree are expected to evidence the ability to conduct a research project.

5. As an option, speech-language pathology students may choose to qualify for Michigan Teaching Certification in order to work as a Teacher of the Speech and Language Impaired (TSLI) in Michigan schools. Students desiring this credential should consult with departmental advisors and/or contact the Certification Office of the WMU College of Education.

Statistics

Advisors:
Michael Stoline, Jung Chao Wang
Room 3519, 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 680, 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 and 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 complete calculus sequence, a course in probability, and a course in computer programming. A complete undergraduate mathematics major is not required since the requirements in pure mathematics are not as extensive as in Option I.

Program requirements

This option requires at least thirty-one hours of approved courses from the following groups:

1. MATH 510, 562, 666, 680, and 682.
2. Three of the following: MATH 563, 566, 661, 663, 665, 666, 667, 669.
3. Two hours of MATH 681 and/or 684.
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).
Programs Leading To A Graduate Certificate

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

Alcohol And Drug Abuse
Advisor:
Janice Dekker,
Room B-329, Ellsworth Hall

Western Michigan University offers a program for the training of substance abuse specialists through the Graduate Certificate 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 councils, hospitals, schools, and industries.

Admission requirements
Persons who are eligible for graduate credit may apply for admission to the SPADA Program.

Program requirements
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 a department or school in which the student earns his or her graduate degree or in the certificate program. In some graduate degree programs 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 of field training experience, the following courses are required in the Graduate Specialty Program in Alcohol and Drug Abuse:

*Bios 507—The Biology of Addictive Drugs (3 hrs.)
SOC 617—The Etiologies of Substance Abuse (3 hrs.)
ADA 631, CECP 631, or SWRK 665—Seminar in Substance Abuse I (3 hrs.)
ADA 632, CECP 632, or SWRK 665—Seminar in Substance Abuse II (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 Marital Therapy (3 hrs.)
SOC 642 Social Epidemiology (3 hrs.)
SOC 687 Evaluation Research I (3 hrs.)
SWRK 636 Theory and Practice of Group Treatment (3 hrs.)
SWRK 687 Seminar in Social Policy, Planning, and Administration (3 hrs.) or any one of twenty-one Alcohol and Drug Abuse (ADA) courses—see later Bulletin entry.

Electron Microscopy
Advisor:
Leonard Beuving,
Room 5351, McCracken Hall

The Graduate Certificate in Electron Microscopy 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. The candidate must demonstrate to the satisfaction of a committee composed of three members (two of whom 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 by 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 included use of an electron microscope laboratory).
3. Chemistry background through two courses in biochemistry.

General Course requirements
The candidate must complete BIOS 632, 710, 712, and a course in histology.

List of required courses:
BIOS 632, 633—Seminar in Substance Abuse (3 hrs.)

*BIOS 70 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 737 Histology, 3 hrs. (Winter)

BIOS 744 Embryology, 3 hrs. (Winter)

*To be arranged as projects between W.M.U. and a commercial electron microscope laboratory.

**To be arranged between W.M.U. and the Argonne National Laboratories Electron Microscope Laboratories. The student will work for one semester at Argonne National 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
Advisor:
Ellen K. Page-Robin,
B308 Ellsworth Hall

Western Michigan University offers a multidisciplinary Graduate Certificate Program in Gerontology. This program consists of 20 hours of course work, field experience, and/or thesis/dissertation credit. A Certificate in Gerontology will be awarded at the completion of the course of study.

Admission requirements
Students apply for admission to the Graduate Certificate Program through the Admissions Office and the Gerontology Program Office.

Program requirements
Persons seeking the Graduate Certificate in Gerontology must complete a course of study totaling 20 semester hours. Some required courses for the specialization may be integrated into related graduate degree programs. Three courses are required: Blind Rehabilitation 599, Gerontology, 2 credit hours; Gerontology 660, Multidisciplinary Seminar in Gerontology, 3 credit hours; and Gerontology 681, Program Planning and Development in Gerontology, 3 credit hours. Up to six hours of thesis/dissertation or field experience in Gerontology or from a related graduate degree program may also be counted. The thesis/dissertation topic or the field placement must be approved by the Gerontology advisor.

The remainder of the 20-hour requirement will be acquired through elective courses chosen from a list of approved courses available through the Gerontology Program Office.
Holistic Health Care
Advisor: Jan Dekker, B329 Ellsworth Hall

The Graduate Certificate Program in Holistic Health Care is designed to provide education and experience in holistic approaches to health. Multidisciplinary in nature, it includes eighteen semester hours of study in holistic health care and related topics.

The Holistic Health Care specialization may be taken independently or 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 Certificate 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 setting that emphasizes holistic approaches. The program is designed to provide opportunities for advanced training in the following areas: emerging health care paradigms; lifestyle assessment, health counseling, stress management and biofeedback, spirituality in health and healing, community 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
Successful completion of HOL 531, Introduction to Holistic Health, 3 credit hours, is a prerequisite to admission. Admission forms are available through the Holistic Health Program Office.

Program requirements
The academic program consists of eighteen semester hours, distributed in the following manner:

HOL 531 Introduction to Holistic Health (3 hrs.)
HOL 650 Holistic Methods, part I (3 hrs.)
HOL 651 Holistic Methods, part II (3 hrs.)
HHS 712 Field Experience in Holistic Health Care (3 hrs.) or equivalent credit from a related graduate degree program with approval of the Holistic Health Faculty Advisor.

Cognates in Holistic Health (6 hrs.)

Policy, Planning, And Administration
Advisor: 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 Certificate 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 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 completed a research and statistics course, be or have been employed in a health or human service organization, and complete 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.

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. Scores on standardized tests approved for each program by the Graduate Studies Council.
5. Admission by the academic unit offering the specialist program and endorsement by The Graduate College.

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: Established by the program and approved by the University's curriculum review process.
4. Grade Point Average: 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. 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. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university. Transfer credit will be recorded on the Western Michigan University transcript as "Credit" (CR) only and will not be calculated into the honor points earned and the grade point average at Western Michigan University.
6. **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.

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 assuring compliance with the regulations for the protection of such subjects. For more information, call Research and Sponsored Programs, 387-8270.

8. **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.

9. **Continuous Enrollment in 720**: The course 720, Specialist Project, is six credit hours and may be registered for in increments of one to six hours. Following a student's first enrollment in 720, the student will enroll for a minimum of one hour of credit in 720 in each semester/session continuously until all project requirements are completed satisfactorily and approved by the appropriate bodies. A student unable to complete the project within the first six hours of registration will be required to continue to enroll in 720; however, only six hours of 720 will count toward meeting the program requirements for the degree.

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### Educational Leadership

**Advisors:**
- Patricia F. First, Chair, Zoe A. barley, Robert O. Brinkerhoff, Mary Anne Bunda, David J. Cowden, Patrick M. Jenlink, Uldis Smidchens, Eugene W. Thompson, and Charles C. Werfield.

**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 advisors by calling the Educational Leadership Department.

**Admission Procedures**

Applicants to the Ed.S. program should submit application materials to the Office of Admissions and Orientation, Graduate Admissions, 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 655, Elementary Administrator or EDLD 670, Secondary Administrator
- 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)
- EDLD 720, Specialist Project (6 credit hours)

In addition, 24 semester credit hours of elective courses will be selected, with advisor 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 advisor or with the Educational Leadership Department office.

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### School Psychology

**Howard Farris, Program Director**

**Linda Rowen, 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 advisor and two faculty sponsors. These faculty then 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 acquires and refines educational and behavioral techniques which focus on constructing educational environments to maximize each child's personal set of learning characteristics.

The Educational Specialist Degree leads to certification as a school psychologist, a credential awarded by the Michigan Department of Education. Students may obtain preliminary certification upon completion of specified coursework totaling 45 credit hours and a 600-clock hour internship. Full certification as a school psychologist is obtained upon completion of the Educational Specialist Degree and a second 600-clock hour internship.

The Educational Specialist Degree is part of the collaboratively-governed School Psychology Program, which includes participation from the Departments of Psychology, Counselor Education and Counseling Psychology, and Special Education. Applicants to the program must submit application materials to the Office of Admissions and Orientation, Graduate Admissions, which will be forwarded to the Department of Psychology, Admission is offered for the Fall semester each year. Applicants must submit materials by February 1.

**Admission Requirements**

1. Completion of a major (or broad minor) in Psychology, related social sciences, or education.
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 60-63 graduate credit hours, a Specialist in Education in School Psychology is awarded. The program is approved by the Michigan State Board of Education and is fully accredited by the National Association of School Psychologists and the National Council on Accreditation of Teacher Education. Applicants should contact the Department of Psychology for more information. The training sequence will include courses in the following areas:

1. Professional Core (3 hrs.)
2. School Psychology Core (24 hrs.)
3. Special Education (6 hrs.)
4. Research Methodology (6 hrs.)
Section IV
Doctoral Degree Programs and Requirements

Western Michigan University offers doctoral programs in twenty-one 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 Applied Economics, Biological Sciences, Computer Science, Educational Leadership, English, Geology, History, Industrial Engineering, Mathematics, Mathematics Education, Mechanical Engineering, Physics, Political Science, Psychology, Science Education, Sociology, and Statistics. The Doctor of Public Administration is also offered.

Failure to meet these standards and ethical principles of 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 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.

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 must be submitted.
3. For students who have completed at least twenty hours of graduate work, a one-hour exam is required.
4. All research tool requirements.
5. Comprehensive examinations of the subject matter areas included in the student's program of study and a final oral examination.

Candidacy
A candidate for a doctoral degree, prior to the session or semester in which the dissertation is defended, is required to have earned or completed satisfactorily the following:
1. An overall grade point average of 3.25 or better.
2. Appointment of a doctoral dissertation committee and approval of the dissertation proposal by the committee.
3. All courses (excluding dissertation credit) and program requirements.
4. All research tool requirements.
5. Comprehensive examinations.

Graduation
See Calendar of Events for Application deadline.
1. Completion of an approved, planned program of study, including the dissertation, research tools, and comprehensive examinations, with an overall point-hour ratio of at least 3.25. Honor point deficiencies accrued in credits earned at Western Michigan University cannot be made up by credits earned at another university.
Programs Leading To A Doctoral Degree

Biological Sciences
Graduate Advisor: Elwood Ehle

The Doctor of Philosophy in Biological Sciences at Western Michigan University is designed to train individuals wishing to pursue teaching or research careers in the biological sciences in two- and four-year colleges and universities, or careers in industry and government. The program stresses breadth of knowledge and pedagogy in the biological sciences in addition to a significant, focused research project. Thus, the Ph.D. in Biological Sciences at Western Michigan University differs from traditional Ph.D. training centered on a highly specialized, research-intensive experience. The program consists of three components: breadth of knowledge of modern biological sciences, teaching, and research. The breadth required to teach college level biology successfully and to perform meaningful research in cellular and molecular aspects of biology is provided through course work and laboratory rotations. Communication of knowledge has long been a major function of Ph.D. scientists, and organization and dissemination of knowledge are critically important to all scientists. Therefore, an integrated part of the program is an emphasis on the training of Ph.D.s for their central role as communicators and teachers. This will be accomplished through course work focused on teaching and supervised practical experience. Original research, culminating in the doctoral dissertation in a cellular or molecular aspect of biology, completes the triad and gives the student a focused view of one aspect of biology to complement the breadth found elsewhere in the program.

Admission Requirements
Application materials may be obtained from the Office of Admissions and Orientation (Graduate Admissions) and the graduate advisor, Department of Biological Sciences. International students should also contact the Office of International Student Services. Conditions stated under 1 or 2 below must be met for regular admission to the Biological Sciences Ph.D. program:

1. For persons possessing a bachelor's degree from an accredited college or university:
   a. Grade point average of 3.0 or higher.
   b. Scores on the verbal, analytical, quantitative and biology sections of the Graduate Record Examination.
   c. College courses as follows:
      i. Appropriate courses in the biological sciences as determined by the graduate advisor.
      ii. Organic chemistry
      iii. Two courses in physics with laboratory
      iv. Two mathematics courses, including calculus.

2. For persons possessing a master's degree in one of the biological sciences from an accredited university:
   a. Grade point average of 3.25 or higher.
   b. Scores on the verbal, analytical, quantitative and biology sections of the Graduate Record Examination.
   c. Three letters of recommendation.
   d. Availability of a potential dissertation advisor in an area of planned specialization.

Note: Some course deficiencies in admission requirements may be completed after "admission with reservations." These deficiencies must be completed in addition to the minimum credit hours required for the Ph.D. degree. All reservations, including course deficiencies, must be removed before advancement to candidacy.

Financial Assistance
The Department of Biological Sciences offers opportunities for financial support of doctoral students through Graduate Assistantships and fellowships. Individuals desiring further information about such opportunities, or about the graduate program, should contact the graduate advisor and The Graduate College.

Applicancy Requirements
1. Applicancy requirements are those of The Graduate College.
2. Committee Structure: Prior to the first teaching experience the student must establish a Teaching Committee. The teaching committee will be composed on one faculty member in Biological Sciences, one faculty member in Science Studies and one representative from the biology department of a collaborating two- or four-year college. By the end of the first year, or before taking the first independent research hours (BIOS 735), a Dissertation Committee should be constituted. The Dissertation Committee will be composed of at least four members, including the major professor, two or more members of the Department of Biological Sciences, and one or more outside examiners.

Candidacy
No later than the end of the third calendar year after enrollment in the Ph.D. program the applicant must seek candidacy. By this time the student should have completed the distribution requirements, the research tools requirement, and a preliminary plan for the dissertation endorsed by the Dissertation Committee. To be admitted to candidacy, the student must successfully complete the Comprehensive Examination. This exam, administered by the Dissertation Committee, will examine the student over the biological science topics covered by the distribution requirements. Students will be given a grade...
DOCTORAL DEGREE PROGRAMS AND REQUIREMENTS

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of pass or fail. This exam may be retaken once in the event of failure. Candidacy will be approved or denied by the Graduate Program Advisor based upon successful completion of the Comprehensive Examination. A positive recommendation of the Doctoral Program Committee, the student’s performance in course work, a positive recommendation from the teaching advisory committee, and successful performance in all other professionally related activities, including teaching assistantship.

Program Requirements
1. A minimum of 76 graduate semester hours. These hours shall consist of the following:
   a. 18 hours of distribution courses.
   b. At least 12 hours of electives chosen from the graduate offerings of Biological Sciences or other departments appropriate to the student’s research interest as mutually agreed upon by the student and the Dissertation Committee.
   c. Three hours of BIOS 699 taken during three laboratory rotations.
   d. Nine hours of courses focused on teaching. For a list of acceptable courses see the graduate advisor.
   e. Four hours of BIOS 610 (Teaching of Biological Sciences) including a formal course and three Teaching Experiences.
   f. Doctoral Research composed of 15 hours of BIOS 735 (Independent Research) and 15 hours of BIOS 730 (Doctoral Dissertation).
2. Satisfaction of the research tools requirement.
3. Successful completion of Comprehensive Examination.
5. Any other requirements as specified by The Graduate College.

General Plan and Sequence of the Program
1. Students will satisfy any curricular deficiencies beginning with the first semester in residence.
2. Distributed core courses should be taken early in the program to assist in preparation for the Comprehensive Examination. These courses and the electives need not be taken in sequence as each is independent with separate prerequisites.
3. Course work pertaining to teaching and Teaching Experiences should be initiated no later than the second year of graduate study.

Counselor Education and Counseling Psychology
Advisors:
Alan J. Hovestadt Chairperson; Michael W. Behr, Karen R. Blaisure, Robert L. Betz, James Croteau, John S. Geisier, Arlen Gulickson, Suzanne Hedstrom, Joseph R. Morris, Diane Johnson Prosser, Donna M. Talbot, Edward L. Trembley, Melanie Warnke

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 guided by the following doctoral program concentration. The Counseling and Related Educational Program Training Committee is responsible for the Counseling Psychology doctoral program concentration. The Counseling and Related Educational Program Training Committee is responsible for the Counseling Education concentration which includes four doctoral program options:

Community Agency Counseling. 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 and the Counseling Psychology doctoral program is fully accredited by the American Psychological Association.

Admission
Admission to a specific doctoral option is made by the appropriate departmental training committee and then by The Graduate College. Applicants should request current admission information from the Office of Admissions and Orientation, Graduate Admissions, and from the Department. The department recognizes the importance of increasing the educational opportunities of minority students, as well as ensuring diversity of role models in the fields of counseling, psychology, and student personnel. Therefore, the department strives to create an atmosphere conducive to the concerns of diverse populations, to integrate these concerns into programs and course offerings, and to fulfill the need for the department to recruit, admit, and graduate minority students prepared for their chosen careers. Toward this end, the department, College of Education, and The Graduate College provide financial support for eligible minority students.

A student admitted to a specific doctoral program is expected to follow the policies, procedures, code of ethics, and degree requirements for that program. A student may not change to another option without formal approval. Each student, upon admission to a doctoral program, is assigned a temporary doctoral advisor. Later, as outlined in The Doctoral Handbooks, a student selects and requests the appointment of a permanent Doctoral Committee.

Counseling Psychology
The doctoral program in counseling psychology is based on a philosophy that theory, research, and practice are interdependent and complementary dimensions of professional education in a scientist-practitioner model. The educational curriculum and practical experiences of the program are designed to ensure competency in all three dimensions

Department of Computer Science and The Graduate College.

Computer Science
Advisor: Alfred Boisits
3090 Friedmann Hall

The Doctor of Philosophy Degree in Computer Science is a research degree designed for persons intending to take leadership roles in research and teaching in computer science. Applicants will be expected to meet the entrance requirements of the Graduate College, and to demonstrate that they have an interest in, and aptitude for, conducting high quality research.

As soon as possible after admission, students will be assigned an individual Doctoral Program Advisor, who will be responsible for assisting the students in planning their program. The plan of study will be approved by the Department Graduate Advisor.

Admission Requirements
Admission will be granted based on The Graduate College requirements and the following:
1. Master’s degree in Computer Science (normally required). Applicants with master’s degrees in Electrical Engineering, Computer Engineering, Mathematics or other engineering and science disciplines will be evaluated for prerequisite work. Outstanding students who have not completed a master’s degree but who have met all other entrance requirements, may be considered for admission to the Ph.D. program.
2. A grade point average of 3.5 (of 4.0) should be achieved in graduate computer science courses.
3. Results of the Verbal, Analytical, and Quantitative portions of the Graduate Record Examination (GRE). Also the subject test in Computer Science, or major area if other than Computer Science.

Program Requirements
1. Complete at least 57 hrs. of course and dissertation credits beyond the master’s degree (33 hrs.), or a total of at least 90 hrs. of graduate work.
2. Obtain approval for two research skills courses from the following:
   a. A foreign language other than English
   b. Statistics or probability
   c. Computer document preparation and library tools
3. Secure appointment of a Doctoral Dissertation Committee. This is a Graduate College requirement for the student to be awarded the status of Applicant.
4. Pass Qualifying Examination. Before admission to Candidacy for the doctoral degree, the student must pass a general examination in Computer Science. This examination is intended to determine the student’s fundamental knowledge of the field in several areas of specialization including: Theory, Algorithms, Operating Systems, Computer Graphics and Computer Architecture. A student will have one opportunity to repeat a failed qualifying examination. A student who is an applicant for the doctoral degree must take the qualifying exam for the first time no later than the end of the second calendar year and pass it within three years after first enrollment.
5. Maintain a GPA of 3.25 (in accordance with The Graduate College Requirements). Courses with a grade of "C" or lower cannot count toward the Ph.D. program.
6. Pass Preliminary Examination. Students must obtain approval of their thesis topic plan by their Doctoral Dissertation Committee through a preliminary examination. The preliminary examination must be passed a year before the thesis defense. A student will have one opportunity to repeat the examination.
7. Complete and successfully defend a dissertation. Fifteen (15) credit hours are required for the doctoral dissertation.

Financial Support
Financial support can be sought through departmental, university and grant-funded fellowships, assistantships and research assistantships. Application forms and additional information are available from the
and to facilitate their integration in the development of a professional identity. Consistent with these goals, the curriculum in counseling psychology consists of course work and experiences in four broad areas: 1) the science of psychology; 2) specialization in counseling psychology; 3) counseling and psychotherapy; and 4) research. The program recognizes that counseling psychologists may be employed in a variety of professional settings such as academic departments, colleges and universities, counseling centers, mental health agencies, private practices, and business and industry. Consequently, the program provides broad-based training appropriate to accommodate the potentially diverse career interests of its graduates.

Training typically fulfills expectations for psychological licensure/certification eligibility. The program is fully accredited by the American Psychological Association and is designated as a doctoral program in psychology by the National Register of Health Service Providers in Psychology. The credit hour requirements and the course work for the Counseling Psychology Program include:

1. Basic scientific core (36 hrs.)
   a. Research design and statistics (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 behavior and human development (6 hrs.)
   f. Other scientific foundation courses (3 hrs.)
   g. Knowledge and use of ethics (3 hrs.)
   h. History of Psychology (3 hrs.)

2. Specialization in Counseling Psychology (34 hrs.)
   a. Counseling Psychology (17 hrs.)
   b. Human Assessment (6 hrs.)
   c. Supervised Practica (12 hrs.)

3. Recommended Electives (9 hrs.)

4. Doctoral Dissertation (18 hrs.)
   a. Dissertation Seminar (3 hrs.)
   b. Dissertation (15 hrs.)

5. Pre-doctoral Internship (4 hrs.)

Total Hours 101

Counseling Psychology students are expected to demonstrate competencies in psychological theory, practice, and research by passing written comprehensive examinations in the following areas: 1) counseling psychology information, and knowledge; 2) scholarly inquiry and communications; and 3) professional work sample.

Student Personnel Services in Higher Education

The student personnel option in higher education and specifically the history, academic and special advisement; 4) career development, planning, and placement; 5) knowledge of organization models, budgetary systems, personnel practices, and administrative techniques; 6) an understanding of methods and techniques related to assessment of student needs and program evaluation; 5) an awareness of the law and education as services in constitutional provisions, legislative enactments, and court decisions, and 6) an understanding of the development of influencing contexts refer to institutional decision-making processes and political realities. This option has been accredited by the Council for the Accreditation of Counseling and Related Educational Programs.

The following options are accredited by the Council for the Accreditation of Counseling and Related Educational Programs and also lead to a license as a Professional Counselor in the State of Michigan.

Community Agency Counseling

The significant growth in the number of community counseling and mental health agencies 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 correction 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 develop an orientation to the role of counselor educators and to develop a role orientation to the role of counselor educators and to develop a role orientation to the role of counselor educators.

Economics

Advisor: Werner Sichel
Room 5075 Friedmann Hall

The Doctor of Philosophy in Applied Economics is designed to meet the needs of future high-level practicing economists, primarily in non-academic settings. Recent studies have found that non-academic employers of Ph.D.-level economists are concerned about the training that existing programs give their graduates. In a 1991 report commissioned by the American Economic Association, Dr. Anne O. Krueger reported that the proportion of new economics doctorates taking their first job in academia has significantly declined and that universities are not adequately serving the non-academic portion of the market. She wrote that "... our major concern focuses on the extent to which graduate education in economics may have become too removed from real economic problems... and that the focus on developing skills required for applied research should be stronger. ..." The Ph.D. program offered by the WMU Economics Department is designed to address this need.

The Applied Economics Ph.D. program retains a core curriculum as is required by traditional Ph.D. programs in economics, but requires that students participate in a series of applied economics workshops and complete a one-year internship in a non-academic organization. Doctoral students intern with organizations such as governmental agencies, consulting and research firms and institutes; financial institutions; businesses, and hospitals. This internship is conducted under the aegis of an experienced professional of the organization as well as a Department of Economics faculty member. The purpose of this internship is to give the student the incentive and opportunity to apply economics theory and empirical methods to actual problems faced by organizations. The internship is also intended to provide the subject of the student's dissertation and therefore send the Department's graduates into the job market with a somewhat different orientation than that of graduates from traditional economics programs.
The Applied Economics Ph.D. program is designed to be completed within four years by a student entering with good undergraduate economics and quantitative methods (mathematics and statistics) training or a Master of Arts in Economics.

Admission Requirements
Admission to the Ph.D. program in Applied Economics requires:
1. GRE scores (verbal, quantitative, analytical).
2. Satisfactory completion of high-level undergraduate or M.A.-level microeconomic and macroeconomic theory courses.
3. Satisfactory completion of undergraduate calculus and statistics courses.
4. A personal statement discussing your career plans.
5. Three letters of reference from persons in a position to assess your qualifications for doctoral-level study and likelihood of successful completion of the Ph.D. degree.

Program Requirements
A minimum of ninety Ph.D.-level credit hours is required in this program. This includes eighteen hours of workshops, eighteen hours of internships, and fifteen hours of dissertation. Each student is required to take a core of nine courses:
- ECON 504 Mathematical Economics
- ECON 619 Introduction to Econometrics
- ECON 622 Economic Statistics
- ECON 665 Microeconomic Theory I
- ECON 666 Microeconomic Theory II
- ECON 676 Macroeconomic Theory II
- ECON 605 History of Economic Thought
- ECON 670 Advanced Econometrics

In the fall semester of the second year, students are administered a qualifying examination in economics, calculus, and methods. Upon passing this examination, the student is considered a candidate for the Ph.D. degree. Each student is required to specialize in two of the following five fields: Economic Development and Human Resource Economics, Public Finance, Business/Industrial Organization, and International Economics. (Only three of the fields will be offered in any given year.) To specialize in a field, students take a sequence of two courses. Students are required to pass a field qualifying examination in each specialization they select.

Third- and fourth-year candidates devote their time to their workshops, internship, and dissertation. Doctoral candidates are required to participate in six workshops designed to deepen their understanding of theoretical and empirical economics by giving them the opportunity to discuss the research being conducted by the Department's faculty, economists from other institutions, and graduate students. An Applied Economics Workshop (ECON 698) is offered each semester and during the Spring session. In the third year, candidates intern (ECON 712) at a non-academic organization. The internship provides students an opportunity to put what they have learned into practice and to gain practical experience. Each internship is tailored to the individual student. However, the internship is normally within commuting distance of the University.

Interns are typically unpaid and are expected to work approximately twenty hours per week during the internship project. Advisers and students are matched on the basis of mutual interest in the internship project. The dissertation is the culminating experience for each student. It is expected that the dissertation will be an outgrowth of a student's internship project. The dissertation should be so designed as to take no more than one academic year (fall and spring) after the internship year. A satisfactory oral defense of the dissertation completes all the requirements of the Ph.D. degree.

Financial Assistance
A number of doctoral assistantships are awarded each year. Recipients are selected by a Department committee on a competitive basis. Financial assistance is limited to four years. Graduate minority financial assistance is available to eligible students.

Educational Leadership
Advisors:
- Patricia F. First, Chair, Zoe A. Bailey
- Robert O. Brinkerhoff, Mary Anne Bunda
- David J. Cowden, Patrick M. Jenlink, Ulids Smidichens, Eugene W. Thompson, and Charles C. Warfield.

The Department office is located in Room 3312, Sangren Hall.

The Department of Educational Leadership offers programs that lead to either a Doctor of Education (Ph.D.) or a Doctor of Education (Ed.D.), depending upon the area of specialization. The Ph.D. degree is designed for persons who wish to develop leadership skills and serve in administrative positions in the State of Michigan school systems. The Ed.D. degree is designed for persons who wish to develop leadership skills for those who find specialization unnecessary.

Program Requirements
Admission to the Department requires that students meet The Graduate College criteria for admission and that they complete a Resume of Leadership Experience form (available in the Department). Each student will be reviewed for acceptance by the entire 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 successful completion 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:
- ELDL 620, Educational Leadership; ELDL 639, Theories of Leadership; ELDL 640, Introduction to Research; ELDL 645, Research Design and Data Analysis I; ELDL 646, Research Design and Data Analysis II; ELDL 665, Elementary Administrator; ELDL 670, Secondary Administrator; ELDL 681, School Law; ELDL 682, School Business Management; ELDL 664, Curriculum Development; ELDL 672, School Finance; ELDL 673, Supervision; ELDL 674, School Community Relations; ELDL 680, The Superintendent; ELDL 695, Dissertation Seminar; ELDL 712, Professional Field Experience (9 credit hours), and ELDL 730, Doctoral Dissertation (15 credit hours). In addition, these courses will be selected, with advisory committee approval, from among courses in 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 a superintendent in the State of Michigan school systems. Contact the Teacher Certification Officer at Western Michigan University for complete information on compliance for State of Michigan certification as a superintendent to be sure that you meet the other requirements.

Required courses:
- ELDL 602, Educational Leadership; ELDL 609, Theories of Leadership; ELDL 640, Introduction to Research; ELDL 645, Research Design and Data Analysis I; ELDL 646, Research Design and Data Analysis II; ELDL 665, Elementary Administrator; ELDL 670, Secondary Administrator; ELDL 680, The Superintendent; ELDL 685, School Facilities Planning; ELDL 695, Dissertation Seminar; ELDL 712, Professional Field Experience (9 credit hours); and ELDL 730, Doctoral Dissertation (15 credit hours). In addition, these courses will be selected, with advisory committee approval, from among courses in the Department of Educational Leadership.

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 for State of Michigan certification as a superintendent to be sure that you meet the other requirements.

Required courses:
- ELDL 602, Educational Leadership; ELDL 609, Theories of Leadership; ELDL 640, Introduction to Research; ELDL 645, Research Design and Data Analysis I; ELDL 646, Research Design and Data Analysis II; ELDL 665, Elementary Administrator; ELDL 670, Secondary Administrator; ELDL 681, School Law; ELDL 682, School Business Management; ELDL 664, Curriculum Development; ELDL 672, School Finance; ELDL 673, Supervision; ELDL 674, School Community Relations; ELDL 680, The Superintendent; ELDL 695, Dissertation Seminar; ELDL 712, Professional Field Experience (9 credit hours); and ELDL 730, Doctoral Dissertation (15 credit hours).
EDLD 642, Program Evaluation; EDLD 643, Personnel Evaluation; and EDLD 647, Survey Research Design and Analysis. Another 12 credit hours will be 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.

Human Resource Development (Ed.D.; 93 credit hours minimum) The following courses and requirements will lead to a doctoral degree in Educational Leadership (Ed.D.) with a concentration in Human Resource Development (HRD). The HRD program is designed for persons who are interested in leadership roles in 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 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 training/educational nature.

Required courses: EDLD 602, Educational Leadership; EDLD 609, Theories of Leadership; EDLD 620, Human Resource Development; EDLD 621, Needs Assessment and Program Development; EDLD 622, Training Skills Development; EDLD 623, Education and Training Project Management; EDLD 629, Field Studies Seminar; 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 686, Dissertation Seminar; EDLD 712, Professional Field Experience (9 credit hours); EDLD 730, Doctoral Dissertation (15 credit hours); ED 504, Adult Development; and ED 641, Instructional Development. 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. This 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 educational, 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 641, Measurement Techniques in Education; EDLD 642, Program Evaluation; EDLD 645, Research Design and Data Analysis I; EDLD 646, Research Design and Data Analysis II; EDLD 647, Survey Research Design and Analysis; EDLD 651, Advanced Applications of Measurement Methods; EDLD 652, Evaluation Practicum; EDLD 655 or 656 or 657, EDLD 673, Supervision; EDLD 685, Dissertation Seminar; EDLD 712, Professional Field Experience (9 credit hours); and EDLD 730, Doctoral Dissertation (15 credit hours). In addition, 3 credit hours will be selected, with advisory committee approval, from courses that build on research skills, and 27 credit hours will be selected, with advisory committee approval, from courses in departments outside of the College of Education.

English
Advisor: Seamus Cooney Room 618, Sprau Tower (616) 387-2584

The Doctor of Philosophy in English is designed to meet the needs of future scholars and writers, particularly those who intend to teach at graduate institutions. The program requires all candidates to have broad knowledge of English and American literature, acquaintance with non-traditional literature, practical and/or theoretical background in the teaching of English, and a specialization in one or more of the discipline's fields—literature, English language, creative writing, and pedagogy. Whatever their specialization, all candidates will receive essential experience in scholarship, teaching, and training in the profession, and will develop the breadth required of teachers in relatively small English departments.

Program Requirements
Candidates entering with an MA or an MFA are credited with 30 hours (or more if their transcripts warrant it). Those entering directly from a baccalaureate program will be expected to complete the courses designated as "prerequisites" as early as possible in their studies.
1. Prerequisites (equivalent courses from other institutions are accepted) — 12 hours
   a. For candidates in literature, language, or pedagogy: Literary Criticism; an approved course in contemporary literature; a genre-specific course; an approved English language course.
   b. For candidates in creative writing: Critical Writing; an approved course in creative writing; and a genre-specific course.
2. Distribution requirement — 18 hours Six graduate-level courses from the following list of areas, selected so that no two contiguous areas are skipped.
   a. American literature before 1865
   b. American literature 1865-1945
   c. British literature to 1500
   d. Renaissance British literature (through Milton)
   e. Restoration and 18th-century British literature
   f. Modern British literature
3. Non-traditional literature — 3 hours At least one course in literature in English by a non-European minority group, by women writers, by post-colonial writers, or by other groups not traditionally included in the canon.
4. Teaching component — 6 hours Six credit hours elected from courses or practica in the teaching of composition, literature, English language, or creative writing.
5. Area of specialization — 12 hours At least 12 credit hours in an area (or for creative writing students, a genre) chosen in preparation for the dissertation. The areas include the following:
   a. English language, and the Theory and Practice of Teaching English at the college level.
   b. Cognate or support area — 6-9 hours An optional area to complement the specialization. May include courses from other departments.
   c. Dissertation — 15 hours The dissertation is to be a book-length manuscript of scholarship, criticism, research, or creative writing comprised of either a single piece of work or a coherent collection of shorter pieces that are methodologically, structurally, or thematically related.

Financial assistance A small number of doctoral fellowships are awarded each year, together with a number of doctoral teaching assistantships.

Geology
Advisor: Alan E. Kehew Room 1129, Rood Hall

The Doctor of Philosophy in Geology with emphasis in hydrogeology is a research degree designed for persons intending to take leadership roles in teaching and research and in applied areas of hydrogeology. Applicants will be expected to meet the entrance requirements of The Graduate College and to demonstrate that they have an interest in, and aptitude for, conducting high quality research. As soon as possible after matriculation, students will be assigned a graduate advisor. After admission to candidacy the student will be assigned an individual doctoral research committee chairperson and two faculty sponsors. The composition of the committee will be based on the student's expressed interests. In special cases a third faculty sponsor from another institution or research faculty may also be added to the doctoral research committee. These members of the Graduate Faculty will facilitate and guide the students' work. The Dissertation — 15 hours The dissertation is to be a book-length manuscript of scholarship, criticism, research, or creative writing comprised of either a single piece of work or a coherent collection of shorter pieces that are methodologically, structurally, or thematically related.

Admission Requirements
1. Master's degree in hydrogeology or related field, e.g., geology, geophysics, or geochemistry. Applicants with degrees in chemistry, biology, environmental engineering, civil engineering, and geography may be admitted provided they take remedial work in hydrogeology.
2. Grade-point average of 3.25 (of 4.0) in graduate work.
3. Applicants are to arrange for three letters of recommendation to be sent from academic and/or professional sources.

4. Applicants are to submit the results of the Verbal, Analytical, Quantitative, and Geology, or major area if other than geology, portions of the Graduate Record Examination.

Program Requirements

1. Complete at least sixty (60) hours of course and dissertation credits beyond the master’s degree. Programs will be developed by the student in consultation with the student’s doctoral committee.

2. Two research skills from the following:
   a. Reading proficiency in one foreign language other than English selected in consultation with the graduate advisor, and
   b. Research skill in mathematics, statistics, or computer science. For specific details concerning approved research skills, students will consult with the graduate advisor.

3. Qualifying Examination. Before admission to candidacy for the doctoral degree the student must pass a general examination in hydrogeology. This examination is intended to determine the student’s fundamental knowledge of the field in several areas of specialization including: hydrology, geological measurements and interpretation, geochemistry, mathematics/modeling and field methods. It shall consist of an initial written portion, and an oral portion that will be conducted within six months of the successful completion of the written part of the examination. The student will have the opportunity to repeat the written portion of the examination in order to qualify as a Ph.D. candidate.

4. Complete and successfully defend a dissertation on a research topic approved by the student’s doctoral committee. Fifteen credit hours are required for the doctoral dissertation.

General Plan and Sequence of Program

As soon as possible after admission, and with the advice of the departmental doctoral committee, the student will select an advisor who will chair his/her dissertation committee. The doctoral program will be planned by the student in consultation with his/her advisor and the doctoral committee.

Minimum requirements in ancillary fields include mathematics through differential equations as approved upper division courses in chemistry, biology, physics, geography, and statistics. Additional outside course work applicable to the dissertation problem may be required by the doctoral committee. The student will present a seminar on the results of his or her dissertation research to the University and defend his/her dissertation.

Students entering the Ph.D. program in hydrogeology will consider the following in developing the curricular sequences in their program:

1. If curricular deficiencies exist, required courses are to be taken beginning in the first semester in residence. A minimum of one deficiency must be satisfied each semester or term until all are removed. All exceptions must be approved by the Graduate Committee.

2. Research tool courses are to be taken as early as practicable in the program of study.

3. Courses that are logical precursors to other courses should be taken in their proper sequential order. Each student will develop a “proper sequencing” of courses with his/her graduate committee.

4. Sample program for a student entering with a bachelor’s degree in geology.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 512 Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 509 Surface Water Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 544 Environmental Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 525 Techniques in Water Analysis</td>
<td>2</td>
</tr>
<tr>
<td>GEOL 600 Hydrogeochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 615 Contaminant Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 605 Groundwater Modeling</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 634 Summer Field Hydrogeology</td>
<td>3</td>
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</tbody>
</table>

Research

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 700 Master’s Thesis</td>
<td>6</td>
</tr>
</tbody>
</table>
| Entering students who do not have MATH 274, Ordinary Differential Equations, or CHEM 365, Introduction to Organic Chemistry, will be required to take these courses as deficiencies during their first year in the program.

*Students who have had the equivalent of any of the courses listed will be permitted to take alternate courses from the list of elective courses. Entering students will be encouraged to take courses to develop “tool skills” early in their program.

Doctoral portion of program

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>GEOL 515 Applied Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 536 Glacial Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 563 Electrical Methods</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 610 Organic Geochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 611 Mineral Analysis</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 612 Quantitative Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 608 Advanced Hydrogeochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 614 Water Law</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 666 Seminar in Hydrogeology</td>
<td>3</td>
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</tbody>
</table>

Research and professional field experience

<table>
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<tr>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>GEOL 710 Independent Research</td>
<td>5</td>
</tr>
<tr>
<td>GEOL 712 Professional Field Experience</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 735 Graduate Research</td>
<td>10</td>
</tr>
<tr>
<td>GEOL 730 Doctoral Dissertation</td>
<td>15</td>
</tr>
</tbody>
</table>

5. Sample program for a student entering with a master’s degree in geology.

<table>
<thead>
<tr>
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<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>GEOL 536 Glacial Geology</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 525 Techniques in Water Analysis</td>
<td>2</td>
</tr>
<tr>
<td>GEOL 600 Hydrogeochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 605 Ground-water Modeling</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 606 Advanced Hydrogeochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 609 Surface Water Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 611 Mineral Analysis</td>
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</tr>
<tr>
<td>GEOL 612 Quantitative Hydrogeology</td>
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<tr>
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<td>3</td>
</tr>
<tr>
<td>GEOL 666 Seminar in Hydrogeology</td>
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</tbody>
</table>

Research and Professional Field Experience

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<td>GRAD 710 Independent Research</td>
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<tr>
<td>GRAD 735 Graduate Research</td>
<td>10</td>
</tr>
<tr>
<td>GRAD 730 Doctoral Dissertation</td>
<td>15</td>
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</tbody>
</table>

Basic or core courses required of students in this program

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 625 Techniques in Water Analysis</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 515 Applied Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 544 Environmental Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 605 Ground-water Modeling</td>
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<td>3</td>
</tr>
<tr>
<td>GEOL 634 Summer Field Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 666 Hydrogeology Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

Elective courses

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 536 Glacial Geology</td>
<td>3</td>
</tr>
</tbody>
</table>
Program requirements
Award of the Doctor of Philosophy in History is based upon successful completion of qualifying examinations in several fields, and dissertation and the dissertation of the ability to conduct original research. Programs of study are developed in consultation with the Graduate Advisor and appropriate faculty. The program requires a minimum of 75 hours of credit beyond the baccalaureate degree or 45 hours beyond the master's degree. The Master of Arts thesis option and the Doctor of Philosophy program share many common structures and requirements, and may be planned as a single program of study. Candidates admitted with a master's degree from another institution or discipline may need more than the minimum of 45 hours of course work to complete the field requirements.

The program includes course work in three or four fields:

Core
HIST 510 Colloquium 1 hr.
HIST 600 Historical Method 3 hrs.
HIST 601 Historiography 3 hrs.
HIST 602 Historical Theory 3 hrs.
HIST 698 Teaching and Lecture Presentation 3 hrs.

Each candidate will do additional course work in their field appropriate to the candidate's research agenda, including in each case course work in an allied social science or humanities discipline.

Major Field
A chronologically broad teaching field covering a major civilization. Within the field candidates will identify, in consultation with the Graduate Advisor and appropriate faculty, chronological/geographical and/or topical research emphases. See the department's graduate handbook for additional information.

Minor Field
The minor field may be internal or external to the major field depending upon the nature of the program of study. The minor field normally is a chronological/geographical or topical adjunct to the major field, but may also be a concentration in theory, research or application skills.

Outside Field
An outside field may consist of work in a single discipline, or a series of courses with an interdisciplinary focus appropriate to the major field and dissertation topic.

Qualifying Examinations
Written and oral qualifying examinations are taken at or near completion of required course work. Examinations cover the core, major and minor fields, and in some cases the outside field.

Foreign language requirement
Each student in the program is required to demonstrate reading proficiency in at least one foreign language appropriate to the program of study, by satisfactory completion of a 201-level or 401-level foreign language course, or by a department-approved examination. Many major fields have additional language requirements. All required course work to achieve necessary proficiencies must be completed prior to qualifying examinations.

Dissertation
The dissertation may comprise from 12 to 18 hours of graduate course work depending upon other characteristics of the program of study.

Industrial Engineering
Advisor:
Richard Munsterman, 2007 Kohrman Hall

The Doctor of Philosophy in Industrial Engineering at Western Michigan University is designed to intensify the student's knowledge and comprehension in the various disciplines of the subject with emphasis on original research in a chosen area of specialty. It will assist individuals wishing to pursue a career as a research practitioner in industry and government or teaching and research careers in industrial engineering in colleges and universities. The program emphasizes breadth of knowledge and requires students to conduct a significant, focused field study, and complete a dissertation research project.

Admission requirements
Application materials may be obtained from The Office of Admissions and Orientation (Graduate Admissions) and from the Department of Industrial Engineering. International students should contact the Office of International Student Services.

Decisions for admission will be made by the department doctoral committee. All applicants must meet the general requirements for a doctorate as specified in Section 4 of the Graduate College Catalog. In addition to these requirements the student must fulfill either of two educational requirements: a bachelor's degree in engineering or related discipline from an Accreditation Board for Engineering and Technology (ABET/EAC) accredited engineering program, including at least three courses in industrial engineering, or a master's degree in engineering from a department offering an ABET accredited undergraduate program, including at least five courses in industrial engineering. Three letters of recommendation must be submitted. Students not having these requirements may be conditionally admitted, with full admission granted upon completion of additional prerequisites.

Applicancy Requirements
The applications are those stated in the general requirements of The Graduate College. The student should establish a dissertation committee by the end of the first year. The committee will be composed of at least four members of the Department of Industrial Engineering, and one or more outside examiners.

Candidacy Requirements
The applicant must seek candidacy no later than the end of the third calendar year after enrollment in the Ph.D. program. By this time the student should have completed the course work and have a preliminary plan for the dissertation endorsed by the chair of his/her dissertation committee. To be admitted to candidacy, the student must successfully complete the comprehensive examination. This exam, administered by the doctoral committee, will be composed of at least five courses in industrial engineering. Three letters of recommendation must be submitted by the student's doctoral committee, and those drawn from the departmental pool of questions relating to the core courses. The questions are designed to evaluate the student's knowledge in the engineering management area of concentration as well as his/her area of specialization. The oral component will be administered by the doctoral committee. The student's performance in the exam will be evaluated by the doctoral committee. If student fails the comprehensive exam, the student can apply to retake the exam in the next semester. A second failure results in dismissal from the program. Candidacy will be approved or denied based upon the student's performance in the course work, successful completion of the comprehensive examination, and a positive recommendation of the dissertation committee.

Program Requirements
In addition to The Graduate College requirements, the following requirements must be fulfilled:
1. 84 credit hours of courses beyond the baccalaureate. A student with a master's degree may be able to transfer up to 36 credit hours, with this decision being made by the doctoral committee at the time of admission.
   a. The determination of how the master's level credits can be used to fulfill the requirements listed below is made at the time of admission.
   b. For a student entering the program with a bachelor's degree, a maximum of 21 credit hours of 300-level, post-baccalaureate graduate courses can be applied to the Ph.D. program, and for a student entering the program with a master's degree, a maximum of 6 credit hours of 500-level courses beyond the master's degree can be applied to the Ph.D. program.
2. The credit hours are grouped into seven areas as follows:
   a. 18 hours of Core Courses with 3 hours of IE 725 required
   b. 12 hours from the engineering management concentration area
   c. 9 hours from one of the area of specialization course groups
   d. 18 hours of electives chosen from the graduate offerings of Industrial Engineering or other departments appropriate to the student's research interest as mutually agreed upon by the student and the dissertation committee.
   e. 6 hours of electives chosen from the graduate offerings of Industrial Engineering or other departments appropriate to the student's research interest as mutually agreed upon by the student and the dissertation committee.
   f. 6 hours of IE 712, Professional Field Experience
   g. 15 hours of IE 730, Doctoral Dissertation
3. Successful completion of the comprehensive examination after completion of all course work.
4. Successful oral defense of dissertation and approval of the dissertation committee and The Graduate College.
5. Successful completion of the teaching internship requirement.
6. Residency Requirement: Enrollment on campus in four consecutive semesters or more.
7. Research Tool: The required research tools are computer programming and statistics. Competency will be based on successful completion of CS 506 and MATH 660 or equivalent with a grade of "B" or better.

Financial Assistance
The Department of Industrial Engineering offers opportunities for financial support of doctoral students through graduate assistantships and fellowships. Information is available from the department or The Graduate College.
Mathematics

Philip Helch, Chairperson of Advisors
Room 3319, Everett Tower

The Department of Mathematics and Statistics offers programs leading to the Doctor of Philosophy degree in either Mathematics, Mathematics Education, or Statistics. The latter two programs are described under separate headings listed alphabetically. Doctoral work in mathematics can be in pure mathematics or applied mathematics. The program in applied mathematics is modeled after the concentration in Computer Science. The balance of his/herspecialty, provided that 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 this 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

Advisors:

Yousef Alavi, Gary Chartrand, S.F. Kapoor, Allen J. Schwenk
Room 3319, Everett Tower

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. The student must have a C average or better in mathematics as well as a C average or better in all other courses attempted. Students with a B average in mathematics as well as a B average in all other courses attempted may be admitted to the graduate program upon completion of the required coursework in the Department of Mathematics and Statistics.

Program requirements

A minimum of ninety hours is required in the program. As early as possible in his/her program the student must pass the Departmental Graduate Examinations in Algebra (introduction to modern algebra and Math 530), Real Analysis (Math 673), and Logic (Math 522). In addition, each student must complete the following basic course requirements: (1) two-semester graduate sequences in Algebra, Analysis, or Topology, and a semester course in Complex Analysis; (2) an approved graduate course in some area other than those specified in (1), (3) one approved graduate course in Applied 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) five additional approved courses including at least one graduate course in each of Applied Mathematics, Probability/Statistics, and Computer Science. The balance of the program will consist of advanced courses, seminars, and research leading ultimately to a dissertation constituting a significant contribution to the 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 a three-hour written examination 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 two approved areas. A student must take each Preliminary Examination the first time it is offered following his/her completion of the required course work in that field. 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 must not take an examination in 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 Advisor 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 the research tools requirement by demonstrating competence in computer usage and statistics.

Many mathematics Ph.D.'s will eventually take a position which involves some teaching commitment. Thus, as part of his/her training, each applicant will instruct a sophomore or junior level college mathematics course (under the guidance of a faculty member), and will participate in faculty discussions on college mathematics teaching and curricula.

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 advisor 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 chairperson of the Doctoral Committee. When a faculty member accepts a doctoral student, this is reported, in writing, to the chairperson of the Doctoral Committee.

Prior to beginning work on a dissertation, the student commonly discusses possible directions for research with his or her advisor, does background reading on the subject and, with the aid of the advisor, develops questions for possible study.

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. Following this approval, the Dissertation Committee is submitted to The Graduate College, for final approval. This is done during the semester or session preceding the anticipated defense. The Dissertation Committee must contain at least five members. The dissertation advisor 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 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. If any 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.
CONCENTRATION IN STATISTICS

Advisors:
Joseph McKean,
Room 3319, Everett Tower

Admission Requirements
Students in the doctoral program, Statistics Option, will be those who have been admitted to the doctoral program of the Department and who have been designated as "Statistics Option" at the time of admission. A student in the regular doctoral program can request a change of status to the Statistics Option.

Admission and change of status requests for the doctoral program, Statistics Option, will be considered by the Statistics Doctoral Subcommittee and final decisions will be made by the Departmental Doctoral Committee.

The usual admission requirements of The Graduate College and the Department must be met. In addition, applicants should have completed (or be completing) a 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.

Departmental 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
DOCTORAL DEGREE PROGRAMS AND REQUIREMENTS

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).

Mechanical Engineering
Parviz Merati, Chair
Department of Mechanical and Aeronautical Engineering
2065 Kohrum Hall

The Doctor of Philosophy in Mechanical Engineering is designed to intensify the knowledge and comprehension of the student in the various disciplines of the subject, with emphasis on original research in a chosen area of specialty.

Admission Requirements
In addition to the general admission requirements for a doctoral degree at Western Michigan University, a Master of Science in Mechanical Engineering or a related engineering discipline will be required. Students with a Master of Science in mathematics or in a natural science discipline may also be admitted if they have a Bachelor of Science in Mechanical Engineering or a related engineering discipline. The Master of Science should be from a university recognized and approved by the Graduate Committee of the department. Evidence of scholarship and potential for independent research in mechanical engineering must be presented to the Graduate Committee. The level of achievement in mathematics, physics, and chemistry, which are prerequisites for success in doctoral studies in engineering, will also be considered in evaluating the application. The applicant must also submit the results of the verbal, analytical, quantitative, and engineering portions of the Graduate Record Examination.

In exceptional cases, experienced, superbly qualified and highly recommended engineers with only a bachelor's degree in mechanical engineering (or a related area) may be admitted to the Ph.D. program.

Program Requirements
The main accomplishment of the Ph.D. student should be original, high quality research. The program is oriented toward that achievement. The course work and number of credit hours that a student will be required to take depend on the individual qualifications, level of preparation for independent research, and the needs for successful accomplishment of the dissertation.

The doctoral student must acquire through coursework and demonstrate in a comprehensive examination a broad knowledge and understanding of the core areas of mechanical engineering, materials and structures, thermodynamics and heat transfer, fluid mechanics, and systems and controls. Intensive and successful use of a required area of competency in the research work must be approved by the dissertation committee.

At least 18 of the 30 non-dissertation credit hours must be taken from the graduate courses of the Department of Mechanical and Aeronautical Engineering. To ensure adequate preparation for the graduate research subject, enrollment in courses from other programs must be approved by the dissertation faculty advisor. A minimum grade point average of 3.25 is required in the doctoral studies. These graduation requirements complement the general university regulations.

In addition, students who were admitted with only a Bachelor of Science need 24 more graduate credit hours, or a minimum total of 69 credit hours for graduation.

Physics
Advisor:
R. E. Shamu

The Department of Physics offers a program leading to the degree of 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, condensed matter physics, or nuclear physics and in theoretical physics the area may be nuclear physics or condensed matter physics. Special facilities available for research include a 6 million volt model EN tandem Van De Graaff accelerator. The graduate advisor of the Physics Department will counsel the student until a research advisor is selected.

Admission Requirements
Students entering this program are expected to have completed a bachelor's degree in physics or at least 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 of the student's qualifications for admission and financial support. It is also recommended that students take the Physics Subject Test part of the Graduate Record Examination. The departmental graduate advisor 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 includes a minimum of 60 hours of graduate credit. These credits are composed of course work, supervised reading, seminars, and research. The research will be performed under the guidance of the student's research advisor and must culminate in a dissertation suitable for publication. The required 60 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).

Additional courses chosen from:

a. Research courses (PHYS 680, 681, or 682)

The requirement 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 after the beginning of the second 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, of whether or not a student should become a doctoral candidate.

After successful completion of the Qualifying Examination, the student will, upon consultation with the graduate advisor and with the consent of the faculty member involved, select a research advisor. The student will be a member of the graduate faculty. With the agreement from his or her advisor, the student will select a dissertation committee. This committee will consist of the research advisor 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 on the 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 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 Doctor of Philosophy in Political Science is designed to prepare students for careers in teaching, policy analysis, and applied as well as academic research. The central focus of the program is comparative political systems, comparative political institutions, and comparative policy-making. It combines the study of the American political system with those of other countries, and it stresses the linkages between subnational, national, and international systems. The central focus rests upon a theoretical foundation, and it requires an understanding of, as well as a capacity to apply, contemporary methodological criteria and instruments in analyzing and measuring political expression and performance.

Admission Requirements
In addition to satisfying the general admission requirements of The Graduate College, a student must have completed at least twenty hours of college work with a point-hour ratio of at least 3.25 for all graduate work undertaken beyond the bachelor's degree. The student who has a bachelor's degree and less than twenty hours of completed graduate work needs at least an overall 3.0 point-hour ratio in undergraduate work and at least a 3.25 for all completed graduate work. The Graduate Record Examination is required.

Program Requirements
Students without the equivalent of PSCI 590 Research Methods and PSCI 591 Statistics for Political Scientists will be required to complete these courses before enrolling in doctoral methodology courses. Requirements in the doctoral program include a minimum of 90 hours of graduate credit beyond the baccalaureate degree; this includes 30 hours of political science or political science-related M.A. degree work. Twenty-seven credit hours in the doctoral program are required from the foundation courses (PSCI 662, 663, 690, 691, 694, 695, 696, 697) and from the concentration courses (PSCI 605, 641, 643). PSCI 694 and PSCI 696 should be taken during the student's first year following admission. Each student will also elect 18 additional hours from the three fields of concentration (at least one additional course from each field), from approved cognates, and/or approved research tools courses. Doctoral dissertations are awarded for the dissertation. Each doctoral student is required to demonstrate mastery of two foreign languages, or one foreign language and either research methodology or statistics. In order to maintain eligibility, the student must pass PSCI 662 and PSCI 663 (Political Philosophy I and II) with a minimum average of 3.25 for the two courses. After the first year and upon completion of the courses in the fields of concentration, each student must successfully complete written and oral examinations prepared by a committee specializing in the three fields of concentration. The student will complete a dissertation under the supervision of the dissertation advisor.

Applied Behavior Analysis (84 hrs.)
1. Principles of Learning and Motivation (3 hrs.)
2. Research Methods (6 hrs.)
3. Research in Behavior Analysis (6 hrs.)
4. Theoretical Issues in Behavior Analysis (6 hrs.)
5. Professional Issues (3 hrs.)
6. Behavioral Approaches to Individual and Systems Management (9 hrs.)
8. Professional Experience (6 hrs.)
9. Cognates (0-6 hrs.)
10. Two Research Tools (0 hrs.)
11. Master’s Thesis or Project (6 hrs.)
12. Doctoral Dissertation (15 hrs.)

Research Methods (6 hrs.)

Theoretical Issues in Behavior Analysis (6 hrs.)

Professional Issues (3 hrs.)

Behavioral Approaches to Individual and Systems Management (9 hrs.)

Behavior Analysis: Theory and Application (9-15 hrs.)

Professional Experience (6 hrs.)

Cognates (0-6 hrs.)

Two Research Tools (0 hrs.)

Master’s Thesis or Project (6 hrs.)

Doctoral Dissertation (15 hrs.)

Courses count toward the Ph.D. program in Applied Behavior Analysis, only after the student has completed all courses in an M.A. program, including the M.A. thesis or M.A. project requirement.

Experimental Analysis (94 hrs.)
1. Core (33 hrs.)
2. Theoretical Issues in Behavior Analysis (6 hrs.)
3. Behavior Analysis: Theory and Application (9-12 hrs.)
4. Professional Experience (12 hrs.)
5. Cognates (0-6 hrs.)
6. Two Research Tools (0 hrs.)
7. Master’s Thesis or Project (6 hrs.)
8. Doctoral Dissertation (15 hrs.)

Courses count toward the Ph.D. program in the Experimental Analysis of Behavior, only after the student has completed all courses in an M.A. program, including the M.A. thesis or M.A. project requirement.

School Psychology (91 hrs.)
1. Professional Core (3 hrs.)
2. Foundations in Psychology (18 hrs.)
3. Methodology (6 hrs.)
4. School Psychology Core (24 hrs.)
5. Special Education (6 hrs.)
6. School Psychology Practicum and Field Experience (6 hrs.)
7. Pre Doctoral Internship (2 hrs.)
8. Specialist Project (6 hrs.)
9. Dissertation (15 hrs.)
10. CECP 607 (3 hrs.)

Clinical Psychology (96 hrs.)
1. Professional Core (3 hrs.)
2. Clinical Foundations in Psychology (16 hrs.)
3. Methodology (12 hrs.)
4. Clinical Psychology (21 hrs.)
5. Clinical Practicum (18 hrs.)
6. Thesis (6 hrs.)
7. Dissertation (15 hrs.)
8. Pre-doctoral Internship (3 hrs.)

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 two research tools 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 a comprehensive examination.

The program is arranged to provide formal evaluations of the student as he/she progresses from baccalaureate apprentice to doctoral candidate with the completion of the Master’s Thesis and to doctoral degree candidate with completion of the comprehensive examination. The award of the Ph.D. degree is made following satisfactory completion of the required hours of approved course credit, demonstration of competence in two research tools, satisfactory completion of a comprehensive examination, 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 endeavors, professional service and 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 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 the "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. The Department of Psychology offers financial assistance through Department assistantships and program fellowships. Additional information concerning financial awards and program requirements may be obtained from the Department office.

Public Administration
Advisor: Peter Kobrak
School of Public Affairs and Administration
Walwood Hall

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 alternative policies and management, administrative leadership, and policy analysis. The program is structured to provide decision makers with a more sophisticated understanding of the 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 graduate faculty 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.

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 from persons acquainted with applicant’s professional work.
4. A career resume.
5. Graduate Record Examination (GRE) scores.

Program requirements
1. Sixty semester hours of core 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.)
- POLICY RESEARCH CORE (15 hours)
  - PADM 674 Human Behavior in Public Organizations (3 hrs.)
  - PADM 684 Management of Public Financial Resources (3 hrs.)
  - PADM 677 The Public Administration (3 hrs.)
  - PADM 685 Bureaucracy and Society (3 hrs.)
  - PADM 680 Intellectual Foundations of Public Administration (3 hrs.)
  - PADM 678 Program Evaluation (3 hrs.)
  - PADM 691 Statistics for Public Administrators (3 hrs.)
  - PADM 685 Bureaucracy and Society (3 hrs.)
  - PADM 673 Quantitative Public Policy Analysis (3 hrs.)
  - PADM 694 Quantitative Research Methods (3 hrs.)

ELECTIVE CORE (9 hours)
Course sequences in four areas:
- Administration, Quantitative Analysis, Health Policy, and Administration, and Policy Administration.
- DISSERTATION CORE (15 hours)
  - PADM 730 Doctoral Dissertation (15 hrs.)

The initial three years of the program involve course work with classes meeting three evenings per week. The fourth year will be devoted to the dissertation. This work involves a review of the literature in a policy or management area and then research and interpretation of those findings.

The course schedule will entail two courses or their equivalent each semester. Advising will be done at the WMU Lansing Study Center.

Science Education
Advisor: Robert Hafner
Room 335, Moore Hall

The Department of Science Studies of the College of Arts and Sciences offers a graduate program leading to a Doctor of Philosophy in Science Education. The program is designed for students who wish to obtain a strong background in science and to pursue research in science education. The program requires a minimum of seventy-two semester hours of graduate work in science and in science education. Appropriate course work at the master’s level will count toward the seventy-two semester hours.

Admission requirements
The minimum admission requirements to this degree program are:
1. A master’s degree in a science or science education, and
2. Teacher certification. Students lacking the above may be admitted provisionally, however, satisfactory completion of undergraduate science and/or education courses will be needed before enrollment in the required graduate courses. These requirements are in addition to the general admission requirements of The Graduate College.

Program requirements
The program consists of seventy-two semester hours of graduate work. Each student’s program is planned in consultation with the advisor and consists of the following:
1. Twenty-four semester hours of graduate science to include a course in the history and philosophy of science (SCI 615).
2. Fifteen semester hours of science education to include SCI 615, 616, 617, and 690 (617 and 690 must be taken at least twice),
3. Twelve semester hours of research tools and design to include two semesters of statistics and a generic research design course.
4. Six semester hours of electives.

All candidates for the Ph.D. in Science Education must have satisfactorily passed a comprehensive examination. The examination should be taken after the student has completed the required course work and will include material from graduate science education “core” of courses (SCI 615, 616, 617, 690) and material from the appropriate science area chosen by the student and his/her dissertation advisor. The science area material will be prepared and evaluated by faculty in the science area after consultation with the science education faculty. The dissertation advisor may recommend either a written or an oral examination.

The research and dissertation are completed under the direction of a major advisor and a Doctoral Advisory Committee. The major advisor is selected by the student and the Committee members are selected by the student in consultation with the major advisor. The research problem generally must be formulated by the student and must be approved by the Committee. Dissertation Committees and topics are subject to the approval of the deans of the College of Arts and Sciences and The Graduate College.

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 have satisfactorily completed the course work, the research tools, the comprehensive examination, and a teaching experience in addition to the other candidacy requirements of doctoral programs in The Graduate College.

Sociology
Director and Advisor, Graduate Studies: Douglas V. Davidson
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 two areas of sociology. The 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. Areas of concentration are important and active ones in the field, and thus provide students with valuable specialities to augment the doctoral training in the discipline as a whole.

Admission requirements
1. Master’s degree in sociology.
2. Graduate-point average of 3.5 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 the 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. Fifteen credit hours are required for the dissertation.

5. Criteria and procedures for meeting these requirements are described in detail in the department’s Graduate Manual.

Financial support

A number of departmental, University, and government 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. Kercher 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, Christina Bahr, Barbara Harris, Dena Isabone, Abraham Nicolaou, George Haus, Elizabeth Whitten

Office: 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 an administrator of educational programs for the handicapped.

Application for admission to the Ed.D. program must be made to The Graduate College. Prospective students are expected to satisfy all requirements for admission to graduate programs specified by The Graduate College. They must also have acquired a minimum of two years of successful 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 Advisor 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 will select a dissertation advisor 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.

Statistics

Advisors: Joseph McKean
Room 3309 Everett Tower

The Doctor of Philosophy in Statistics is designed to prepare students for careers in teaching and research in universities, in industry, or in government. It is expected that students, through courses and other experiences, will develop facility in theoretical statistics and in several applied statistics areas.

Admission Requirements

The usual admission requirements of The Graduate College and the Department must be met. In addition, applicants should exhibit good scholarship and have sufficient mathematics background, including courses in probability and advanced calculus.

Advising

The Statistics Doctoral Committee will be responsible for the advising of students in the statistics doctoral program.

Upon entrance to the doctoral program in Statistics, the student will be assigned an advisor by the Statistics Doctoral Committee for planning the student’s program until he/she reaches the status of candidate. During the first semester in which the student attains the status of candidate, with the approval and advice of the Departmental Doctoral Committee and the Statistics Doctoral Committee, the student will be assigned a dissertation advisor. The candidate and the dissertation advisory committee will select, with the approval of these committees a Dissertation Committee for the candidate. In each of the above situations final appointment is subject to the approval of the Chairperson of the Department and The Graduate College.

During the first semester, the student must have a plan of study written by the Statistics Doctoral Committee and approved by the Departmental Doctoral Committee. The selection of preliminary exams shall be included.

Program Requirements

1. As soon as possible, a student must pass the Departmental Graduate Examination in Statistics at the doctoral level. This consists of three two-hour exams in the areas of probability, theoretical statistics and applied statistics from the courses MATH 560, 562, 600 and 662.

2. Course and dissertation work, at least 90 credit hours, including:
   a. Three approved two-semester sequences in models/design, statistical inference and advanced statistics.
   b. Fifteen credit hours in an approved cognate area related to statistical applications such as computer science, computational or applied mathematics, engineering, biological sciences, management or economics.
   c. Five credit hours of seminar work, MATH 691 or 696.
   d. Research and dissertation, fifteen credit hours.

3. A student must pass Preliminary Examinations in Linear Models/Design (MATH 663, 684), in Statistical Inference (MATH 665, 666) and in a third area to be chosen, with the approval of the Statistics Doctoral Committee, from Advanced Statistics, Analysis, Algebra or a cognate area depending on the career interests of the student. Two failures on the same examination will result in dismissal from the program.

A student is expected to take preliminary exams at the first opportunity after the necessary coursework is completed. Normally the exams in statistics will be given at most once a year, and students should be aware that failure to take and pass an exam could cause a delay in their progress and possibly being dropped from the program.

A student must also pass a Dissertation Proposal Defense, which is an oral presentation of a thesis proposal to the Statistics Committee. This would take place at the end of the first semester of dissertation work.

4. Research Tools: In accordance with the requirements of The Graduate College, each student is required to attain competence in two research tools.

Normally for students in Statistics these will consist of demonstrated competence in computer usage and one foreign language, selected from French, German, or Russian.

Administration

This program will be jointly administered by the Departmental Doctoral Committee and the Statistics Doctoral Committee. The Statistical Doctoral Committee will be responsible for the scheduling, preparation, and grading of preliminary examinations in statistics and for arranging a Thesis Proposal Defense.

Progress toward completion

Each year in February, the Statistics Doctoral Committee will review the progress of all doctoral students in the Statistics program. Any student not making satisfactory progress may be dropped from the program with approval of the Departmental Doctoral Committee. Grades, performance on preliminary exams, the schedule of completed classes, general 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).
Section V  
Description of Graduate Courses

COLLEGE OF  
ARTS AND SCIENCES

The mission of the College of Arts and Sciences, in accordance with the traditional stewardship of the liberal arts, is to engender in students those skills, attitudes, and habits of mind which permit them to challenge successfully a profoundly complex and changing world. To that end, the College of Arts and Sciences offers graduate courses and programs of study in the humanities, the social and behavioral sciences, and the physical, biological, and mathematical sciences. In addition to providing specialization in its many disciplines at the graduate level, the College provides opportunity for the liberal education of all graduate students at the University. The goals of the graduate programs within the College are specifically focused to offer research, teaching, and professional degrees to prepare the graduate to assume a leadership role in academy, government, and other institutions of society.


Anthropology (ANTH)

Professors Cremin, Garland, Helweg, Jacobs, Loeffler, Sundick; Associate Professors Israel, Zagarell; Assistant Professors Nassaney, Simmons; 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: Junior status, 12 hours of Anthropology, 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: Junior status, 12 hours of Anthropology, 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: Junior status, 12 hours of Anthropology, ANTH 110, 210, or consent of instructor.

ANTH 505 Social Archaeology  
3 hrs.
Investigates the mechanisms of social, political, and economic integration within human social groups by analyzing and interpreting the material world. Focus will vary between communal and complex social forms. Prerequisite: Junior status, 12 hours of Anthropology, and ANTH 210 or consent.

ANTH 510 Field Methods in Archeology I  
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: Junior status, 12 hours of Anthropology, and ANTH 210 or consent.

ANTH 511 Field Methods in Archeology II
3 hrs.
Implementation of the field research strategy. Instructs 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: Junior status, 12 hours of Anthropology, and ANTH 210 or consent.

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: Junior status, 12 hours of Anthropology, and ANTH 240 or consent.

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: Junior status, 12 hours of Anthropology, and ANTH 220, 240, or consent.

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 applied or adaptive research techniques designed to insure that directed social change actually benefits those for whom it is intended. Also surveys numerous research strategies, methods and constraints involved in conducting research for national or international development agencies. Prerequisites: Junior status, 12 hours of Anthropology, and ANTH 240 or consent.

ANTH 543 Art and Culture
3 hrs.
In the anthropological exploration of interrelationships among art, artist, and culture, examples from so-called "primitive art" will be used and various theories about creativity. Discussions will cover the biology and evolution of art, cross-cultural aesthetics, socio-cultural contexts, material culture semiotics, and acculturation processes in arts and crafts. Prerequisite: Junior status, 12 hours of Anthropology, and ANTH 240 or consent.

ANTH 545 Topics in Ethnology
3 hrs.
An intensive study of the cultures of an area of the world (e.g., Japan, Philippines, Caribbean, East Africa) or selected problems (e.g., kinship systems, millenarian movements). Topic will be announced each semester. May be repeated for credit. Prerequisite: Junior status, 12 hours of Anthropology, and ANTH 240 or consent.

ANTH 552 Forensic Anthropology
3 hrs.
The study of physical anthropology as it applies to the legal system. Primary emphasis will be on skeletal and dental identification, facial reconstruction and analysis of time since death. Courtroom procedures and responsibilities of the expert witness in the legal system will also be covered. Prerequisite: Junior status, 12 hours of Anthropology, and ANTH 250 or consent.

ANTH 555 Topics in Physical Anthropology
3 hrs.
A consideration of the biological relationships of specific population groups of general problems in human biology (e.g., human genetics, human growth and constitution, palaeopathology, dental anthropology). Topic will be announced each semester. May be repeated for credit with different topics. Prerequisite: Junior status, 12 hours of Anthropology, and ANTH 250 or consent.

Open to Graduate Students Only
ANTH 601 Seminar in Cultural Anthropology
3-4 hrs.
Intensive study of the contemporary issues in sociocultural theory. May be elected as a graduate cognate course by students in other disciplines. May be repeated for credit when topics vary. Prerequisite: Consent of instructor.

ANTH 602 Seminar in Archeology
3-4 hrs.
Advanced study in the major problem areas of prehistoric research. May be elected as a graduate cognate course by students in other disciplines. May be repeated for credit when topics vary. Prerequisite: Consent of instructor.

ANTH 603 Seminar in Physical Anthropology
3-4 hrs.
Advanced instruction and research in the principal problem areas in physical anthropology. May be elected as a graduate cognate course by students in other disciplines. May be repeated for credit when topics vary. Prerequisite: Consent of instructor.

ANTH 610 Topics in Archaeology
3 hrs.
An intensive study of a selected topic or emerging field in archaeology. Topics will vary and will be announced in the Schedule of Classes. May be repeated for credit with different topics. Prerequisite: consent of instructor.

ANTH 640 Topics in Sociocultural Anthropology
3 hrs.
An intensive study of a selected topic or emerging field in sociocultural anthropology. Topics will vary and will be announced in the Schedule of Classes. May be repeated for credit with different topics. Prerequisite: Consent of instructor.

ANTH 650 Topics in Biological Anthropology
3 hrs.
An intensive study of a selected topic or emerging field in biological anthropology. Topics will vary and will be announced in the Schedule of Classes. May be repeated for credit with different topics. Prerequisite: Consent of instructor.

ANTH 698 Independent Readings in Anthropology
1-3 hrs.
Students may contact a faculty member to conduct research under the guidance of the faculty member. Before the initiation of the research a literature search and a written proposal must be prepared. At the conclusion of the research project, a written report will be submitted to the guiding faculty member. Prerequisite: Graduate standing.

Open to Graduate Students Only—See 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)

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 604 Graduate 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 department 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. Prerequisite: Approval of the student's graduate advisor and the instructor.

A-S 605 Graduate Foreign Studies Seminar
1-6 hrs.
Seminars in the Humanities conducted outside the U.S. Students who complete such a seminar may receive credit in the departments of Communication, English, Foreign Languages and Literatures, Philosophy, Comparative 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. Prerequisite: Approval of the student's graduate advisor and the instructor.

Biological Sciences (BIOS)

Ginsberg, Chairperson; Professors Beugling, Brewer, Cowan, Ehrle, Eisenberg, Engemann, Fiscor, Jackson, Pippen; Associate Professors Inselberg, McIntire, Assistant Professors Eyendi, Essan, Hoon, Malcolm.

Open to Upperclass and Graduate Students
All 500-level courses have the following prerequisite: Junior/Senior standing and at least 12 credits in biology, including the specific prerequisite for each course.

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 512 Environment and Health Problems 3 hrs.
The impact of the environment on the health of the individual and of populations, the recurring 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, rice, wood and its uses, 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 202 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 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 molecular research. Prerequisites: BIOS 250 and 312 or consent of instructor; biochemistry is recommended.

BIOS 527 Systematic Botany 4 hrs.
Principles and techniques of plant classification, nomenclature, and biosystematics are presented in lectures, in the field, and laboratory experiences 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 202 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 202.

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 202.

BIOS 530 Bryology 3 hrs.
Mosses and liverworts will be studied in lecture, lab, field trips, and herbarium. Aspects of bryophyte ecology, systematics, and biogeography will be considered. Microscope and keying techniques will be developed. Each student will produce personal collections and keys. Prerequisites: Eight hours of biology including BIOS 202 or consent of instructor.

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 lectures 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 534 Virology 3 hrs. Winter
A study of the classification, structure and chemistry of viruses. Emphasis will be placed on the cell-virus interaction leading to the disease process or cellular alterations in mammalian systems. Prerequisite: BIOS 312; biochemistry is recommended.

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 is studied from the viewpoint of the origin of behavior, and the possible reasons for their existence. Particular emphasis is placed on how natural selection has affected individual, and social behavior. 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: BIOS 151.

BIOS 542 Entomology 4 hrs. Fall (alternate years)
This course is a general survey of the insecta, their structure, classification, physiology, life histories, ecological relationships, and economic importance. Students will learn to identify common families of insects, and make individual collections. Prerequisite: BIOS 151.

BIOS 547 Ornithology 3 hrs.
An introductory course that explores both descriptive and experimental cellular points 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 vivo and in vitro. Prerequisite: BIOS 250.

BIOS 555 Marine Biology 4 hrs.
A study 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 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. Prerequisites: 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 vivo and in vitro. Prerequisite: BIOS 250.

BIOS 597 Topics in Biological Sciences 3-4 hrs.
Lectures or seminars in various areas of the biological sciences will be offered. The student’s record will indicate the topic studied. May be repeated for credit.

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 605 Biological Sciences Colloquium 1 hr.
A series of seminars describing current research in various fields in the Biological Sciences. Reports on these research seminars are required. May be repeated for a total of 2 hours. Graded on a "Credit/No Credit" basis. Prerequisite: Admitted to department degree program.

BIOS 610 Teaching of Biological Sciences 1-4 hrs.
This course will provide instructional techniques for the teaching of Biological Sciences at the college or secondary level. May be repeated for credit. Prerequisite: Consent of instructor.

BIOS 611 Eukaryotic Cell Biology 3 hrs.
A study of the structure and function of the organelles and biochemical components of eukaryotic cells. Through lectures and readings in current literature, students will examine the latest information on the working of eukaryotic cells. Prerequisite: A course in Biochemistry.

BIOS 612 Prokaryotic Cell Biology 3 hrs.
Bacterial structure-function relationships are examined in a biochemical context. Current and classical concepts of cell biochemistry are organized around the bacterial cell as a model for understanding energetics, synthesis of cell structures, transport, metabolism, and regulatory mechanisms. Readings will be from the literature and substantial use will be made of review articles in biochemistry and microbiology for lecture topics. One paper will be required. Prerequisites: A course in biochemistry and a course in microbiology or consent of instructor.

BIOS 613 Animal Physiology 3 hrs.
Current concepts and molecular details of modern systems physiology will be examined through lecture, readings from the current literature, discussion, and student presentations. Emphasis will be placed on understanding the mechanisms used by the organ systems of animals to maintain homeostasis. Prerequisite: One course in physiology or consent of instructor.

BIOS 614 Plant Physiology 3 hrs.
An advanced topics course covering the current research emphasis on the physiology, molecular biology, environmental biology, biochemistry, and cell biology of plants. Prerequisite: Biochemistry.

BIOS 615 Ecology 3 hrs.
The structure and dynamics of plant and animal populations are considered with critical evaluations of current concepts. Emphasizes include the relative roles of competition and trophic interactions in population dynamics and how communities are structured. Applications of ecological concepts will consider aspects of conversation biology, pest control, agroecosystem function, and risks of genetic engineering. Prerequisite: Course in Ecology or consent of instructor.

BIOS 616 Evolution 3 hrs.
Evolution is approached as the all-encompassing theory of biology. Topics range from genetic and molecular issues to adaptation in life histories and behavior. At least one paper will be required. Course readings will be drawn primarily from journal articles. Prerequisites: A course in genetics and a course in ecology or consent of instructor.

BIOS 620 Mutagenesis/Carcinogenesis 3 hrs.
Through lectures, presentations by students, and reading of the current literature, the mechanism 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 3 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 biological problems. The course will be personalized 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 Biological 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.

BIOS 699 Laboratory Rotations 1-4 hrs.
This course provides credit for Laboratory Rotation requirement of the Ph.D. program. Students will carry out directed study in a research laboratory different from the research laboratory in which their thesis research is conducted.

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.

BIOS 730 Doctoral Dissertation 15 hrs.

BIOS 735 Graduate Research 2-10 hrs.

Black Americana Studies (BAS)
LeRoi R. Ray, Jr., Director; Professors Jones, Wilson.

BAS 500 Black Humanism 3 hrs.
An examination of the creative dimension of the Black Experience. Isolated and set apart in an enemy 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” as 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 multietnic setting. The course is primarily aimed at helping teachers at any level who teach with 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 makeup and resources of the local community, develop instructional packages for use in multiethnic courses, and evaluate materials prepared for multiethnic 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 Barcelona, Berndt, Brown, Cooke, Harmon, Howell, Kanamuaier, McCarville, Steinhaus; Associate Professor Warren; Assistant Professors Reinhold, Schreiber, Stapleton.

Open to Upperclass and Graduate Students

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 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 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 modern chemical instrumentation is presented. General topics covered are elementary electronics, electrochemistry, spectroscopy, and other instrumental techniques. Four hours of laboratory per week. Prerequisites or concurrent enrollment: CHEM 431, 432.

CHEM 525 Techniques in Water Analysis 2 hrs.
Analytical techniques and methodology commonly used to determine water quality are presented. Modern instrumental methods are stressed with particular emphasis on spectroscopic and chromatographic measurements. Laboratory provides practical experience in application of principles discussed in lecture. Not available to Chemistry majors. Prerequisite: CHEM 361 or 365.

CHEM 528 Chemical Separations 3 hrs.
Principles and applications of chemical separations, including distillation, crystallization, extraction, electrophoresis and a variety of chromatographic techniques. Laboratory exercises illustrate typical applications of the methods. Prerequisite: CHEM 361.

CHEM 535 Introduction to Physical Chemistry 3 hrs.
Theory and applications of chemical structure, energetics, and rates and mechanisms of processes as a basis for understanding the principles of chemistry. This course may not be applied to the requirements for a major in chemistry or for a graduate curriculum in chemistry. Prerequisites: Sixteen hours of chemistry, MATH 123, PHYS 111, or 211.

CHEM 550 Biochemistry I 3 hrs.
The chemistry, properties, and molecular biology of proteins and nucleic acids. Includes discussions of amino acids, enzymes, and biochemical energetics. Prerequisites: CHEM 361 and 430 or 535.

CHEM 552 Biochemistry I with Laboratory 4 hrs.
This course consists of 550 plus lab. Experiments involve more advanced techniques and instrumentation than in 356 laboratory. Emphasis will be on purification and properties of proteins and nucleic acids. Prerequisites: CHEM 361 and 430 or 535.

CHEM 554 Biochemistry II 3 hrs.
Continuation of 550. Chemistry and metabolism of carbohydrates and lipids. Metabolism of amino acids and photosynthesis. Prerequisite: CHEM 550 or 552.

CHEM 560 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 361 and twenty-four hours of chemistry.

CHEM 564 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 toxicological applications. 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 physical properties of polymers are studied in terms of the 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 3 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.

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. (Two semesters; 1 hr. credit.)

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 extranuclear structure of the atom, periodic classification of the elements, valency and the chemical bond, complex ions and coordination compounds, acids and bases, and numerous 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 equilibria, 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 polarography, 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 approximate 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 molal qualities, 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,
Chemistry (CHEM)

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, addition, condensation, etc. Prerequisite: CHEM 361.

CHEM 662 Stereoc hemistry 3 hrs.
A consideration of shapes of molecules and the isomeric consequences. Atomic and molecular orbital interpretation of molecular shape. The stereoc hemical relationships in substitution and 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.

CHEM 690 Special Investigations in Chemistry 1-6 hrs.
Research or independent study in one of the specialties of a member of the Chemistry Department. Graded on a credit/ no credit basis. May be repeated for credit. This course cannot be used to partially satisfy the 600-level distributional degree program requirement of the Chemistry Department. Prerequisite: Consent of Instructor.

COM 640 Seminar in Telecommunication 3 hrs.
Exploration of selected topics in telecommunication. Possible topics, each of which may be taken for credit, include:
   a. Communication Technology
   b. Effects of Mass Media

COM 641 Social Effects of Mass Communication 3 hrs.
Examines issues related to mass communication and its effects on individuals, organizations, and society. Primary emphasis of this course will be on media effects theory and research, with a consideration of related ethical issues.

COM 642 Telecommunications Technology and Application 3 hrs.
Provides an overview of the design and performance characteristics of telecommunications technology and services, including satellite, optical fiber, PBX, and cellular telephone communications. The course will include regulatory, economic and social use issues that are likely to affect the development of new and enhanced forms of communication technology and service.

COM 644 News Media and the Organization 3 hrs.
This course is designed for students of communication interested in the function and operation of the news media and its relationships to organizations. Focuses upon the effects of the news media on public opinion which can influence an organization’s goals, as well as an understanding of the structure of news organizations, the forces that drive them, and the bases of news decisions.

COM 647 Corporate and Organizational Video 3 hrs.
An extensive survey of the many ways television is used by organizations, including sales presentations, on-the-job training, customer information, and employee news.

Communication (COM)

Gilchrist, Chairperson; Professors Dieker, Jaksa, Northouse, Rhodes, Smith, Van Hoeven; Associate Professors Crane, Joyce, Lipke, Pajolek, Robeck, Still, Washington, Woodworth, Yelisna, Assistant Professors Ford, Gershon.

COM 505 Special Topics in Communication 1-3 hrs.
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, 301 Sprau Tower. Six (6) hours of 505 and 605 may be accumulated as credit toward a Master of Arts in COM.

Analysis in depth of continuing issues in mass communication. Topics vary from semester to semester, and students may take one or all topics for credit.

COM 541 Mass Communication Law 3 hrs.
Provides an overview of the essential regulatory and policy issues governing the field of Mass Communication and Telecommunications. Special attention is given to such topics as libel, privacy, access and right to reply, and copyright. A case study approach is used for the purpose of understanding legal precedent. Prerequisites: 15 hours of COM courses, including COM 200, or consent of instructor.

COM 548 Telecommunication Management 3 hrs.
Examines three sectors of the telecommunications field, including radio/television broadcasting, cable and telephone with emphasis on the principles of communication management, economics and policy. Course supplemented with a series of case studies and discussion pertaining to select management theories. Prerequisites: 15 hours of COM courses, including COM 200 and 240, or consent of instructor.

COM 555 International Telecommunication Policy 3 hrs.
Provides the student with an overview of the essential regulatory and policy issues governing the field of international telecommunications. Special emphasis on the major regulatory agencies and economic players responsible for the formation of telecommunications policy at the international level. Prerequisite: 15 hours of COM courses, including COM 200, or consent of instructor.

COM 557 Conflict Management 3 hrs.
Based on the assumption that conflict pervades human life, this course explores the strategies of productive and nonproductive interpersonal and social conflict within the organizational setting. Theories of conflict are...
Comparative Religion (REL)

Lawson, Chairperson; Professors Ehrhart, N. Falk, F. Gross, Gruder, Light, Siebert; Associate Professor Ede, Assistant Professor Vasquez.

Open to Underclass and Graduate Students

Undergraduates with junior status and two previous courses in Religion may enroll in 500-level courses.

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; Mystical Dimensions of Islam.

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: Millenium, Utopia, and Revolution; Femininity as a Religious Form; Great Islamic Thinkers; the Hindu Yoga; the Occult Tradition.

REL 511 Women in Religion
3 hrs.

Drawing together materials from many religious traditions, this course explores religion’s effect on women, and women’s effect on religion. It attends especially to women’s roles in traditions studied—both roles allotted to women and roles women shape for themselves. It also traces repeating patterns in women’s religious experience and evaluates common explanations for such patterns. Prerequisites: Junior or senior level and two courses (6 hours) in either Religion or Women’s Studies.

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; the Future 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 religion in comparative perspective and the major methods employed by the 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.

Computer Science (CS)

Nelson, Chairperson; Professors Boals, deDoncker, Williams, Motzkin; Associate Professors Kaminski, J. Kapenga, Kerstetter, Kountanis, Pinkowski, Sherwani, Trenary, Assistant Professor Gupta.

Open to Underclass and Graduate Students

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 and will receive an introduction 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 programs are stressed. Some programming projects in each teacher's area of interest will be assigned. Not for Computer Science majors or minors (except teaching). Prerequisite: CS 502 or equivalent experience.

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 machine and assembly languages is given. Programs will be written in these low level languages. 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: CS 503.

CS 518 Introduction to Computer Modeling and Simulation
3 hrs.
The 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 programs 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 partitioning, 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 525 Computer Architecture
3 hrs.
General topics in computer architecture, memory systems design and evaluation, pipeline design techniques, RISC architectures, vector computers, VLSI systems architecture. Prerequisites: EE 250, CS 223 or EE 251, and CS 331.

CS 526 Parallel Computations I
3 hrs.
Parallel Computations I will cover architecture, synchronization and communication aspects of parallel and distributed systems. This course will focus on the design and analysis of algorithms which have a prototype treatment on current machines. These algorithms may include parallel sorting, combinatorial search, graph search and traversal, applications in graphics, 2-d finite difference methods, one-dimensional elements, matrix algorithms and the Fast Fourier Transform. Prerequisite: 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, connection 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 use 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 protocols will also be covered. A student may not receive credit for both CS 443 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, composite design, object-oriented software, HIPO, project management. Emphasis is placed on the solution of large software system problems using a top-down approach. Prerequisite: CS 331.

CS 554 Operating Systems
3 hrs.
The internal and external views of computer operating systems are presented. A historical survey of the development and growth of operating systems is given. Fundamentals of systems and system design are stressed. Basic concepts and terminology are emphasized. Processes, communication and synchronization, deadlocks, scheduling, shared resources, resource allocation, and deallocation, memory management, file management, and protection are discussed. Applications to real systems are investigated to motivate the ideas presented. Students build or run simulations and modify the internals of a working operating system. Prerequisites: CS 224 and 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 145 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 595 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 advisor. 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. Prerequisite: Approval of department.

CS 620 Algorithms for VLSI Design II
3 hrs.
Advanced topics in computer aided VLSI design will be covered. Students are expected to read research papers and complete projects using VLSI design software packages. Topics include various VLSI design representations, tools and algorithms for the representation and manipulation of design of different levels, as well as on the analysis of the pertinent algorithms. Prerequisite: CS 520.

CS 625 Advanced Computer Architecture
3 hrs.
Multiprocessor architectures, various interconnection networks, communication and synchronization techniques, data flow architectures. Prerequisite: CS 525.
CS 626 Parallel Computations II
3 hrs.
This course will focus on advanced topics in Parallel Computations, such as on algorithms in the areas of graph algorithms, numerical algorithms, computer graphics and VLSI design. Focus will be on aspects of operating systems and languages. Students will be expected to read research papers and complete a semester project involving the use and implementation of parallel programming paradigms on current machines. Prerequisite: CS 526.

CS 627 Computer Graphics II
3 hrs.
A course in advanced computer graphics topics selected from current research. Some of the areas of interest include: visualization of complex processes, full motion video, virtual reality, client/server protocols and parallel image rendering. Emphasis is on research, and students are expected to participate in a research project with a faculty member during the course. Prerequisite: CS 527.

CS 628 Parallel Scientific Computations
3 hrs.
This course will focus on the design and implementation of parallel numerical algorithms to solve problems such as singular value decomposition and the solution of linear systems for structured/unstructured sparse matrices; partial differential equations; and multivariate numerical integration. Applications may include the solution of wave equations, heat conduction, particle dynamics, finite element applications and Monte Carlo methods. Prerequisites: CS 526, MATH 230.

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 computational complexity are considered. Methods for improving 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 580 and 631.

CS 633 Computational Geometry
3 hrs.
Design and analysis of algorithms for computational geometry problems and discussion of applications in databases, computer graphics and VLSI design. Specific topics may include: Geometric Formulation, Geometric Searching, Point Location, Multidimensional Problems, Range Trees, Convex Hulls, Simple Polygons, Voronoi Diagrams, and the Geometry of a Rectangle. Prerequisite: CS 631.

CS 634 Combinatorial Optimization
3 hrs.
This course will treat the foundations of algorithmic programming and analyze the computational complexity of algorithms in this area. The topics may include: linear programming, algorithms for max-flow, min-cost and shortest path problems, weighted matching, integer and 0/1 linear programming, nonlinear programming techniques, approximation algorithms, branch-and-bound and dynamic programming methods of 0/1 programming, and properties of local search. Prerequisite: CS 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, database 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 better 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 660 Software Engineering I: Formal Specifications of Software Systems
3 hrs.
Students will be introduced to various models of software life cycles. The remainder of the course will focus on formal methods for specifying requirements and design. Students will be introduced to a number of formal systems using axiomatic specification, abstract models (e.g., VDM), set theoretic systems (e.g., Z), predicate logic systems (e.g., Larch), and specifications based on programming languages such as Alphard, CLU, and Ada. Also discussed will be formal specification of real-time systems using Petri Nets, P A I S L E Y, C S P, SF and others. Examples and exercises illustrating the use of several formal systems will be given. Students teams will be expected to complete the specification of requirements and design of a project using one of the methods presented. Prerequisites: MATH 145 and CS 331.

CS 661 Software Engineering II: Verification and Validation of Software Systems
3 hrs.
Students will become familiar with the terminology and will learn the limitations of verification and validation (V and V) approaches. Five approaches will be presented: technical reviews, testing, proofs of correctness, simulation and prototyping, and requirements tracing. Students will define a V and V plan and carry it out for several stages in the development cycle of a project. Prerequisite: CS 660.

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 grammar-based sequences. Various approaches are covered, 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 679 Theory of Computation II
3 hrs.
Recursive, partial recursive and primitive recursive functions, properties of recursive and recursively enumerable index sets, decidability, Turing computability and recursively enumerable sets, and properties are proved to be unsolvable. Concepts from computational complexity, including relationships between complexity classes are covered. Prerequisite: CS 580.

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., computer vision and image processing, natural language and speech processing, expert systems, computer learning or other A.I. topics. Prerequisite: CS 582.

CS 681 Seminar in Computer Science
1-3 hrs.
Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

CS 700 Master's Thesis
6 hrs.

CS 710 Independent Research
2-6 hrs.

CS 712 Professional Field Experience
2-6 hrs.

CS 730 Doctoral Dissertation
15 hrs.

Economics (ECON)

Professors Barrett, Gardner, Hoffman, Sicel, Zelder; Associate Professors Asela, Caruso, B. Harik, S. Harik, Huang, Kern, Nest, Pozo, Thistle; Assistant Professors Alexander, Bossardt, Meyer, Wheeler, Zhou.

Open to Upperclass and Graduate Students Undergraduate students wishing to take 500-level courses must be of junior or senior standing and have 12 or more credit hours of Economics or the consent of the Department Chairperson.

ECON 501 Studies in Economic Problems: Variable Topics
3 hrs.
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, plus 6 additional credit hours of economics or consent of instructor.
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. Prerequisites: ECON 201, 202, 320 or 406 plus three additional credit hours of intermediate level economics.

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 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 588 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 featuring invited visiting economists. Topics will vary and courses may be repeated.

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. Prerequisites: 12 credit hours of Economics and the consent of instructor and Department Chairperson.

Open to Graduate Students Only

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 multiperiodic 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). Prerequisite: MATH 122 or equivalent.

ECON 604 Introduction to Mathematical Economics
3 hrs.
This course is intended to introduce graduate students to the concepts of multivariate calculus and mathematical analysis commonly used in the mathematical analysis of economic problems. Its primary objective is to teach students the rudiments of mathematical programming as they apply to economic theory. Thus, students will also be introduced to selected topics from consumer theory and the theory of the firm. Prerequisites: MATH 122, MATH 123 or equivalents.

ECON 605 History of Economic Thought
3 hrs.
A survey of the origins and development of economic analysis from the Ancient Greeks to the present. Focuses upon the development of important schools of thought, their analytical contributions, and the significant figures in the history of economics. Prerequisites: ECON 403, 406 or equivalents.

ECON 609 Seminar in Economics
3 hrs.
Offers the graduate an opportunity to investigate contemporary problems in economic theory and analysis. Prerequisite: Four hours of advanced economic theory or consent of instructor. Topics will vary, and course may be repeated.

ECON 610 Human Resources I
3 hrs.
This course is an introduction to human resource economics. Its objective is to provide students with the theoretical background necessary to undertake studies relating to human resources and labor problems. Thus, this course will present a general survey of the theory that forms the core of modern labor economics. Prerequisite: ECON 603 or equivalent.

ECON 611 Human Resources II
3 hrs.
This course is the second course in a two course sequence required for the Ph.D. field in human resource economics. The objective of this course is to apply theory and quantitative methods to various topic areas in human resource and labor economics, such as discrimination, employment and training policies, income distribution, turnover and migration, unions and collective bargaining, and household production and family decisions. Prerequisite: ECON 610.

ECON 616 Collective Bargaining in Public Employment
3 hrs.
This course examines collective bargaining developments in public and local, state, and federal governments, including bargaining units, negotiations, grievance procedures, strikes, and dispute settlements. Prerequisites: ECON 201 and 202 or consent of instructor. Not open to Economics graduate students.

ECON 617 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. Prerequisites: ECON 201 and 202 or consent of instructor. Not open to Economics graduate students.

ECON 619 Introduction to Econometrics
3 hrs.
This course is an introduction to econometric models and their use in economic analysis. The course covers multiple regression models, the implications and treatment of serial correlation and heteroskedasticity. Prerequisite: ECON 622 or equivalent.

ECON 622 Economic Statistics
3 hrs.
This course focuses on the theory and practice of testing hypotheses, statistical estimation theory, the basic theory underlying the linear model, and the use of econometric models, and the nature and difficulties which arise in applying statistical models to economic research problems. Prerequisites: MATH 122 or equivalent, ECON 402 or equivalent.

ECON 624 Public Finance I
3 hrs.
This course is devoted to a study of welfare and public sector economics. The objective is to acquaint students with the framework used by economists to analyze and evaluate public policy. Prerequisite: ECON 603 or equivalent.

ECON 625 Public Finance II
3 hrs.
Selected topics from public sector economics will be presented. Foremost among these is benefit-cost analysis. Thus, consumers' surplus, the social discount rate, and decision making under uncertainty are other topics that will be covered regularly. The main purpose of this course is to provide students with the background necessary to conduct research in public finance. Prerequisites: ECON 624, ECON 665.

ECON 650 Industrial Organization/Business Economics I
3 hrs.
This course will survey the major topics in industrial organization, antitrust economics, and the economics of regulation. Prerequisite: ECON 603 or equivalent.

ECON 651 Industrial Organization/Business Economics II
3 hrs.
This course will cover selected topics in industrial organization, antitrust economics, and the economics of regulation. Prerequisites: ECON 650, ECON 665.

ECON 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 403 and 406.

ECON 665 Microeconomic Theory I
3 hrs.
Core ideas in theoretical microeconomics will be introduced. The course will address a number of standard microeconomic topics, including the theories of consumption and production, cost and expenditure functions, market structures, and input demand. Prerequisites: MATH 122, MATH 123 or equivalents.

ECON 666 Microeconomic Theory II
3 hrs.
This course presents an advanced treatment of consumer and producer theory. It will be composed of selected topics in microeconomic theory, including general equilibrium and welfare analysis. Prerequisites: ECON 664, ECON 665.
English (ENGL)


Open to Upperclass and Graduate Students

ENGL 522 Studies in American Literature
3 hrs.
Study of a movement or a recurring theme in American literature, such as romanticism, realism, naturalism, humor, or racial issues.

ENGL 530 Medieval Literature
3 hrs.
Readings in the medieval literary tradition. Some Middle English works will be studied in the original; works in Old English and Continental literature will be studied mainly in translation.

ENGL 532 English Renaissance Literature
3 hrs.
Readings in representative writers of the period 1500-1660.

ENGL 534 Restoration and Eighteenth Century Literature
3 hrs.
Readings in representative writers of the period 1660-1800, focusing on the diversity of literary forms in the period.

ENGL 536 Romantic Literature
3 hrs.
Readings in poetry and criticism, with emphasis on such writers as Blake, Burns, the Wordsworths, Coleridge, Scott, Byron, the Shelleys, and Keats.

ENGL 537 Victorian Literature
3 hrs.
Readings emphasizing such writers as Carlyle, Mill, Dickens, Thackeray, Eliot, Tennyson, the Brownings, and Arnold.

ENGL 538 Modern Literature
3 hrs.
Readings in representative writers in the period 1890-1945, not exclusively in British and American literature.

ENGL 539 Post-Colonial Literature
3 hrs.
Readings in representative writers from colonial and post-colonial cultures.

ENGL 540 Contemporary Literature
3 hrs.
Readings in representative writers who have come to prominence chiefly since 1945.

ENGL 555 Studies in Major Writers
3 hrs.
Study of the works of classical, European, British, or American writers. Limited to one or two authors. May be repeated for credit as long as the authors covered are different.

ENGL 566 Creative Writing Workshop
4 hrs.
An advanced course in the writing of poetry, fiction, or drama, with class criticism of each student's writing. The course may be taken more than once.

ENGL 574 Grammar for Teachers
4 hrs.
Deals with issues surrounding the teaching of grammar, various aspects of grammatical skill, and ways of teaching grammar and developing students' grammatical competence.

ENGL 582 Studies in Children's Literature
3 hrs.
A study in depth of significant themes, movements, and types of children's literature. Prerequisite: ENGL 282 or permission of the department.

ENGL 583 Multi-Cultural American Literature for Children
3 hrs.
A course designed to develop an understanding of the cultural diversity of the American experience through multi-cultural oral and written literature for young people. Attention will be paid to developing criteria for selecting and evaluating literature which reflects diversity within the American heritage. Prerequisites: 16 hrs. of English course work, including ENGL 282.

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. Open to graduate students accepted into the M.F.A. program and, with the permission of the instructor, to other graduate students.

ENGL 669 Methods of Teaching College Writing
3 hrs.
A course required of those teaching the freshman composition course. ENGL 105, for the first time. Establishes the basic structure and methodology for teaching such a course. Participants prepare assignment sequences for their classes, design appropriate learning activities, and practice evaluating and responding to student writing. Participants are introduced to activities that reflect different theories and approaches to the teaching of composition.

ENGL 672 Language, Dialects, and Sociolinguistics
3 hrs.
A course focusing on specific varieties of American English studied from historical, linguistic, literary, and/or social perspectives as the basis for application of sociolinguistic theory and research to a variety of topics. These may include the study of American culture and literature, educational implications of dialect diversity in monolingual and multilingual settings, the links between language and social identity, and gender/ethnic differences in language. Issues such as language change, attitudes toward language, and implications for teaching English will be explored in detail.

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 676 Old English
3 hrs.
A course dealing with the grammatical structures of Old English and the sociolinguistic context in which this language was spoken and written, with a view to applying such linguistic study to translating and interpreting pre-1066 English literary texts, both prose and poetry, including Beowulf.

ENGL 677 Middle English
3 hrs.
A course dealing with the grammatical structures of Middle English and the sociocultural context in which this language was spoken and written, with a view to applying such linguistic study to translating and interpreting pre-1066 English literary texts, both prose and poetic. Chaucerian and non-Chaucerian, stemming from various regions of English-speaking Britain.

ENGL 679 Studies in Composition Theory
3 hrs.
A course which examines various approaches to the teaching of composition. Aims to increase awareness of the relationship between theory and practice, acquaint participants with ongoing dialogues within the field, and help them identify and formulate their own professional stances. Attention will be given to the impact on composition theory of scholarship in fields such as classical rhetoric, linguistics, literary theory, cognitive psychology, human development and learning, social constructionism, and ethnology. Prerequisite: Teaching experience.

ENGL 680 Advanced Methods in Teaching Literature
3 hrs.
A study of theories and methods of teaching literature.

ENGL 681 Advanced Methods in Teaching Language and Composition
3 hrs.
A study of theories and methods of teaching language and composition.

ENGL 690 Scholarship and Writing in the Profession
3 hrs.
In this seminar students will prepare the capstone Essay to be submitted as the culminating requirement for the M.A. in English. The course will include analysis and evaluation of journals and articles in areas relevant to the student's research topic. "Workshop" review and editing of the paper, and preparation for oral presentation and discussion of the student's work in a Master's Colloquium. Graded as a Credit/No Credit basis. Prerequisite: ENGL 630 and prior completion of at least 21 hours of credit toward the Master of Arts in English.

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 711 Readings in Doctoral Specialization
3-6 hrs.
In consultation with a faculty member, the doctoral student will design a reading list of 20 to 30 books in a specialized area. Students wishing additional guided reading may register a second time. The student will master these works independently and, in consultation with faculty members, select a representative list of approximately 20 works on which to be evaluated in a two-hour oral exam, conducted by a committee of at least two faculty members. Prerequisite: Doctoral candidacy.

ENGL 712 Professional Field Experience
2-12 hrs.

ENGL 713 Practicum in Teaching in the Discipline
3 hrs.
A practicum in teaching in the discipline will be done as collaborative teaching with an experienced faculty member in a broad-based undergraduate course in literature, language, or composition. Prerequisite: Doctoral candidacy. There will be opportunity for both guided praxis and reflection on praxis. May be repeated. Prerequisite: Consent of advisor.

ENGL 730 Doctoral Dissertation
15 hrs.
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, 452, or GER 316, 317, 325, 452, or LATV 316, 317, 325, 452.

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, 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 560 Advanced Readings in French 3-6 hrs.
Topics of literary, cultural, or linguistic merit will be analyzed. Topics will vary from semester to semester. May be repeated for credit. Prerequisite: FREN 316, 317, 325, or permission of instructor.

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. Prerequisites: GER 316, 317, 322 or 325 or equivalent.

Japanese (JPNS)

JPNS 550 Independent Study in Japanese 1-3 hrs.
Directed individual study of a specific topic in Japanese language, literature, or culture. May be repeated for credit. Prerequisite: Completion of four courses in Japanese or equivalent; minimum grade point average of 3.0 in Japanese; departmental approval required.

German (GER)

Open to Upperclass and Graduate Students
GER 550 Independent Study in German 1-3 hrs.
Directed individual study of a specific topic in German literature or linguistics. Departmental approval required for admission. Repeatable for credit. Prerequisite: A minimum grade point average of 3.0 in the major.

LAT 557 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 survey of the development of Medieval Latin from late antiquity to the Renaissance. Specimens will include major literary and documentary sources of the medieval centuries including new genres such as hagiography, monastic rules, hymns, and homilies. Prerequisite: One of LAT 200, LAT 201, LAT 204, LAT 324, or equivalent, or permission of department.

Latvian (LATV)
Open to Upperclass and Graduate Students
500-level courses may be taken only by advanced undergraduate students. Advanced undergraduate students are defined as those who have satisfactorily completed a minimum of four courses, or equivalent, applicable toward a major or minor in any one language. Each course, however, may have more specific and/or additional prerequisites.

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 work on language-teaching materials. Prerequisite: LATV 316 and 317, 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 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 different topics. Prerequisite: LATV 316 and 317, or equivalent 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: LATV 316 and 317, or equivalent, or instructor’s permission.

LATV 598 Readings in Latvian
1-4 hrs.
Individual reading project available to advanced students with good scholastic records to study in depth an author or materials not being offered currently in the Schedule of Classes. Prerequisite: LATV 316 and 317, or equivalent, or permission of adviser, instructor, and chair of department required.

Russian (RUSS)
Open to Upperclass and Graduate Students
500-level courses may be taken only by advanced undergraduate students. Advanced undergraduate students are defined as those who have satisfactorily completed a minimum of four courses, or equivalent, applicable toward a major or minor in any one language. Each course, however, may have more specific and/or additional prerequisites.

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
500-level courses may be taken only by advanced undergraduate students. Advanced undergraduate students are defined as those who have satisfactorily completed a minimum of four courses, or equivalent, applicable toward a major or minor in any one language. Each course, however, may have more specific and/or additional prerequisites.

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 eighteenth 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 560 Studies in Spanish 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. Prerequisite: Three hours of SPAN 526, 527, 528, 529, or departmental permission. Representative topics which may be treated in this area include: Cervantes—Don Quixote 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 Ferran Caballero through Blasco Ibañez. Generation of 38—Thought and works of typical representatives such as Unamuno, Azorin, Baroja, and A. Machado. Contemporary Theatrical Movement 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 Quixote
3 hrs.
An in depth study of Cervantes’ masterpiece. Emphasis is on literary analysis, but attention will also be paid to Cervantes’ background.

SPAN 610 Topics in Hispanic Literature
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: Medieval Spanish Literature; Golden Age Poetry and Theatre; Golden Age Prose; Cervantes; Galatea, Novelas ejemplares; Poesies y Sigismunda; Nineteenth Century Literature; Generation of 1898; Contemporary Spanish Theatre; Modern Spanish Theatre; Modern Spanish Poetry.

SPAN 630 Topics in Spanish American Literature
3 hrs.
The advanced study of selected aspects of Spanish literature. Course varies according to topic and may be repeated with permission of adviser. Representative topics include: Medieval Spanish Literature; Spanish; Methods of Teaching Culture; Non-Castillian 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 650 Independent Study in Spanish American Literature
3 hrs.
The advanced study of selected aspects of Spanish American literature. Course varies according to topic and may be repeated with permission of adviser. Representative topics include: Literature of the Colonial Period, Nineteenth Century Literature; Spanish American Modernismo; Contemporary Spanish American Fiction; Spanish American Essay; Spanish American Poetry.

SPAN 660 Topics in Language and Methodology
3 hrs.
The advanced study of selected aspects of language and methodology. Course varies according to topic and may be repeated with permission of adviser. Representative topics include: Applied Linguistics in the Teaching of Spanish; Methods of Teaching Culture; History of the Spanish Language.

SPAN 680 Research and Writing
3 hrs.
A study of the techniques of research and the art of expression, leading to the completion of a scholarly monograph. (Enrollment limited to ten students.)

SPAN 690 Seminar
3 hrs.
Innovative study of a particular author or of a literary, linguistic, or cultural topic. Course varies according to topic and may be repeated with permission of adviser.
Linguistics (LING)

GENERAL LINGUISTICS COURSES

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 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 the nature of language.
LING 690 Seminar in Linguistics—Variable Topics 2-4 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.
LING 691 Practicum in Teaching English as a Second Language 3 hrs.
Students review current ESL materials, aid teachers in constructing new materials, plan lessons, and tutor or teach a class in ESL under the supervision of an experienced teacher.

Open to Graduate Students Only—Please refer to The Graduate College section for course description

Geography (GEOG)

Quandt, Chairperson; Professors Dickason, Heller, Micklin, Raup, Stoltman; Associate Professors Erhart, Stolle; Assistant Professors Cutrin, Dillworth

SYSTEMATIC GEOGRAPHY

Open to Upperclass and Graduate Students
GEOG 521 Studies in Climatology and Meteorology 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 industrial, 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. Prerequisite: GEOG 203 or 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 occupancy 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 resource development and use with emphasis upon rational 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 issues 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 required for 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 implementation 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 356 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 and procedures 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, function, and geographical distribution of cities; 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 566a 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 518 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 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 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.

GEOPHYSICAL AND HUMAN GEOGRAPHY
Open to Graduate Students Only
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 556 Field Geography
2-4 hrs.
The theory and application of geographic techniques and instruments of field
investigations: collection and analysis of field data, preparation and presentation of
materials. The course is based primarily upon 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 assessments, and urban
and regional planning), and in representing these data by computer mapping methods.
Equivalent applications of these methods will be made to both microcomputers and larger
main-frame computer systems. Prerequisite: Senior or graduate standing.

GEOG 558 Quantitative Methodology
3 hrs.
Introduction to the application of quantitative concepts and methods in the analysis of
graphic 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

GEOG 559 Geographic Information Systems
4 hrs.
This course focuses on the fundamental concepts and procedures of GIS,
and may be repeated. Prerequisite: GEOG 375 or equivalent.

GEOG 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
graphology, 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.

GEOG 597 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.

GEOG 665 Seminar in Geography
1-3 hrs.
This course focuses on the interactive modes of geographic thought and current practices. Other course
emphases are sources of geographic information, search strategies, and the written
presentation of research findings. Graduate

GEOG 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
colleagues. May be repeated. This course is graded on a Credit/No Credit basis.

GEOG 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
interphased with computer generated data to
establish geographic information systems. Individual projects will be carried out
involving detailed fieldwork.

GEOG 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, multicolor production, photo-reproduction and computer-assisted
mapping. It is recommended that GEOG 567 be taken before 580. Prerequisite: GEOG 375 or equivalent.

GEOG 77
**Geology (GEOL)**

Straw, Chairperson; Professors Chase, Grace, Harrison, Kelew, Passero, Schmidt; Associate Professor Barnes; Assistant Professors Atewaani, Hampton, Smith.

**Open to Underclass 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 503 Environmental Consulting Practice**

2 hrs.

An introduction to the principles and practices that are peculiar to environmental consulting. Emphasis is placed on the legal, business, and practical considerations needed for on-going consulting practice. This course is not to be counted toward the 60 credits beyond the master’s in the Ph.D. program. Prerequisite: Graduate standing in Geology or Earth Science.

**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: GEOL 301 or GEOL 335; MATH 122, MATH 123 to be taken concurrently.

**GEOL 515 Applied Hydrology**

3 hrs.

Application of hydrogeologic theory to water supply networks. Topics include well installation, well testing, aquifer testing, and distribution systems. Prerequisite: 12 hours of geology, earth science, or consent of instructor.

**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 301 or GEOL 440.

**GEOL 525 Surface Geophysics**

1 hr.

An introduction to the use of those surface geophysical methods used in the investigation of ground water. Includes shallow seismic, electrical methods, and ground penetrating radar. Prerequisite: GEOL 412 or GEOL 512.

**GEOL 526 Principles and Practices of Aquifer Testing**

1 hr.

Introduction to the methods of aquifer testing with emphasis on step drawdown pump tests, forty-hour pumping test with recovery, slug tests and bail tests, data processing using computer software, water level recorders, data loggers and water level measuring equipment. Prerequisite: GEOL 412 or GEOL 512.

**GEOL 527 Principles of Well Drilling and Installation**

1 hr.

An introduction to hollow-stem auger drilling and well installation, rotary drilling with mud and air, cable tool drilling, monitoring well design, sample collection and description; cuttings, split spoon, and Shelby tube, borehole geophysics, and installation and development of wells. Prerequisite: GEOL 412 or GEOL 512.

**GEOL 528 Principles/Practices of Ground-Water Sampling/Monitoring**

1 hr.

An introduction to state-of-the-art techniques for sampling, monitoring, and evaluating groundwater systems and surface water interactions. Includes quality control and assurance procedures, ground-water sampling equipment and procedures, field hydrochemical equipment and procedures, and vadose zone sampling of water and gas. Prerequisite: GEOL 412 or 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 301, or GEOL 440.

**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 Great Lakes area. Prerequisites: GEOL 301, GEOL 440.

**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 urban geology. Field trips required. Prerequisites: GEOL 131, GEOL 301 or GEOL 335; or consent.

**GEOL 560 Introduction to Geophysics**

3 hrs.

Introduction to geophysical exploration methods including seismic reflection and refraction, gravity, electric, and electromagnetics. Prerequisites: Two semester of college physics; GEOL 301 or GEOL 440; GEOL 430; MATH 122; or consent.

**GEOL 561 Reflection Seismology**

3 hrs.

Reflection seismology and related techniques as applied to petroleum exploration and deep crustal studies. Theoretical background, data collection, data processing and interpretation will be discussed. Prerequisites: GEOL 560, CS 306, and MATH 123.

**GEOL 562 Gravity and Magnetic Exploration**

3 hrs.

Gravity and magnetic methods applied to tectonic, mineral exploration, hydrogeologic, and crustal studies. Theoretical background, instrumentation, surveying techniques, data reduction, processing, computer modeling, and interpretation will be discussed. Two lectures and three hours of laboratory, problem solving, and field exercises. Prerequisites: GEOL 560 and MATH 123.

**GEOL 563 Electrical Methods**

3 hrs.

Resistivity sounding and profiling, induced polarization, spontaneous potential, electromagnetic methods using natural and artificial fields. Two lectures and three-hour laboratory with field studies and laboratory modeling. Prerequisites: GEOL 560, MATH 123, and PHYS 440; or consent of instructor.

**GEOL 564 Field Geophysics**

3 hrs.

Field studies demonstrating the use of seismic reflection, gravity, and electrical resistivity 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.

Geochemoic 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 rates using analytical and numerical models. Prerequisites: GEOL 512, 600, Fortran or Basic, MATH 274; or consent of instructor.

**GEOL 608 Advanced Hydrogeochemistry**

3 hrs.

Investigation of selected topics in hydrogeochemistry. A problem-oriented approach to the study of classical and current topics dealing with natural and contaminated ground waters. Prerequisite: GEOL 600.

**GEOL 609 Surface Water Hydrology**

3 hrs.

Hydrology describes the waters of the earth, their occurrence, circulation, and distribution, and their reaction with the environment. Emphasis is on quantitative aspects of surface water. Topics include, stream flow precipitation, evapotranspiration, hydrographs, runoff, probability analysis and modeling.

**GEOL 610 Geochemistry**

3 hrs.

An introduction to the basic principles and theories of geochemistry. Prerequisites: 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 612 Advanced Hydrology**

3 hrs.

Analytical and numerical analysis of groundwater flow and contaminant transport. Topics include well hydraulics, flow in unconfined aquifers, multi-phase flow, and advection-dispersion. Prerequisites: GEOL 512, 605, and MATH 123.

**GEOL 613 Wetlands Hydrology**

3 hrs.

Introduction to hydrologic function of wetland, 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: GEOL 512 or consent of instructor.

**GEOL 614 Water Law**

3 hrs.

Study of those federal and state laws that govern the distribution, use and pollution of natural waters. Emphasis is placed on current interpretations and policy.
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 of and methods involved in the
geometric, kinematic, and dynamic analysis
of deformed rock bodies. All scales of
observation are considered from hand
samples 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 645 Carbonate Petrology and
Paleoecology
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
environs. GEOL 433 and 435, or consent of
instructor.

GEOL 646 Carbonate and Evaporite
Depositional Systems
3 hrs.
Processes, characteristics, and relationships
of modern and ancient basinal carbonate and
evaporite facies. Course includes an 11-day
field trip (Spring Vacation) to investigate
Holocene, Pleistocene, and Tertiary carbonate
environments and facies in Florida; and a
3-day trip to northern Indiana and Ohio to
examine Silurian Platform carbonates. Student
projects include logging, description, and
interpretation of cores and slabs at the
mesoscopic level. Two lectures and one
3-hour laboratory per week. Prerequisites:
GEOL 433, GEOL 435.

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.

GEOL 656 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 435 or
consent of instructor.

GEOL 660 Seminar in Geology and Earth
Science
1 hr.
A seminar designed to provide students with
the opportunity to examine and discuss
important problems in Earth Science. Oral
presentations will be required. Prerequisite:
Consent.

GEOL 666 Advanced Hydrology Seminar
1-3 hrs.
Topics in theoretical and applied hydrology.
Course is repeatable for credit. Prerequisite:
Graduate standing.

Open to Graduate Students Only—Please
refer to The Graduate College section for
course descriptions.

GEOL 700 Master’s Thesis
6 hrs.

GEOL 710 Independent Research
2-6 hrs.

GEOL 712 Professional Field Experience
2-12 hrs.

GEOL 730 Doctoral Dissertation
15 hrs.

GEOL 735 Graduate Research
2-10 hrs.

History (HIST)

Davis, Chairperson; Professors Beech,
Bresach, Carlson, Cordier, Dooley, Ferreira,
Freico, Gregory, Haight, Maier, Nahm, Porter,
Rosu, Schmitt, Associate Professors Havria,
Hawks, Houdek, Patterson; Assistant
Professors Borsh, Coryell, Davis, Norman,
Simon, Stone, Xiong.

Open to Undergraduate 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 MIDL 500. Topics
listed in Schedule of Classes. May be
repeated under different topics.

HIST 556 Studies in Modern European History
3 hrs.
Selected approaches to European history
since the Renaissance. Topics listed in
Schedule of Classes. May be repeated under
different topics.

HIST 585 Studies in Asian and African 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, museum and historical agency
databases and registration systems,
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
topics 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 602 Historical Theory
3 hrs.
Study of the literature, research, and explanatory strategies of contemporary historical theory with emphasis on social and cultural history. Prerequisites: HIST 600 and HIST 601
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. May be repeated under different instructor
HIST 608 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. May be repeated under different instructor
HIST 612 Readings in Medieval History
3 hrs.
Intensive study of historiography, major works, serials, and databases in medieval history. May be repeated under different instructor
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. May be repeated under different instructor
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 620 Bibliographical Research
1-3 hrs.
Research in the literature of specialized topics and issues as they pertain to theses or dissertation preparation, and preparation of a bibliographical essay. Topics may be listed in Schedule of Classes: Prerequisites: HIST 600, HIST 601
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 approval of the Department Chair. May be repeated to a maximum of six hours
HIST 642 Oral History
3 hrs.
Techniques and methodology of orally transmitted historical data. Considers oral history in various cultural settings under both literate and nonliterate conditions.
HIST 644 Material Culture and Technology
3 hrs.
Development of historical data and interpretations derived from portable artifacts such as ceramics, glassware, and metalwork, photographs, artistic traditions, structures, and secondary evidence of material remains. Identification and analysis of objects including practical and aesthetic functions, economic and technological implications, environmental conditions, etc.
HIST 646 Historical and Industrial Archaeology
3 hrs.
Theories, methods, and interpretive potential of historical and industrial archaeology. Survey of major sites in North America, Europe, and the rest of the world.
HIST 650 Special Projects
1-3 hrs.
Participation in departmental research and interpretive projects. Topics may be listed in Schedule of Classes. Registration requires approval of the Department Chair. May be repeated to a maximum of six hours. Prerequisite: HIST 650, HIST 601, and possession of or admission to candidacy for a graduate degree.
HIST 670 Seminar in History
3 hrs.
Selected issues and problems in historical studies. Topics announced in Schedule of Classes. May be repeated under different topic
HIST 671 Seminar in Theory and Philosophy of History
3 hrs.
Advanced research. Topics may be listed in Schedule of Classes. May be repeated under different topics. Prerequisites: HIST 650 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. Topics may be listed in Schedule of Classes. May be repeated under different topics.
HIST 675 Seminar in Early United States History
3 hrs.
Advanced research. Topics may be listed in Schedule of Class. 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. Topics may be listed in Schedule of Classes. May be repeated. Prerequisites: HIST 600 and 601, 608 or consent of instructor
HIST 682 Seminar in Medieval History
3 hrs.
Advanced research. Topics may be listed in Schedule of Classes. May be repeated. Prerequisites: HIST 600 and 601, 612 or 635 or consent of instructor
HIST 686 Seminar in Modern European History
3 hrs.
Advanced research. Topics may be listed in Schedule of Classes. May be repeated. Prerequisites: HIST 600 and 601
HIST 688 Seminar in Global and Contemporary History
3 hrs.
Advanced research. Topics may be listed in Schedule of Classes. May be repeated under different topics. Prerequisites: HIST 600 and HIST 601
HIST 689 Seminar in Public History
3 hrs.
Advanced research. Topics may be listed in Schedule of Classes. May be repeated under different topics
HIST 698 College Teaching and Lecture Presentation
3 hrs.
Research and practice in oral presentation and instruction in the college and university classroom, professional meetings, and to media and public audiences
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.
HIST 730 Doctoral Dissertation
12-18 hrs.
HIST 735 Graduate Research
2-10 hrs.

Mathematics and Statistics (MATH)
Meyer, Charpenson, Professors Alavi, Buckley, Chanwell, Chartrand, Ealy, Eenigenburg, Goia, Hirsch, Hseh, Kapoor, Laing, McKean, Mihalko, Petro, Riley, Schwenk, Sievers, Stoline, White, Yang; Associate Professors Bielko, Browning, Pence, Stoddart, Treiman, Turner; Assistant Professors Crowell, Marmho, Naranjo, Sheets, Richardson, Wang.
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, variate 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, delicate 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 transformations, 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 noneuclidean geometry. Prerequisite: Consent of instructor.

MATH 552 Teaching of Elementary Mathematics
3 hrs.
This course covers curriculum issues and trends in K-8 mathematics education. Specifically, it focuses on methods and materials for teaching mathematics effectively to K-8 students. This course is not open to undergraduate students who have completed MATH 352 with a "C" or better. Prerequisite: MATH 150 with a grade of "C" or better or a course equivalent to MATH 150.

MATH 554 Algebra in the Elementary/Middle School Curriculum
3 hrs.
This course is devoted to the teaching and learning of algebra in elementary and middle grades. Concepts and skills are developed and reinforced using a variety of approaches and materials. Calculators and computers are used throughout the course to develop concepts, to model numerical methods, and to explore the connections between symbolic and graphic representations of mathematical ideas. Prerequisite: MATH 352 or 555 with a grade of "C" or better or consent of instructor.

MATH 555 Mathematical Problem Solving in the Elementary/Middle School Curriculum
3 hrs.
This course provides experiences in mathematical problem solving for elementary/middle school teachers. Content for the problems is selected from number theory, algebra, geometry, probability and statistics. Emphasis is placed upon teaching problem solving. Computers are used extensively to solve problems. Prerequisite: MATH 352 or 555 with a grade of "C" or better or consent of instructor.

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 procedures 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, 563 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 effects 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 survey data 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 BMOP. Statistical work treatment 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 methods will be discussed along with modifications from standard statistical practice. Topics will include planning an experiment, experimental strategy. Analysis of Variance concepts, factorial design, 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 based on ranking methods, measures of rank correlation, efficiency. Emphasis will be on the application of nonparametric statistical methods to data from many different applied fields. 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 polynomials; multiple comparisons; factorial arrangement of treatments; confounding; fractional replication. This course is modeled 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, Jacobian, 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, solution 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 Topics in Elementary/Middle School Mathematics
3 hrs.
This course addresses topics in mathematics content and pedagogy relative to the teaching and learning of elementary/middle school mathematics. Course may be repeated for credit. Prerequisite: MATH 352 or consent of instructor.

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 student. Prerequisite: Approval of chairperson of department.
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 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. Prerequisite: Approval of instructor.

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, polygonal rings and finite fields. Prerequisite: Consent of adviser.

MATH 619 Computer Methods in Secondary School Mathematics
3 hrs.
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. Prerequisite: Approval of instructor.

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 530.

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 iterative methods. Prerequisites: MATH 510 or 530, and 506 or 507.

MATH 639 Studies in Algebra
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
4 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 graphs of groups, 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.

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.

MATH 653 Studies in Teaching Secondary 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 secondary school level. Explicit attention is given to the impact of technology on the teaching/learning process. Prerequisite: Consent of adviser.
MATH 654 Topics in Secondary School Mathematics Curricula 3 hrs.
Participants in this course examine curricula issues and trends in secondary school mathematics. A student may analyze recent experimental and commercial curricula materials. This course may be taken more than once with the approval of the student's advisor. Prerequisite: Consent of adviser.

MATH 656 Teaching of College Mathematics 2 hrs.
In this course consideration is given to curriculum problems and trends in post-high school mathematics, research on specific problems of the teaching of 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 interval; 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 T^2-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, nonlinear, and stepwise regression; correlation; residual analysis; model building; use of the regression computer packages at WMLU, 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 cdfs, M-estimates, rank statistics, optimality considerations, asymptotic distribution theory. 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-Kolmogrov systems; transient and limiting behavior; examples and illustrations; random walks, birth-and-death processes, etc.; stationary processes. Prerequisites: MATH 673, 510 or 550, 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, iterative proportional fitting, model selection, goodness of fit, logistic models, incomplete tables, symmetry, marginal homogeneity, 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.

MATH 673 Real Analysis 4 hrs.
Topology of n-dimensional space, continuity and differentiability of functions of one variable, Riemann-Sieltjes 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 Lebesque 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 to implement mathematical and statistical packages. Problems covered include approximating probabilities and quantiles for selected distributions, Monte Carlo studies, least squares computations for general linear and non-linear models such as QR decompositions and iteratively reweighted least squares, and robust estimating procedures. Additional topics may include generalized linear models, nonlinear models, and multivariate problems. Prerequisites: CS 306 or CS 301; MATH 662 or MATH 568 and MATH 230.

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 some of these 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, 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 (AutoRegressive Integrated Moving Average) Box-Jenkins time series models is presented. Identification of correct time series models, estimation of model parameters, and diagnostic checks of fitted models will be covered. The uses of these models for forecasting future trends and assessing interventions will be examined. Extensive data analysis using SAS is included. A few VAX statistical packages are included. Topics include: autocorrelation function, partial autocorrelation functions, Yule-Walker equations, differencing, autoregressive moving average 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 M-, L- and R-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 repeated measurement designs, analysis of covariance designs, attempts to fit such 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 Topics in Design. 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 662 (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)
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.

Medieval Institute

Open to Upperclass 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.

MDVL 700 Master's Thesis 6 hrs.

MDVL 710 Independent Research 2-6 hrs.

MDVL 712 Professional Field Experience 2-12 hrs.

Required Core Courses:

ENGLISH
ENGL 630 Medieval Literature 3 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 521 Topics in Art History: Variable Topics 3 hrs.

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 562 Readings in Medieval History 3 hrs.

HIST 682 Seminar in Medieval History 3 hrs.

ENGLISH
ENGL 532 English Renaissance Literature 3 hrs.

ENGL 555 Studies in Major Writers: Chaucer, Dante, Milton, Spenser 3 hrs.

ENGL 642 Studies in Drama 3 hrs.

ENGL 652 Studies in Shakespeare: Tragedy 3 hrs.

ENGL 653 Studies in Shakespeare: Comedy 3 hrs.

ENGL 676 Old English 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)

Pritchard, Chairperson; Professors Bach, Ellin, A. Falk, Pisaneschi, Scriven, Wight; Associate Professors Baldner, Dilworth, Pulaski, Smith; Assistant Professor Culp.

Open to Upperclass and Graduate Students

The prerequisites for admission into 500-level courses are: Junior status and 12 hours of philosophy. Specific prerequisites may be added to individual courses.

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: Junior or senior status, and PHIL 320 (MATH 314 or CS 331 may substitute for PHIL 320), and two other courses in philosophy, math above the level of 110, or computer science above the level of 105.

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. Prerequisites: Junior or senior status, and PHIL 220 or PHIL 320, and two other courses in philosophy, math above the level of 110, or computer science above the level of 105.
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 human kind 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. Prerequisites: Junior or senior status, and twelve credit hours in philosophy and/or biological sciences or a health professional field.

PHIL 570 Philosophical Topics
1-4 hrs.
An examination of special philosophical topics. Topics to be listed in the Schedule of Classes. Prerequisites: Junior or senior status, and twelve credit hours in philosophy. Specific course prerequisites may be stipulated for specific topics and substitutions for philosophy may be allowed. Usually at least one of PHIL 300 or PHIL 301 will be required.

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. Prerequisites: Junior or senior status, and twelve credit hours in philosophy. Selections may vary from term to term.

Open to Graduate Students Only
PHIL 600 Colloquium
2-4 hrs.
A seminar in which one or more faculty involve the students in their current research. Topics may vary from term to term.

PHIL 610 Seminar in the History of Philosophy
2-4 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
2-4 hrs.
The theory and practice of a disciplined mind. Topics may vary from term to term. There may be drawn from deductive and inductive logic, scientific methods, theories of rationality, and artificial intelligence. PHIL 320 or 520 may be substituted for topics presupposing knowledge of symbolic logic.

PHIL 630 Seminar in Ethics and Value Theory
2-4 hrs.
A study of theories of value and duty, with special emphasis on applications. Topics may vary from term to term.

PHIL 632 Theory of Knowledge
2-4 hrs.
An examination of the nature of truth, belief, and evidence. Topics may vary from term to term. Examples include: questions about the fundamental kinds of entities that comprise reality, the existence of God, universals and particulars, space and time, causation and free will, mind and matter, identity and change, and other related topics. May be repeated.

PHIL 640 Seminar in the Philosophy of Life
2-4 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 meaninglessness, science and religion, reconciling subjectivity and objectivity.

Open to Graduate Students Only
PHIL 700 Master's Thesis
6 hrs.
PHIL 710 Independent Research
2-6 hrs.

Physics (PHYS)
Haidernor, Chairperson; Professors Hardie, McGunn, Shamu, Tanis, Associate Professors Chung, Kamber, Jaul, Rosenthal, Assistant Professors Berrah, Parecella, Paulus.

Open to Upperclass and Graduate Students
PHYS 562 Atomic and Molecular Physics
3 hrs.
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: PHYS 460 or consent of instructor.

PHYS 563 Solid State Physics
3 hrs.
Physicists study the nature and purpose of the new materials that are emerging. This course is designed to provide a foundation of fundamental techniques for the application of mathematics to the new materials. Prerequisites: PHYS 562 or consent of instructor.

PHYS 564 Nuclear and Particle Physics
3 hrs.
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: PHYS 460 or consent of instructor.

PHYS 566 Advanced Laboratory
3 hrs.
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 in depth. The course consists of three, three-hour laboratory periods each week. Prerequisites: PHYS 342 and PHYS 460.

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 point masses, collisions, electromagnetism, and conservation laws. An introduction to the general theory of relativity will also be given. Prerequisite: PHYS 420.

PHYS 598 Selected Topics
1-4 hrs.
This course offers 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 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 equation and operator theory 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 angular momentum. 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 electrodynamic, Feynman diagrams, and the properties of the strong and electric weak 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 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 682 Research in 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 622 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 research 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 research 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 research adviser.

PHYS 598, 599, 698, 699 Master's Thesis
2-10 hrs.
This course includes computer exercises and application packages such as SPSS and DPL. Applications in political science and public administration. They will learn to use methods used by contemporary political scientists with an emphasis on the application of leading models of political and the formulation of concepts, generalizations, and theories. Equivalent or consent of instructor.

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)
Rogers, Chairperson; Professors Chandler, Dahl; Directors of doctoral research in political science, Kaufman, McNam, Renstrom, Ritchie, Robin, Ross, Ziring; Associate Professors Butterfield, Datta-Sandhu, Houghton; Assistant Professors Dalton, Lewis, Pinney, Tammar.

Open to Underclass and Graduate Students

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 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 determination. 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 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 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 544 Political Change in Russia
3 hrs.
An examination of processes of political change in Russia in areas of policy and structure. Past reform efforts in the former Soviet Union and Russia are studied, followed by an extensive inquiry into system change. The course relates the Soviet and Russian experience to the literature on political change and theories of comparative politics.

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 problems confronting world organization, i.e., functional and dysfunctional aspects of the UN; nationalism vs. internationalism; conflict resolution and UN peace-keeping efforts; specific UN accomplishments in maintaining a dynamic international equilibrium; UN weaknesses and the future of world organization.

PSCI 555 International Law
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 Mosca, Michels, 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
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 revolution. Included are applications of leading models of politics and the formulation of concepts, generalizations, and theories.

PSCI 562 Modern Democratic Theory
3 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. Included are applications of leading models of politics and the formulation of concepts, generalizations, and theories.

PSCI 572 Computer Applications for Political Scientists
3 hrs.
This course is designed to provide students with a foundation in computer concepts and applications in political science and public administration. They will learn to use application packages such as SPSS and DPL. The course includes computer exercises and a term project. Prerequisite: CS 105 or equivalent or consent of instructor.
influences, and the processes by which public policy is formulated and carried out.

An examination of two models, the free market mechanism and national industrial policy, that are used to respond to global economic challenges. The American political economy is compared with British and French models. The course will review current literature in the area of political behavior and psychology. Special attention will be paid to controversies in voting behavior and the meaning and significance of vital concepts such as partisanship, ideology, issue voting, belief systems, political sophistication, affective reactions to politics, and the dynamics of citizen participation.

This course focuses on the development of policy over time and across state and national boundaries. It deals with how and why policy emerges in particular forms in different countries. Selected substantive issues will be examined comparatively in greater detail.

An examination of two models, the free market mechanism and national industrial policy, that explains how the political-economic system functions in the U.S. and in the American states. The relationship between private enterprise and democracy will be assessed in response to global economic challenges. The American political economy is compared with alternative approaches in the world.

This seminar examines how resource, environmental, and technological processes are generating increasingly important political and economic conflicts as well as how policy made in these areas can either exacerbate or ameliorate such conflict. Examples (e.g., fossil fuel dependent particular forms in different countries. Selected substantive issues will be examined comparatively in greater detail.

This course focuses on the development of policy over time and across state and national boundaries. It deals with how and why policy emerges in particular forms in different countries. Selected substantive issues will be examined comparatively in greater detail.

This seminar addresses the principal types of political institutions, political processes, political behavior, and political development. The course explores interdependences 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 conflict and external commitment.

This course is designed to introduce and familiarize students with the constitution and legal basis 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.

This course focuses on the developing areas and uses an interdisciplinary approach. The strategies of development are examined in selected countries or typically on a cross-national basis.
PSCI 650 Seminar: International Systems
3 hrs.
Study and research on a common topic of current international political, organizational, or legal significance. 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 661 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.

PSCI 662 Political Philosophy I
3 hrs.
A synthesis of the history of political philosophy and the formal analysis of those positive and normative concepts and processes necessary to the understanding of political systems. The course covers the period from classical Greece through the Renaissance. Superimposed on the overall chronological format are critical inquiries into basic concepts and processes.

PSCI 663 Political Philosophy II
3 hrs.
A synthesis of the history of political philosophy from the seventeenth century to contemporary times. The course also includes a formal analysis of applicable positive and normative concepts necessary to the understanding of political systems. Superimposed on the overall chronological format are critical inquiries into basic concepts and processes. Prerequisite: PSCI 662.

PSCI 664 The Nature of Political Inquiry and Analysis
3 hrs.
An examination of the principles underlying the systematic study of politics. Included are discussions of such basic questions as: What do we mean by political science? What do we mean by political phenomena? How do we explain political phenomena? and What is the relationship between the empirical analysis and normative evaluation of political phenomena? Attention will be given to leading approaches to the study of politics and the formulation and use of concepts, generalizations, and theories.

PSCI 690 Comparative Research Strategies
3 hrs.
An advanced examination of the methodology and methods of comparative research. The course first focuses on the methodological difficulties of comparative research, and then concentrates on the use of qualitative and quantitative methods of investigating research issues with a comparative approach. Students are expected to complete a research design. Prerequisite: PSCI 590.

PSCI 691 Quantitative Methods
3 hrs.
The development and use of quantitative variables in political science research. Relevant statistical procedures such as time series, regression analysis, cluster and factor analysis, analysis of variance and covariance, and path analysis are assigned to show their use in quantitative systems, institutions, and public policy. Prerequisite: PSCI 591.

PSCI 694 Teaching Political Science
1 hr.
This course addresses the basics of teaching in higher education: class preparation, leading discussions, classroom policies, university policies, classroom management, dealing with problematic situations, and basic teaching skills, among others. Graded on a Credit/No Credit basis.

PSCI 695 Teaching Excellence
2 hrs.
This course introduces advanced graduate students and teaching assistants to ideas, information and methods that are innovative and encourages them to approach teaching in a way that goes beyond the traditional lecture format. Critical thinking exercises, group projects, project-oriented learning, portfolio learning, computer-aided instruction and computer simulations are possible topics. Recent research on the nature of the learning process, both among late adolescents and adults, will also be included. Graded on a Credit/No Credit basis. Prerequisite: PSCI 694.

PSCI 696 Research and Professional Skills
2 hrs.
Goals in this course include acquaintance with the department’s research agenda; familiarization with the state of the discipline; overcoming common research problems faced by professionals; demystifying certain professional activities such as conference participation, article submission and grant writing; familiarization with on-campus facilities, including library and computer support; and introduction to computer programs and databases commonly used in political science. Graded on a Credit/No Credit basis.

PSCI 697 Proposal Workshop
1 hr.
During the course of this workshop, the student will develop a dissertation proposal (and attending grant proposals, where appropriate). While this will be done primarily in conjunction with the committee, the workshop will provide a weekly support structure in which students will discuss their research question, progress and any complications. Graded on a Credit/No Credit basis. Open only to doctoral students.

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.

PSCI 730 Dissertation
15 hrs.
The preparation and completion of an original research project.

Psychology (PSY)

Farris, Chairperson; Professors Alessi, Brehower, Farris, Ferraro, Fuqua, Huiterna, Kent, Lyon, Maiott, Michael, Poering, Robertson, Spates, Ulrich, Associate Professors Brethower, Dickens, Redmon; Assistant Professors Armstrong, Baker, Campbell, Meinhold.

Open to Underclass and Graduate Students
All 500-level courses in the Department of Psychology have a prerequisite of junior level status and of PSY 360 (Concepts of Principles of Behavioral Analysis) and PSY 330 (Methodology of Behavioral Analysis).

Exceptions to this requirement must be approved by the course instructor on a case-by-case basis.

PSY 510 Advanced General Psychology
3 hrs.
Readings, lecture, and discussion designed to introduce students to the principles of 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 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, behavioral 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. Prequisite: 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, developing 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 526 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 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 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 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 regimens, and issues related to working in a medical setting.

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 retardation.

PSY 578 Research Practicum: Developmentally Disabled Population
3 hrs.
Supervised experience at the Crowley Avenue School which offers an educational program for mentally 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 advisor.

PSY 598 Special Projects in Psychology
1-5 hrs.
This course provides the graduate student with the opportunity for independent reading 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 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 Assessment
1 hr.
This course is designed to introduce the student of professional psychology to the general area of psychological assessment. Through course readings and lectures the student will acquire a background in issues such as Principles of Measurement, Types of Measurement Tools, Use of Rapid Assessment Devices, and criteria for selecting measures for practice. Additional areas covered will compare and contrast traditional psychometric considerations with behavioral assessment concerns, examine the DSMIII and behavioral assessment, address behavioral interviewing, as well as direct observation of behavior. The course will prepare the student to operate with sufficient understanding of assessment issues in the valuable clinical and research roles anticipated during the early professional psychology training career at Western Michigan University.

PSY 602 Introduction to Theoretical Issues
1 hr.
This course is designed to introduce the student of professional psychology to selected systems of behavior change and their theoretical underpinnings. Problems characteristic of these theoretical models will be outlined. Client populations most suitably treated by the various systems will also be identified. Considerable emphasis will be devoted to comparing and contrasting a radical behavioral model with alternative conceptual schemes. Freudian analytical, cognitive, and behavioral theories will be considered in lecture and readings. The student will develop an appreciation for the position of technical eclecticism while maintaining a theoretical preference.

PSY 603 Introduction to Professional Issues
1 hr.
This course is designed to introduce the student of professional psychology to many of the professional and ethical standards as well as contemporary issues affecting practice. Covered will be topics concerning the American Psychological Association's Ethical Standards for Psychologists, Standards for Providers of Psychological Services, Ethical Principles for Research with Human Subjects, the Licensing Rules for Psychologists in the State of Michigan, issues concerning Professional Training, and Ethnic and Gender in Research and Practice. Students will develop an appreciation for the contemporary complexity of the field and as it pertains to professional practice and related activity. This content will be addressed through course reading and lectures, as well as special projects conducted by students.

PSY 606 Research Methods in Applied Behavior Analysis
3 hrs.
This advanced course on research methods in behavior analysis addresses research with human and nonhuman subjects, placing an emphasis on applied, human research. Research issues and specific research methods are discussed at philosophical, strategic, and practical levels. Research decisions are placed within the context of the philosophy of science underlying all scientific research endeavors. Topics include: the mission of science; behavioral assessment and measurement; experimental design, with emphasis on single-subject designs, analysis and interpretation of data; dissemination of scientific research; and, ethical issues in research. Students demonstrate their mastery of research issues through the proposal of a research project. Prerequisites: Courses in applied behavior analysis and previous or concurrent enrollment in PSY 530, PSY 634, or the equivalent.

PSY 609 Advanced Seminar in Applied Behavior Analysis Research
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). Prerequisites: Previous enrollment in PSY 608 and permission of instructor.

PSY 610 Conditioning and Learning
3 hrs.
This course examines conditioning and learning from the perspective of the experimental analysis of behavior. Emphasis is placed on basic laboratory research procedures and findings.

PSY 611 Current Research in Experimental Analysis
3 hrs.
This course examines basic research areas of current interest to behavior analysts. A central component of the course is a detailed consideration of articles published in the Journal of the Experimental Analysis of Behavior. Prerequisite: PSY 610.

PSY 612 Advanced Physiological Psychology
3 hrs.
A survey of the interrelationships of physiological and behavioral processes. Lecture and laboratory. Prerequisite: Permission of the instructor.

PSY 613 Behavioral Pharmacology
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-R 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 variants of time series and analysis of covariance. Prerequisite: PSY 634 and 635.

PSY 640 Industrial Psychology
3 hrs.
The course covers recent applications of behavioral analytic strategies in organizational settings. Specific OMB 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.
The course is designed to teach students: (1) the legal and professional requirements for personnel selection and placement programs; (2) how to design and conduct job analyses, interviews, and tests that conform to the legal and professional requirements; and (3) how to evaluate the adequacy (the reliability and validity) of personnel selection and placement instruments. Prerequisite: An undergraduate 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.
The course is an advanced course designed to examine human behavior in organizations from a behavioral psychology perspective. Topics covered include the history of industrial/organizational psychology, motivation, performance improvement techniques, compensation, quality, job satisfaction, and its relation to productivity, and the ethics of personnel management. Students entering the course are expected to have an understanding of the basic principles of operant and respondent conditioning because these concepts are used to interpret and analyze worker behavior. Prerequisite: PSY 610 or PSY 510.

PSY 646 Advanced Organizational Behavior Management
3 hrs.
The course is designed to familiarize the student with current issues in the field of Organizational Behavior Management (OBM) and to teach the skills necessary to translate basic research findings into a form that facilitates practical application. Laboratory and controlled field research will be reviewed and principles derived from this research will be applied to current practical problems in organizational settings. Prerequisites: PSY 610, PSY 645, PSY 651.

PSY 650 Professional Issues in Psychology
3 hrs.
The course covers professional and ethical issues, including the American Psychological Association code of ethics, ethical issues in the conduct of research with human and nonhuman subjects; intrusive, restrictive, and aversive interventions; licensure, and career and professional development.

PSY 651 Applied Behavior Analysis: A Systems Approach
3 hrs.
The application of systems analysis concepts to the design of systems which yield behavioral measures of complex social situations.

PSY 652 Advanced 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. Students analyze complex systems, propose alternative solutions, and develop objective measures to determine whether organizational systems are consistent with and effectively contributing to the organization's mission, goals and objectives. Prerequisite: PSY 651.

PSY 655 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 660 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 661 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 662 Group Therapy
3 hrs.
Theory and application of problem solving interventions 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 663 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 664 Behavior Therapy
3 hrs.
This is a treatment course designed to familiarize the student with the methods, applications, theory and clinical literature of behavior therapy. This course is to be taken concurrently with PSY 669. Prerequisite: Permission of the Instructor.

PSY 665 Behavioral Approaches to Treatment
3 hrs.
This is a treatment course designed to familiarize the student with pragmatic issues in the application of behavior management and behavior analysis techniques and the underlying conceptual foundations. Among the topics to be covered are: functional analysis, token economies, behavioral contracting, response accelerating and decelerating techniques, and packaged behavior-management programs in areas such as social skills and assertiveness.

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 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 Analysis and Treatment of Developmental Disabilities
3 hrs.
This is a treatment course designed to familiarize students with pragmatic issues in the application of behavioral and behavior analysis techniques to clients who are mentally retarded or traumatically brain injured.

PSY 669 Child Behavior Therapy
3 hrs.
An introduction to behavioral clinical approaches to emotional, social, and behavioral problems of children. The course content emphasizes both the theoretical and practical implementation of a range of behavioral therapeutic techniques, including those based on classical and operant conditioning processes, social learning, and cognitive-behavioral models. Students will gain direct experience applying one or more behavior therapy techniques learned in class within the setting of the Psychology Clinic. This course is to be taken concurrently with PSY 664. Prerequisite: Permission of instructor.

PSY 670 Basic Behavioral Processes and Their Applications
3 hrs.
The course is an advanced seminar dealing with the basic behavioral concepts, principles, and processes and their application to the interpretation and analysis of behavior as well as the amelioration of behavioral problems. The emphasis is on the behavior of nonhuman animals in research settings and nonverbal human beings. However, the course also continually stresses the relevance of these basic concepts and principles to the everyday life of normal, verbal human beings. The course emphasizes the empirical and logical basis of behavioral concepts and principles in areas such as behavioral contingencies, motivational processes, stimulus control, and respondent conditioning. Prerequisite: Permission of the instructor. Prerequisite: Permission of instructor.

PSY 671 Higher-order Behavioral Processes and Their Applications
3 hrs.
The course is a continuation of PSY 670. The emphasis is on the rule governance of complex behavior of verbal human beings. Areas of analysis include behavioral medicine, and rehabilitation, behavioral anthropology, family life, child rearing, community interventions, education, self-management, organizational behavior management, developmental disabilities, autistic behavior, neurotic behavior, and
sexual behavior. These two courses combine to provide a behavior-analytic world view. Prerequisite: PSY 670.

**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.

Prerequisite: PSY 676 Skinner's Recent Writings 3 hrs. A consideration of About Behaviorism, Beyond Freedom and Dignity, and Contingencies of Reinforcement, especially as they consider issues of broad scientific, philosophical, and public policy relevance. 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: development from the field of verbal learning, information theory, psycholinguistics, ethology, Piaget, and the cognitive behaviorists. Prerequisite: Nine hours of graduate credit in Psychology or permission of Instructor.

**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, ITTP, Columbia Mental Maturity Scale, WP-PSI, WISC-R, and WAIS. Prerequisites: PSY 601 and graduate standing in school or clinical psychology or permission of instructor. PSY 680, 681, and degree program status.

**PSY 686 Criterion Referenced Assessment** 3 hrs.

A combined lecture and laboratory course covering theory and basic concepts related to criterion or domain referenced behavioral assessment. Supervised experience in administering, scoring, and interpreting selected formal and informal criterion referenced test 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, social and self-help skills. Formal systems include: SRA Diagnostic AIDS, reading and math, Pupil Record of Educational Behavior, Besse (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 688 Advanced Behavioral Assessment** 3 hrs.

The course is intended to develop knowledge in the functional analysis of behavior using self-report measures, behavioral interviewing, direct observation techniques, and physical recording. Reliability and validity issues with respect to each assessment method are covered. Behavioral consultation, and efficient alternative to one-on-one counseling in which the therapist contact is primarily with the mediator rather than the client, is introduced. Prerequisite: CECP 660, CECP 651, and PSY 602.

**PSY 690 Behavioral Approaches to Training and Education** 3 hrs.

This course addresses selection and use of test materials, the role of lecture and discussion, direct observation, grading practices, all considered from a behavioral perspective. Higher education is emphasized.

**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 undergraduate 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.
human resources planning and recruitment, training and development, compensation, and benefits plans.

PADM 572 Computer Applications in Administration 3 hrs.
Administrators at all levels increasingly rely on 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 dependent on the administrative uses of computers.

PADM 590 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 number varies 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 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 621 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 grantsmanship process, including how to: formulate and promote the 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 integrative 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 622 Applied Research Methods 3 hrs.
This course will stress the formulation of appropriate research questions, the design and utilization of various survey research methods and techniques, the essential distinctions between qualitative and quantitative research methodologies, the collection, manipulation, interpretation, and presentation of data gathered, and the use of information thus obtained in the solution of policy problems confronting professional administrators.

PADM 623 Principles of Budgeting 3 hrs.
This required Technical Core course examines the budgeting process, emphasizes the need for a thorough preparation of the budgetary process, 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 regulations.

PADM 628 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 629 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 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 reenforcement 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 provide an understanding of what it means to be a thoroughly professional administrator, to evaluate some of the major dilemmas, responsibilities, and functions of the professional administrator, and to examine some of the moral and ethical challenges confronting professional administrators.

PADM 632 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 new and innovative solutions to policy problems. This course is designed to help policy leadership and to analyze the role of entrepreneurship in bringing policy options to the arena of organizational and public debate.

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 assure 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 external and internal 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 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 skills 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 framework 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 working 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 how power in organizations is generated and exercised 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 include: systems theory, 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 better understanding of individual, group, and organization behavior; c) to provide a
administer uses discretionary power; and personal moral codes relate to the constructively about moral dilemmas; how the reasoning; the ambiguities of the value side of problems associated with defining the public good. The course explores the role of agency leadership in extending from policy formulation through implementation. Attention is directed both to public management problems. Students will be asked to weigh such factors as the effect of a systemic decision framework upon organizational processes. Attention will be devoted to the impact of bureaucratic pathologies on communication and system of linked subsystems and analyze the professional ethics and standards. 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 seminal discussions which have shaped the discipline. Participants are also introduced to the problems associated with defining the public good and the public interest, the ambiguities of the value side of the policymaker's life, and to 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 elements of public policy analysis. The focus of the course will be on the use of quantitative analytic 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, perception, stress, and motivation. The course examines interpersonal influence and considers such dimensions of group dynamics as ingroup and intergroup norms, 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 analyze real-world problems, 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; growing power; working the hierarchy, designing valid controls, initiating change; the skills of the project manager; and 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 government programs.

PADM 679 Seminar: Current Issues in Health Service Management and Delivery 3 hrs. An advanced seminar that 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 seminal discussions which have shaped the discipline. Participants are also introduced to the problems associated with defining the public good and the public interest, the ambiguities of the value side of the policymaker's life, and to 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 analysis process and illustrates how quantitative models fit into that process. Building upon this base, the second part of this course focuses on the problems associated with designing both the government and the public interest, the ambiguities of the value side of the policymaker's life, and to how personal moral codes relate to assumptions about professional ethics and standards.

PADM 682 Administrative Decision Making 3 hrs. This course will examine the organization as a system of linked subsystems and analyze the elements of decision making as influenced by this environment. The impact of bureaucratic pathologies on communication and control patterns will be related to national and subnational processes. Attention will be devoted to the effect of a systemic decision framework 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 the public and private sector case studies, and examines how managerial decisions are made within such constraints as economic costs and benefits, political stakes, organizational processes, interpersonal relations, legal requirements, ethical considerations, and technological limitations.

PADM 684 Management of Public Financial Resources 3 hrs. 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 then looks at alternative models seeking to describe and explain planning and public policy making, and explores the role of agency leadership in making critical decisions.
and Marxist approaches. Attention is also paid to the relationship of bureaucracy 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 subunits. 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 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 of 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 effect of proposed legislation upon their clientele, and 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 research 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 comprehend 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 these statistical procedures. Presented topics will include descriptive, difference, bivariate, associational, and multivariate statistics.

PADM 693 Action Research Project 3 hrs.
This course may be taken twice. Each time it will follow the 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 presented 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, literature review, 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.

PADM 699 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 end 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.

Open to Graduate Students Only—Please refer to The Graduate College section for course description.

PADM 710 Independent Research 2-6 hrs.

PADM 730 Doctoral Dissertation 1-15 hrs.

Science Studies (SCI)
Profs. R. Poel, Assistant Professors R. Halper, A. Mcconney, K. Sharma.

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 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 new 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-8 level and the appropriate methods of teaching these concepts to children. Science activities and learning by doing will be stressed, and resources for teaching science will be examined.
Sociology (SOC)

Sociology of Aging (SOC 552)
3 hrs.
Prerequisite: SOC 373 or graduate standing.
This course examines the process of aging in American society, with particular emphasis on the study of crime victims, the probabilities of violent behavior. Assault, murder, rape, robbery, mass murder, domestic violence, and war will be analyzed from a theoretical and methodological perspective. This course will be repeated for credit with a different area.

Violence and the Violent Offender (SOC 561)
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.

Violence (SOC 562)
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.

Violent Offender (SOC 561)
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.

Violent Offender (SOC 562)
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.

Violent Offender (SOC 561)
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.

Violent Offender (SOC 562)
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 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 critical overview of the current state of knowledge in the major subfields of social problems. Emphasis will be placed on conceptual and methodological problems in the area 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 causing people to present-day conflicts situations are examined and special emphasis is given to techniques of adjustment through individual and community action. Prerequisite: SOC 200 or equivalent.

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 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 processes regarding the causation of alcohol and drug addiction. The findings of research will be examined as they tend to support or discredit these social and behavioral theories.

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: Consent of instructor.

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 chronological development of criminological theory in a critical and analytical manner, addressing the impact of ideology on theory and the subsequent impact of theory on criminal justice policy. Research related to the verification of theory will be assessed. Prerequisite: SOC 666.

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 timely and relevant issues emerging from current literature and conference debates.

SOC 662 Seminar in Corrections 3 hrs.
Review and analysis of the philosophies, objectives, dilemmas, and critical issues in corrections. Innovative and alternative strategies in Social Control will be reviewed. The role of institutional and non-institutional corrections will be reviewed relative to social policy goals and objectives.

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 methodological approaches in different societies, and the applicability and tests of theories in these societies. Prerequisite: SOC 666.

SOC 664 Studies in Criminology: Variable Topics 3 hrs.
This seminar is designed to provide in depth analysis and assessment of various substantive topics within criminology, including race and crime, gender and crime, capital punishment, and/or specific types of criminal behaviors. May be repeated for credit with a different topic.

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 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 basics multicovariate 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 686 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 687 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 688 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.

SOCI 97
Prerequisite: Fifteen hours of graduate sociology courses and consent of instructor. Graded on a Credit/No Credit basis.

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)

Professors Dykxhoorn, Newell, Sinning, Tang, Welke; Associate Professors Forrest, Hines, Hodges, Kreuze, Langsam, Morris, Schaabberle; Assistant Professor Blankley, Fransson, Ruhl.

Open to Upperclass and Graduate Students

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). Prerequisite: ACTY 311 or equivalent.

ACTY 513 Advanced Accounting Systems
3 hrs.
Special studies related to computerized accounting packages currently used in practice. A case study approach involving typical business transactions, internal accounting control review, flowcharting, financial statement preparation, special reports, and decision making processes using specific software packages. Prerequisite: ACTY 416.

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 all 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 and 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.

Open to Graduate Students Only (Not open to students with PTG status)

ACTY 606 Financial Accounting Concepts I
3 hrs.
An intensive study of asset liability valuation, income determination, and financial reporting. The current literature is explored, and a research paper on one of the course topics is required. 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 Financial Accounting Concepts II
3 hrs.
Financial Accounting Concepts II is a continuation of ACTY 606. The accounting and financial reporting for liabilities, long-term investments, stockholders' equity, pensions, leases, and taxes are studied. A research paper on a financial accounting topic is required. 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.
FINANCE AND COMMERCIAL LAW

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 systems procedure techniques.

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.

Finance and Commercial Law (FCL)

Finance Area
Professors Edwards, Issa; Associate Professors Balk, Burnie, D’Mello, Kennedy, Mangia, Metwalli, Scheu, Assistant Professors Jones, Krishna-Swamy, Peterson, Samant.

Open to Upperclass and Graduate Students
FCL 562 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 361 or consent.

FCL 563 Risk Management and Insurance
3 hrs.
This course covers the function 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 360 or consent of instructor.

Open to Graduate Students Only
FCL 608 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, effecting mergers and consolidations, 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 620 The Capital Market
3 hrs.
Study of the sources and flow of demand and supply of credit. The business application of monetary theory to financial institutions and their operational problems. Prerequisite: FCL 608 or consent of instructor.

FCL 622 Mergers and Acquisitions
3 hrs.
A detailed investigation and analysis of the financial aspects of corporate business combinations. The course analyzes valuation considerations in large and closely-held companies and examines the structuring of the financial package to be offered. Prerequisite: FCL 608 or consent of instructor.

FCL 624 Applied Financial Management
3 hrs.
An analytical approach to problems facing the financial executive. Cases selected cover short- and long-term financial decision-making processes with particular emphasis on statement analysis and working capital management. Other problems will emphasize capital investment decision, valuation and cost of capital, risk analysis, capital structure, and dividend policies. Prerequisite: FCL 608.

FCL 640 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 642 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 608 or equivalent or consent of instructor.

FCL 644 Quantitative Finance
3 hrs.
The focus of this course is the use of various quantitative techniques and computer programs to analyze financial problems. Examples of quantitative techniques are regression and simulation. Examples of computer programs are spreadsheet programs, such as Lotus 1-2-3, and statistical packages, such as MINITAB. The primary financial problems analyzed are the valuation and use of options, futures, and swaps. Prerequisite: FCL 608.

FCL 654 Investment Analysis and Management
3 hrs.
A detailed analysis of the investigation of corporate securities as long-term investment media, largely from the standpoint of the individual investor. Investigates the techniques for security valuation and portfolio management, with some discussion of financial institution investment procedures. Considers mechanical procedures, instruments, and instruments important to the investment process. Not open to students with credit
earned in FCL 351 or its equivalent. Prerequisite: FCL 606 or consent of instructor.

FCL 655 Portfolio Theory and Analysis
3 hrs.
A study of the theoretical structures (models and their applications). Theoretical concepts are used to study model development and evaluate competing models. Extensive use of market-based data for computer applications of models such as Markowitz analysis, single and multiple models, simplified techniques, duration and convexity. Prerequisite: FCL 608.

FCL 662 Health Care Financial Management
3 hrs.
This course deals with advanced financial management concepts affecting health care institutions. Working capital management, capital budgeting and medical reimbursement programs are examined. Prerequisite: FCL 320 or equivalent.

FCL 681 Seminar in Finance
3 hrs.
The analysis of specialized financial problems (e.g., financial futures markets, financial forecasting, commodities, and similar contemporary problems). Topics will vary from semester to semester. Prerequisite: FCL 608.

Law Area
McCarty, Chairperson; Professor Gossman; Associate Professors Batch, Stevenson; Assistant Professor Van Auken-Haight.

Open to Upperclass and Graduate Students

FCL 583 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, zoning, condemnation and urban land development problems. Prerequisite: FCL 380 or consent.

FCL 584 International Business Law
3 hrs.
A study of national, regional and international laws which affect the conduct of international business. An examination of the legal regulations which promote or restrain trade or investment by international business firms. Prerequisite: FCL 380 or consent.

FCL 585 Government Regulation of Business
3 hrs.
This course examines the laws, rules and regulations on the federal, state and local level which affect most business enterprises. Substantive laws affecting the firm’s obligation to employees, stockholders and the general public are examined as are procedural laws affecting the regulation of the firm by public institutions. Prerequisite: FCL 380 or consent.

FCL 586 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 380 or consent.

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 contracts are examined. The administrative regulating process is discussed and various facets of product liability, antitrust and employment laws are studied. Prerequisite: FCL 380.

FCL 682 Managerial Aspects of Labor Law
3 hrs.
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 380.

FCL 688 Health Law Administration
3 hrs.
The course provides a study of the law as it relates to the delivery of health care services. The cases, regulations and statutes in state and federal legal systems that affect the health care professional and institutions are examined. Legal concepts such as respondent superior, good samaritan laws, informed consent, and confidentiality will be explored. Prerequisite: FCL 380.

FCL 689 Legal Problems of Health Care Organizations
3 hrs.
An analysis of the organization and structure of various health care entities. The medicare reimbursement program, medical malpractice and risk avoidance concepts will be discussed. Laws affecting the maintenance and disclosure of medical records and organizational certificate of needs will be examined. Prerequisite: FCL 688 or consent of instructor.

General Area
McCarty, Chairperson; Professors Beam, Farrell, Keenan, Rizzo; Associate Professors Alie, Casey, Deshpone, Verser; Assistant Professors Ahire, Flanagan, Landers, Milman, Waller.

Open to Graduate Students Only

FCL 600 Seminar in Business
3 hrs.
Open to Upperclass and Graduate Students

FCL 594 International Business Seminar 1-6 hrs.
A foreign study seminar designed for qualified and capable undergraduate students, graduate students, teachers, and business executives. The seminar introduces participants to a first-hand knowledge of business operations abroad through on-site inspection of foreign manufacturing, marketing, financial, and governmental organizational systems. Representatives are provided by coordinated faculty lectures and assigned readings. Undergraduate or graduate credit of up to six hours, in one or more of the following departments upon consent of department head: Accouting, Business Information Systems, Finance and Commercial Law, Management, or Marketing.

Open to Graduate Students Only

FCL 600 Seminar in Business
3 hrs.
Intensive problem-solving in the primary business fields. Consent of instructor required. May be repeated for credit.

FCL 686 Readings and Research in Finance and Commercial Law
1-3 hrs.
Directed individual study of bodies of knowledge not otherwise treated in departmental courses. Prerequisite: Written consent of instructor.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

FCL 700 Master’s Thesis
6 hrs.
FCL 710 Independent Research
2-6 hrs.
FCL 712 Professional Field Experience
2-12 hrs.

Management (MGMT)

Gothar, Chairperson; Professors Beam, Farrell, Keenan, Rizzo; Associate Professors Alie, Casey, Deshpone, Verser; Assistant Professors Ahire, Flanagan, Landers, Milman, Waller.

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, individual and group behavior, decision making and change. Values, as they relate to the managerial process, will be considered.

MGMT 640 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, point and interval estimates, statistical inference, comparison tests (two-sample and K-sample), association tests (correlations and regression), and non-parametric tests. Prerequisite: MATH 216.

MGMT 653 Managing Organizational Behavior
3 hrs.
A study of current theories, research, and practices concerned with understanding behavior at work. Topics include decision making, motivation, leadership, learning, communication, group behavior, conflict resolution, and job design. Emphasis is placed on the issues of productivity, satisfaction, retention, and change.

MGMT 655 Organization Theory
3 hrs.
Topics: (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.
The theory of scheduling and inventory
This course focuses on the job of the general
strategy and detailed operating plans. Using cases drawn from actual
courses are needed to develop practical,
company-wide general management
chairman. May be repeated for credit.

MGMT 664 Simulation
3 hrs.
A systematic study and application of the
methodology of system simulation including
development, computer implementation,
and probabilistic models beyond the
systems. Prerequisite: MGMT 360 or
and equivalent.

MGMT 665 Advanced Simulation
3 hrs.
Analysis, design, and implementation of
computer-based simulation models. Emphasis
on effective use of simulations for training
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 695 Advanced Independent Study
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 699 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.
Consumer Resources and Technology (CRT)

Dannison, Chairperson; Professor Woloszyk; Associate Professors Petzons, Steinhaus; Assistant Professors Geasler, Wilson.

Open To Upperclass and Graduate Students

CRT 500 Seminar in Consumer Resources and Technology
3 hrs. Fall, Winter
An intensive study of problems related to C.R.T. This seminar is especially recommended for graduates of C.R.T. or C.T.E. programs.

CRT 522 Topics in C.R.T.
1-3 hrs.
A study of the current issues impacting the areas of study in Consumer Resources and Technology: dietetics, human nutrition, family life education, home economics education, textile and apparel technology or career and technical education. Prerequisite: Seniors and graduate students only.

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 575 Administration of Child Development Centers
3 hrs.
Examination of day care and preschool regulations and/or requirements and knowledge of administrative materials and duties in providing optimum growth for young children. Includes management, planning, and organizing child development centers. (Cross-listed with ED 575.)

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 604 Studies in Textiles and Clothing
2 hrs.
An investigation of current literature and research within these field 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
4 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 Home Economics
2 hrs.
Influence of developmental needs of adults and changes in society affecting families in developing adult programs in career and technical education.

CRT 652 Family Life Education
3 hrs.
Current issues, trends, and methods in teaching family life education.
COUNSELOR EDUCATION AND COUNSELING PSYCHOLOGY

Counselor Education and Counseling Psychology (CECP)

Hovestadt, Chairperson; Professors Betz, Geisler, Gullickson, Tremblay; Associate Professor Morris; Assistant Professors Bahr, Blasure, Croteau, Hedstrom, Prosser, Talbot, Warrick

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. Graded on a Credit/No Credit basis.

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 607 Multicultural Counseling and Psychology 3 hrs.
This course is designed to help students develop knowledge, skills, and attitudes for more effective work as helping professionals with culturally different groups and individuals. Substantial attention is given to interpersonal issues, concerns related to different cultures, and programming in a variety of settings. Prerequisites: CECP 604 and 611.

CECP 608 Counseling Across the Life Span: A Family Systems Perspective 3 hrs.
The course describes counseling implications for assessing and enhancing human development across the life span from a family systems perspective. The content includes: (a) theories of human development; (b) the stages of family development; (c) factors which influence family system patterns (e.g., race, socioeconomic status, sexual/affectional orientations, childbearing status, marital status, and divorce or blending of families); and (d) implications for assessing and enhancing the development of family members and family systems within each stage.

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.
A supervised field placement in a setting appropriate to the student's M.A. option arranged in consultation with advisor and department coordinator. A minimum of 600 clock hours on site are required for all M.A. options. Graded on a Credit/No Credit basis. Prerequisite: Consent of adviser.

CECP 614 Student Personnel Administration Practicum 4 hrs.
This course emphasizes practical experience in the student's area of specialization. Student personnel administrative experiences are provided in selected supervised settings so that students can apply knowledge and skills acquired during previous studies. Graded on a Credit/No Credit basis.

CECP 615 Practicum in School Psychology 3 hrs.
This course emphasizes practical application of the principles of school psychology. Relevant experiences are provided under supervision in order for students to acquire and develop the skills learned in previous studies. Students practice in a school setting and work with a variety of presenting problems, educational staff, and school-aged youth.

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-affective 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 programs. 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 programs and evaluation. Theories of college student development, administrative strategies and techniques of program implementation are studied.

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 the 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.

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.

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 development 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 prevention 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 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 650 Intellectual Assessment 3 hrs.
This course provides instruction in clinical assessment with primary emphasis on individually administered intelligence tests. Emphasis is placed on accuracy of administration, scoring, and interpretation of psychological results via written and oral reports. Laboratory experience provides instruction in the administration of the Wechsler scales, Binet IV, and other individually administered measures of intellectual functioning. Additional topics include theories of intellectual development, neuropsychological assessment, test bias, and procedures for non-biased assessment. Prerequisite: CECP 601.

CECP 651 Personality Assessment 3 hrs.
Survey of theory of personality assessment and the basic concepts of non-projective measurement, with emphasis on the
administration, scoring, and interpretation of various instruments. Primary attention given to the MMPI. Additional emphasis includes study of the Milon, 16-PF, CPI, and other measures. Prerequisite: CECP 603.

CECP 654 Psychoeducational Assessment 3 hrs.
This course combines lecture and laboratory experience in psychoeducational assessment with primary emphasis on academic learning problems. Diagnostic assessment of reading, math written language, perceptualmotor, adaptive behavior, and social problems behavior is presented. Several academic screening and diagnostic instruments are examined. Particular emphasis is given to accuracy of administration, scoring and interpretation via oral or written reports. Curriculum-based measurement procedures designed to link assessment to intervention more effectively are also examined. Prerequisites: CECP 603 and 650.

CECP 656 Seminar in School Psychology 3 hrs.
This course examines current professional practices in school psychology. Specific issues include the history of the profession, role and function of school psychologist; research methodology applied in the field, and issues surrounding professional conduct, ethics, and the legal regulation of school psychology. More advanced issues address psychological assessment, legal regulation of school psychology, consultation and intervention, organizational development in schools, and multiculturalism.

CECP 661 Foundations of Systemic Family Therapy 3 hrs.
An in depth focus on the theoretical foundations of family therapy. Emphasis is placed on systems theory and recent theoretical developments. Nomenclature and concepts particular to family therapy are stressed. Course content also includes an overview of the historical development, major models, and diversity issues related to family therapy.

CECP 662 Couple Interaction and Therapy 3 hrs.
Application of a systemic perspective to the assessment and treatment of couples who are seeking therapy. Models of couple therapy are examined and applied to problems common to couples. Attention is given to gender, race, culture, and couple forms. Prerequisite: CECP 661.

CECP 663 Family Interaction and Therapy 3 hrs.
Application of a systemic perspective to the assessment and treatment of families who are seeking therapy. Models of family therapy are examined and applied to a variety of families and common problems. Multicultural and gender perspectives on family life are integrated in course content. Prerequisite: CECP 661.

CECP 671 Assessment and Treatment in Marital and Family Therapy 3 hrs.
This is an advanced didactic and experiential course in marital and family therapy. Goals include the assimilation, integration, and application of the major approaches to the field. Further emphasis is placed on the development of the student's therapeutic expertise in MFT intervention techniques and strategies. Class activities include use of exemplary cases, video tapes, role playing, and possible instructor participation in counseling as a consulting therapist. Prerequisite: PSY 663, or PSY 666 or CECP 673 or SWRK 669.

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 terms 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 psychodynamics, 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, 612, and 621 or equivalents.

CECP 680 Proseminar in Counseling Psychology 3 hrs.
This seminar will address historical and current issues affecting counseling psychology. Specific areas studied include professional identity; American Psychological Association, in particular Division 17 and other divisions related to the science and practice of counseling psychology; research and publishing; professional conduct and consumer issues; diverse populations; counseling psychology-related organizations; training issues; and the future of counseling psychology.

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 691 Supervision in Counseling and Psychotherapy 3 hrs.
This 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, and functions for 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: Permission of the instructor.

CECP 692 Advanced Practicum in Counseling and Psychotherapy 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 693 Doctoral Practicum 4 hrs.
Supervised practicum for doctoral students with emphasis in (a) Individual Counseling and Psychotherapy, (b) Group Counseling, (c) Marital and Family Therapy, and (d) Career Counseling.

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. Prerequisite: CECP 610.

CECP 698 Readings in Counselor 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 700 Master's Thesis 6 hrs.

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.
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 of registration by the program adviser. Graduate credit/no credit basis.

ED 502 Curriculum Workshop 1-6 hrs.
Opportunity provided for teachers, supervisors, and administrators in selected school systems to develop programs of curriculum improvement. This may include short-term offerings 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 503 Educational Technology Academy 1-3 hrs.
An organized group of workshops designed to permit students to update knowledge and skills in current educational technology and apply this learning for use in educational programs for students in pre-kindergarten through college programs. Such applications include methods of using computer, video and audiovisual technologies in literacy development, content area programs, instructional management, and the arts, as well as others appropriate to preservice and inservice professions. Participation in the courses presumes subject matter knowledge on the part of the students. Normally scheduled in one-credit-hour blocks, the ETA offerings bring students with specific needs, instructors with unique expertise and facilities with appropriate resources together for intensive and highly-focused learning experiences. The workshops are offered on weekends during the regular year, and on a week-day basis during the summer.

ED 504 Adult Development 3 hrs.
This course provides an in-depth look at each age and stage in the life cycle. It explores such probing questions as the changing roles of parents and singles, the changing societal pressures on teachers, new adult life-styles, midlife career changes, the changing roles of males and females, and unique health stressors. 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 provides an in depth look at the learning adult from approximately age 22 through old age with special emphasis on human variability in 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 are also 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, and computers, 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 2 hrs.
Emphasis is placed on cooperative problem-solving between parents and teachers of school-age children and youth. Problems encountered 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 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 learning 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 548 Instructional Technology I 3 hrs.
This course provides for the development of knowledge and skills required to make use of information and communication technologies as instructional tools. Use of instructional technology will be considered within a context of relevant research and theory pertaining to human learning. Various technologies used to produce, present, and distribute instruction, such as computer-assisted instruction, camcorders, CD ROM, CDI (compact-disc interactive), video editing equipment, scanning and digitizing equipment, satellite and cable, etc. will be examined. The hardware and software used for production and presentation will also be examined, and skills in using such software acquired. Particular emphasis will be placed on instructional design. Students will have hands-on experiences pertaining to the evaluation, selection, and implementation of media in teaching and learning settings.

ED 549 Instructional Technology II 3 hrs.
This course is intended to extend basic skills and understandings acquired in Instructional Technology I or in other comparable experiences. Emphasis will be placed on the production of instructional media. Students will be expected to produce one proto-typical application of instructional research and design. This could be used in an instructional setting. The course will also examine the use of instructional technology with the roles, rules, procedures, and customs of the organization. Students will also examine emergent technologies which are expected to have impact on how teaching and learning occur in our society.

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 $80 or more for supplies. Although no prerequisite is required, it is helpful to have had some experience with basic darkroom procedures. May be repeated up to a total of six credits.

ED 575 Administration of Child Development Centers 3 hrs.
Examination of day care and preschool regulations and/or requirements and knowledge of administrative materials and duties in providing optimum growth for young children. Includes management, planning, and organizing Child Development Centers. (Cross-listed with CRT 575.)

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 advisor 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 techniques 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 historical 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 learners in their educational settings, 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 the role of the social studies in the elementary school, gain insight into important considerations in the selection of content, and discover how to guide and assess 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 or permission of instructor.

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. Prerequisite: ED 606 or permission of instructor.

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. Prerequisite: ED 606 and ED 607 or permission of instructor.

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. Prerequisite: ED 606, ED 607, and ED 608 or permission of instructor.

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 skills in 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 disciplines 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 614 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 aids is included.

ED 615 Play and Young Children's Learning 3 hrs.
Students will develop understanding and appreciation of the nature and influence of play in humankind, and of the relationship of play to humanity's artistic endeavor, invention, and problem-solving, and will learn what play from historical and anthropological points of view. Emphasis will be placed on the stages of play in young children, and on the intimate relationship between play and young children's cognitive and affective development. Students will make practical application to their own curriculum for children.

ED 616 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 will be able to improve curriculum for young children with growing understanding of these children's minds.

ED 617 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 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 educational, 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. Prerequisite: 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 both 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 310 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.
The 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 on 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, skill, 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 621 and 622.

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 include teaching, comprehending and learning from texts. A secondary focus will be the examination of exemplary reading programs in the middle school.

ED 628 Curriculum Theory 3 hrs.
This course provides students with an in depth examination of significant historical and philosophical influences on curriculum, as well as important theoretical orientations within the field. The purpose of the course is to enable students to engage in critical reflection from theoretical perspectives on the purposes of schooling, and to bring this critical reflection to curriculum planning and evaluation, and to their own teaching practices.

ED 630 History of Education in the United States 3 hrs.
Development of educational thought, practice, and social change in the United States. Critical examination of the development of the American commitment to commonality in education: The changing relationship between school and community since 1800; the functioning of the professional educator, and the shift and progress toward educational goals. Implications of historical background for present problems in education with emphasis on the revision of previously held conventional thinking about schooling in America will be addressed.

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 technology to actual courses and units 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. Prerequisite: ED 546 or equivalent.

ED 643 Practicum in Clinical Studies in Reading 3 hrs.
This course is intended to give students experience in employing informal and formal standardized instruments and techniques necessary for the diagnosis and treatment of the disabled reader. The course emphasizes the use of various measurement pointing out their capabilities and limitations. Skills in interviewing, observing, diagnosing, planning, treatment, and evaluation of progress and school personnel are emphasized. 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 Gamiing, 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 reading and language programs from this point of view. Deeper understandings of the trade-off 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 client basis under the direction of a trained clinical therapist. The course serves as an instructional internship for working with pupils who have problems in reading and related areas. This course will provide graduate students experience in setting up descriptive instructional objectives, selecting materials in terms of needs, and carefully designing instructional procedures for disabled readers. Prerequisites: ED 519, 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, kindergarden 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. Emphases are new approaches to working successfully with problem students and classes.

ED 671 Structuring Classroom Dialogue 3 hrs.
This course is designed to assist teachers in the development of their ability to conduct dialogue in a classroom. Each student prepares lessons, presents them to a small group of students, and is 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. 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 assess 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 origin 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 fuse the teaching of 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 is 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. Graduate students will become knowledgeable about the readability of textbooks and how to adjust methods and materials to a wide range of reading levels. Opportunities for understanding and using standardized and informal instruments as measures of student progress will be provided. Emphasis will be placed on the application of instructional strategies in various disciplines. Prerequisite: ED 301 or ED 312.

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 research and exploring middle level education issues. Students examine 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 experience is 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 and is designed to acquaint teachers, reading specialists, and administrators with the current research and literature pertinent to their areas of specialization. Students should be able to demonstrate an ability to design reading research studies which contribute to the body of knowledge in reading. As this course is intended as the capstone course, it must be taken in the last six hours of graduate work.

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. Students may repeat this course providing topics vary. No more than six hours of 698 may be applied toward a graduate degree.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

ED 700 Master’s Thesis 0 hrs.
ED 710 Independent Research 2-6 hrs.
ED 712 Professional Field Experience 2-12 hrs.

Educational Leadership (EDLD)

Advisers:
Patricia First, Chairperson; Zoe Barley, Robert O. Brinkerhoff, Mary Anne Bunda, David J. Cowden, Patrick M. Jenlink, Ulldis Smidchens, Eugene W. Thompson, Charles C. Warfield

Prototypical programs for areas of concentration offered and course syllabi for courses offered may be obtained from the department office, 3312 Sangren Hall.

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. May not be applied to degree programs. 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...
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 instrumentation 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 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 advisor.

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 beyond classical test theory (e.g., item response theory and generalizability theory) are applied to instruments relevant to education. Prerequisites: EDLD 651.

EDLD 657 Evaluation Seminar
3 hrs.
An advanced seminar for the study of theoretical and practical problems in evaluation. Issues of ethics and quality in evaluation are addressed. Prerequisite: EDLD 642.

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.

EDLD 662 School Business Management
3 hrs.
Development of knowledge and skill in management of business operations in schools: budget planning, budget management, accounting, inventorying of equipment and supplies, use of standard budget formats, 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 productivity are studied. Prerequisites: EDLD 602 and 640.

EDLD 664 Curriculum Development
3 hrs.
Principles of curriculum design; study of value premises, principles, 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 the design of forces which influence curriculum development. Prerequisites: EDLD 602 and 640.

EDLD 665 The Elementary Administrator
3 hrs.
Systematic study of the tasks and functions of elementary school administration; emphasis given to planning within the context of the community, planning and evaluation for program development and school improvement, and planning for supervision of personnel and programs. Development of generic leadership skills by use of simulations and case studies. One or more field projects required demonstrating strategic and long range planning skills for an elementary or middle school. Prerequisites: EDLD 602; EDLD 640 recommended.

EDLD 670 The Secondary Administrator
3 hrs.
Systematic study of the tasks and functions of middle school and secondary administration; emphasis given to planning within the context of the community, planning and evaluation for program development and school improvement, and planning for supervision of programs and personnel. Development of generic leadership skills by use of simulations and case studies. One or more field projects required demonstrating strategic and long range planning skills for a middle or secondary school. Prerequisites: EDLD 602; EDLD 640 recommended.

EDLD 672 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 patterns for design of public funding formula and practices for funding public schools. Consideration of patterns of funding in other public resource development other than public funds as a means of financing public or private education. Completion of EDLD 662 before enrollment in EDLD 672 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 Superintendency
3 hrs.
Examination of the line and staff roles involved in the "superintendency" 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, 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 programs 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.
Directs individual study of topics or bodies of knowledge not otherwise treated in department courses. A maximum of four hours earned in EDDL 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)

Berkey, Chairperson; Professors Cheatum, Dawson, Zabik; Associate Professors Frye, Gross, Meyer, Mosi, Assistant Professors Bentely, Brylnsky, Cook, Frauenknecht, Meyer, Powell.

PEGR 500 Studies in Health, Physical Education, and Recreation
1-2 hrs.
In depth study of selected topics in HPED. Format can include clinics, workshops, seminars, travel and/or minor 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 Underclass and Graduate Students

PEGR 510 Modern Health for Teachers and Health Professionals
3 hrs.
This 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.

PEGR 512 Principles, Practices, and Methods in Health Education
3 hrs.
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 capabilities 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; Health Promotion; Health Careers; Aids; 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 560 Administration of 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 582 Administration of Athletics
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 athletics. Prerequisites: BMED 210, 240.

PEGR 591 Evaluation in Health, Physical Education, and Recreation
2 hrs.
Acquaints 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, purchases 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 area; demonstrations and practice in teaching activities.

PEGR 642 Motor Development
2 hrs.
Scientific evidence studied to determine the nature of motor learning and its inter-relationships with physical growth, biological maturity, and social development.

PEGR 643 Psychology of Motor Learning
2 hrs.
An overview of major concepts and conditions important for the learning of motor skills and emphasis on the introduction and explanation of the psychomotor domain.

PEGR 645 Curriculum Building in HPERS
2 hrs.
A critical analysis of Health, Physical Education, and Recreation programs. This interdisciplinary approach reflects local, national, and international developments. Construction of a comprehensive program, curricular models, and program evaluation are highlighted.

PEGR 648 Advanced Studies in Motor Development
1-3 hrs.
A series of advanced seminars dealing with specific topics in motor development and special physical education. Emphasis will be placed on in depth study of theories, problems, practices, and issues with appropriate lectures and experiences leading toward the development of a research project or a master’s thesis. Topics include: Play Theory, Psychology of Sport, Mainstreaming Developmental Programs in Special P.E., Aquatic Programs in Special P.E.

PEGR 650 Socio-Cultural Foundations in HPERS
2 hrs.
The course is intended to investigate and identify the function of sport in contemporary society with special emphasis on the relationship of sport to social institutions. A cross-cultural approach.

PEGR 661 Problems and Trends in Health, Physical Education, and Recreation
2 hrs.
Deals with modern trends, and with instructional and supervisory problems involved in conducting an effective program of physical education including a critical appraisal of present practices.

PEGR 668 Advanced Studies in Administration of Physical Education and Athletics
1-3 hrs.
A series of advanced seminars dealing with specific topics in administration of physical education and athletics. Emphasis will be placed on in depth study of theories, problems, practices, and issues with appropriate lectures and experiences. Topics include: Planning Facilities, Business Procedures, Ethics in Sport, Public Relations and Promotion, Administration of Athletic Programs, Legal Liability, Sport Management.

PEGR 680 Advanced Studies in Athletic Training
1-3 hrs.
A series of advanced seminars dealing with specific topics in sports medicine. Emphasis will be placed on in depth study of theories, problems, practices, and issues with appropriate lectures by physicians and specialists in the field. Professional sports medicine seminars will complement conventional on-campus study. Prerequisite: Completion of 560 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 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 and sport; introduction to and special emphasis on the application of psychological, scientific, and statistical 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 the development of sportsmen 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 590.

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; Professor Nicolaou; Associate Professors Bahr, Harris, Haus, Ickowire, Whitten.

Open to Upperclass and Graduate Students

SPED 504 Teaching Practicum in Special Education: Elementary
1 hr.
This course will provide the student with a structured assignment working with a handicapped, at-risk, or mainstreamed pupil at the elementary level. 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 at-risk or handicapped student in a mainstreamed or self-contained setting. Graded on a Credit/No Credit basis. Concurrent enrollment in SPED 534.

SPED 506 Teaching Practicum in Special Education: Secondary
1 hr.
This course will provide the student with a structured assignment working with a handicapped, at-risk, or mainstreamed pupil at the secondary level. 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 at-risk or handicapped student in a mainstreamed or self-contained setting. Graded on a Credit/No Credit basis. Concurrent enrollment in SPED 536.

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. Prerequisite: 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. Prerequisite: 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 understanding 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 group—El, Ml, POHI, 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 532 Assessment and Prescription in Special Education 3 hrs.
The major focus of this course is understanding 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, and major 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 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 intervention 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 and 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 behavioral problems. Classroom management strategies will be discussed and related to the establishment of a positive classroom climate. Diagnose 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. Graded on a Credit/No Credit basis. 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, including mental, physical, emotional, and sensory impairments. The problem of severe impairments are examined in light of biomedical, legal, sociological, and educational perspectives. Special emphasis will be placed on the relevance of special education services to the severely impaired. 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 and instructional adaptations. Special emphasis will be given to communication and instructional adaptations. 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 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 such 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 POHI population. This course is intended to provide the student with an awareness of a continuum of special education placements and the role of the non-school agencies serving POHI individuals and their families. Graded on a Credit/No Credit basis. Prerequisites: 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 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. 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 emotionally disturbed persons and their families. Graded on a Credit/No Credit basis. Prerequisites: 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 for students with emotional impairment. Prerequisite: Consent of department.

SPED 586 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 581 Acquisition and Organization of Information in Special Education 3 hrs.
This course is designed to provide an introduction to information processing techniques in special education. The course will present an information processing model emphasizing the initial components of that model, namely methods and techniques for locating, accessing, and organizing and manipulating text and media source material as well as field-based information. Students will apply the model by analyzing information needs, accessing materials, and organizing
information related to current issues and trends in the field of special education. 
Prerequisite: Consent of department.

**SPED 602 Seminar in Critical Analysis of Information in Special Education** 3 hrs.
This course is designed to provide graduate level special educators with the skills to evaluate and develop responses to questions related to etiology, identification of, and programming for students with disabilities. Using skills learned in SPED 601, related to the acquisition of information, students will learn and apply the processes of information synthesis, inductive and deductive reasoning, critical analysis, and hypothesis generation.
Prerequisites: SPED 601 and consent of department.

**SPED 603 The Special Educator as User and Disseminator of Information** 3 hrs.
This course is designed to prepare the special educator to use information to form judgments, make decisions, substantiate positions, persuade others, and/or to demonstrate or explain to others. The processes will be directly related to a variety of special education problems and/or issues. Students will learn to apply the processes through demonstration, guided instruction, small group activities, and individual assignments. Special education content domains targeted by this course include: Parent Relations, Collaboration, Community Advocacy, Interdisciplinary Concerns, and Inservice Training.
Prerequisites: SPED 602 and consent of department.

**SPED 620 Advanced Assessment of the Exceptional Learner** 3 hrs.
The emphasis of this course is on basic psychometric concepts related to the theory and interpretation of test results and psychological assessment reports. Special attention is given to the diagnosis of students based upon psychometric data. The selection of remedial education programs related to these test results as well as recent issues in testing are discussed. The course emphasizes the selection of standardized test batteries and norm- and reference-score, criterion-referenced assessment techniques.
Prerequisites: SPED 603 and consent of department.

**SPED 621 Curriculum Development for Exceptional Learners** 3 hrs.
This course is designed to provide experienced special education personnel with knowledge and skill in the conceptualization, construction, adaptation, and evaluation of instructional programs for learners with disabilities including accommodating to state and national curricular trends and issues.
Prerequisites: SPED 603 and consent of department.

**SPED 622 Development and Assessment of Preparatory 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 collection and writing of diagnostic information.
Prerequisites: Consent of department.

**SPED 623 Curriculum and Methods for Preparatory 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 situations-specific teaching roles as well as curricular and methodologic strategies in preparatory special education. 
Prerequisite: Consent of department.

**SPED 630 Clinical Practice in Special Education** 3 hrs.
This course serves as a clinical/practical experience within the Master Teacher Program, the Clinical Teacher Program, and the Special Education Technology Program. Students will apply their knowledge and skills in a clinical setting with youngsters with varying handicapping conditions. The course is offered on a Credit/No Credit Basis.
Prerequisites: SPED 603 and 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 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** 3 hrs.
This course is designed to provide students with fundamental knowledge and skills in research and evaluation in special education. Topics include the use of the scientific approach, research and evaluation design, observations and measurement instruments, statistical analysis, and report writing. Students will be expected to design and carry out a small research project.
Prerequisites: SPED 603 and 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 knowledges 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 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 monitoring 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, a 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 Seminar: Current Issues in Special Education** 3 hrs.
This course is designed to provide an in depth exploration of current issues in the field of special education and in the various specific areas of exceptionality. Issues relating to the interface of general and special education will also be explored. Utilizing skills acquired in SPED 601, 602, and 603, students will be expected to review, evaluate and present information on the various topics considered.
Prerequisites: SPED 603 and 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 the knowledges 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 consultant 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 680 Instructional Software in Special Education** 3 hrs.
This course will examine strategies for evaluating, modifying, and designing computer-assisted instruction for students with learning problems. The course will also address the integration of CAI into the special education curriculum and explore how technology tools can assist teachers. Prerequisites: SPED 537 or Equivalent and Consent of department.

**SPED 681 Assistive Technology for Persons with Physical, Sensory, and Cognitive Impairments** 3 hrs.
This course will examine assistive technology, including both hardware and software, to remove barriers to independence and education for persons with motor, visual, hearing, and cognitive impairments. Prerequisites: SPED 537 or equivalent and consent of department.

**SPED 682 Current Research in Special Education Technology** 3 hrs.
This course will examine current research topics in special education technology. As technology rapidly changes, this course will allow students to examine current issues and trends in technology integration, training, and development. Prerequisite: Consent of department.

**SPED 683 Authoring and Multimedia Systems** 3 hrs.
This course will provide information about various authoring languages, authoring systems, and mini-authoring systems available for development of special education computer-assisted instruction (CAI) and multimedia. The course will provide students with authoring experience using Apple, Macintosh, and IBM hardware. Prerequisites: SPED 537 or equivalent and 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 700 Master's Thesis** 6 hrs.

**SPED 710 Independent Research** 2-6 hrs.

**SPED 712 Professional Field Experience** 2-12 hrs.

**SPED 730 Doctoral Dissertation** 15 hrs.
Electrical Engineering

Piatkowski, Chairperson. Professors Davis, Mousavinezhad, VanderKooi; Associate Professors Gesink, Johnson, Mason, Taylor; Assistant Professors Geij, Grantner, Greenwood, Hu, Severance.

Open to Upperclass and Graduate Students

EE 550 Introduction to VLSI Design
4 hrs.
Introduction to VLSI design, 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, transmissions lines and waveguides. Introduction to perturbational and variational methods. Engineering EM Background needed for more advanced topics. Prerequisite: EE 455 or equivalent.

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 380. Cross-listed with CS 555.

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 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 350, 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 670 Modern Control Theory (3-0)
3 hrs.
Modern control theory using "state variable" formulations provides a unified approach to a wide variety of problems. Depends on matrix theory and linear algebra. Prerequisite: EE 371 or permission of instructor.

EE 671 Optimal Control Systems (3-0)
3 hrs.
Optimal control dynamic programming, Pontryagin's principle, linear optimal regulator, system identification. Stochastic and adaptive control. Prerequisite: EE 670.

EE 695 Topics in Electrical Engineering (3-0)
3 hrs.
Special topics in advanced area of Electrical Engineering or Computer Engineering not included in other courses. May be repeated for credit with a different topic for up to 6 hours maximum. Prerequisite: Consent of Instructor.

EE 697 Problems in Electrical Engineering
1-6 hrs.
Special problems based on individual need or interest under the direction of a member of the Graduate Faculty.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

EE 700 Master's Thesis
6 hrs.

Engineering Technology

ET 500 Manufacturing Engineering Fundamentals (3-3)
4 hrs.
This course reviews the fundamental principles in Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM), and metrology used in the practice of manufacturing engineering. Topics covered include: CAD documentation techniques, CAD modeling, Geometric Dimensioning and Tolerancing (GD and T), EIA/ISO format (G and M code) Numerical Control (N/C) programming, graphical N/C programming systems, and Statistical Process Control (SPC). The laboratory includes hands-on...
The synthesis of automated design, analysis, fluid relationships and wood stabilization testing techniques will be carried out for Scientific study of dendrology and forest and manufacturing process generation will be and consent of instructor. Activities will involve machining theory, wood fluid relationships and wood stabilization. Prerequisites: MATH 374, PHYS 207, ME 250, and consent of instructor.

Open to Graduate Students Only

ET 651 Corrosion Science and Engineering (3-0)
3 hrs.
Corrosion and environmental degradation of metals, alloys, ceramics and polymers. Causes, theoretical and empirical methods of protection and design for prevention. Prerequisites: MATH 374, PHYS 207, ME 250 and consent of instructor.

ET 653 Advanced Physical Metallurgy (3-0)
3 hrs.
Review of dislocation theory. Interactions of dislocations with point defects, other dislocations and surfaces. Electronic structure and physical properties. Advanced metallurgical techniques. Prerequisites: MATH 374, PHYS 207, ME 250, and consent of instructor.

ET 654 Non-traditional Manufacturing Processes (2-2)
3 hrs.
Non-traditional manufacturing processes may use electric currents, amplified light, gases, loose abrasive, chemical solutions, explosives, or water to convert materials that are sometimes difficult to process by conventional methods. Topics include non-traditional manufacturing methods, process capabilities, tooling and fixturing. Prerequisites: ET 555 or ET 653.

ET 656 Material Selection and Processing (2-2)
3 hrs.
Properties of metals, ceramics, polymers, wood, and composites. Factors in selection of materials and their fabrication process. Failure mechanisms and prevention. Prerequisites: ET 256 and ET 250 or ET 501 and ET 281. ET 657 Analysis of Metal Forming and Cutting Operations (3-0)
3 hrs.

ET 659 Structure of Polymers and Composites (3-0)
3 hrs.

Industrial Engineering (IE)

Munisterian, Chairperson; Professors Bafna, Lamberseth, White, Wolf, Wygant; Associate Professors Gupta, Houdey, Lyth; Assistant Professors Bringel, Mallak.

Open to Upperclass and Graduate Students

IE 500 Advanced Industrial Relations (3-0)
3 hrs.
Interplay among government agencies, labor organizations, and management. Particular emphasis is placed on collective bargaining procedures, issues, and applications through case studies. Prerequisite: IE 403 or permission of instructor.

IE 501 Survey of Industrial Engineering Topics (3 hrs.
Course devoted to studying the basics of the industrial engineering profession. Subjects will include work analysis, engineering economy, statistical quality control, production planning and control, and materials handling. Emphasis is placed on the application of these techniques to manufacturing related problems. This course cannot be applied for credit toward the Master of Science degrees in engineering management or industrial...
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 the time value of money, 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. Prerequisites: IE 261 and 262 or MATH 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 queueing 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 systems, 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. Analysis of the writings, literature, and philosophy concerning line supervision and employee direction in manufacturing industries. Prerequisite: IE 600 or permission of instructor.

IE 626 Advanced Engineering Economics 3 hrs. Advanced topics in engineering economics including deterministic and stochastic investment analysis, life cycle analysis, and linear programming and applications in capital budgeting. Prerequisites: IE 606 and 610.

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 430 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 systems.

IE 643 Physiology of Work 3 hrs. A thorough review of the musculoskeletal system and energy development in the work environment. A practical guide to what the body can do and how this is influenced by the respiratory, circulatory, and metabolic systems. Laboratory projects emphasize applications in actual work tasks.

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 700 Master's Thesis 6 hrs. Prerequisite: IE 657.

IE 712 Professional Field Experience 2-12 hrs. Prerequisite: IE 657.

IE 725 Doctoral Research Seminar 2-6 hrs. Prerequisite: IE 657.

IE 730 Doctoral Dissertation 15 hrs. Prerequisite: IE 657.

Mechanical and Aeronautical Engineering (ME)

Professors Groper, Hamelink, Hoadle, Williams, Associate Professors Ali-Qur, Cho, Easwaran, Guchelaar, Hathaway, Merati, Sahin, Sharma, VandenBrik, Assistant Professors Donney, Kamman, Li.

Open to Upperclass 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 535 Theoretical and Computational Fluid Mechanics 3 hrs. Theory and numerical implementation of ideal flow, viscous effects and exact solutions of Navier-Stokes equations. Special emphasis on panel methods, conformal mapping and singular distributions for flows around two- and three-dimensional bodies. Familiarity with VMS and some Fortran experience are required. Prerequisites: ME 356 and MATH 506 or consent.

ME 537 Doctoral Dissertation 15 hrs. Prerequisite: IE 657.
ME 553 Advanced Product Design (3-0) 3 hrs.
A design project to explore new and creative solutions to problems. Focus on the design process, including ideation, prototyping, and customer feedback. Prerequisite: ME 350 or equivalent.

ME 556 Mechanical Vibrations (3-0) 3 hrs.
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. Prerequisite: ME 358.

ME 560 Engineering Analysis (3-0) 3 hrs.
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, stress and strains, elasticity, time dependent 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; 2D finite-differentiation; 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. Ideal and real gases, shock waves, supersonic wind tunnels; and linearized flow 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 of engineering alloys at high and low temperatures. Prerequisite: ME 250.

Open to Graduate Students Only

ME 621 Theory of Plates and Shells (3-0) 3 hrs.
A study of theoretical and practical aspects of plate and shell structures. Emphasis on the development of mathematical models and the application of these models to real-world problems. Prerequisites: ME 360, 435, or ME 561.

ME 622 Stability of Thin-Walled Structures (3-0) 3 hrs.
Bifurcation buckling of flat circular and rectangular plates. Interaction curves for combined loads. Effective loads for cylindrical and conical shells. Prerequisites: ME 621.

ME 630 Advanced Fluid Dynamics (3-0) 3 hrs.
Modern developments in fluid dynamics of compressible and incompressible fluid flow. Applications to fluid motion, laminar and turbulent flow, pipe flow, 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 integrations, data analysis, and project report preparation and presentation. Prerequisite: ME 437 or permission of instructor.

ME 632 Energy Resources and Conversion (3-0) 3 hrs.
Availability and economic utilization of energy resources. Terrestrial and thermodynamic limitations. Energy conversion applications. Fusion and fission. Applications of solar, wind, geothermal, and nuclear energy. Prerequisite: ME 232 or consent.

ME 633 Advance Control Systems (3-0) 3 hrs.
Digital controls, 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 431.

ME 652 Mechanics of Composite Materials (3-0) 3 hrs.

ME 654 Composite Materials (3-0) 3 hrs.
Introduction to matrix and fiber materials that form the basis of modern composites. Fabrication of these materials into composites. Behavior of unidirectional and short fiber composites. Experimental characterization of composites. Fatigue mechanics, damage, impact, and environmental effects. Prerequisite: ME 350 or consent of instructor.

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. Reliability 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 658 Similarities in Structural Dynamics (3-0) 3 hrs.

ME 661 Advanced Finite Elements (3-0) 3 hrs.

ME 670 Advanced Heat Transfer—Radiation (3-0) 3 hrs.

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
1-6 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.
ME 710 Independent Research
2-6 hrs.
ME 730 Doctoral Dissertation
15 hrs.

Paper and Printing Science and Engineering (PAPR)
Byle, Chairperson; Professor Janes; Associate Professors Aravamuthan, Darling, Peterson; Assistant Professor Scheller

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 colloidal 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 shrinking 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.

PAPR 696 Paper Industry Control Systems (2-3)
3 hrs.
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.

PAPR 698 Pulping and Bleaching (3-0)
A study of the control of pulping and bleaching of both chemical and high yield pulps. Bleaching chemicals that will be discussed will include chlorine, chlorine dioxide, hypochlorite, dithionite, hydrogen peroxide, oxygen, and ozone. Various bleaching sequences that are currently in practice and under development will be discussed. Prerequisites: PAPR 203, 333.

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
2-6 hrs.

PAPR 712 Professional Field Experience
1-12 hrs.
COLLEGE OF FINE ARTS

Robert H. Luscombe, Dean
Janet E. Stillwell, Associate Dean

Graduate Offerings:
Art
Dance
Music
Theatre

Art (ART)
Vander Weg, Chairperson, Professors Argyropoulos, Carney, Deluca, Depeaux, Keaveny, King, LaVergne, Link, Rhodes, Rizzolo, Robbert, Associate Professors Grinwis, Harkness, Hennessy, Naftel, Assistant Professors Clark, Jones.

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. Prerequisites: 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 print-making 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 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 570 Intern I 3 hrs.
Design Practicum in Design Center. Involves an introduction to problem solving for real clients from the community and university. Focus is on the design process from concept to completion and involves client contact, budget preparation, electronic pre-press production, and interface with printers and the printing industry. Fall and winter semester. Prerequisites: ART 351 and ART 361.
ART 571 Intern II
3-6 hrs.
Design Practicum in Design Center. Involves an introduction to problem solving for real clients from the community and university. Focus is on the design process from concept to completion and involves client contact, budget preparation, electronic pre-press production, and interface with printers and the printing industry. Credits are variable due to the fact that larger more intense projects are sometimes given and the credits are determined by the depth of the project. Winter semester only. Prerequisites: ART 460 and ART 580.

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.
The art of the late 17th, 18th, and early 19th 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.
The art in the United States from the Colonial Period to 1900. Emphasized are Federal and Georgian 18th Century styles; 19th Century Realism, Romanticism and Nationalism. Prerequisite: ART 580. Open to Graduate Students Only. Graduate level work in painting. Prerequisite: ART 540 and official admission to an Art graduate program. Repeatable for credit.

ART 600 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 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 621 Graduate Topics 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 629 Advanced Topics in Art History
3 hrs.
Graduate level seminar in art history covering varying topics, ranging from prehistoric to modern periods.

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 or equivalent experience and official admission to an Art graduate program. Repeatable for credit.

Dance (DANC)

Professors Cornish, Stillwell: Associate Professors Bass, Cobb, Nelson, Thomas.

Open to Underclass and Graduate Students
DANC 598 Readings 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.

DANC 599 Non-reading Independent Study in Dance
1-4 hrs.
Advanced students with good standing may elect to pursue independently the study of some area of dance through the creative process. Topics are chosen and arrangements are made to suit the needs of each particular student. Prerequisite: Approved application required.

Music (MUS)

Professors Appel, Curtis-Smith, Humiston, Jones, Kynaston, Pernigo, Rappeport, Ricci, Sheldon, Whaley, Wilson, Zegree, Zupko; Associate Professors Arnold, R. Knific, T. Knific, McCarthy, Moont, O'Hearn, Scoovel, Smith, Sprading, Steel, Uchimura, Wolfinbarger, Wong, Work; Assistant Professors Carlton, Gauthier, Little, Purseley, Roederer, Rose, Thornburg, Trotter.

Open to Underclass and Graduate Students
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 quintets, brass quintets, percussion ensembles, piano trios, etc. Credit will be given only if a sufficient rehearsal/ performance schedule warrants.

MUS 516 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: Audition required.

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: Audition required.

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 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 that it 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 158 (or consent of Instructor) and MUS 161; "C" or better required in each course.

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 concurrently.

MUS 558 Jazz Improvisation I 2 hrs.
A study and directed application of the fundamentals of jazz improvisation including basic techniques, scales, chord 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 158 (or consent of Instructor) and MUS 161; "C" or better required in each course.

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 analogue 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 multi-track 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 vibrating 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, psychoacoustics. 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 I 3 hrs.
A course in general methods and techniques or research in the field of music. Students will complete annotated note cards on important reference works and write a research paper on a topic of their choice. Prerequisite: Permission of instructor.

MUS 571 Introduction to Musicology II 3 hrs.
The course will deal with the history, purposes, and scope of musicology. Topics to be studied include leading historians, past and present; modern methods of research, with special emphasis on primary sources; and bibliography of the field. Prerequisite: MUS 570.

MUS 572 Baroque Music (1600-1750) 3 hrs.
A survey of the choral and instrumental music of the Baroque masters 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 beginning with Beethoven, along with the historical, cultural, and political background of the era. Prerequisites: MUS 270 and 271.

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 department'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 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 587 Contemporary Music 2 hrs.
A survey of trends in European music and music of the Americas from about 1910 to the present.

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 used in various recording situations and its operations, as well as discussing the artistic use of this equipment. Although predominate a technique course, other areas which affect the creative aspects of the final recording will be discussed (such as microphone placement, taste 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 pianos, 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 1-4 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 599 Projects in Recording Technology 1-4 hrs.
An independent study allowing the unusually qualified student the opportunity to explore a topic or problem in recording technology. Prerequisite: MUS 596, approved application, and instructor permission required.

Open to Graduate Students Only
MUS 500 Applied Music 1-2 hrs. ($7)
Private lessons for the graduate student in a non-major area of performance.

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 scene. 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, diction, singing technique, 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 multi-media. Seminars will include analysis of advanced contemporary works, discussion of current trends in music composition, 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 2 hrs.
A course designed to permit the student to explore selected areas of music history. A project is required which will be subject to group analysis and discussion. The course may be repeated for credit.

MUS 672 Seminar in Jazz 2 hrs.
A course designed to permit the student to explore selected areas in jazz studies. A project is required which will be subject to group analysis and discussion. The course may be repeated for credit.

MUS 674 Seminar in Music Theory 2 hrs.
A course designed to permit the student to explore areas of music theory. A project is required which will be subject to group analysis and discussion. The course may be repeated for credit.

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 applied 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 requirements.

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.

MUS 698 Readings in Music
1-4 hrs.
An advanced, designated project of study. Graduate students may enroll in this course after consultation with the graduate advisor. Prerequisite: Approval of graduate advisor.

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.

Theatre (THEA)
Williams, Chairperson; Professors Cottrell, Karsten, L. Stillwell; Associate Professors Luscombe, Roehrick, V. Stillwell, Washington; Assistant Professor Nagle.

Open to Upperclass and Graduate Students

THEA 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. $15 fee. Prerequisites: EED admission, ART, DANC, MUS, or THEA 148, ART 200, ED 230, DANC 290, MUS 140; consent of instructor.
**Blind Rehabilitation**  
(BLRH)

Wiener, Chairperson; Professor P. Ponchillia;  
Associate Professors Guth, LaDuke, Leja, S.  
Ponchillia, Weesies.

Open to Upperclass and Graduate Students
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 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 Tactual  
Communication Systems  
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 593 Methods of Teaching Adaptive  
Communications  
2-3 hr.  
Adaptive communication methods used by  
visually impaired persons, and the techniques  
of teaching them, are explored in this course.  
Specifically, braille, handwriting, listening,  
recording devices, and typewriting are  
presented. This course also includes a  
supervised practical teaching experience with  
a visually impaired person.

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 596 Introduction to Electronic Travel  
Aids  
1 hr.  
Systematic Instruction in use of Fundamental  
Electronic Travel Aid and Overview of Major  
Electronic Devices. Prerequisite: BLRH 595.

BLRH 597 Principles and Practices of Low  
Vision  
3 hrs.  
This course deals with assessment and  
training of individuals with functional vision  
problems. Emphasis is placed on optical,  
non-optical, and electronic devices which  
increase visual functioning. This course  
combines lecture and laboratory experience  
to present principles of visual rehabilitation  
along with practice in the application of those  
principles.

BLRH 598 Readings in Blind Rehabilitation  
1-4 hrs.  
This course is arranged on an individual basis  

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 602 Gerontology in Orientation and Mobility 2 hrs.  
Elderly individuals who are visually impaired have specific rehabilitation needs that differ from those of younger people. This course is intended to provide students with the special knowledge and adapted skills necessary to assist older individuals in meeting their travel needs and related management requirements. The course includes topics related to: assessment, hearing and vision screening, environmental evaluation and modification, wheelchair mobility, basic RT skills, modifications of O and M techniques, and discharge planning among others. Prerequisite: Enrolled in Graduate Specialty Program in Gerontology.  

BLRH 604 Issues in Independent Travel 1 hr.  
This course is taken concurrently with Orientation 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 691 Practicum in Rehabilitation Teaching 1-2 hrs.  
This course provides supervised teaching experiences with blind or visually impaired individuals in a variety of settings. Graded on a Credit/No Credit basis.  

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.  
This 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 served 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 2-6 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.  

Community Health Services (CHS)  
Professors Forsythe, Howard, Page-Robin, Simpson; Associate Professor Vass.  

Open to Upperclass and Graduate Students  
CHS 530 Seminar in Community Health Services 1-4 hrs.  
This course focuses on emerging issues relevant to the certificate programs in the School of Community Health Services.  

CHS 598 Readings in Community Health Services 1-4 hrs.  
This course is arranged on an individual basis to provide students an opportunity to pursue independently the study of inter-disciplinary areas of interest. May be repeated up to a maximum of four hours in a program of study. Prerequisite: Consent of instructor.  

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.  

CHS 700 Master's Thesis 6 hrs.  

Alcohol and Drug Abuse (ADA)  

ADA 520 Family and Addiction 3 hrs.  
This course provides students with knowledge on the effects of substance abuse on the family. Included is theory and practice regarding dysfunctional relationships, children of substance abusers, and resulting disorders.  

ADA 525 Women and Substance Abuse Treatment 3 hrs.  
This course provides knowledge on gender specific treatment of substance abusers. This includes physiological aspects of women, as well as cultural aspects and methods to enhance the treatment of women substance abusers.  

ADA 530 Clinical Theory in Substance Abuse Services 1-4 hrs.  
This course covers selected theories which form the foundation for substance abuse services practice in specific areas. Students are expected to master the content as a basis for building foundation knowledge for applied practice. The specific topics are announced with each semester offering.  

ADA 535 Drug Testing 3 hrs.  
This course explores the theory and practice of drug testing and its applications in both clinical practice and employment settings. The spectrum of testing ranges from field dextrotoy to gas chromatography. Federal requirements are reviewed for application in both clinic and work settings.  

ADA 537 Constructive Confrontation and Referral in Substance Abuse Services 3 hrs.  
This course provides students with knowledge of intervention strategies for active substance abusers. Emphasis is placed on strategic constructive confrontation techniques and effective referral processes.  

ADA 540 Current Issues in Alcohol and Drug Abuse 1 hr.  
This course, taught in seminar, reviews basic and applied research advances in prevention and treatment of substance abuse. Emphasis is on bridging research advances to practice areas. The focus of the course is research published in the previous year.  

ADA 541 Group Home Treatment 1-6 hrs.  
This course reviews custodial, milieu, and function aspects of group home treatment. Theories and practices are presented with emphasis on long-term treatment outcomes.  

ADA 545 Alcohol, Drugs, and Aging 3 hrs.  
The problems of alcohol, medication, and legal and illegal drug use, misuse, and abuse among older persons will be discussed. Prevention, intervention, and treatment will be considered. (Cross-listed with GRN 545.)  

ADA 560 Clinical Practice in Selected Substance Abuse Services Areas 1-4 hrs.  
This course covers variable topics in Clinical Substance Abuse Services Practice. It is a skills development course which helps students to become proficient in specific techniques and procedures related to client service. The specific areas are announced with each semester.  

ADA 565 Alcohol, Drug Abuse, and Violence 3 hrs.  
This course provides the student with knowledge on the multiple relationships of substance abuse and violence, child abuse, and other assaultive behaviors.  

ADA 567 Legal Offenders and Substance Abuse 3 hrs.  
This course provides the student with knowledge on the theories associating substance abuse with criminal and civil offenses. Specific focus is the treatment strategies and techniques related to the offending population and long-term outcomes of decreased recidivism.  

ADA 570 Field Education: Substance Abuse 1-6 hrs.  
A clinical, prevention, research, or administrative field experience, meeting practice requirements in certification of substance abuse services. The field experience involves direct supervision by faculty and clinical supervisors. Graded on a Credit/No Credit basis. Prerequisite: Admission to Substance Abuse minor.  

ADA 580 Substance Abuse Prevention 3 hrs.  
This course explores the multiple theories and techniques used in the prevention of substance abuse. The history and evolution of prevention is presented, as well as cognitive, effective, and behavioral strategies.
ADA 585 Student Assistance Programs 3 hrs. This course provides students with knowledge of the theories and practices of student involvement with drugs, intervention strategies, referrals, and follow-up.

ADA 590 Applied Alcohol and Drug Dependence Recovery Techniques 3 hrs. This course provides the student with knowledge of self-help groups and formal relapse prevention strategies. Application of relapse prevention strategies are integrated into multiple aspects of the continuum of care.

ADA 598 Readings in Substance Abuse 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. May be repeated up to a maximum of 4 hours in a program of study. Prerequisite: consent of instructor and program adviser.

Open to Graduate Students Only ADA 610 Drugs and the Workplace 3 hrs. This course provides knowledge of work based programming theories and practices regarding drugs of abuse. Course work and readings focus on policy formulation and implementation of procedures.

ADA 630 Legal and Illegal Drugs of Abuse 3 hrs. This course deals with the pharmacological aspects of psychoactive/psychotropic drugs having abuse potential. Special emphasis is placed on observable signs and symptoms resulting from use/abuse/dependence of those drugs.

ADA 631 Seminar in Substance Abuse I 3 hrs. An interdisciplinary seminar designed to reflect broadly conceived intervention strategies emerging from primary prevention to rehabilitation of the addict. (Cross-listed with CECP 631 and SWRK 663.)

ADA 632 Seminar in Substance Abuse II 3 hrs. Continuation of ADA 631. (Cross-listed with CECP 632 and SWRK 665.)

ADA 650 Substance Abuse Assessment 3 hrs. This course deals with the physical, social, psychological, vocational, economic and legal symptoms of substance abuse. Instrumentation for assessment in clinical practice is presented as well as medical and non-medical diagnostic criteria. This course includes clinic-based instruction in assessment strategies.

ADA 680 Clinical Supervision in Substance Abuse Service 3 hrs. This course explores the theories and techniques used in the provision of clinical supervision to substance abuse services practitioners. Direct clinical supervisory skills are covered in detail and clinic-based instruction in clinical supervision is included.

Open to Graduate Students Only—Please refer to The Graduate College section of course descriptions.

ADA 710 Independent Research 2-6 hrs.

ADA 712 Professional Field Experience 2-12 hrs.

Gerontology (GRN)

GRN 521 Women and Aging 3 hrs. An examination of the impact of aging on women, with special emphasis on the diverse experiences, challenges, and social and economic conditions of older women. The course will explore the statuses and roles of women in an aging society. Topics to be covered include the economics and politics of aging, the health status of women, women as caregivers and retirees. The plight of minority older women will be addressed.

GRN 525 Religion and Aging 3 hrs. A survey of the views of and attitudes toward the aging process and older people held by the world's major religions. Particular attention will be paid to the relation of religious views and social policy in the U.S.

GRN 530 Special Topics in Gerontology 1-4 hrs. Variable topics, variable credit course for consideration of current and special interests in gerontology. Specific topics, number of credit hours and prerequisites, if any, will be announced each time the course is scheduled. May be repeated for credit with different topics.

GRN 543 Survey of Geriatric Medicine 3 hrs. This course provides an overview and survey of the care of the elderly patient from a medical perspective. The issues of medical problems, long-term care, nursing, rehabilitation, and the social considerations will be broadly discussed. In addition, the interaction of all of the issues of elderly care will be analyzed.

GRN 544 Aging and Mental Health 3 hrs. Survey of mental health and mental health treatment problems of older adults. Topics include the courses of major mental illness in old age, depression, and dementia. Consideration will be given to etiologies, current therapies, and treatments, as well as barriers to treatment in this population.

GRN 545 Alcohol, Drugs, and Aging 3 hrs. The problems of alcohol, medication, and legal and illegal drug use, misuse, and abuse among older persons will be discussed. Prevention, intervention, and treatment will be considered. (Cross-listed with ADA 545.)

GRN 547 Alzheimer's Disease and Other Dementias 3 hrs. Dementia is a complex issue compounded by stereotypical views of aging and the aged. This course focuses on social, psychological, etiological, and epidemiological issues related to dementia together with the problems of diagnosis and treatment. Alzheimer's Disease, probably the most common cause of dementia, will receive specific attention. The purpose of this course is to help students gain an understanding of dementia as both a social and medical problem.

GRN 598 Readings in Gerontology 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. May be repeated up to a maximum of 4 hours in a program of study. Prerequisite: Consent of instructor and program adviser.

GRN 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.

GRN 681 Program Planning and Development in Gerontology 3 hrs. This seminar in the gerontology graduate specialty program will explore 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.

GRN 690 Field Education in Gerontology 1-4 hrs. This course is designed to give the student a learning experience during which the student can apply some of the knowledge and information acquired in the gerontology academic setting and further develop and refine his/her professional skills with the guidance and assistance of those professionals currently working in gerontology. Prerequisite: Permission of instructor.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

GRN 710 Independent Research 2-6 hrs.

GRN 712 Professional Field Experience 2-12 hrs.

Holistic Health (HOL)

HOL 530 Special Topics in Holistic Health 1-4 hrs. Variable topics, variable credit course for consideration of current and special interests in holistic health. Specific topics, number of credit hours and prerequisites, if any, will be announced each time the course is scheduled. May be repeated for credit with different topics.

HOL 531 Introduction to Holistic Health 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 holistic and as an essential basic instruction for person wishing to apply for admission to the graduate specialty program in Holistic Health Care. Prerequisite: Graduate status.
Open to Graduate Students Only

HOL 650 Seminar in Holistic Methods I 3 hrs. This course will provide students with an understanding of health from a whole perspective. Through experiential activities and the exploration of new models and paradigms of health, students will develop a deeper knowledge of the relationship between body, mind and spirit, and the effect on health and healing. The course will provide an opportunity for students to discuss ways to integrate holistic methods into a healthcare setting or practice and to work with other health care providers. The format for this course will be a combination of experiential, lecture, discussion, small group activities, guest speakers, and audio and video presentations.

HOL 651 Seminar in Holistic Methods II 3 hrs. An opportunity for further exposure to additional holistic methods utilizing the same format and evaluation system as HOL 650. Prerequisite: HOL 531.

Open to Graduate Students Only—Please refer to The Graduate College section for course description.

HOL 712 Professional Field Experience 2-12 hrs.

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 is expected 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 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 or client 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 offering. 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 planning 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 569 AIDS: Natural History of an Epidemic 3 hrs. This course is intended to provide a historical perspective and introduction to the social, psychological, biological, political, economic, ethical, and medical implications of HIV infection and the Acquired Immune Deficiency Syndrome (AIDS). The course will be taught by faculty and others in a variety of fields.

HHS 570 Field Education in Holistic Health 1-6 hrs. This seminar 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 of those professionals currently working in the health and human service area. By permission of instructor.
Students' potential for future professional part in community, state, or national be discussed. Students will take an active
extremities; clinical conditions affecting upper extremity function; and current treatment
This lecture/lab course provides advanced gross anatomy, neuroanatomy, neurophysiology, and kinesiology of the upper
Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

HHS 712 Professional Field Experience 2-12 hrs.

Occupational Therapy (OT)
Professors Bush, Tyndall; Associate Professors Cooper, Edwards, Hemphill, Lukens, Meyers, Peterson; Assistant Professor Hazell.

Open to Upperclass and Graduate Students
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, 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 602 Function and Treatment of the Upper Extremity 3 hrs.
This lecture/lab course provides advanced study of function, dysfunction, and treatment of the upper extremities. Topics include the gross anatomy, neuroanatomy, neurophysiology, and kinesiology of the upper extremities; clinical conditions affecting upper extremity function; and current treatment methods and modalities used by occupational therapists.
OT 610 Professional Issues 3 hrs.
Current and emerging professional issues will be discussed. Students will take an active part in community, 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 620 Introduction to Neurodevelopmental Treatment for Pediatrics 3 hrs.
Foundations of neurophysiology and motor development in neurodevelopmental treatment. Application of neurodevelopmental theory, treatment principles and techniques to occupational therapy. Special attention will be given to the occupational therapy management problems of children with neuromotor disorders. Prerequisite: OTR, PTR, or consent.
OT 621 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 undergraduate course work except Fieldwork I and II.

OT 686 Graduate Seminar 3 hrs.
The course examines 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—Please refer to The Graduate College section for course descriptions.
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 Blakely, Judd, Mathews, Pawlak, Poppie, Reid, Thompson, Werkin, Winberg, Associate Professors Cooney, Halseth, Lish, MacDonald, Phillips, Reiser, Assistant Professors Holmes, Weinger.

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 action and improve social conditions. Prerequisite: 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 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 court 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 substantive and particular social policy areas, and 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 subject areas or on the development of policy practice skills. Prerequisite: Consent of instructor.

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 area. 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. Prerequisite: Consent of instructor.

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 632 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 more effectively 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 with in the context of social work practice. Prerequisite: Consent of instructor.

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 and cultural labeling. Primary focus is on the interaction between physiological, developmental, emotional, and social aspects of adult 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. 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 assessment 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. Prerequisite: Consent of instructor.

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. Prerequisite: SWRK 671 or consent of instructor.

SWRK 661 Social Work Practice: Individuals and Families
3 hrs.
This 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 theories, psychological 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 and 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 student’s basic professional 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, Counselor Education and Counseling Psychology, and Sociology. Open to SPADA students only. Graded on a Credit/No Credit basis.

SWRK 664 Social Work Practice in Special Areas
3 hrs.
Study of problem solving in specialized areas of social work practice. Focus upon the role of the social work practitioner in assessment, goal establishment, and intervention in the use of various social work methods in different arenas of practice. Specific topic will be announced each semester. May be repeated for credit up to a maximum of six hours. Prerequisite: Consent of instructor.

SWRK 665 Seminar in Substance Abuse II
3 hrs.
Continuation of SWRK 663. This course is cross-listed with Biology, Counselor Education and Counseling Psychology, and Sociology. Graded on a Credit/No Credit basis.

SWRK 666 Seminar in Individual Treatment
3 hrs.
This course will introduce the student to social work practice with individuals. Social, psychological, economic, and biological stressors are considered as they impact on the individual’s efforts to grow and survive. The ego developmental and crisis intervention approaches are the major orientations presented, augmented by concepts from cognitive theory. Particular attention will be paid to client’s coping capacities. Prerequisite: SWRK 664.

SWRK 667 Program Planning
3 hrs.
The course focuses on the requisite knowledge and skills of program planning in the human services. The essential components of program planning are studied including planning models and roles, needs assessment, marketing, goals and objectives, program and service delivery design and program evaluation. Prerequisite: Concurrent enrollment in SWRK 677 or consent of instructor.

SWRK 668 Social Work Treatment with Families
3 hrs.
This course provides knowledge and skills in clinical social work practice with families. Family systems theory and principles and techniques of structural family therapy are the
central foci of the course. Concepts from communications theory and related interventions are also covered. Aspects of human diversity are used in relation to their impact on family functioning. Prerequisite: SWRK 666 or consent of instructor.

SWRK 669 Advanced Seminar in Program Administration 3 hrs. Students utilize knowledge and skill learned in SWRK 667 Program Planning to develop a written program proposal under the direction of the instructor. Students formulate a problem statement, goals and objectives, a program design, and a program budget. The course also focuses on the selection, development, supervision, and evaluation of program staff as an aspect of program planning and management. Prerequisites: SWRK 667 and concurrent enrollment in SWRK 670 or consent of instructor.

SWRK 670 Seminar in Social Policy Practice 3 hrs. This course is an integrative seminar in the policy, planning, and administrative concentration that focuses on skills needed for participation in the development and implementation of social welfare policy in program planning and executive positions in the human services environment. The course focuses on both the technical and interactive aspects of practice by identifying theoretical and ethical frameworks, and develops skills in the application of selected techniques of social welfare policy practice. Prerequisite: SWRK 610.

SWRK 671 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 laboratory 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 672 Field Education in Social Work Practice II 3 hrs. This is the second of two field practice courses in the MSW Foundation 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 SWRK 662.

SWRK 676 Field Education in Social Work Practice 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 672, and concurrent enrollment in SWRK 636, SWRK 666, and/or SWRK 668 or consent of the instructor. Graded on a Credit/No Credit basis.

SWRK 677 Field Education in Social Policy, Planning, and Administration 3 hrs. Field education in the Social Policy, Planning, and Administration concentration is intended to provide students with opportunities to develop and practice skills for designing, maintaining, and changing social systems. Field placements in social welfare organizations and special programs are arranged in accordance with student interests and abilities. Graded on a Credit/No Credit basis. Prerequisite: SWRK 672 or consent of instructor, concurrent with SWRK 667.

SWRK 678 Advanced Field Education in Social Work Practice Social Work Practice 3 hrs. Continuation of SWRK 676. Students will remain in the same 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 671, 692, 693, 694, 695, or 696, or consent of the instructor. Graded on a Credit/No Credit basis.

SWRK 679 Advanced Field Education in Social Policy, Planning, and Administration 3 hrs. The advanced field education experience for students concentrating in Social Policy, Planning, and Administration builds on the work which the student began in SWRK 677 during the fall semester. Accordingly, students remain in the same field work setting and work under the direction of the same field instructor. During the first winter semester, the emphasis will be upon the development of skills in the implementation of change and administration activities. It is expected that students will be assigned increased responsibilities in accordance with their professional growth. Graded on a Credit/No Credit basis. Prerequisite: SWRK 677, concurrent with SWRK 669.

SWRK 686 Applied Social Work Research 3 or 6 hrs. This 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, 672.

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 and 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 situational 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, 688.

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.

SWRK 695 Supervision in Human Service Programs 3 hrs. This course explores processes, strategies, and problems in supervision. It prepares students for supervisory roles in social work agencies, highlighting the importance of this role in maintaining professional expertise, in developing professional social work practice models, and in linking organizational goals to service delivery. Direct supervisory skills are covered in detail. Student participation is essential. Prerequisites: SWRK 661 or consent of instructor.

SWRK 696 Advanced Social Treatment: Families at Risk 3 hrs. This course is designed to provide students with the opportunity to broaden and deepen their knowledge of advanced clinical social work with families. Building on SWRK 668, the course provides theoretical content on structural-strategic family therapy which augments material previously taught, and may provide additional consideration of other perspectives such as communications and intergenerational approaches. Application of theoretical content is made to practice with families often encountered in social work practice, and seen as being at risk for problems in social and emotional functioning. The course is designed to meet the requirements for an advanced practice course in social treatment. Prerequisites: SWRK 638, SWRK 668.

Special Seminars and Projects

Open to Upperclass and Graduate 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 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. Senior or graduate student standing.

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)
Hanley, Chairperson; Professors Bate, Erickson, Nelson; Associate Professors Bedrosian, Boersma, Clark, Hillenbrand, Lawson, Oas, Seelig; Assistant Professor Carlson, Glitta, Warner.

Open to Underclass and Graduate Students
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, 253, 354, 358 or permission of instructor.

SPPA 556 Rehabilitative Audiology
3 hrs.
Orientation to the clinical management of communication problems associated with auditory impairment.

SPPA 595 Oral Language Development and Disfunction
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 lectures, laboratory experiences, and student projects. Possible areas of study are instrumentation in audiology, manual communication, electrophysiological audiology, computer applications to speech pathology and audiology, augmentative communication, and contemporary professional issues.

a. Autism ...

b. American Sign Language I ...
c. American Sign Language II ...

SPPA 598 Readings in Speech Pathology and Audiology
1-4 hrs.
Arranged on individual basis to provide students the opportunity to pursue independently the study of special areas of interest in depth.

Open to Graduate Students Only
SPPA 601 Advanced Speech Science
3 hrs.
Overview of the anatomy, physics, biology, physiology, and psychology of human speech production and speech perception. This course is intended to focus not only on well-established concepts in speech science, but also on the many research areas in which our understanding is incomplete. Prerequisite: Department approval.

SPPA 602 Advanced Hearing Science
2 hrs.
This course acquaints the student with principles, theories, and methods of hearing measurement which provide the basis for clinical audiometric procedures. Prerequisite: Department approval.

SPPA 615 Research Methods in Speech-Language Pathology and Audiology
3 hrs.
This course deals with methods and procedures for gathering, reducing and analyzing data to reach conclusions concerning hypotheses regarding communication disorders and processes. Prerequisite: Department approval.

SPPA 616 Instrumentation in Audiology
3 hrs.
This course introduces the basic principles and applications of electronics and electronic instruments as they pertain to audiology. The first section of the course will be an introduction to basic principles of DC and AC electronics, with a particular focus on the concept of electrical impedance. The second section of the course will consist of a survey of the principles of operation and use of a variety of instruments that are used to generate, record, reproduce, control, calibrate, and measure electrical signals. Prerequisite: Department approval.

SPPA 619 Seminar in Speech and Hearing Science
1-4 hrs.
Selected topics in speech and hearing science are systematically explored through individual study projects. Prerequisite: Department approval.

SPPA 621 Diagnostic Audiology I
4 hrs.
This course, which is one of two courses devoted to diagnostic audiology, deals with audiological techniques for assessing peripheral hearing disorders to determine rehabilitative needs. Prerequisite: Department approval.

SPPA 622 Hearing Aids
3 hrs.
Components, characteristics, evaluation, selection, use and maintenance of hearing aids are studied in detail. Prerequisite: Department approval.

SPPA 623 Pediatric Audiology
3 hrs.
This course deals with the identification, measurement, and management of hearing impairment in infants and young children. Prerequisite: Department approval.

SPPA 624 Educational Audiology
3 hrs.
This course deals with educational, psychological, and vocational needs of the hearing impaired child and the parameters of educational programming. Prerequisite: Department approval.

SPPA 625 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 as a public health hazard; and hearing screening and deafness prevention programs. Prerequisite: Department approval.

SPPA 631 Diagnostic Audiology II
4 hrs.
A course dealing with electrophysiological and other advanced audiological and medical techniques for assessing peripheral and central auditory and vestibular disorders to determine rehabilitative needs. Prerequisite: SPPA 621.

SPPA 639 Seminar in Audiology
1-4 hrs.
Selected topics in audiology are systematically explored through critical analyses of literature and through individual study projects. Pediatric audiology, geniculate audiology, hearing aids, 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. Prerequisite: Department approval.

SPPA 640 Voice Disorders
3 hrs.
Organic and functional disorders of laryngeal and resonator origin are studied in depth. Prerequisite: Department approval.

SPPA 641 Articulation Disorders
3 hrs.
This course considers in detail the nature and treatment of functional misarticulations and of misarticulation associated with various organic disorders. Prerequisite: Department approval.

SPPA 642 Stuttering
3 hrs.
Theories and therapies applicable to the understanding and clinical management of stuttering are studied in depth. Prerequisite: Department approval.

SPPA 643 Aphasia in Adults
3 hrs.
This course deals comprehensively with the identification and treatment of communication problems in the adult aphasic individual. Prerequisite: Department approval.
SPPA 644 Motor Speech Disorders
3 hrs.
This course examines dysarthrias and verbal apraxias as manifested in children and adults. Prerequisite: Department approval.

SPPA 645 Non-Speech Communication
3 hrs.
This course deals with alternative and augmentative communication (AAC) for individuals with severe communicative disorders. Strategies and technologies for establishing or restoring functional communication are investigated. Communication disorders of various etiologies are surveyed in relation to intervention needs. Assessment, intervention, and advocacy for non-speaking persons are discussed in detail. Practical and simulated experiences with low- and high-technological AAC are included. Overall communication needs are highlighted in reference to educational, vocational, and social interaction purposes. Prerequisite: Department approval.

SPPA 649 Seminar in Speech-Language Pathology
1-4 hrs.
Selected topics in speech pathology are systematically explored through critical analysis of literature and through individual study projects. Voice disorders, 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. Prerequisite: Department approval.

SPPA 653 Diagnosis and Appraisal
3 hrs.
The student is instructed in methods and procedures for evaluation of speech and language disorders. Prerequisite: Department approval.

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. Prerequisite: Department approval.

SPPA 658 Theoretical Bases for Therapy
3 hrs.
In this course disorders of communication are examined in terms of servosystem, learning theory, and personality theory.

SPPA 669 Principles of Professional Practice
2 hrs.
Current professional and philosophical questions are studied with reference to the history of the profession of speech pathology and audiology. Prerequisite: Department approval.

SPPA 670 Clinical Practicum
1-4 hrs.
Supervised clinical experience in the evaluation and/or management of speech, language and/or hearing disorders. Prerequisite: Department approval.

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
(Graduate College)

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, biohazards, genetic materials, or nuclear materials/radiation 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 the Office of the Vice President for Research, 387-8298.

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. Prior to registering for 700, Master's Thesis, a Permission to Elect form (available in all departments) must be completed and the student must meet with the Dissertation Assistant in The Graduate College so that the student is informed about the regulations pertaining to the preparation of the manuscript and to the requirements for research involving regulated subjects and hazardous materials. A master's thesis is six credit hours. It may be registered for in increments of one (1) to six (6) hours. Following a student's first enrollment in 700, the student will enroll in 700 in each semester/session continuously until all thesis requirements are completed satisfactorily and approved by the appropriate bodies. A student unable to complete the thesis within the first six hours of registration will be required to continue to enroll in 700; however, only six hours of 700 will count toward meeting the program requirements for the degree. The thesis is 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 Records Office prior to registration. Graded on a Credit/No Credit basis.

GRAD 711 Readings in Doctoral Specialization
3 hrs.
In consultation with a faculty member, the doctoral student will design a reading list of 20 to 30 books in a specialized area, students wishing additional guided reading may register a second time. The student will master these works independently and, in consultation with faculty members, select a representation list of approximately 20 works on which to be evaluated in a two-hour oral examination, conducted by a committee of at least two faculty members. May be repeated up to a total of six hours. Graded on a Credit/No Credit basis. Prerequisite: Doctoral Candidacy.

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 Records Office prior to registration. Graded on a Credit/No Credit basis.

GRAD 713 Practicum in Teaching in the Discipline
3 hrs.
A practicum in teaching in the discipline will be done as collaborative teaching with an experienced faculty member in a broad-based undergraduate course. There will be opportunity for both guided praxis and reflection on praxis. 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. Candidates for the specialist degree may elect to write a project in their field of specialization under the supervision of a project committee. Prior to registering for 720, Specialist Project, a Permission to Elect form (available in all departments) must be completed and the student must meet with the Dissertation Assistant in The Graduate College so that the student is informed about the regulated subjects and hazardous materials. A specialist project is six credit hours. It may be registered for in increments of one (1) to six (6) hours. Following a student's first enrollment in 720, the student will enroll in 720 in each semester/session continuously until all project requirements are completed satisfactorily and approved by the appropriate bodies. A student unable to complete the project within the first six hours of registration will be required to continue to enroll in 720; however, only six hours of 720 will count toward meeting the program requirements for the degree. The project is graded on a Credit/No Credit basis.

GRAD 725 Doctoral Research Seminar
2-12 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
12-24 hrs.
The Doctoral Dissertation is required in all doctoral programs and is completed under the supervision of a dissertation committee. Prior to registering for 730, Doctoral Dissertation, a Permission to Elect form (available in all departments) must be completed and the student must meet with the Dissertation Assistant in The Graduate College so that the student is informed about the regulations pertaining to the preparation of the manuscript and to the requirements for research involving regulated subjects and hazardous materials.

A doctoral dissertation varies in credit from a minimum of 12 credit hours to a maximum, of 24 credit hours. The hours required in a program of study are determined by the student's department. GRAD 730 may be registered for in increments of one (1) or more hours. Following a student's first enrollment in 730, the student will enroll in 730 in each semester/session continuously until all dissertation requirements are completed satisfactorily and approved by the appropriate bodies. A student unable to complete the dissertation within the number of hours stipulated in the student's approved program of study will be required to continue to enroll in 730; however, only those hours stipulated in the student's approved program of study will count toward meeting the program requirements for the degree. The dissertation is 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.
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
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</tr>
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<tr>
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<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>MacDonald, Richard R.</td>
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</tr>
<tr>
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<tr>
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<tr>
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</tr>
<tr>
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<tr>
<td>Rose, Gwendolyn</td>
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<tr>
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</tr>
</tbody>
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**Associate Members**

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<tr>
<th>Name</th>
<th>Title/City/State</th>
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<tbody>
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