Western Michigan University

Western Michigan University is located in Kalamazoo, midway between Chicago and Detroit. Three major highways, Amtrak, commercial airlines, 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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**1996-98 Calendar**

**Fall Semester, 1996**
- August 27, Tuesday: Advising Day
- August 28, Wednesday: Classes Begin
- September 2, Monday: Labor Day Recess
- See Class Schedule
- Final Day to Add Classes
- Final Day to Drop Classes
- October 25, Friday: Classes Dismissed
- November 15, Friday: Approved Theses, Projects, and Dissertations Due in The Graduate College for December Graduation
- November 27, Wednesday: Thanksgiving Recess Begins at Noon
- December 2, Monday: Classes Resume
- Applications Due for June Graduation
- December 3-9: Final Examination Week
- December 14, Saturday: Semester Ends—Commencement

**Summer Session, 1997**
- June 30, Friday: Applications due for June Graduation
- July 25, Friday: Independence Day Recess
- August 20, Wednesday: Approved Theses, Projects, and Dissertations Due in The Graduate College for August Graduation
- September 2, Tuesday: Advising Day
- September 3, Wednesday: Classes Begin
- See Class Schedule
- Final Day to Add Classes
- Final Day to Drop Classes
- October 3, Friday: Classes Dismissed
- October 4, Saturday: Homecoming (Saturday classes will meet)
- November 21, Friday: Thanksgiving Recess Begins at Noon
- December 1, Monday: Classes Resume
- Applications Due for April Graduation
- December 15-19: Final Examination Week
- December 20, Saturday: Semester Ends—Commencement

**Winter Semester 1998**
- January 5, Monday: Advising Day
- January 6, Tuesday: Classes Begin
- See Class Schedule
- Final Day to Add Classes
- Final Day to Drop Classes
- February 2, Monday: Applications Due For June Graduation
- February 16, Monday: Applications for Fellowships and Associateships
- March 2, Monday: Semester Recess
- March 9, Monday: Classes Resume
- March 27, Friday: Approved Theses, Projects and Dissertations Due in The Graduate College for April Graduation
- April 1, Wednesday: Applications Due for August Commencement
- April 20-24: Final Exam week
- April 25, Saturday: Semester Ends—Commencement

**Spring Session, 1998**
- May 4, Monday: Classes Begin
- See Class Schedule
- Final Day to Add Classes
- Final Day to Drop Classes
- May 25, Monday: Memorial Day Recess
- May 29, Friday: Approved Theses, Projects and Dissertations Due in The Graduate College for June Graduation
- June 24, Wednesday: Session Ends
- June 27, Saturday: Commencement

**Summer Session, 1998**
- July 6, Monday: Applications for Graduate Admission Due
- July 31, Friday: Approved Theses, Projects, and Dissertations Due in The Graduate College for August Graduation
- August 26, Wednesday: Session Ends—NO COMMENCEMENT

**Exercises**
- Fall Semester, 1997
- Spring Semester, 1997
- Winter Semester 1998
- Summer Session, 1998
- Fall Semester 1998
- Spring Session, 1998
- Winter Semester 1999
- Summer Session, 1999

**Graduate College Events**
- Spring 2000
- Fall 2000
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 1995, was 26,537, with 6,216 enrolled in eighty-six graduate programs.

Graduate programs were first offered in 1936 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-one 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, Rehabilitation Counseling, 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, Career and Technical Education, Chemistry, Communication, Comparative Religion, Economics, English, Family and Consumer Sciences, Geography, History, 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, Materials Science and Engineering, Medicine, 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 nineteen departments. The Doctor of Education degree is offered in Counselor Education, Educational Leadership, and Special Education. The Doctor of Philosophy degree is offered in Applied Economics, Biological Sciences, Comparative Religion, Computer Science, Counseling Psychology, 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 higher education institutions 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
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:

<table>
<thead>
<tr>
<th>Session</th>
<th>Deadline</th>
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<tbody>
<tr>
<td>Fall Semester</td>
<td>July 1</td>
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<tr>
<td>Winter Semester</td>
<td>November 1</td>
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<tr>
<td>Spring Session</td>
<td>March 1</td>
</tr>
<tr>
<td>Summer Session</td>
<td>May 1</td>
</tr>
</tbody>
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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 some programs close early as openings are filled. Also, some programs require the results of entrance examinations which are scheduled in advance of the deadlines for admission.

Regular admission—Degree status

1. Admission is granted to the student who has fulfilled the admission requirements of the graduate program.
2. Admission with reservation is granted to the student who has met the admission requirements of the graduate program but whose academic record (3.0 grade point average of at least 2.5 in the final two years of undergraduate study) is only somewhat less than satisfactory academic achievement.
3. Probationary admission is granted to the student who has met at least the minimum academic requirements of the graduate program.

Admission Application Fee

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

Admission Procedures

Graduate admission is handled via a self-managed application process. Admission to a graduate program is secured through the following steps:

1. Request a Graduate Self-Managed Application form from the Office of Admissions and Orientation.

2. Follow exactly the instructions for completion of the form and submission of required materials. The self-managed application process requires that the student take responsibility for gathering all required admission materials and submitting those materials to the appropriate office before the published admission dates, as follows:

Materials to be submitted to the Office of Admissions and Orientation:

- White copy of application form;
- One official transcript from every previous undergraduate and graduate institution attended (except WMU); self-addressed, stamped department postcard; reference forms, if required by department;
- Supplemental admission materials as required by department.

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

Approved by Board of Trustees February 20, 1970; amended June 13, 1983; June 25, 1982; and April 27, 1990.
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 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 graduate degree, or is not eligible for admission, may enroll in certain classes with Permission to Take Classes (PTG) status. This status also is granted to a student admitted to a certificate program who is not also admitted to a degree 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 toward 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 at the time of application.

Foreign students wishing to apply for admission to Western may secure an application from the OISS. Credentials will be evaluated by 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 staff are eligible to apply for admission to doctoral programs at Western, but only in the academic units where they are not employed. WMU faculty holding explicitly temporary or term appointments may apply for admission to any doctoral program. All faculty and staff are eligible to apply for admission to master's and specialist programs at 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 who is good standing in a master's, specialist, or doctoral program at an institution 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.

Graduate Credit By Examination
Credit by examination can be earned only in graduate programs. Credit by examination shall be graded on a scale of 0 to 90. Only credit obtained through examination may be used to obtain credit for a graduate program and who have current admission eligibility.

Summer sessions, the normal full-time load is five to eight hours. The required load for a student with a full Graduate Assistantship or Fellowship is normally six hours per semester or three hours per session; some specific assistantship and fellowship programs may require more hours.

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 in which a student may have been enrolled more than once is considered a repeated course. A grade must be presented for each course. With the program 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 and computed in the student's overall, graduate grade point average.

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 earn 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 no fewer than two faculty members from the academic unit offering the particular course.
3. All credit by examination shall be granted "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.
8 GENERAL POLICIES AND PROCEDURES

6. Credit by examination earned at another university may be transferred in accordance with the current policies of The Graduate College governing the transfer of credit.

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

Research Subject Protection

Students conducting research that involves human or animal subjects, biohazards, genetic materials, or nuclear materials/radiation must have prior approval of the research proposal by the appropriate University board, thus assuming compliance with the regulations for the protection of such subjects or for the use of such materials. For more information, call the Office of the Vice President for Research, 387-8296.

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 pursue 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 thirty-six semester hours. A student without a master's degree who completes the credits for a specialist degree at Western Michigan University may transfer up to twelve semester hours.

Residency

The following residency policy was adopted by the Board of Trustees of Western Michigan University on July 20, 1973:

1. Since 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.

Please note that the deadline for applying for a change in resident classification is 20 days after the first day of classes for each semester or session.

Any questions concerning residency should be directed to the Office of the Assistant Vice President for Business, 3682 Seibert Administration Building. Telephone: 387-2366.

Student Fees

The following is the 1996-97 tuition fee schedule used for graduate study on campus:

Resident, $130.40 per credit hour
Non-Resident, $325.65 per credit hour

The fee for graduate study in courses offered off-campus through the Division of Continuing Education is $155.40 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, $85.00 (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 (as 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

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 10th day of each semester or session. A student who withdraws from the University or who reduces a credit hour load, resulting in lower fees, will be granted a partial refund of the total paid, subject to the following conditions:

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

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

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

Grading System

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

A student may elect graduate classes as an auditor with the permission of the instructor, but will receive no regular grade or credit. The student must enroll in the audit status at the time of registration. The auditor may not be transferred from the list of regular students to the audit status after enrollment has been completed.

The Credit/No Credit grading option is available only in 700-level courses and in those other 500- and 600-level courses specifically approved by the curriculum review process for Credit/No Credit registration. Check the course description in this catalog to determine if the course is approved for the Credit/No Credit grading designation.

Graduate appointments:
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, $85.00 (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 (as 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, $6.00 each semester
Transcript fee, $3.00

Student fees are subject to change by Western Michigan University Board of Trustees at any time without notice.

Credit/No Credit

Student transfers subject to change by Western Michigan University Board of Trustees at any time without notice.
attended class or has discontinued attendance and does not qualify for the grade of "I." The "X" will be computed into a student’s honor-point ratio as hours attempted with zero credit hours.

1. Incomplete: This is a temporary grade given for work which is passing in quality but lacking in quantity to meet course objectives. It is given for work not completed or 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 730, and courses directly 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.

CR or NC — Credit or No Credit: The credit/no credit grading system (A, B, C, D, E = credit; CR, NC, D = no credit) is used in all 700-level courses, as well as some departmental courses approved by the Graduate Studies Council. The student’s permanent record will indicate "CR" when the course is passed, "NC" when incomplete, and "NC" when failed.

AUDAudt: The symbol "AUD" is used to indicate when a student has enrolled in a course as an auditor. No credit is awarded for auditing a graduate course.

Honor Points

The number of honor points earned in a course is the number of semester hours credit given by the course multiplied by the value of the letter grade received, as shown in the preceding table. For example, a grade of "B" in a four-hour course gives 4X3, or 12 honor points.

Honor points are not involved in courses in which the credit/no credit grading system is used.

Undergraduate credit is not computed into the graduate point-hour ratio.

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

A grade point average is obtained by dividing the total number of honor points earned by the total number of semester hours of work for which the student is officially enrolled during any period. For example, a total of forty-eight honor points earned in a semester by a student officially enrolled for sixteen hours of work, gives a grade point average of 48/16 or 3.0 for the semester.

Academic Standards

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

1. Good Standing: A graduate student is in good standing whenever that student’s overall grade point average is at least 3.0 (3.25 for specialist and doctoral students).

2. Warning: Whenever the grade point average for 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), 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 Removed: 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 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 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 if they wish to be considered for normal admission process. The student will send a Readmission Application 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.

Fall Semester: Apply by August 1.

Winter Semester: Apply by December 1.

Spring Session: Apply by February 1.

All work taken either on or off the campus must be completed by graduation day. Students who fail to meet the degree requirements as determined from graduation lists automatically. Such students will be placed in the class of the succeeding semester or session only after reappraisal for graduation, assuming other requirements can then be met. When a student fails to meet requirements for graduation resulting from failed courses, from incomplete work, or for any reason for which the student accepts responsibility or has control, responsibility rests with the student to reapply for the next regular graduating class following completion of his/her requirements. 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 the 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, if any. Charges are $3.00 each. The transcript will be released only upon written authorization of the student and only after payment is made.

Fellowships, Associateships, Assistantships

Western Michigan University provides fellowships and assistantships for students planning to pursue graduate study. Applications are due by February 15, and appointments are usually made by April 1 for students planning to enroll in the fall semester. Appointments are often renewable, except for Graduate College Fellowships and Dissertation Fellowships. The following appointments are available; the stipend amounts are those in effect during the 1996-97 academic year.

1. Graduate College Fellowships of $7,940 for two semesters are offered to recruit outstanding students entering master’s degree programs. An applicant is defined as one who will have earned no more than six graduate credits by the beginning of the fall semester. Awards are made on the basis of scholarship and leadership potential.


3. Dissertation Fellowships of $9,780 for two semesters are awarded in open competition and on the basis of superior scholarly achievement to assist full-time doctoral students with dissertation completion. To be eligible, an applicant must be a doctoral candidate who can demonstrate superior academic achievement and a record of timely and steady progress toward degree completion. Applicants must have completed all requirements for the degree except the dissertation, and must have an accepted dissertation proposal.

4. Thurgood Marshall Assistantships of $10,545 for three semesters are offered to planning to pursue graduate study. They are awarded to U.S. citizens from minority groups on the basis of scholarship and financial need. Participation in the professional activities of a department is required.

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

6. Teaching and Research Assistantships at a full-time appointment are available in many departments of the University. Inquiries should be sent to the chairperson of the department.
7. Service assistantships up to $7,940 in administrative units of the University may be applied for by sending a resume and cover letter to The Graduate College. Resumes are distributed to the units with openings.

Policies Governing Graduate Appointees

1. Definitions

A graduate appointee is a student enrolled in a program leading to a graduate degree or a graduate certificate who receives a University-administered salary and stipend which is not less than one-half of the prevailing full amount set by the University for that particular type of appointment. To be eligible for a graduate appointment a student must be regularly admitted, in good academic standing, and enrolled in a program leading to a graduate degree or a graduate certificate. A student admitted to a graduate degree program or concurrently to a graduate degree program and a graduate certificate program is eligible for an appointment in any unit in the University. A student admitted only to a graduate certificate program is eligible for an appointment only within the academic unit offering the graduate certificate. Although graduate appointments differ in many important ways, each can be classified as either an assistantship or a fellowship. The critical difference between an assistantship and a fellowship lies in the primary intent of the awardee—as payment for service (salary) or as a gift (stipend) to help the awardee achieve an educational goal, rather than a payment for services.

2. Type of Appointments

a. Assistantships

Graduate Assistants shall be informed that the offer of an appointment is contingent upon the conditions of the appointment. Each appointee shall be provided with a contract of the appointment, and the service rendered is secondary to the educational goal. Although all, or nearly all, of an Assistant's service to the department should also be part of the learning experience in the discipline, the primary thrust is in doing the activity under the supervision of a faculty member. If there are any other conditions peculiar to an individual appointment, they shall be stated in the letter of appointment. Any such remission will be identified in the specific conditions of the appointment. The letter shall also state the amount of the stipend for full-time Assistantships in each type of appointment is established by the Provost and Vice President for Academic Affairs. Fractional awards are made for fractional appointments.

b. Fellowships

Fellows are students who have distinguished themselves by outstanding academic achievement or special ability. Fellowships are provided by the University or by another donor with the concurrence of the Provost and Vice President for Academic Affairs.

3. Service Requirement

The kinds of service required of Graduate Assistants may vary among departments, each of which determines its own range of appropriate possibilities subject to administrative oversight. Although the requirements of service are expected, however, a full assistantship in any department consists 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 full-time Assistantships in each type of appointment is established by the Provost and Vice President for Academic Affairs. Fractions of stipends are made for fractional appointments.

5. Affirmative Action

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

6. Professional Ethics

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

7. Notification of Status

At the time of their appointment, graduate appointees shall be informed in writing of the specific conditions of the appointment. They shall be informed that the offer of an appointment is contingent upon acceptance into a graduate degree program at the University, and continuance of the appointment depends in part on satisfactory progress in that program and satisfactory performance of assigned duties. The letter shall also state the amount of the stipend for full-time Assistantships in each type of appointment is established by the Provost and Vice President for Academic Affairs. Each appointee shall be provided with information prepared by The Graduate College concerning current University-wide procedures, practices, privileges, and responsibilities that apply to graduate appointees. Each department is responsible for providing any supplemental information on these matters that is necessary and special.

8. Professional Development

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

9. Enrollment Status

A full appointment requires a minimum enrollment of six credits per semester or three credits per session. Individual departments may require an enrollment of more than the minimum number of credit hours. A Graduate College Fellowship requires full-time enrollment (at least 9 credit hours per semester). Some circumstances may allow for decreased enrollment, however; departments will advise appointees.

10. Evidence of Status

For formal identification as a graduate appointee, the student should have a special validation card. This validation card must be secured in The Graduate College at the beginning of each semester. 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 statement of accounts.

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 if 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 vehicles. Application may be made to the Public Safety Annex for parking privileges in designated lots.

e. Campus Bookstore: Graduate appointees will be accorded the same privileges and responsibilities as faculty members in the use of the bookstore. Effective Fall 2019, the bookstore will be called Western Michigan University Bookstore.

f. University facilities: Graduate appointees are granted full access to University facilities (e.g., student centers, 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 encourage research by the 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
research reports and research findings at
professional meetings.

The typing of these 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. The criteria are set by federal and
date Departments of Education and are
subject to periodic revision.

Application procedures for both the federal
and state College Work-Study Program, the
Federal Perkins Loan Program, the Federal
Direct Stafford Loan Program, and the WMU
Nontraditional Student Award:

Submit a Free Application for Federal
Student Aid (FAFSA) to the appropriate
address on the envelope. The FAFSA may be
obtained from college financial aid offices or
from WMU Student Financial Aid.

To receive Stafford Loan, students must now apply through Western
Michigan University by simply completing the
FAFSA. Banks or other private lending
agencies cannot be used.

Students applying for all programs listed
above must also submit a Financial Aid
 Transcript from all institutions (except WMU)
attended since high school and must complete
their WMU financial aid file with documents
required by the federal government. Forms are
available at WMU Student Financial Aid.

To receive Perkins Loan, students must now apply through Western
Michigan University by simply completing the
FAFSA. Banks or other private lending
agencies cannot be used.

Students applying for all programs listed
above must also submit a Financial Aid
 Transcript from all institutions (except WMU)
attended since high school and must complete
their WMU financial aid file with documents
required by the federal government. Forms are
available at WMU Student Financial Aid.

Tuition Management Services Plan offers a
monthly payment plan. The minimum
payment is $30 a month. A portion of the student's loan, both
principal and interest, may be canceled for each year the student
remains enrolled in the program.

A. School designated by the United States
Secretary of Education as having a high
enrollment of students from low income
families, or

B. A school for physically, mentally, or
economically handicapped children
according to the following schedule:

- 15 percent for the first year
- 20 percent for the second year
- 25 percent for the third year
- 30 percent for the fourth year
- 50 percent for the fifth year

Note that:

1. Fifteen percent of the loan (principal
and interest) may be canceled for each year
that the student teaches full time in the
Headstart Program, up to the whole loan
amount.

2. The student's loan may be canceled at the
rate of 12 1/2 percent for each complete
year of service in the Armed Forces of the
United States (in an area of hostilities that
qualifies as a 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 the
three years for service:

   - In the Armed Forces (Army, Navy, Air
     Force, Marine Corps, or Coast Guard).

   - As an officer full-time 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

   - As a full-time volunteer in a tax-exempt
     organization comparable to service
     performed in the Peace Corps,

   - When temporarily totally disabled or
     unable to secure employment because of
     providing care required by a spouse who
     is disabled.

5. The student may defer payments up to two
years while serving an internship, the
successful completion of which is required
to begin professional practice or service.

After the deferment period there is an
additional six-month grace period.

- As an officer on full-time duty in the
  commissioned corps of the U.S. Public
  Health Service,

- As a volunteer under the Peace Corps
  Act.

- As a volunteer under the Domestic
  Volunteer Service Act of 1973, 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.

- 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.

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  commissioned corps of the U.S. Public
  Health Service,

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  Corps, and when temporarily
totally disabled or unable to secure
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- 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.

- 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.
12 GENERAL POLICIES AND PROCEDURES

The cost of the program is $50 annually, with no interest charges. For information, call toll free 800-342-3876 or write: Tuition Management Services, Inc., 42 Valley Road, Newport, Rhode Island 02842-6376

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 various amounts and average $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. Students may apply to study in 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 of 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 in Japan. The student will receive $500 to assist students in participating in WMU-sponsored overseas programs and field courses.

Student Employment

Student Employment Referral Service
The Student Employment Office actively recruits employment opportunities for Western students. Part-time employment is available in and around Kalamazoo; internships and summer jobs are posted from all over the country.

Students seeking employment should visit the office regularly. Those interested specifically in an internship can register in the Internship Services and have their employment information shared with interested employers. Listings of available part-time and internship positions are distributed to 30 locations on campus weekly. In the near future, available employment opportunities will also be posted through the university computer system for access 24 hours a day.

The department oversees the administration of all on-campus student employment. Student pay rates are set by this office, and all student employees are monitored for minimal enrollment and maximum working hours. All student payroll cards pass through this office for verification before going to Tuition Management Services for payment.

College Work Study positions, both for graduate and undergraduate students are posted in our office. Western Michigan University also participates in the Federal Community Service Work Study program, giving students a chance to use work-study funding in off-campus, not-for-profit organization. Most of these opportunities are directly connected to the student's field of study.

The office frequently hosts on campus interviews from such organizations as Chrysler, Upjohn, Dow Jones Newspapers and many others. Other employment opportunities will also be posted through the university computer system for access 24 hours a day.

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

The areas of assistance include, but are not limited to, veterans’ educational benefits, vocational rehabilitation benefits, and tutorial assistance. If difficulties or questions arise in receiving benefits, the veteran should contact the Veterans Administration through the toll free number 1-800-877-1000.

Changes in enrollment or current address must be reported immediately to the Registrar’s Office. Any change in dependents should be sent directly to the Veterans Administration. These changes may be obtained at the Registrar’s 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 Registrar’s Office. A student copy of this record is available each semester/session. There is a $3.00 charge for additional or official copies of this transcript.

2. A 3.00 grade point average is required of master’s degree students at all times for continued certification. A 3.25 grade point average is required of specialist and doctoral degree students at all times for continued enrollment. Students who fall below these standards must seek the appropriate counseling from the Veterans Certification Officer before recertification can be made. The VA is notified 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 may be petitioned to be counted as “X” grades in consideration for eligibility for certification to the VA.

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3. Incomplete grades in graduate courses may be petitioned to be counted as “X” grades in consideration for eligibility for certification to the VA.

Students are certified on the basis of attendance and academic progress toward degree goals. Serious over-payment problems can be eliminated by prompt notification to the Registrar’s Office of changes in these areas.

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

The Family Educational Rights and Privacy Act
The Family Educational Rights and Privacy Act of 1974 is a Federal law which states that (a) a student has the right to inspect and review information contained in his education records; and (b) a statement of adopted procedures covering the privacy rights of students be made available. The law provides that the institution maintain confidentiality of student education records.

Western Michigan University accords all the rights under the law to students. No one outside the institutions will disclose any information from, students’ education records without the written consent of students, except to publications or other persons within the institution, to officials of other institutions in which students seek to enroll, to persons or organizations providing services to the institution and carrying out that function, to persons in compliance with a judicial order, and to persons in an emergency in order to protect the health or safety of students or other persons. All these exceptions are permitted under the Act.

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

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 admissions, personal, academic, and financial files, as well as academic, cooperative education, and placement records. Students wishing to review their education records must make written requests to the Registrar. The records covered by the Act will be made available within forty-five days of the request. Students
may have copies made of their records with certain exceptions, (e.g., a transcript of an original or source document which exists elsewhere). These copies would be made at the student's expense at the prevailing rate of ten cents per page. Education records do not include records of instructional, administrative, and educational personnel—which are the sole possession of the maker and are not accessible or revealed to any individual except a temporary substitute—records of the law enforcement unit, student health records, employment records, or alumni records. Health records, however, may be reviewed by physicians of the students' choosing. Students may not inspect and review the following as outlined by the Act: financial information submitted by their parents; confidential letters and recommendations associated with admissions, employment or job placement, or honors to which they have waived their rights of inspection and review; or education records containing information about more than one student, in which case the institution will permit access only to that part of the record which pertains to the inquiring student. The institution is not required to permit students to inspect and review confidential letters and recommendations provided prior to January 1, 1977, 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 may have the records amended by the Registrar. Students who have problems informally with the person in charge of the records involved. If the decisions are 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 time of the hearing. Students may present evidence relevant to the issues raised and may be assisted or represented at the hearing 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, 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 education records containing information about more than one student, in which case the institution will permit access only to that part of the record which pertains to the inquiring student. The institution is not required to permit students to inspect and review confidential letters and recommendations provided prior to January 1, 1977, provided those letters were collected under established policies of confidentiality and were used only for the purposes for which they were collected.

Sexual Harassment and Sexism
Western Michigan University is committed to an environment which encourages fair, humane, and 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 include more than overt advances toward actual sexual relations. It applies as well to repeated or unwarranted sex-related statements, unwelcome touching, sexually explicit comments, and/or graphics. All persons should be sensitive to situations that may affect the recipient, such as discomfort or humiliation or may play a role in the recipient's ability to perform. In a situation in which an individual, but as a member of a category or group. The definition is intended to operate in the classroom or in the workplace is unacceptable at the University. The elimination shall be the responsibility of the entire University community. Depending upon the seriousness of the misconduct, informal corrective action may be adequate.

COMPRAINT 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 dismissal. Properly, to enable the University to act through these formal procedures, employees and students are encouraged to report such incidents. Students and faculty members who report such conduct to the Affirmative Action Office, 274 Walwood Hall (387-8858).

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 characteristics.
- 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 dismissal."

YOU COULD BE A VICTIM
Who are the victims? Anyone, male or female, old or young, 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 environment. The harasser, sensing 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.

Some options available to you are:
- 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.

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 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 established for the benefit of students unless otherwise provided by law.

Students who have inquiries about the University's Anti-Discrimination Policy or about anti-discrimination laws, should contact the Office of the Vice President for Institutional Review, 274 Walwood Hall (387-8655). The Complaint Officer will receive and investigate complaints of prohibited discrimination filed with him by students and may assist 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 Office or professor, instructor, or program director within fourteen (14) calendar days of events or information becoming available 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.
or will designate a representative to conduct a hearing or investigation of the grievance, report findings and recommend a decision. The President 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 shall apply to all matters of student academic conduct.

1. **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 decision 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 to respond to the grievance. The Step 1 representative must provide a written answer within fourteen (14) calendar days after receiving the formal grievance.

2. **Step 2: Appeal to the Vice President 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 designated representative will then arrange a meeting with the grievant, his/her representative (if requested), and any other individuals who may help resolve the grievance. Such a meeting 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.

3. **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 appeal is received. The President, at his/her discretion, will handle 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 will make the final grievance decision and communicate it to the appropriate parties.

**Academic Honesty**

If a student is uncertain about an issue of academic honesty, he/she should contact the faculty member to resolve questions in any situation prior to the submission of the academic exercise.

Violations of academic honesty include but are not limited to:

1. **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.
   - **Clarification**
     - Examples of multiple submission include submitting the same paper 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 history may receive credit for its content in a history course, while the student may receive separate credit for constructing the report in another course.

2. **Cheating**
   - **Definition**
     - Cheating is intentionally using or attempting to use unauthorized materials, information, notes, study aids or other devices or materials in any academic exercise.
   - **Clarification**
     - 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 other students) unless specifically allowed in advance by the faculty member.
     - Students may not have others conduct research or prepare work for them without advance authorization from the faculty member.

3. **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.
   - **Clarification**
     - 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.

**Multiple Submission**

**Definition**

The submission of substantial portions of the same work (including oral reports) for credit more than once without authorization.

**Plagiarism**

The intentional, 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 and appropriate indentation and must be properly acknowledged, in the text by citation or in a footnote.

2. **Paraphrase**
   - The use of material from another source is 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**
   - Facts not directly stated by the author are in the student’s own words and are cited in the text.

4. **Common Knowledge**
   - Common knowledge includes generally known facts such as the names of leaders, government positions, basic scientific laws, etc. Materials which add only to a general understanding of the subject may be acknowledged in the
appropriate representations of originality, authorship and collaborative crediting. Faculty members are responsible for informing students concerning appropriate formats for handling quotations, footnotes, endnotes, and bibliographic references.

Complicity

Complicity is intentionally or knowingly helping or attempting 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.

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. No 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, without authorization.
2. Disruptive or illegal use of computer resources includes, but is not limited to: violating copyrights held on software or programs; tampering with computer equipment or hardware or with the operation of any computer system or function/executed; plagiarizing or cheating in any form; acting in a manner disruptive to other users or operators; and invading personal or institutional privacy with the use or aid of any computer equipment.

Conduct in Research

Research and creative activities occur in a variety of settings at the University, including class papers, theses, dissertations, reports or projects, grant funded projects and service activities. Research and creative activities rest on a foundation of mutual trust. Misconduct in research and in creative activity destroys that trust and is prohibited. Students shall adhere to professional standards of integrity in both artistic and scientific research including appropriate representations of originality, authorship and collaborative crediting.

Definition

Misconduct in research is defined as serious deviation, such as fabrication or falsification of data, plagiarism, or scientific or creative misrepresentation, from accepted professional practices in the discipline or University carrying out research and creative activities or in reporting or exhibiting/performing the results of research and creative activities. It does not include honest error or honest differences in judgments or interpretations of data.

Clarification

Examples of misconduct in research include but are not limited to:
1. Fabrication or Deliberate invention or counterfeiting of information.
2. Falsification of Data Dishonesty in reporting results, ranging from unauthorized alteration of data, improper revision or correcting of data, gross negligence in collecting or analyzing data, to selective reporting or omission of conflicting data.
3. Plagiarism and Other Misrepresentation of the Work of Another The representation of another person's ideas or writing as one's own, in such ways as stealing others' results or methods, conceiving or presenting the writing or ideas of others without acknowledgment, or otherwise taking credit falsely. Representing another's artistic or technical work or creation as one's own. Just as there are standards to which one must adhere in the preparation and publication of written works, there are standards to which one must adhere in creative works in the tonal, temporal, visual, literary and dramatic arts.

4. Abuse of Confidentiality Taking or releasing the ideas or data of others which were given in the expectation of confidentiality, e.g., stealing ideas from grant proposals, award documents, or manuscripts intended for publication; exhibiting/exhibition when one is a reviewer for granting agencies or journals or when one is a juror.
5. Dishonesty in Publication or Exhibition/Performance Knowingly publishing, exhibiting or performing work that will mislead, e.g., misrepresenting material, particularly its originality, or adding or omitting the names of other authors without permission.
6. Deliberate Violation of Requirements Failure to adhere to or receive the approval required for work, e.g., research regulations of federal, state, local or university agencies, including guidelines for the protection of human subjects or animal subjects and the use of recombinant DNA, radioactive material, and chemical or biological hazards.
7. Failure to Report Fraud Concealing or otherwise failing to disclose 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 and 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 found 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 may 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 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 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 file an appeal 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 an agreeable resolution cannot be reached, and the grade or penalty will then be referred to the Academic Fairness Committee.

5. The Academic Fairness Committee is appointed by 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, making 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 used by the Records Office. The decision of the Committee is final and the decision remains in effect for one nonrenewable four-year term. One undergraduate student and one graduate student who are candidates for degree programs in the college will serve on 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.

7. If the Academic Fairness Committee decides there is no change of grade, it will inform the student, the faculty member, the academic unit chair/director, and the ombudsman. If the Committee recommends a change of grade, the Committee will first inform the faculty member of its intent so that he/she may initiate the change. If the faculty member prefers not to initiate the change, the Committee will notify the registrar of the change.

8. To protect all parties involved, confidentiality consistent with the Committee’s task will be maintained.

9. Occasions do occur when a faculty member or an administrative official may wish to question a grade or a grade change 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 unit does not have established procedures, the student may appeal in writing to the Academic Fairness Committee.

3. If no resolution is reached and the student wishes to appeal the unit level decision, he/she may request in writing a review by 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 a College Academic Review Board under procedures outlined below. The College Academic Review Board will make a recommendation to the dean within 30 days. The Academic Review Board consists of five members, three faculty and two students. The three faculty members are elected by the college council for one nonrenewable four-year term. One undergraduate student and one graduate student who are candidates for degree programs in the college will serve on 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 to a review by the president 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, the Academic Unit or the Graduate Unit, 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. 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 faculty, administration, and students. The policies, when approved by the Board of Trustees, are published in The Admissions 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 right 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 that 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 in the institution that will make it more responsive to every member of the community. The basic principles of the University Ombudsman are independence, impartiality, and confidentiality. The Ombudsman is an intervention agent who makes thorough investigations and has access to most 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.

University Libraries

The University Libraries consist of the Dwight B. Waldo (Main) Library, the Education Library, and the Archives and Regional History Collections. The main collection is housed in Waldo Library, which is named for the first president of the University. Built in 1959 and enlarged in 1967, a new 105,000 square foot addition and renovation of 145,000 square feet of existing space was completed in 1991 providing space for the ever-expanding collection and 1,900 student study stations.

The total University Libraries' collection, which numbers over three million items, includes books, bound periodicals, electronic data bases, music scores, sound recordings, maps, documents, and materials in microform. About 550 new newspaper titles are currently received. Through the use of various approval and gathering plans—as a part of the acquisitions program—the library emphasizes building a strong collection of current imprints in all the fields of study at the University.

The University Libraries is a depository for United States and Michigan government documents. Microprint editions of selected United Nations documents and official records are also available. A collection of about 1,450,000 microforms consists of such items as the Human Relations Area File, the American Periodical Series, Early American Newspapers of the 18th and 19th centuries, Early English 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 and special collections are 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 research commitment to international and area studies.

3. Another area of collection strength is the history, religion, philosophy and culture of the Middle East. These 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 Gethsemane. Over 900 of the some 9,000 volumes in this collection are rare items of special interest to medieval scholars from all over the world.

4. The Randall Frazier Memorial Collection, honoring a notable alumnus, has a wealth of American literature and history of Black America.

5. The C. C. Adams Ecological Collection located in East Hall, is a specialized collection of books in the field of biology and geology. Victor Wood, who was one of the original group of faculty hired at Western, taught on campus from 1904-1933.

6. 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.

7. The Map 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 includes special microform collections, annual reports from businesses and industries, and many periodical and serial titles in the field of business and finance. The University Archives and Regional History Collections located in East Hall, is also a specialized collection of books in the field of business and finance.

The WMU Apartments are home to many single and family 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 typically rent for less than area off-campus apartments. One apartment building 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 computers. Residents may purchase a campus-wide dining plan which offers continuous "all-you-can-eat" dining services.

All apartments are convenient to classrooms, libraries, computer labs, recreational facilities, and many community activities. On-site laundry facilities are also convenient to residents. Parents rely on "Kids' Club," a popular after-school program, and the recreational and children play-areas which are located throughout the system.

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) 387-4786.

Housing

Western Michigan University offers several types of housing to students: apartments, residence halls, and sleeping rooms. All three options provide safe, convenient, and affordable environments conducive to the academic and social aspects of higher education. The leases/contracts coincide with the academic calendar, and the costs are lower than typically found off-campus.
beautiful, historic building. Spindler Hall has plenty of convenient parking and is right on the bus line. Call (616) 387-7101 for more details.

WMU Residence Halls
Twenty-two residence halls attract over 5,500 students each fall and winter semester. By living in a residence hall, students discover much more about the University, the world in which they live, their colleagues, and themselves. The residence halls provide the best opportunities for making new friends, developing leadership skills and meeting people from a variety of backgrounds with different lifetime experiences. Most of the fifty states and many foreign countries are represented in the Residence Halls.

Residence Halls offer convenience and value to residents. All utilities, local phone and cable television are included in the rates - so there are no monthly bills to pay. Most contracts include a dining plan - no cooking, cleaning or shopping to do. Common areas of each hall are cleaned by staff members, which leaves more time for academic and/or social pursuits. The proximity to campus also reduces the stress of driving and parking on campus. Most room assignments are double-occupancy but single rooms are available. WMU also offers halls which are co-ed by suite, floor or building. Most halls also offer services not found off-campus, such as notation rooms and message center, formal lounges, fitness centers, saunas, television rooms, rental refrigerators, paint-your-own-room opportunities; VCR usage, free housekeeping supplies and academic computer terminals. Each residence hall room comes with beds, desks and study chairs.

Graduate and undergraduate students are welcome in the halls. Four halls, in particular, are typically of interest to graduate students: Davis and Zimmerman Halls (on main campus) and Harrison and Sinson Halls (in the Goldsworth Valley complex). Theses halls are reserved for students who are at least 21 or have a junior (or above) class standing. Many single rooms are available in these halls. One hall (Bigelow) offers room-only assignments and is open throughout the year, including semester breaks. Another hall (Davis) is open all year, with required participation in a WMU Dining Plan during the Fall and Winter terms. These are attractive options to students who remain in Kalamazoo between semesters.

Residents of other halls must make alternative housing arrangements for these terms. Residents are permitted to remain in their assigned rooms during the Thanksgiving and spring break period.

Education takes place both in and out of the classroom, and a well-rounded education includes a variety of outside experiences. Residence halls provide those meaningful experiences and memories which help build a foundation for future successes.

Off-Campus Housing
The Off Campus Life Office responds to the diverse needs of the 74 percent of Western Michigan University students who reside off campus. Specifically, graduate students are provided assistance in locating a place to live. A computerized data base system has been developed to aid students in their search for rental housing or rooms. Students can access rental and roommate information from any campus computer or home computer with a modem. Printed listings of apartments, houses, rooms, students in need of roommates and those available as roommates are also available in Room 3510, Faunce Student Services Building.

To assist students in their transportation needs, carpooling and share-a-ride 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 387-4111.

SPORTS MEDICINE CLINIC/PHYSICAL THERAPY SERVICES
The Sports Medicine Clinic provides comprehensive diagnostic services and treatment of injuries and all bone or joint problems. There are complete physical therapy services offered. The clinic is staffed by a physical therapist, a certified athletic trainer, 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 or 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 the nurses' desk. Plan to arrive ten minutes early for your appointment and plan on your visit lasting at least an hour. If you have insurance coverage, 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 a.m. 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, 8:00 - 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 non-exempt credit hours per semester (four or more per session) 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, pay the Student Health Fee on their first 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 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 Sindecue Health Center. Visits to hospital emergency rooms, immediate care centers, medical specialists outside the Health Center, and transportation by ambulance are 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, Discover Card, or Bronto Card; however, we request that all fees under $1 be paid in cash. You may also pay health charges 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 choose. 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, seriously 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 sponsor. 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 1:30 p.m. Mondays, Tuesdays, and Fridays (3 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 Sindecue Health Center can offer high-quality health services at the lowest possible cost for students. Board 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 Western Michigan University are eligible to serve on the SHAB as a representative of a Registered Student Organization or in an at-large position.

Call 387-3263 for more information.

IMPORTANT PHONE NUMBERS

Appointments 387-3230
Insurance Information 387-3267
Pharmacy 387-3301
Health Promotion/Health Information 387-3263
Sports Medicine Clinic/Physical Therapy 387-3240
HIV Antibody Testing 387-4-HIV

Career Services

Assistance in total job search planning is offered free of charge by Career Services to graduate students of Western Michigan University. These services include career planning, a career resource center, on-campus interviewing, weekly job opportunities bulletin and vacancy postings, direct referral 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.

Through 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 skills can be matched with community needs. Individual volunteer opportunities and one-time group projects are available in a variety of interest areas including food/clothing/shelter services, mental and physical health care, friendship/role model services, recreation, education, cultural arts and sciences, financial services, handicapped services, advocacy, natural resources, and media/public relations.

Individual volunteer opportunities typically require a two to four hour weekly time commitment; one-time group projects vary from three to eight hours.

Service projects coordinated by SVS include Alternative Spring Break, Into the Streets, Service Week, and the Volunteer Opportunities Fair. Presentations are offered throughout the academic year and include information on service learning opportunities, 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 career counseling, academic counseling, educational goals. Psychological counseling services and counseling for married couples are available to students on active admission status with the University on a time available basis.

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

3. Career Development Program To assist students in the exploration of individual career possibilities and 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 Counselor Education and Counseling Psychology, the Department of Psychology, and the School of Social Work.

The Counseling Center is accredited by the National Association of Counseling Services, Inc., and is staffed with licensed 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 service as many students as possible within staffing limitations. Graduate students unable to use the Counseling Center services during regular hours may request to make arrangements for Wednesday evening appointments by calling the Center office, (616) 387-1850.

HEALTH PROMOTION AND EDUCATION, SINDECUE HEALTH CENTER

You, more than anyone else, are in charge of your health. A healthy body, high self-esteem, the skills to manage stress, and prevention of illness are all within your personal power to achieve.

The office of Health Promotion and Education, Sindecue Health Center, offers a wide range of resources and services to help students grow toward understanding, maintaining, and enhancing their current and future health. The following resources are offered as a Student Health Fee benefit:

- An interactive Health Resource Center, located in the lower level of Sindecue Health Center. This center offers computer-assisted learning, self-help information and a wide range of resources designed to help you enhance your health.
- Skill development for building healthy lifestyle 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.
- Vegetarian food planning workshops.
- Weight management workshops focused on building a healthy relationship to food.
- Cholesterol screening and education, scheduled by appointment (minimal fee).
- Stress management workshops including sessions dealing with time management, relationship building, relaxation, and assertive communication (group programs, personal manuals).
- Stop smoking services (options include a seven-session group behavior change and recovery program, personal self-help manuals, a take home video, and nicotine patches).
- Blood pressure screening and education.
- American Heart Association Adult CPR certification (minimal fee).

The office of Health Promotion and Education can also design programs to meet special group needs.

Call 387-3263 for more information.

GENERAL POLICIES AND PROCEDURES 19
University Counseling and Testing Center

The services of the Counseling and Testing Center are open to all graduate students. The department offers career counseling, utilizing their own career guidance inventory, which is available to all WMU students, staff, and faculty for a small fee. The test includes a Personality Questionnaire, Vocational Interest Inventory, Occupational Value Questionnaire, and a Diagnostic/Achievement Quiz.

Information and applications for most of The Graduate College tests are also available in the Testing Center. This center serves as the regional office for the Miller Analog Test, which is given by appointment only.

- Counseling and Testing Center has the largest selection of test files in Michigan. These tests may be obtained in the Testing Center and are for the use of students and faculty members for informational purposes, class projects, research purposes, or almost any other valid reason.

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

Univ. Counseling and Testing Center is located in Faunce Student Services Building, Room 2510.

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

Career English Language Center For International Students (CELCIS)

The Career English Language Center for International Students (CELCIS) provides intensive English language instruction for those prospective students who need further training in English in order to qualify for regular admission to the University. Most students in the CELCIS program must be enrolled full-time; part-time study is not permitted for those prospective students who need further training in English.

In the CELCIS program, students learn the basics of English, including grammar, listening, speaking, reading, and writing. The program is designed to help students develop the skills necessary to succeed in their academic studies.

In addition to classroom instruction, CELCIS offers a variety of extracurricular activities, including cultural events, social gatherings, and community service projects.

Office Of International Student Services

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

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

International Student Admission

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

English Competency of Students from Non-English Speaking Countries

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 need to demonstrate proficiency in the English language prior to enrollment in an academic program at Western Michigan University.

In order to be considered for admission, students must meet the following English proficiency requirements:

1. Test of English as a Foreign Language (TOEFL). A score of 500 is required for restricted admission (part-time remedial English and part-time academics during the first semester) or 550 for unrestricted admission.
2. Michigan English Language Assessment Battery (MELAB). A score of 75 is required for restricted admission or 85 for unrestricted admission.
3. General Certificate of Education Advanced Level Pass in English with grade of A, B, or C from one of the five British-based examining boards only. This is equivalent to a 550 TOEFL.
4. International English Language Testing System (IELTS) using Modules A, B, or C (not the General Training Module). A score of 6.5 is required for restricted admission or 7.0 for unrestricted admission.
5. International Baccalaureate (IB). A grade of 5 in English is required at the Higher Level for unrestricted admission. This is equivalent to a 550 TOEFL.

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 involvements of the University.

Component units include the Office of International Student Services; the Career English Language Center for International Students (CELCIS); and Foreign Study Services. Other responsibilities of the Office of International Affairs include international and area studies, initiation and maintenance of exchanges with foreign institutions, sponsorship of conferences and lectures on international issues, developing technical assistance and training projects, summer institutes for international students, and assisting faculty and units in preparing grant proposals.

For further information contact the Office of International Affairs, 2090 Friedmann Hall, Western Michigan University, Kalamazoo, Michigan 49008-5177. Telephone (616) 387-3951. FAX (616) 387-3962.

Foreign Study

Students who are interested in studying 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 moped with WMU Parking Services (located on the corner of W. Michigan Avenue and Knohlwood) and pay a registration fee. Detailed information concerning parking regulations, parking permits, and parking violations can be obtained by visiting the Parking Services Office or calling (616) 387-4609. 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 Westerner is 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.

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

General Requirements For
A Master’s Degree

Admission
See Calendar of Events for application
deadline.
1. Bachelor’s degree from an accredited
institution, indicated on an official
transcript.
2. Transcripts of all courses taken beyond
high school.
3. A point hour ratio of at least 3.0 in the last
two years of undergraduate work.
4. Meet any additional admission
requirements as stated in the individual
program descriptions.
5. Acceptance by the academic unit offering
the master's program and by the graduate
dean.
6. Admitted graduate students have active
admission status for 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 Application for
Readmission to a Graduate Degree Program 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 598 (Readings) courses.
2. Diploma Application: A diploma
application must be submitted by August 1
for the December Commencement, by
December 1 for the April Commencement,
by February 1 for the June
Commencement, and by April 1 for the
August graduation. 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. 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 an institution
     accredited for graduate study and are of
     "B" grade or better, and the student's
     average for all graduate work taken at the
     other 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.
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 the Office of the Vice
President for Research, 387-8298.
8. Master’s Thesis: A student who intends to
register for the Master’s Thesis is required
to meet with the Dissertation Assistant in
The Graduate College before registering
for the class so that the student is informed
about the regulations pertaining to the
preparation and publication 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.
See the Graduate Studies section of this
catalog for additional information regarding
the master’s thesis.

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 48–50.
4. Complete an acceptable Master's Thesis (6)

3. Pass a comprehensive written examination

Each applicant must submit to the Program requirements

1. Complete at least thirty semester hours 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: Patricia Opel, Graduate Advisor Room 1406, Sangren Hall Richard DePeaux, Graduate Coordinator 1Eml Room 1402, Sangren Hall

The philosophy underlying the Art Department's courses and programs is to establish an awareness and understanding of the visual arts to gain a liberal arts education, and likewise, that a liberal education is necessary part of a professional artist's training. To that end, programs in Art seek to meet the objectives of three different types of students: those who have an interest in simply taking courses in the field for personal enjoyment and growth, those with professional ambitions in the various areas of practice and teaching, and those liberal arts oriented persons who seek a major in the general field of the visual arts.

The various programs offered by the Art Department are designed to promote the education of good artists and artists-teachers and to increase the artistic awareness among students in other areas. Extracurricular activities include many exhibitions, lectures by visiting artists, and a student-operated gallery.

The purpose of graduate study in the Art Department is to advance: Individual studio and scholarly talents, interests and philosophies, used creatively both to expand and preserve our cultural heritage; professional studio competence exemplified by a significant body of work; individuals with the potential to solve contemporary problems in all aspects of the visual arts and to explore and address new questions and issues; professional competence in the dissemination of knowledge, including logical, clear verbal and written presentation of aesthetic ideas in teaching and other contexts; scholarly competence in the organization, evaluation and interpretation of knowledge.

GRADUATE DEGREE PROGRAMS Both the Master of Arts, an initial graduate degree, and the Master of Fine Arts, which is the terminal studio degree, are offered in the following practice oriented areas of emphasis: sculpture, ceramics, printmaking, photography, painting/watercolor, and graphic design.

In the belief that arts understanding, involvement, and appreciation are an important part of liberal education, the Department of Art offers many opportunities for the non-arts major to participate in applied, theoretical, and appreciational curricular and co-curricular activities, such as general art, art history and studio art courses.

Western Michigan University is an accredited member of the National Association of Schools of Art and Design and subscribes to the recommendation of this organization.

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. At the end of each student's first and second semester, a formal review by a Graduate Committee will (a) determine continuation in the degree program; (b) delay review by one semester; (c) drop the student from further degree status in the 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 hours in electives, five of which must be taken within the Art Department.

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, chosen in consultation with the student's faculty advisor.

4. Three hours in ART 610, Advanced Drawing.

5. Four hours in ART 625, Graduate Seminar.

6. Required reviews: At the end of each student's first and second semester, a formal review by The Graduate Program Committee will: (a) determine continuation of the degree program; (b) delay review for one semester; (c) drop the student from further degree status in the program; (d) drop the student from the M.F.A. degree status and offer the option to pursue M.A.
Biological Sciences

Advisor:  Elwood Ehle
Room 428, Hoekje 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 bachelor's degree from an accredited college or university.
2. Earn a grade point average of 3.0 or greater in all undergraduate courses.
3. Take verbal, quantitative, and analytical sections of the Graduate Record Exam and have official scores sent to the department and to the Admissions Office.
4. Take appropriate prerequisite courses, if necessary, in biology, chemistry, physics, and mathematics.
5. Submit three letters of recommendation.
6. Have a major advisor appointed in the student's 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 deficiencies in course work and 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
This 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.

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.

Required Courses
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.)

Final Examination: Before beginning the internship each intern must have successfully passed a written comprehensive examination covering the material of MATH 562, 560, and 662.

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
Advisor:  Advisors and Faculty:  William R. Wiener, Chairperson and Rehabilitation Counseling/Rehabilitation Teaching Advisor 3409 Sangen Hall Susan Ponchillia, Rehabilitation Teaching Advisor 3409 Sangen Hall Marvin Wessies, Orientation and Mobility Advisor 3405 Sangen Hall

The Department office is located in 3404 Sangen Hall.

The Master of Arts programs in Blind Rehabilitation consist of three options:
1. Orientation and Mobility*
   a. Standard Program
   b. Specialty in Gerontology
   c. Specialty in Low Vision
2. Rehabilitation Teaching*
   a. Standard Program
   b. Specialty in Low Vision
   c. Specialty in Gerontology
3. Rehabilitation Counseling/Teaching**
   This degree is offered through the Rehabilitation Counseling/Teaching program (RCPT). It is jointly administered by the Department of Blind Rehabilitation and the Department of Counselor Education and Counseling Psychology.

It is also possible to earn dual degrees in Orientation and Mobility and Rehabilitation Teaching.

**Leads to national certification
**Leads to Michigan license as a counselor and national certification

All master’s options (except Rehabilitation Counseling) are approved by the Association for Education and Rehabilitation for the Blind and Visually Impaired.

It is the case of our programs to promote quality rehabilitation services for individuals who are blind or have other disabilities by educating rehabilitation personnel; providing services to individuals; agencies, foundations, and associations; and sponsoring research related to rehabilitation.

Federal grants from the Rehabilitation Services Administration are available from the Department of Education allowing the Department to provide students enrolled in our masters’ programs with tuition assistance and stipend awards.

The programs are designed to prepare individuals for entry level positions in orientation and mobility, rehabilitation teaching, and rehabilitation counseling/teaching in public schools, blind and visually impaired schools, and rehabilitation facilities. The Orientation and Mobility and the Rehabilitation Teaching programs require 36 and 37 semester hours of course work respectively and can each be completed in three consecutive semesters. The Rehabilitation Counseling/Teaching program requires 74 semester hours of course work and can be completed in six consecutive semesters. Curriculum guides for the program options are available from the Department office.

The orientation and mobility option prepares a dual competency practitioner who is able to provide both rehabilitation counseling and rehabilitation teaching skills. Graduates receive dual Master of Arts degrees that make them eligible to become certified rehabilitation counselors (CRC) and AER certified rehabilitation teachers (AA). They provide the full range of vocational rehabilitation counseling services to individuals and by sensory handicaps, physical handicaps, and mental disability. As Rehabilitation Counselors, the graduates assist clients with career choices, manage their acquisition of work-related skills, develop jobs, and assist with placement into employment. As Rehabilitation Teachers, they serve blind and visually impaired individuals by providing instruction in the activities of daily living, compensatory living, communication, recreation/leisure.

The professional preparation for students entering any of the above three options includes on-campus, simulated disability experiences, a research project, practicum, and an off-campus supervised clinical field experience.

Admission to a Master of Arts option in the Department is based upon undergraduate academic record, appropriate goals, related experience, interpersonal and communication skills, emotional stability, and functional independence. Prior to consideration by the M.A. Admissions Committee, applicants are required to complete and return a departmental application and a graduate college application. Upon admission, an applicant is assigned an advisor who will assist in preparing a Program of Study.

Business
The degree programs leading to the Master of Business Administration, the Master of Science in Management 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 work effectively in administrative and other leadership roles.

Under the guidance of the graduate staff of the Haworth College of Business, personal programming for the participant is provided.

Admission requirements
MBA applicants must submit scores for the Graduate Management Admission Test (GMAT) prior to consideration for admission to the program.

MBA applicants must demonstrate proficiency in three basic skills areas: quantitative analysis, computer usage and written communication.

Students admitted on a Permission to Take Classes (PTG) status are not allowed to enroll in graduate business courses.

Program requirements
The MBA degree program requires, in addition to the basic core courses, a minimum of thirty-six hours of coursework. A minimum of thirty hours must be taken in 600 or higher level courses. The program consists of basic skills requirements, core business courses, integrated core courses, free or combination courses and a cross-functional integrated experience.

A 3.0 overall graduate grade point average is required for graduation. A 3.0 average, and a minimum grade of "C" is also required for all courses required for the MBA degree.

1. Basic skills requirements:
   Students are required to demonstrate proficiency in three basic skills areas before admission to the MBA program: quantitative analysis, such as algebra, matrix algebra and differential calculus; computer usage skills of word processing, data base, and spreadsheet programs; and written communication, showing a basic proficiency in written English. These requirements could be fulfilled through placement examination, satisfactory completion of one or more courses in these topics, or completion of a non-credit workshop.

2. Basic Core:
   In order to provide students with the background of the common body of knowledge in business and administration, study is required in areas of Accountancy, Economics, Finance, Business Information Systems, and Law is required. This requirement may be satisfied by waiver (in case of prior completion of appropriate undergraduate courses, the WMU MBA core courses, or the equivalent), by examination; or by taking BUS 601, Accounting Information Systems; BUS 602, Corporate Finance; BUS 603, Information Management; BUS 604, Legal, Regulatory and Political Aspects of Business; and PADM 601, Economic Analysis for Administrators (or the equivalent).

3. Integrated Core:
   The integrated core consists of BUS 610, Communication and Intercultural Aspects of Business; BUS 611, Accounting Management; BUS 612, Financial Management; BUS 613, Consumer-Driven Marketing Management; BUS 614, Operations and Technology Management; BUS 615, Global Aspects of Business; BUS 616, Social Responsibility and Ethics in Business; and BUS 617, Human Behavior in Organizations.

4. Free or Concentration Electives:
   Students seeking a general MBA have 12 free elective credit hours. A concentration may be formed by taking additional courses in an area beyond the integrated core.

Admission requirements
Applicants must submit scores for the Graduate Management Admission Test (GMAT) prior to consideration for admission to the 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 average is also required for all courses required for the MSB program.

Career and Technical Education
Advisor: Linda Dannison, Room 3018 Kohrman Hall

The Department of Family and Consumer Sciences offers the Master of Arts in Career and Technical Education. This thirty-hour degree program includes coursework that will strengthen student abilities to teach in career and technical education and to assist in developing and implementing new programs or curricula.

Admission requirements
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 as 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 three options: Option A—Interpersonal Communication, Option B—Organizational Communication, and Option C—Telecommunication. 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. The option in Telecommunication is designed for those students who wish to learn about the theory underlying the uses of telecommunications technologies, the practical applications of the technologies by organizations, and the operations of this expanded area of business. 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 educational 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.

**OPTION A—INTERPERSONAL COMMUNICATION**

The Master of Arts in Interpersonal Communication is intended 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.

**Option A—Interpersonal Communication**

**Required Courses** 9 hours

- **COM 601** Introduction to Graduate Study in Communication 3 hrs.
- **COM 602** Communication Research Methods 3 hrs.
- **COM 674** Theories of Interpersonal Communication 3 hrs.

**Interpersonal Electives** 12 hours

- **COM 650** Listening Interaction 3
- **COM 670** Seminar in Interpersonal Communication
  - A. Nonverbal Communication 3
  - B. Personality and Communication 3
  - C. Family Communication 3
  - D. Health Communication 3
  - E. Female/Male Interaction 3
  - F. Intercultural Communication 3
  - G. Intergroup Communication 3 (or any other approved COM 670 seminar)
- **COM 671** Cognition and Emotion 3
- **COM 672** Conflict Management 3
- **COM 680** Seminar in Organizational Communication
  - A. Organizational Communication Ethics 3
  - B. Communication and Organizational Culture 3
  - C. Advanced Organizational Communication 3
  - or any other approved COM 680 Seminar.
- **COM 681** Group Communication Processes 3 hrs.
- **COM 685** Special Topics in Organizational Communication
  - A. Communication Training and Development 3
  - B. Interviewing for Managers 3
  - C. Public Relations for Managers 3
  - D. Communication Assessment and Consulting 3
  - E. Communication Training and Evaluation Methods 3
  - F. Communication and Customer Services 3
  - or any other approved COM 685 Special Topics.

**Thesis Option Requirements** 9 hours

- An approved statistics course* 3
- **COM 700** Master’s Thesis 6

**Graduate Electives** 3-12 hours

Select electives to complete 33 hours (may include up to 6 cognate hours from other departments, selected in consultation with the 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 Organization 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 their 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 relations with other organizations.

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

**Option B—Organizational Communication**

**Required Courses** 9 hours

- **COM 601** Introduction to Graduate Study in Communication 3 hrs.
- **COM 602** Communication Research Methods 3
- **COM 682** Organizational Communication 3
- **COM 683** Organizational Electives: 12 hours
- **COM 673** Conflict Management 3
- **COM 680** Seminar in Organizational Communication
  - A. Organizational Communication Ethics 3
  - B. Communication and Organizational Culture 3
  - C. Advanced Organizational Communication 3
  - or any other approved COM 680 Seminar.
- **COM 681** Group Communication Processes 3 hrs.
- **COM 685** Special Topics in Organizational Communication
  - A. Communication Training and Development 3
  - B. Interviewing for Managers 3
  - C. Public Relations for Managers 3
  - D. Communication Assessment and Consulting 3
  - E. Communication Training and Evaluation Methods 3
  - F. Communication and Customer Services 3
  - or any other approved COM 685 Special Topics.

**Graduate Electives** 3-12 hours

Select electives to complete 33 hours (may include up to 6 cognate hours from other departments, selected in consultation with the 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 C—TELECOMMUNICATION**

Telecommunications is the process of communicating by means of electronic technologies, including radio, television, and audio teleconferencing, and the technologies used to create, store, and transmit messages to one another. As an area of academic study, telecommunications is the study of the use of these technologies by individuals and organizations.

Telecommunications encompasses a broad range of technologies that are becoming less distinct from one another. As telephone companies and cable companies begin to compete for business with each other and as computers become multi-media workstations capable of telephone, video, and data communication.

Telecommunications technologies now pervade all contexts of communication. Traditionally, these technologies were used for mass entertainment (television and radio) and for interpersonal point-to-point communication (telephone), but are now widely used by business, government, and education. All of these new uses of telecommunications technologies occur in the context of extensive government regulations, at both the national and international levels. People making use of these technologies, must, therefore, be knowledgeable of the regulatory context.

The option in telecommunications is intended for those students who wish to learn about the theory underlying the uses of these technologies, the practical applications of the technologies by organizations, and the operations of this expanding area of business.

A thesis is recommended for those considering further graduate work in communication. Elective credit may include course work in interpersonal or organizational communication.

**Option C—Telecommunication**

**Required Courses** 12 hours

- **COM 601** Introduction to Graduate Study in Telecommunication 3 hrs.
- **COM 602** Communication Research Methods 3
- **COM 641** Theories of Telecommunication Uses and Effects 3
- **COM 643** Telecommunications and Organizational Planning 3
- **COM 645** Telecommunication Electives 9 hours
- **COM 541** Telecommunications Law and Policy 3
- **COM 551** Methods of Media Analysis 3
- **COM 554** Communication Technology 3
- **COM 640** Seminar in Telecommunication
  - A. Leisure and Mass Entertainment 3
  - B. Electronic Media Programming 3
  - C. International Telecommunication Policy 3
  - D. Media and the Child 3
  - or any other approved COM 640 Seminar.
- **COM 644** News Media and the Organization 3 hrs.
Core courses: (required of all students)

Computer Science
Advisor: Alfred Boais
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, and EE 250 (or their equivalents). Applicants are urged to submit appropriate 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 600 and 531 (6 hours).
2. Additional approved electives chosen from CS 518, 520, 525, 526, 527, 520, 543, 554, 555, 561, 562, 563, 563, 569, 569, 603, 620, 625, 626, 627, 629, 631, 632, 633, 634, 643, 655, 660, 661, 672, 679, 680, 681, 682, 710, MATH 507, 607, 637, 640, and PHIL 520, for a program total of 32 hours.

Note: At least 15 hours of course work must be at the 600 level or higher. 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.

Requirements for the Master of Science in Computer Science are intended mainly for students whose background is in an engineering field or in mathematics, physics, chemistry, or biology. The degree must include calculus through differential equations, at least two semesters of calculus-based physics, and at least four credit hours of chemistry. Based on the candidate's background (experience and course work), the graduate committee may require the incoming student to take some undergraduate courses.

A grade point average of 3.0 or better (A=4.0) in the last two years of undergraduate work.

Admission requirements
1. An undergraduate degree in an engineering field or in mathematics, physics, chemistry, or biology. The degree must include calculus through differential equations, at least two semesters of calculus-based physics, and at least 40 hours of chemistry. Based on the candidate's background (experience and course work), the graduate committee may require the incoming student to take some undergraduate courses.

2. A grade point average of 3.0 or better (A=4.0) in the last two years of undergraduate work.

Admission requirements
1. An undergraduate degree in an engineering field or in mathematics, physics, chemistry, or biology. The degree must include calculus through differential equations, at least two semesters of calculus-based physics, and at least four credit hours of chemistry. Based on the candidate's background (experience and course work), the graduate committee may require the incoming student to take some undergraduate courses.

A grade point average of 3.0 or better (A=4.0) in the last two years of undergraduate work.

Program requirements
To graduate, students will be required to take thirty-two credit hours that must include the following:
1. At least eighteen credit hours should be taken from the list of core courses. These courses will be at the 600 level or higher. 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 teaching assistantships are provided for individuals working in the computer science curriculum. 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.
These master's programs are designed to prepare individuals for entry level positions in counseling, psychology, rehabilitation, and student affairs practice in a variety of educational and non-educational settings. All programs require a minimum of forty-eight semester hours of course work. The program of study for each of the options includes six, three semester hour, core courses. Curriculum guides for the program options are available from the Department. The department recognizes the importance of increasing the educational opportunities of minority students. Students, pursuing diversity of roles models in the fields of counseling, psychology, rehabilitation, and student affairs. 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 its commitment 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.

Students are expected to work with advisors in order to be informed of policies, course offerings, prerequisites, and applications required for designated courses. A student's performance and progress will be evaluated throughout the program. This process includes "check points," such as candidacy, assignment of a grade below "B" in any course, and final evaluation prior to graduation. The student is referred to the Department's Policy on Retention.

The Counseling Psychology option provides, beyond the departmental required core coursework, a focus on psychopathology, psychological assessment, counseling and psychotherapy theories and practices, and advanced practicum experiences. This option is selected by students seeking limited licensure as a psychologist in the State of Michigan. The Counseling in Community Agency option provides great flexibility in designing a course of studies to meet the interests and needs of the student. In addition to theory and practice courses, students must, with the approval of an advisor, select courses for a special area of concentration related to counseling. Selection may be made from, but not limited to, areas such as gerontology, criminal justice, alcohol and drug abuse, marriage and family, and holistic health care. This option leads to license as a professional counselor.

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

The Administration of College Student Affairs option focuses on college student development, philosophy of student affairs, legal and ethical issues, college populations and educational environment, communication skills, and administration of student affairs in higher education. The Counseling in Higher Education option accords college student development, individual and group counseling, ethics, testing, philosophy of student affairs, and student service delivery systems in higher education. This option leads to license as a professional counselor.

Admission to the Master of Arts or option in the Department is based upon grade point average, educational background, counseling and/or student affairs related experiences, as well as other factors. Prior to consideration by the M.A. Admissions Committee, applicants are required to complete a questionnaire indicating, among other things, the program option desired. Interviews, letters of recommendation, test scores, and other material may be required. Upon admission, each student is assigned an 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 also serves as the application for candidacy, be completed during the first semester or session of enrollment. Application deadlines are January 15 for Fall semester and August 1 for the Winter semester. Applications materials may be obtained from the Office of Admissions, Graduate.

The program is designed for two types of students: Public administrators and officials from developing countries who require additional training to meet new or increased responsibilities; recent graduates from developing and industrial countries, including the United States, who are interested in careers in development—whether with governments, non-government organizations, or international organizations.

The MDA program provides an understanding of development administration theory and practice, exposure to development strategies, and the skills to serve the practical needs of the MDA students are guided in their work by established and experienced members of the academic community, and the majority of whom have lived and worked in the developing countries. Many faculty also have had assignments with national and/or international organizations, or have worked with other governments on development projects.

Admission requirements

Applicants must satisfy the requirements for admission to The Graduate College in order to be considered for admission to this program. All applicants must possess undergraduate degrees, preferably in the social sciences with either a concentration in political science or...
The MDA is a professional degree that requires a minimum grade point average of 3.0 on a 4.0 scale). In all courses, students must maintain a minimum "B" average (GPA 3.0 on a 4.0 scale). Students are required to submit all applications by June 15 for the fall semester; by September 15 for the winter semester; and by February 15 for the spring session.

Program requirements
The MDA is a professional degree that requires forty-two semester hours of graduate courses. Up to six hours may be waived for those with extensive administration experience. To enter the MDA program, students must maintain a minimum "B" average (GPA 3.0 on a 4.0 scale) in all courses. Students normally complete the program in 20 months. The basic requirements are as follows:

1. Prerequisites (non-credit): The following courses or their equivalents: PSCI 330, Introduction to Public Administration; ECON 201 or 202, Principles of Economics.

2. Required Core Courses. Six courses (18 hours): PSCI 532, Administration in Developing Countries; PSCI 633, Political Economics; PADM 620, Applied Research Methods; PADM 624, Financial Decisionmaking; PADM 626, Statistical Applications in Administration; BIS 514, Institutional Accounting; or BIS 602, Computer Information Systems.

3. Tools or Skills. Three courses (9 hours). Choose either PSCI 632, Public Budgeting in Developing Countries or PADM 623, Principles of Budgeting, and two other courses: PSCI 691, Political Analysis I; PSCI 692, Political Analysis II; PSCI 696, Political Economy; PADM 622, Applied Research Methods; PADM 624, Financial Decisionmaking; PADM 626, Statistical Applications in Administration; BIS 514, Institutional Accounting; or BIS 602, Computer Information Systems.

4. International and Comparative Studies. One course (3 hours): PSCI 552 (with an appropriate topic; PSCI 553, United Nations; PSCI 555, International Law; PSCI 643, Subnational, National, and International Systems; PSCI 645, National Political Systems and International Politics; PSCI 647, Comparative Constitutionalism; or PSCI 650, Third World Problems.

5. Concentrations. Three courses within one of the following concentrations (nine hours). Most students take the Standard Concentration. Under special circumstances, a mix of courses appropriate to the needs of the student may be selected with the approval of the MDA Director.

A. The Standard Concentration. Leadership PSCI 644, Comparative Strategies of Development; PSCI 649, Sustainable Rural Development; PADM 625, Managing Environmental Development; PADM 626, Administrative Law and Governmental Regulation; PADM 630, Administrative Analysis and Strategies in Public Administration; PADM 635, Exercise of Power in Organizations; CCM 673, Conflict Management; CCM 683, Power and leadership in organizational communication; or EDL 632, Educational Leadership.


C. Health and Human Services: PADM 651, Health Services Environment; PADM 655, The Administration of Health Services; PADM 675, Program Evaluation; PADM 679, Seminar on Current Issues in Health Service Management; HHS 651, Problem Solving in Health and Human Service Organizations; SWRK 643, Leadership and Management in Human Services.


E. Public Policy Analysis: PSCI 605, Comparative Public Policy; PSCI 664, The Nature of Political Inquiry and Analysis; PSCI 691, Political Analysis I; PSCI 692, Political Analysis II; PADM 601, Economic Analysis for Administrators; PADM 621, Program Planning and Proposal Writing; ECON 558/658 Economic Development; or ECON 668, Applied Economics for Management.

6. Approved Elective (3 hours). With the approval of the MDA Director, choose one course from the above.

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. Courses for the program will be drawn from geology, geography, biology, anthropology, economics, political science, communication, chemistry, physics, agriculture, and others.

Program requirements
1. A minimum of thirty-five hours is required for the degree with a major's thesis or thirty hours with a thesis.

2. A core of eighteen semester hours in geology is required, including GEOL 539 or (equivalent).

3. Students may include satisfactory completion of four hours of GEOG 610 (Field Research) or three hours of GEOG 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.

5. 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.

Economics
Advisor: Paul Thielle
Room 5047, 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 MA 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 the 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 the graduate advisor. The required classes are: Economic Statistics, 622; Mathematics for Economists, 504; Introduction to Econometrics, 619; Applied Economics for Management, 600; Applied Economics, 602; Advanced Price Theory, 603; National Income Analysis, 662; Professional Field Experience, 712. In special cases, courses may be waived and others substituted.

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 stronger theoretical/research orientation leading to research-oriented business or government jobs. The degree is awarded on the basis of 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 the graduate advisor. The required classes are: Economic Statistics, 622; Mathematics for Economists, 504; 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, 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 reservation and be required to complete satisfactory 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.
3. ECON 622, Economic Statistics; ECON 504, Mathematics for Economists; ECON 619, Introduction to Econometrics; ECON 603, Advanced Price Theory; and ECON 662, National Income Analysis, are required.
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.
3. ECON 622, Economic Statistics; ECON 504, Mathematics for Economists; ECON 619, Introduction to Econometrics; ECON 603, Advanced Price Theory; ECON 662, National Income Analysis; and ECON 712, Field Experience, are required.
4. Pass comprehensive examination.

Education And Professional Development
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 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 (ED 601), Reading (ED 604).

Applicants with grade point averages below 3.0 may be probated into one of the programs if the graduate advisor determines that they possess an unusually strong academic background or they have demonstrated strong academic potential in one or more areas.

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), to be taken in sequence with 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.

Note: The State of Michigan has adopted new standards for obtaining the Early Childhood Specialist Endorsement. The Early Childhood MA program which leads to this endorsement is currently undergoing revision to ensure compliance with new state standards. Thus, requirements additional to those listed above may be applicable for students admitted to the program beginning in fall 1995. Students must consult with assigned advisors to determine specific program requirements.

Reading
Advisors: Jim Burns, Joe Chapel, Ron Crowell, Janet Dynak, Paul Wilson

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

Elementary—designed to assist the elementary classroom teacher to improve reading instruction for the classroom or to serve as an elementary school reading teacher.

Secondary—designed for secondary teachers 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 634, Psychological Foundations of Education

2. The Reading Concentration—Twenty-one hours
   Twenty-one hours in reading, fifteen to eighteen of which must be appropriate courses that are taken in an advisor-approved concentration: elementary, secondary, or special services. Six to ten hours may be selected from the various required electives. All courses must be approved by the candidate's program advisor.
Teaching In The Elementary School

Advisors:
DeWayne Anderson, David Dynak, Paul Farber, Richard Harring, 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 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 502, 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:
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 (6 hrs.), teaching practice (9 hrs.), subject matter concentration (9 hrs.), and a culminating middle grades seminar and project (6 hrs.).

Educational Leadership

Advisors:
Mary Anne Bunda, Chair, Zoe Bailey, David J. Cowden, James Sanders, Catherine Silke, Uldic Smidchens, 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 government, education, and other institutions. The master's degree in Educational Leadership offers several areas of concentration, in addition to the general degree: 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 (with course substitutions allowed for Directors of Special Education), and school district superintendents. At Western Michigan University the term concentration is a formal designation obtained through the curriculum review process. Transcripts and degrees, when granted, carry the formal designation of any concentration which has been adopted and approved.

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 the Admissions process 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 who find specialization 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 661, School Law; EDLD 662, School Business Management; 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 skill set will be chosen with the advisor's approval. Contact the Teacher Certification Officer at Western Michigan University for complete 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 655, Elementary Administrator or EDLD 675, Secondary Administrator; 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 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 652, Educational Leadership; EDLD 640, Introduction to Research; EDLD 661, School Law; EDLD 662, School Business Management; EDLD 663, Personnel Administration; EDLD 664, Curriculum Development; EDLD 672, School Finance, and EDLD 682, Applications in Administration. In addition 9 credit hours are selected, with advisor approval, that add to the personal skills and strengths of the student. Contact the Teacher Certification Officer at Western Michigan University for complete information on compliance for certification for the State of Michigan as a chief school business official.

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

Electrical Engineering
Graduate Program Coordinator:
S. Hosein Mousavinezhad,
Room 308B Knoaman Hall

The Department of Electrical and Computer Engineering offers graduate programs leading to a Master of Science in Engineering (Electrical) or a Master of Science in Engineering (Computer). These programs are designed to prepare students for advanced-level graduate study in electrical and computer engineering or professional practice. They provide opportunities for engineering graduates to enhance their background in engineering science analysis and design. Courses are offered in the areas of computer engineering, control systems and signal processing, real-time embedded systems, electromagnetics, and power electronics.

Admission requirements
Applicants must:
1. Satisfy the general admission requirements of The Graduate College.
2. Possess a Bachelor of Science in Electrical Engineering or Computer Engineering from
3. Have a grade point average of 3.0 or better
4. Submit results of the GRE General Test.

Program requirements – Electrical Engineering

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 Department.
2. Six (6) hours of additional graduate courses approved by the Department from the following disciplines: electrical, computer, industrial, or mechanical engineering; mathematics; computer science, or physics.

Thesis option requirements:
1. Six (6) hours of ECE 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 must consist of courses at the 600-level or higher.

A student's Graduate Student Permanent Program Form must be approved by the Department and the graduate dean.

Program requirements – Computer Engineering

The program consists of thirty-three hours, of which six hours may be taken as a thesis (ECE 700). Course requirements:
1. Twenty-three hours of required computer engineering courses.
2. A minimum of two hours of ECE 690, with a maximum of four hours allowed.
3. The remaining elective hours of additional graduate courses approved by the Department from the following disciplines: computer, electrical, other engineering disciplines, computer science, mathematics, or physics OR
4. A student may elect ECE 700 (Master's thesis, 6 hours) and an approved elective course at the graduate level.

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 and the graduate dean.

English
Graduate Advisor: Seamus Cooney
Room 618, Sprau Tower

Master of Arts In English

The Master of Arts in English provides advanced study in literature, 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 at least 3.0 and a sample of critical writing about literature.

Applicants must take the Graduate Record Examinations, both the General Test and the Subject Test in Literature in English, and forward their scores to the Department of English. 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.

Applicants lacking an undergraduate major but who have at least 20 hours of work in English with a substantial number of courses in literature and who are otherwise judged eligible may be granted admission to the program on condition that they remedy perceived deficiencies by taking some undergraduate courses as prerequisites. Admission, students should consult with the advisor at the earliest opportunity concerning their program 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 691 Scholarship and Writing in the Profession. The additional courses needed to complete a coherent thirty-three hour program are selected in consultation with the graduate director.

For more detailed information and for an application form, write to the department's pages on the World Wide Web at the following URL: http://www.wmich.edu/english.

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 hours degree program designed to meet the increasing demand for people with liberal arts education and a particular skill in writing non-fiction prose.

A student desiring to enter the program should present a thirty-hour undergraduate major with a grade-point average of at least 3.0 and a sample of critical writing about literature.

Applicants lacking an undergraduate major but who have at least 20 hours of work in English with a substantial number of courses in literature and who are otherwise judged eligible may be granted admission to the program on condition that they remedy perceived deficiencies by taking some undergraduate courses as prerequisites. Applicants must take the Graduate Record Examinations, both the General Test and the Subject Test in Literature in English, and forward their scores to the Department of English. On admission, students should consult with the advisor at the earliest opportunity concerning their program of study.

Required courses in the program are (a) two courses chosen from ENGL 615 Literary Criticism, ENGL 630 Research and Writing, and ENGL 640 The Nature of Poetry; (b) two courses in English pedagogy, including the pedagogy of writing; (c) one course in the study of multicultural literature; (d) one course in the English language; and (e) ENGL 691 Research and Scholarship in English Education. Of the additional graduate level courses needed to complete the thirty-three hours, at least nine hours must be in literature (exclusive of ENGL 562 Introduction to English Literature).

For more detailed information and for an application form, write to the department's graduate director or see the department's pages on the World Wide Web at the following URL: http://www.wmich.edu/english.

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 minimal academic qualification appropriate for those who wish to teach the craft of writing at the college or university level.

A student desiring to enter the program should present a thirty-hour undergraduate major with a grade-point average of at least 3.0 and samples both of writing in the genre in which he or she expects to specialize and of critical writing about literature. Applicants must take the Graduate Record Examinations, both the General Test and the Subject Test in Literature in English, and forward their scores to the Department of English. 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.

Applicants lacking an undergraduate major but who have at least 20 hours of work in English with a substantial number of courses in literature and who are otherwise judged eligible may be granted admission to the program on condition that they remedy deficiencies in preparation by taking some undergraduate courses as prerequisites.

Required courses in the program are: (a) 12-18 hours in writing workshops; (b) ENGL 640 The Nature of Poetry; (c) either ENGL 642 Studies in Drama or ENGL 644 Studies in the Novel; (d) two courses in modern literature; (e) ENGL 699 MFA Project. Another course in English and cognate fields will bring the total to 48 hours.

On admission, students should consult with the advisor concerning their program of study. For more detailed information and for an application form, write to the department's graduate director or see the department's pages on the World Wide Web at the following URL: http://www.wmich.edu/english.

Family and Consumer Sciences

Advisor: Linda Dannison
Department of Family and Consumer Sciences
Room 3018, Kohrman Hall

Master Of Arts In Family and Consumer Sciences

The graduate program in Family and Consumer Sciences, offered through the Department of Family and Consumer Sciences, is designed to provide a comprehensive program of studies in Family and Consumer Sciences or an in depth program of studies for the person desiring to strengthen education in limited areas.

The Master of Arts in Family and Consumer Sciences 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 FCS 710, Independent Research.

2. Complete a total of twenty hours in Family and Consumer Sciences 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.

Foreign Languages and Literatures

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 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 coursework 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.

Geography

Advisors: Eldor C. Quandt, Room 348, Hoekje Hall
Chenasheng He Room 345, Hoekje Hall

Master of Arts In Geography

The goals of the geography master's program are: 1) to assist students in acquiring the skills and knowledge necessary for providing instruction to their students. The 34-hour Master of Arts in 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

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

1. Completion of GEOG 460, Concepts and Strategies in the Teaching of Geography, or an approved equivalent with a grade of "B" or better.
34 MASTER'S DEGREE PROGRAMS AND REQUIREMENTS

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 History 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 an English-proctored Graduate Record Examination (GRE) general aptitude test scores.
4. Three letters of recommendation. A brief essay concerning the applicant’s academic and professional objectives. 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 study in history, or other subsequent graduate study, and/or careers in research. Requirements:
1. Core: HIST 510, 600, 601.
2. A broad field of specialization built around readings courses and research seminars. At least two readings courses (HIST 605-620) are required and additional course work in this area is strongly recommended. At least one research seminar (HIST 670, 675-688) is required. Specific research emphases are developed in consultation with the Graduate Advisor and department faculty. Consult the department's Graduate Handbook for further information.
3. At least two courses (including one at the 600-level) in history, or other reading course work may be chosen outside the department. In most cases, the department requires at least one course covering theory and/or research practices in an allied social science or humanities discipline.
4. Thesis: a major research investigation in the field of specialization. Candidates with an advanced record of research and/or publication may substitute a second research seminar (HIST 670, 675-688) with the prior approval of the Graduate Advisor.
5. Comprehensive examination: a field-based written and oral examination following completion of at least 24 hours of course work including required core courses and a research seminar. Evaluation includes a recommendation concerning admission to doctoral study.

Industrial and Manufacturing Engineering
Coordinator, Graduate Programs Michael Atkins, 2057 Kohrman Hall
Paul Engelman, 2002 Kohrman Hall
Azim Houshyar, 2070D Kohrman Hall
David Lyth, 2016 Kohrman Hall
Richard Munsterman, 2043 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; and
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 30 hours of graduate work distributed as follows: 18 hours of core requirements, 6 hours of IME 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.
   c. A 3.0 overall grade point average will be required for all graduate courses on the student's permanent program.

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 and Manufacturing Engineering IME 697, with a written report and presentation, or an approved 600-level IME 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 6 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:
- IME 507 Computer Integrated Manufacturing
- IME 516 Design of Industrial Experiments
- IME 604 Facilities Planning and Design
- IME 606 Capital Budgeting and Cost Analysis
- IME 611 Operations Research for Engineers
- IME 612 Productivity and Operations Management
- IME 630 Advanced Simulation Modeling and Analysis
- IME 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 and Manufacturing Engineering or elsewhere in the University unless restricted by program requirements. The elected courses must be compatable 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, 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 student's 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 companies 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 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 (Graduate Record Examination) 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: sixteen hours of core courses, nine hours of electives, and six hours of thesis.
1. Core courses (16 hours): IME 546, 550 or 654, 558, 681, IME 508 or MATH 565, and IME 683.
2. Elective courses (9 hours) are chosen in consultation with the academic program advisor.

Master of Science in Operations Research
Advisors:
- Frank Wolf, 2017 Kohrman Hall
- Azim Houshyar, 2070D 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 and Manufacturing Engineering, Management, and Mathematics and Statistics. The responsibility for administering the program is with the Department of Industrial and Manufacturing Engineering.

The objective of the program leading to the Master of Science in Operations Research is to provide the student who has an undergraduate degree in one of the involved disciplines with a basic knowledge of the philosophy and techniques of operations research. The student's program will be based on his or her undergraduate preparation, work experience, and occupational goals.
Admission requirements
1. Possess a baccalaureate degree in economics, industrial engineering, management, or mathematics. Students with degrees in other areas will also be considered.
2. Where the student's background is found deficient, prerequisite courses will be required.

Program requirements
1. Complete a minimum of 30 hours of graduate work distributed as follows:
   a. Seven hours of Mathematics: MATH 560, Applied Probability
      MATH 562, Statistical Analysis I.
   b. Twelve hours of operations research related courses selected from an approved list.
   c. Eight hours of courses cognate to the student's undergraduate degree.
   d. Three hours of a project-oriented course developed around a significant topic resulting from graduate study interest. It includes a written report and an oral presentation.
   e. A 3.0 overall grade point average will be required for all graduate courses on the student's permanent program.

Mathematics
Chairman, Graduate Committee
John Martino
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: John Martino, Thomas Richardson
Room 3319, Everett Tower
The Master of Arts in mathematics extends the student's knowledge in the 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 additional 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 select 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 522, 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 571, 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.

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

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

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

Master Of Arts In Mathematics Education
Advisors: Christian Hirsch, Robert Laing
Room 3319, Everett Tower
The Master of Arts in Mathematics Education provides secondary school mathematics teachers with opportunities to prepare themselves for superior classroom performance by developing a broader and deeper understanding of mathematics, mathematics education, and the impact of computer technology on school curricula and instruction.

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

Program requirements
1. Complete at least fifteen approved semester hours in graduate level mathematics courses, usually selected from:
   MATH 530 Linear Algebra
   MATH 580 Number Theory
   MATH 611 Mathematical Applications
   MATH 615 Intermediate Analysis
   MATH 616 Survey of Algebra
   MATH 649 Studies in Geometry
   MATH 619 Computer Methods in Secondary Mathematics
   MATH 653 Studies in Teaching Secondary Mathematics
   MATH 654 Curricular Studies in Secondary Mathematics
   MATH 695 Seminar in Mathematics Education
2. Complete six semester hours of approved electives, usually selected from:
   CS 503 Programming the Microcomputer for Teachers
   CS 504 Advanced Microcomputer Programming for Teachers
   ED 600 Fundamentals of Measurement and Evaluation in Education
   ED 601 Fundamentals of Educational Research
   ED 602 School Curriculum
   ED 604 Psychological Foundations of Education

In meeting these program requirements an effort is made to select courses that deal with central themes in secondary school mathematics programs. These themes are given substance in courses that deal with topics and problems that students would also be prepared to teach in the area of mathematical applications.

Master of Science In Applied Mathematics
Advisors: Dennis Pence, Jay Treiman
Room 3319, Everett Tower
The Master of Science in Applied Mathematics emphasizes a broad-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 courses at WMU which satisfy the admission requirements are: MATH 122, 123, 272, 276, or 274; MATH 111, 112, 201 or 306, 570, and CS 111, 112, (201 or 306), 506. A promising student may be admitted with some deficiencies in these admission requirements. The missing work would then become an extra program requirement.
Program requirements
1. Complete the following 23 semester hours of specified courses: MATH 507 Numerical Analysis I MATH 510 Applied Matrix Algebra MATH 562 Statistical Analysis I MATH 570 Advanced Calculus MATH 571 Real Analysis MATH 587 Theory of Computer Graphics MATH 605 Optimization (MATH 607 Numerical Analysis II OR MATH 637 Numerical Linear Algebra) MATH 654 Complex Variables Seminar (1 hr.) MATH 660 Applied Mathematics Seminar (1 hr.) MATH 662 Applied Linear Models MATH 690 Applied Mathematics Seminar (1 hr.) MATH 699 /712 Reading and Research/Field Experience

2. Complete at least 6 semester hours of approved electives which are different from the above selected courses. These 6 hours are to be selected from the following courses.

Mathematics
MATH 566 Nonparametric Statistical Methods
MATH 572 Vector Calculus Complex Variables
MATH 605 Optimization (MATH 607 Numerical Analysis II OR MATH 637 Numerical Linear Algebra)
MATH 660 Applied Mathematics Seminar (1 hr.) MATH 699 /712 Reading and Research/Field Experience

Computer Science

Electrical Engineering
EE 530 Power System Analysis

Industrial Engineering
IE 611 Operations Research for Engineers

Management
MGMT 664 Simulation

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

*These courses may be repeated for credit.

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

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

Master of Science In Computational Mathematics

Advisors:
Cliff Ealy, Dennis Pence, John Petro, Jay Treiman
Room 3119, Everett Tower

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

Admission requirements
In addition to the general requirements of The Graduate College, the entering student will be expected to have two years of calculus, including multivariate calculus and differential equations, courses in linear algebra, modern algebra, probability, advanced calculus, numerical analysis, a knowledge of the programming languages FORTRAN and Pascal, and a course in data structures. The courses at W&M which satisfy the admission requirements are: MATH 122, 123, 272, 230 (234 and 274) or 374, 330, (362 or 560), 570, 507, and CS 111, (201 or 306), 112, (alternately CS 331 recommended). A promising student may be admitted with some deficiencies in these admission requirements. The missing work would then become an extra program requirement.

Program requirements
1. Complete the following 23 semester hours of specified courses:
   MATH 510 Applied Matrix Algebra
   MATH 530 Linear Algebra
   MATH 562 Statistical Analysis I
   MATH 602 Mathematical Modeling
   MATH 605 Optimization
   MATH 654 Complex Variables Seminar (1 hr.)

2. Complete at least 9 semester hours from the following:
   Mathematics
   MATH 602 Mathematical Modeling
   MATH 608 Linear Programming
   *MATH 690 Applied Mathematics Seminar (1 hr.)

3. Pass written examinations over the program or successfully complete an approved project on an applied problem.
of Engineering and Applied Sciences, or in mathematics and the physical sciences.

**Medieval Studies**

**Advisors:**

Paul E. Szarmach, 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-Ph.D. option)

1. A total of at least 30 hours of course work, including 12 hours of required core courses, and 18 hours of electives, the latter to be chosen from the list of approved courses.
2. Preparation of an acceptable Master's Thesis (6 hours) under the direction of a thesis advisory committee.
3. Demonstrated reading proficiency in Latin, and in either French, German, Italian, or Spanish.

**Option II** (terminal degree option)

1. A total of at least 36 hours of course work, including 12 hours of required core courses and 24 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 Willson, 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 sixty (60) semester hours of acceptable work in music, is required for admission 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 prior to 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 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 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 limitations 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.

1. 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.
2. Special information: Regular and frequent experiences in conducting are a requirement in this program. These experiences will include conducting an approved public school ensemble (at the student's own school) or an apprenticeship with a major University ensemble. Students who are selected as apprentices with a University ensemble must be full-time graduate students and participate in a major ensemble while in residence. Conducting 600 students not in residence must schedule frequent meetings on campus with the supervising teacher in addition to the site visits by the instructor. The Graduate Recital (690) requires presentation of a complete public program, either with an approved school ensemble or with an ensemble of University students. At the direction of the student's committee, piano study may be required in the program of study.

**MUSIC EDUCATION** (Minimum of 30 hrs.)

**Special Admission Requirements**

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

**Entrance Requirements**

Preliminary Examinations in theory and history/literature.

1. Required courses: MUS 610, Introduction to Research in Music (3); MUS 642, Philosophy of Music Education (2); MUS 650, Seminar in Music Education (2). Cullinating option (choose one of a, b, or c).
2. MUS 691, Special Project in Music (2) or MUS 681, Research in Musical Behavior (2) or MUS 700, Master's Thesis (6) or c) eight (8) hours of pre-approved graduate courses, including written comprehensive exam.
3. Electives in music education (5-8).
4. Cognate music studies: applied music, composition, theory, history/literature, jazz studies (9-12).
5. 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..."
Examinations plus that derived from the audition, transcripts, and initial interviews will be used to determine the program of study. This undergraduate credit, however, will not take Preliminary Examinations in theory, piano. Information derived from these examinations will not 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 student’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 teacher education program 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 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 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 interests and goals. Admission requirements are determined by the student’s success in the Preliminary Examinations and a review of the first 6-10 semester hours of course work taken. After this examination is completed, the student advisor will provide 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 of Education (2); MUS 681, Psychological Foundations of Education (3).

2. Eleven hours of Music Education courses: MUS 610, Introduction to Research in Music (3); MUS 642, Philosophy of Music Education (2); MUS 650, Seminar in Music Education (2); Elective in Music Education (2); Cummilating option (choose a or b at MUS 681, 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

Advisor: Sippola Mays
Room 448, Hokee Hall

The Occupational Therapy Department offers graduate professional program (entry level) for non-therapists with a baccalaureate 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 clinical 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 in professional undergraduate courses and thirty semester hours of graduate courses. The program is accredited by the American Council for Occupational Therapy Education. A.O.T.A. Accreditation Department, 4720 Montgomery Lane, P.O. Box 31220, Bethesda, MD 20824-1220, 301-652-2682. 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.
end of the winter semester for which they enrolled. If the faculty of record allows the grad of "Incomplete" to be given (under Graduate College policy for such), then the following department policy for the removal of that incomplete will be enforced.

To assure that graduate students have completed all course work prior to making application for the AOTCB Certification Examination, the following policy has been approved by the Graduate Advisory Committee for the removal of an "Incomplete" held in OT 700 or OT 710:

1. All graduate students must complete all department and Graduate College requirements for OT 700, Thesis or OT 710, Independent Research by October 1 for the March exam and by April 1 for the September exam.
2. Completion of all requirements for OT 710 is defined as having received signatures of completion by all readers and the submission of a grade or change of grade from signed by the first reader.
3. Completion of all requirements for OT 700 is defined as having received signatures of completion by all committee members, submission of a grade or change of grade by the first reader, and notification of acceptance of the thesis from the Graduate College.
4. Graduate students who do not complete the requirements given above by the due dates will have their names removed from the department list of students eligible for the AOTCB Certification Exam.

Cognates in occupational therapy or related fields selected with advice and consent of the graduate coordinator...6 hours
Electives..................3 hours

This 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 graduate grade point average. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by 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.

This 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 graduate grade point average. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by 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.

2. The student must maintain 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, pathology, dysfunction and activity analysis. Students also learn the history of the profession and current practice roles of therapists. The second semester students learn theory and techniques for evaluation and treatment. The third semester centers on additional treatment techniques used in therapy, and a clinical treatment experience with clients. The fourth semester of the professional program consists of a clinical treatment experience with clients in clinical programs in the Kalamazoo area and a graduate research course to develop research and writing skills as applied to occupational therapy.

The final fall and winter semesters are devoted fully to the graduate component designed to enhance growth in professional leadership. Students enroll in OT 490 and OT 491 for the required six months, full-time fieldwork experience as a student therapist in two clinical practice sites (one being a medical model site and one being a community model site). Western Michigan University utilizes fieldwork sites primarily in Michigan and the midwest states with some sites throughout the United States. All fieldwork must be completed within 24 months following the completion of academic coursework.

Remediation and Continuance Policy

1. Students will complete all required departmental courses and prerequisites with a grade of "C" or better. Subsequent courses cannot be taken until prerequisites are completed successfully.
2. Students can repeat only one required pre-professional or departmental course, and that course only once to attain a grade of "C" or better.
3. Students who fail to attain a grade of "C" or better in a professional or pre-professional course will be placed on departmental probation following the grade lower than "C".
4. Students who do not successfully complete departmental probation will not be permitted to continue in the program.
5. The department may refuse to permit a student to continue in the curriculum if at any time it is deemed by a review committee that the student will not be able to perform at a professional level.

Fieldwork Remediation and Continuance Policy

1. Successful completion of OT 443 is a prerequisite for OT 453.
2. Students who receive a failing grade in fieldwork level I (OT 443, OT 453) or level II (OT 490, OT 491) are subject to the academic policy for remediation and continuance, and will repeat the experience in a similar setting.
3. Successful completion of OT 453 and all professional and pre-professional coursework is required for OT 490.

The Graduate Post Professional Program

(Master of Science — Advanced Level)

This graduate program for the certified occupational therapist is designed to enhance growth in professional leadership potential by developing skills in administration, program development, theories and practice, professional issue identification and resolution, and research.

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 and Graduate Record Examination scores.

Program Requirements

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

Occupational Therapy (21 hours):
OT 510 Professional Issues..................3
OT 633 Administration......................3
OT 640 Theory in Occupational Therapy..................3
OT 660 Research in Occupational Therapy.................3
OT 700 Thesis or OT 710 Independent Research.........6

It is expected that students will complete their 710/700 projects by the end of the winter semester for which they enrolled.

If the faculty of record allows the grad of "Incomplete" to be given (under Graduate College policy for such), then the following department policy for the removal of that incomplete will be enforced.

To assure that graduate students have completed all course work prior to making application for the AOTCB Certification Examination, the following policy has been approved by the Graduate Advisory Committee for the removal of an "Incomplete" held in OT 700 or OT 710.

Committee for the removal of an "Incomplete" held in OT 700 or OT 710.
Admission requirements

Applicants with widely diversified science and engineering backgrounds may qualify for admission based upon demonstrated competence at the baccalaureate college or university degree program.

In all cases the applicant's academic credentials and professional experience will be reviewed by the graduate advisor to determine whether any background courses are necessary. These may be taken concurrently with the graduate courses.

Applicants are requested to submit results of the Graduate Record Examination as a supplemental credential for admission. The following gives the general guidelines of prerequisites for four classes of applicants:

1. Graduates from four-year pulp and paper science programs will generally have the necessary prerequisites in Paper Science but may require one or two background courses in Process Engineering, Mathematics, or Chemistry.

2. Chemical Engineering graduates will generally satisfy the Science, Engineering, and Mathematics requirements but will be required to take two Pulp and Paper systems graduate level courses (PAPR 690 and PAPR 696) within the normal graduate program.

3. Chemistry degree graduates will generally be required to complete two background undergraduate courses in Process Engineering and two Pulp and Paper systems graduate courses (PAPR 690 and PAPR 696) within the normal graduate program.

4. Graduates of other science, engineering, or technology programs may be required to take background undergraduate courses in Process Engineering, Mathematics, Chemistry, or Physics, depending on the particular credentials of the applicant. Also, two graduate courses in Pulp and Paper systems (PAPR 690 and PAPR 696) will be required within the normal graduate program.

If the graduates mentioned in paragraphs 2-4 (above) don't have any pulp and paper experience, they are to take three basic undergraduate courses in pulp and paper processes (PAPR 100 or 354, PAPR 203 and 204). In some instances, it may be recommended that the applicant register for one or more quarters of undergraduate course work in order to satisfy particular academic areas prior to applying for graduate admission. Such prerequisite courses are to be passed with a grade of "B" or better to meet the requirements. All such prerequisite courses should be completed prior to enrolling for more than 9 graduate course credits.

Program requirements

1. A minimum of fifteen (maximum of eighteen) hours of Paper Science selected from those twenty-seven or more hours of offerings subject to the stipulations set above. Surface and Colloid Chemistry 600; Paper, Printing, and Ink 620; Coating Rheology 640; Mechanics and Optics of Paper and Fibers 660; High Polymer Topics 680; Pulp and Paper Operations 690; Grad Topics in Paper/Printing 695; Paper Industry Control Systems 696; and Pulping and Bleaching 698.

2. A minimum of six (maximum of nine) additional hours of graduate courses from Chemistry, Computer Science, Physics, Mathematics, Electrical Engineering, Industrial Engineering, or Mechanical Engineering, or Business Information Systems, selected with the consent of the graduate advisor. Approved courses include: Chemistry 520, 530, 550, 560, 570, 624, 626, 653, 651, 663; Computer Science 506, 625, 631; Physics 520, 563; Mathematics 506, 507, 510, 561, 562, 565, 567, 568; Electrical Engineering 501, 605; Industrial Engineering 508, 604, 606, 608, 610, 611; Mechanical Engineering 531, 560, 573; Business Information Systems 602. Other courses may be accepted after approval by the advisor.

3. Satisfactory completion of a Master's Thesis (6 hrs.) based on either an experimental or theoretical topic, under the guidance of a Thesis Committee using procedures established by the Department and The Graduate College.

Philosophy

Advisor: Sylvia Culp
321 Moore Hall
Arthur Falk
311 Moore Hall

The Master of Arts in Philosophy offers advanced study in the main subject areas and historical periods of philosophy.

Admission requirements

In addition to satisfying the admission requirements of The Graduate College, applicants are expected:

1. to have completed a minimum of twelve semester hours of undergraduate work in philosophy, including
2. a course in the history of modern philosophy, and
3. a course in symbolic logic, and
4. to have achieved a 3.0 or above overall grade point average in the applicant's undergraduate philosophy courses.

Applicants who do not meet the above requirements should contact the director of graduate studies in the Department of Philosophy for additional information.

Program requirements

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

Non-thesis option: The student must complete a minimum of 28 hours of courses 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.

Thesis option: The student must complete a minimum of 28 hours of coursework in philosophy which may include up to 4 hours of coursework in other departments, if the Department of Philosophy approves). The student then elects to write a thesis, if the Department consents, by registering for PHIL 700, Master's Thesis (6 hrs.).
Physical Education

Advisors:
Robert L. Basley
Room 4024-S Student Recreation Center

Debra S. Berkey
Room 4021 Student Recreation Center

Judy Breed
Room 4024-7 Student Recreation Center

Billye Ann Cheatum
Room 4024-16 Student Recreation Center

Ray Cool
Room 4024-19 Student Recreation Center

Mary Dawson
Room 4024-8 Student Recreation Center

Marianne Frazendt
Room 4024-6 Student Recreation Center

Patricia Frye
Room 4024-10 Student Recreation Center

William C. Gross
Room 4024-4 Student Recreation Center

Ruth Ann Meyer
Room 4024-22 Student Recreation Center

Robert Moss
Room 4024-8 Student Recreation Center

Roger Zabik
Room 4021 Student Recreation Center

The Department of Health, Physical Education, and Recreation offers a Master of Arts degree program which prepares teachers, coaches, supervisors, and administrators to assume leadership roles in the following:

1. Administration
2. Sports Studies
3. Exercise Science
4. Pedagogy
5. Athletic Training
6. Special Physical Education

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

Program requirements
Each graduate student is expected to show competence 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 695, or an equivalent combination of courses
2. One course from PEGR 645, or PEGR 691
3. The Master of Arts degree in the Department of Health, Physical Education, and Recreation requires the successful completion of a minimum of thirty graduate credit hours beyond the bachelor's degree in one or more of the following areas:
   a. Research
   b. Socio-cultural foundations
   c. Psychological foundations

Master's degree candidates are required to complete a comprehensive, integrated research experience which can be met through (1) PEGR 700, Thesis, (2) PEGR 710, Independent Research, or (3) PEGR 712, Professional Field Experience. Graduate students in this area who seek certification must meet the National Athletic Trainers' Association standards.

Physician Assistant

Advisor:
William Fenn
Room 2223, Everett Tower

The Physician Assistant Department offers a professional entry-level program leading to the Master of Science degree in Medicine. This program is solely offered as a full-time, professional education curriculum, accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP).

Program requirements
The graduate professional program consists of 86 semester hours taken in prescribed sequence over a continuous 24-month time period. The first year consists of 45 hours of primarily classroom education, while the second year consists of 41 hours of primarily classroom education, while the second year consists of 41 hours of primarily clinical placement education. Each student must complete all course offerings (listed elsewhere) and satisfy department professional standards criteria to meet graduation requirements.

Physics

Advisor:
Gerald Hardie
Room 2223, Everett Tower

The Department of Physics offers a graduate program leading to the Master of Arts in Physics. The objective of the program is to enable students to acquire the knowledge and technical skills needed in physics-related occupations and in graduate study at the doctoral level. The first 36 graduate credit hours 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 areas:

1. Theoretical physics—for example, classical liquids, atomic physics, 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 associated microprocessor-based computers.
4. Or any combination of these, or some interdisciplinarian areas.

Admission requirements
To be eligible for admission to the master's degree program in Physics, a prospective student must present evidence of the following:

1. Earned a bachelor's degree from an accredited institution, with a grade point average of 3.0 or better in the most recent 60 hours.
2. Completion of four undergraduate behavioral science courses, which must include developmental psychology.
3. Completion of one course in biochemistry (for science majors).
4. Completion of one course in microbiology (for science majors).
5. Completion of one course in human anatomy (for science majors).
6. Completion of one course in human physiology (upper division).
7. Completion of 1,000 hours of patient contact hours acceptable to the department.
8. The competitive nature of this program, the above should be viewed as minimum standards.

Admission Procedures
To apply, the prospective student must complete both the University's Application for Admission and the department application package. Applications must be completed and received not later than December 31 of each year for the full-time class beginning the following fall. Selected candidates will be invited for a personal interview. Admissions decisions will be based on weighted scoring of academic history, healthcare experience, and information gleaned from essays, letters of recommendation, and interviews, and will be limited by available space.

Program Requirements
The graduate professional program consists of 86 semester hours taken in prescribed sequence over a continuous 24-month time period. The first year consists of 45 hours of primarily classroom education, while the second year consists of 41 hours of primarily classroom education, while the second year consists of 41 hours of primarily clinical placement education. Each student must complete all course offerings (listed elsewhere) and satisfy department professional standards criteria to meet graduation requirements.

Political Science

Graduate Director:
Alan C. Isaac
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 for various career goals: (1) positions in the public service and quasipublic agencies; (2) further professional training in Political Science and related professions; (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 or other relevant fields and have achieved a 3.0 grade point average. Graduate Record Examinations for the quantitative, verbal and analytical parts are required for all students. Additional materials to be submitted include a brief essay about the student's academic and professional objectives and three recommendations (on WMU Graduate Reference Forms). The department may require the student to make up deficiencies in undergraduate preparation.

Program requirements
In order to qualify for the Master of Arts in Political Science, the student, in addition to satisfying the general requirements of The Graduate College, may choose between the thesis and non-thesis options. Requirements in the two options may not be interchanged.

Requirements for the thesis option
1. Thirty hours of graduate credit in Political Science. This is the graduate advisor, a student may substitute up to two courses with a maximum of eight hours of cognate work appropriate to his or her program.
2. PSCI 601, Foundations of American Politics: I: Institutions and Politics; either PSCI 645, National Political Systems and International Politics, or PSCI 641, Comparative Politics: I: Theories of Comparative Politics; either PSCI 622, Political Philosophy I, or PSCI 663, Political Philosophy II: PSCI 664, The Nature of Political Inquiry and Analysis; PSCI 694, Teaching Political Science, and PSCI 696, Research and Professional Skills.
3. PSCI 700, Master's Thesis (six hours).
4. Pass an oral examination on the thesis and on the student's political science program.

Requirements for the non-thesis option
1. Thirty hours of graduate credit in Political Science. With written approval of the graduate advisor, a student may substitute up to two courses with a maximum of eight hours of cognate work appropriate to his or her program.
2. PSCI 601, Foundations of American Politics: I: Institutions and Politics; either PSCI 645, National Political Systems and International Politics, or PSCI 641, Comparative Politics: I: Theories of Comparative Politics; either PSCI 622, Political Philosophy I, or PSCI 663, Political Philosophy II: PSCI 664, The Nature of Political Inquiry and Analysis; PSCI 694, Teaching Political Science, and PSCI 696, Research and Professional Skills.
3. PSCI 700, Research and Professional Skills.
4. Pass written and oral field examinations on the student's political science program.

Psychology
R. Wayne Fuqua, Graduate Training Chairperson
Linda Roven, Program Secretary
Room 239, North 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 scientific and behavior analytic orientation, which influences all of the Department's programs. The master's program is designed primarily for the student with a bachelor's degree in psychology or related discipline to prepare the individual to assume a professional role in business and industry, a variety of mental health services, or to pursue doctoral training. Graduate students receive 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 degree requirements as well as professional activities, including voluntary 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 ethical principles of the discipline and professional guidelines of the discipline and the profession as published by the American Psychological Association. Failure to meet these standards and the ethical principles of the American Psychological Association and the State or failure to abide by "A Student Guide to Academic Dishonesty" and "University Policy on Sexual Harassment and Sexism" published by Western Michigan University may lead to disciplinary action and/or dismissal from the program. Disciplinary reviews, including a due process hearing for the student, are conducted by the Department's Graduate Training Committee and a summary of the findings and a recommendation for discipline 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 and requests for receipt of all application materials are February 1.

Advisors:
Richard Malott, Behavior Analysis
C. Richard Spates, Clinical
Alyce Dickinson, 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 Methodology in Applied Behavior Analysis (3 hours); PSY 661, 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. Practicum (5 hours). This program prepares students for doctoral study or for work with individuals and organizations in developmental disabilities, mental illness, substance abuse, community mental health, behavioral medicine, education, government, business, and industry.

Behavior Analysis: Specialization Track
Developmental Disabilities
The thirty-six-hour general behavior analysis curriculum should include the following: PSY 697, 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 and/or PSY 690, Introduction to Mental Retardation, PSY 668 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 set 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 appropriate guidelines set by 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 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.), research methods and statistical analysis (6 hrs.), and industrial/organizational
44 MASTER’S DEGREE PROGRAMS AND REQUIREMENTS

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. Students who choose the thesis option are required to complete 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 master's degree is offered in School Psychology. The master's degree requires a minimum of thirty-five credit hours. Two or more practical 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 analyses and research skills, and the method to apply them directly with clients within educational settings. Study is focused on learning characteristics of mainstream and exceptional children, as well as careful analysis of the educational environments in which these children are required to perform. Educational and behavioral techniques focus on constructing educational environments to maximize each child's personal set of learning characteristics. The master's program is considered to be an integral part of the Specialist in School Psychology, and basic preparation for doctoral training in School Psychology.

Public Administration

Advisor: Peter Kobak, School of Public Affairs and Administration Walwood Hall

The Master of Public Administration (MPA) degree, provides advanced practical-oriented training to in-career professionals and pre-career students who aspire to positions of administrative leadership in public and nonprofit organizations. The MPA degree enhances the capacity of its graduates to be responsible public leaders who pursue democratic values, foster ethical behavior, and integrate theory and action into effective administrative practice. Program content emphasizes the administration of local, regional, and state government agencies; health care organizations, and other public and nonprofit agencies. Reflecting the multi-disciplinary nature of the field, the MPA draws upon the adverse talents of academic departments throughout the University in addition to the faculty of the School of Public Affairs and Administration. The MPA is offered on the main campus in Kalamazoo, and at the University's regional campuses in Lansing, Grand Rapids, and Battle Creek.

Admission requirements

Applicants to the MPA program must meet Graduate College requirements of an undergraduate degree from an accredited college or university with an overall grade point average of at least 3.0 on a 4.0 scale. Students with a minimum GPA of 2.5 in the final two years of undergraduate study may be considered for probationary admission. In addition, applications are reviewed by the MPA Admissions Committee in the School of Public Affairs and Administration. Admission is competitive and consideration is based on undergraduate grade point average, work experience, letters of recommendations, career goals, and personal interviews. The MPA Admissions Committee meets in March, July, and November of each year to consider applications for the following term.

Program requirements

The MPA curriculum provides a foundation in the theoretical, conceptual, and methodological bases in public management, addressing the practical responsibilities of the public manager, and reflects on the task of administrative leadership. The 42 credit hour program includes three components: the Core Program, and Area of Concentration, and the Project Paper. Pre-career students also complete a three credit hour (300 contact hour) internship. The curriculum assumes that candidates should have basic computer literacy skills and a working knowledge of the American political process at local, state, and national levels.

The Core Program (30 Credit Hours)

The Core Program includes course work in the theoretical foundations of public management, critical areas of administrative responsibility, research methods, and special topics. Students select one course from the listed options in each of the following core areas: Foundations of Public Administration (3 credit hours) PADM 631 Foundations of Public Administration. Political Environment (3 credit hours) PADM 633 The Political Environment of Public Administration. Organization Behavior and Change (3 credit hours) PADM 630 Administrative Analysis PADM 636 Exercise of Power in Organizations PADM 637 Organization Development PADM 638 Organizational Theory and Behavior. Professionalism PADM 534 Administrative Theory SOC 673 Formal Organization MGMT 655 Organization Theory MGMG 653 Managing Organizational Behavior. Economic and Policy Analysis (3 credit hours) PADM 601 Economic Analysis for Administrator PSCI 606 Political Economy ECON 617 Economics of Health and Human Services. Administrative Law and Regulation (3 credit hours) PADM 626 Administrative Law and Governmental Regulation PSCI 528 Administrative Law and Public Regulation FCL 688 Health Law Administration GEOG 514 Water Law. Public Budgeting and Finance (3 credit hours) PADM 623, 624 Public Budgeting ECON 525 State and Local Government Finance. Human Resources Administration (3 credit hours) PADM 610 Human Resources Administration PADM 629 Supervisory Skills for Administrators. Appropriate courses in the Departments of Management, Psychology or Educational Leadership. PYSY 643, PSY 644, EDDLD 620, EDDLD 621, EDDLD 622, EDDLD 623, EDDLD 624, Statistics and Quantitative Methods (3 credit hours) PADM 630 Statistics and Quantitative Applications in Administration PSY 530 Statistics for the Behavioral and Health Sciences GEOG 568 Quantitative Methodology. Applied Research Methods (3 credit hours) PADM 622 Applied Research Methods PADM 678 Program Evaluation EDDLD 640 Introduction to Research. Special Topics (3 credit hours) PADM 599 Topics or other PADM special topics elective. PADM 634 Special Issues Workshops (1 credit hour each) PADM 601 Economic Analysis for Administrator. PADM 626 Administrative Law and Governmental Regulation. PADM 630 Administrative Analysis. PADM 631 Foundations of Public Administration.

The Area of Concentration (9-12 credit hours)

The Area of Concentration allows MPA students to tailor the program to their specific needs and interests. MPA students select a three (to four) course concentration which focuses on a particular area of administrative skill or practice. Students may select from course lists developed for frequently chosen concentrations or, with the help of an advisor, design their own from a wide variety of courses offered by SPAA or by other departments in the University. Commonly selected areas of concentration include health care administration, local government administration, state agency administration, regional planning and economic development, human resources administration, and organization behavior and change.

Health Care Administration (HCA)

The 12-hour Health Care Administration (HCA) concentration is composed of four, three credit hour courses: one course from each of AREAS I, II, and III and one course selected from either AREA IV OR V. No more than three of these courses (or nine of the 12 hours required for the certificate) may be from any one college.

MPA candidates completing the concentration in addition to all other degree requirements will have "Health Care Administration" noted on their official transcript, beginning with those who graduate in the fall of 1996 or later.

AREA I: Legal Dimensions of Health Care Administration FCL 688 Health Law Administration FCL 689 Legal Problems of Health Care Organization.


AREA III: Health Care Environment and Policy Development PADM 651 The Health Services Environment* PADM 679 Health Policy Analysis*.

AREA IV: Management Issues in the Delivery of Health Care Services PADM 655 The Administration of Health Services* PADM 679 Seminar on Current Issues in Health Service Management MKTG 661 Health Care Marketing.

AREA V: Health Planning and Evaluation PADM 654 Strategic Planning in Health Care Organizations* PADM 678 Program Evaluation MGMG 600 Health Care Strategy.

Note: With the approval of an advisor, MPA 650 Seminar in Health Care Administration PADM 599 Topics in Public Administration, or other related courses may be substituted in AREAS IV OR V depending upon the specific topic.

*HHS 511, 512, 513, 514, or 515 may be substituted for PADM 651, 652, 653, 654, 655 respectively by current MPA students as appropriate if the course has been completed within the last six years.

The Project Paper Seminar (3 credit hours)

The Project Paper Seminar is the capstone course of the MPA program. It provides an opportunity for students to integrate theory and practice in a significant problem solving exercise. The program requires that each student select a Project Paper in which the student proposes a solution to a concrete organizational problem or issue. Students may select an issue confronting the unit in which they work or, in the case of pre-career students, the agency in which they are serving a professional field experience/internship. MPA candidates who complete at least 30 of the 42 credit hours may be eligible to enroll in the Project Paper Seminar, although advisors recommend that students enroll in the seminar as their last course if possible.

The Professional Field Experience/internship (3 credit hours)

For pre-career students, the fourth major component of the MPA is a planned...
professional field experience, or internship, equivalent to three credit hours (300 contact hours). The goal of the internship is to provide candidates with a work experience which will afford real-world work experience and exposure to the world of professional administration and the organizational and bureaucratic environment in which the dynamics of an agency are developed.

Science Education
Advisor: Larry Oppinger 302 Moore Hall
The Department of 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 degree requirements to this degree program are: (1) an undergraduate major in science or 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, to include SCI 615, SCI 616, and SCI 690,
3. Six semester hours of thesis, GRAD 700, Master's Thesis OR Six semester hours of project, GRAD 710, Independent Research
The thesis or project is completed under the direction of a major advisor and a thesis or project committee 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 structured as an integrated and sequential set of conceptual and practical educational experiences. In preparing students for practice, the School recognizes a variety of theoretical paradigms and values as critical to 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.

Program requirements
1. The successful completion of sixty hours of credit is required for the master's degree in social work. This includes the following course credits:
   Required Foundation Courses in the School of Social Work (21 hours)
   Required Concentration Courses in the School of Social Work (15 hours)
   Elective Courses in Social Work or in other University departments (6 to 9 hours)
   Field Education (12 hours – 6 in the Foundation, and 6 in the Concentration)
   Advanced Social Work Research (SWRK 642–3 hours or SWRK 666–6 hours)
2. Proficiency exams are available in SWRK 610, 630, 631, and 640. Students have the option of receiving full credit for those courses in which proficiency exams are passed.
3. Students with a B.S.W. degree may waive up to twenty-one hours of required graduate courses, not to include field work courses. This may be arranged upon verification of the following: a 3.0 grade point average in the undergraduate social work major; a grade of 3.0 or above in the equivalent undergraduate course(s) upon which the waiver is based. Students with a B.S.W. will be informed by eligibility for waivers at the time of acceptance into the M.S.W. program. Some waivers may lead to reduction in the number of total hours required to complete the M.S.W. degree. For students with non-B.S.W. degrees, waivers are arranged on a course-by-course basis through advisors.
4. Up to 12 hours graduate credit from another institution or another program at W.M.U. may be considered for transfer to the M.S.W. program. Transfer credit requests are processed after admission.
5. Students who have successfully completed the first year of an M.S.W. program from an accredited school of social work may apply for admission to the second year of W.M.U.'s M.S.W. program.
6. Students may take up to 9 hours of P.T.G. (Permission to Take Graduate Classes) credit before admission is offered. An additional 3 hours of P.T.G. credit (up to a maximum total of 12 P.T.G. hours) may be taken and transferred in after the student receives an offer to admission. Please contact the Director of Social Work Admissions and Student Services for information regarding available P.T.G. classes.

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

This program is intended for the exceptional sociology major who intends to pursue a disciplinary master's degree in sociology at Western Michigan University. It is designed to accelerate progress toward the attainment of the disciplinary master's degree in sociology.

Advisors:
Robert Walt
2512E Sangren Hall

Prerequisites:
1. Application during the second semester of junior standing through the Office of Admissions and Orientation–Graduate Admission.
2. Decision on sociology major.
3. Recommended 3.4 GPA overall, based on at least 30 hours at WMU.

Admission requirements
The program requires completion of all requirements of the Sociology major with this difference: SOC 581 and one additional 500-level sociology course be taken during the junior year and SOC 602, or SOC 603, or SOC 626 and one additional 600-level sociology course be taken during the senior year as part of the thirty-hour minimum requirement for the Sociology Major.

Candidates will be considered for this program by evaluation of the Department of Sociology's Graduate Admissions Committee.

Disciplinary Master's Option I

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

Admission requirements
1. Twenty-four semester hours in undergraduate social sciences, with at least fifteen semester hours in sociology, including courses in theory and research methods.
2. Grade-point average of 3.0 or better in undergraduate sociology courses.
3. If these requirements have not been met, the student may be required to complete additional course work as a condition of admission.
4. Applicants must supply three letters of recommendation from academic and/or professional sources to: Graduate Admissions Committee, Department of Sociology.

Program requirements
1. Complete at least thirty graduate credit hours, selected in consultation with the student's master's committee. At least twenty hours, including thesis, must be in sociology; up to ten hours may be in an approved cognate area. SOC 581, SOC 602, SOC 603, SOC 626, SOC 685, SOC 694, and SOC 700 are required of all master's students.

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


Applied Master's Option II

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

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

Program requirements
1. Complete 40-42 graduate credit hours: 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 scholarships 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.

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: 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.

Prerequisites
1. Michigan Teaching Certificate or equivalent
2. Admission by Department of Special Education

Special Education Technology Option

This option, designed for persons who have special education certification, provides comprehensive knowledge, skills, and experience in the development and use of various special education technologies.

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

Special Education Administration Option

This option, designed for certified and experienced special education teachers, provides course work and field-based experiences necessary to gain State of Michigan Central Office Administrator Certification and approval as either a Director of Special Education or a Supervisor of Special Education.

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

Admission Procedures
Students seeking admission to the Master's degree program should request a Master's Degree Program Application packet from the Department of Special Education. They must follow all instructions on the Graduate Self-Managed Application form and send the following supplemental materials to the Department of Special Education: 1) Department of Special Education Master's Degree Program Application, 2) copy of teaching certificate/endorsement(s), 3) current resume, 4) written statement of experience and professional goals, and 5) two reference forms. Complete files are reviewed four times a year.
year in October, February, May, and August. Applications are evaluated on the basis of: 1) undergraduate GPA (graduate GPA may be used if at least 3 hours of recent and relevant course work have been completed), 2) Graduate Record Examination (GRE) scores — verbal, quantitative, and analytic, 3) special education experience, 4) congruence of goals and requested program option, 5) writing skills, and 6) references.

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

1. A minimum of thirty-seven semester hours of prescribed graduate level work with a point-hour ratio of at least 3.00. Advisors will designate specific course and hour requirements for each option.
2. A comprehensive written examination. This examination may be taken after the student has completed a minimum twenty semester hours. Responsibility for scheduling this examination is assumed by the graduate student after consulting with the program advisor.

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 of Arts degree program in Speech Pathology and Audiology, which is accredited by the Educational Standards Board of the American Speech-Language-Hearing Association, 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 (speech-language pathology) or fifty-seven (audiology) credit hours. Supervised clinical practice is required during every term of full-time registration and includes at least two assignments to off-campus practicum sites, in addition to regular evaluation and therapy responsibilities in the Charles Van Riper Speech and Hearing Clinic.

Admission requirements
Students are admitted for full-time study beginning 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.
2. Completion of an undergraduate major, 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.

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.) 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.
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 practicum, at least 250 of them 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 wish 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 contact the Certification Office of the WMU College of Education.

Statistics
Advisors:
Michael Stoline, Jung Chao Wang
Room 3319, Everett Tower

The master's program in Statistics is offered through the Department of Mathematics and Statistics. Two types of programs are available in this area:

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

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

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

Option II (Applied)
This option will give students a combination of knowledge of statistical techniques, experience with using these techniques in applied situations, and understanding of the theoretical principles behind these techniques. Students receive excellent training for professional employment in industry or government, and at the same time obtain sufficient theoretical background to qualify them to teach elementary statistics or to continue into more advanced degree programs. This program includes an internship experience where it is expected that students will collaborate with professional statisticians in an actual work environment with real problems. The internship placement will be with an industry or organization 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, 660, 662, 664, 680.
2. Three of the following: MATH 553, 566, 661, 663, 665, 666, 667, 669.
3. Two hours of MATH 691 and/or 696.
4. Three credit hours of MATH 698 or 712.
5. Pass the Department Graduate Exams in Mathematics 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 program faculty and 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 field training experience, the following courses are required in the Graduate Certificate 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 663—Seminar in Substance Abuse I (3 hrs.) or 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 667 Evaluation Research I (3 hrs.)
- SWRK 536 Theory and Practice of Group Treatment (3 hrs.)
- SWRK 667 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 in to allow the interested student to acquire skills beyond the master's degree but short of the requirements for a Ph.D. The program will be balanced between theoretical, practical preparations, interpretation, and scope operation and maintenance. It will equip the candidate to be a productive member of an operating electron microscopy laboratory.

Requirements for entry
1. Completed master's degree in a biologically related area.
2. A degree of competence in electron microscopy (i.e., the Master's Thesis or project area required use of an electron microscope laboratory).
3. Chemistry background through two courses in biochemistry.

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

List of required courses:
- BIOS 632 Advanced Techniques in Electron Microscopy, 4 hrs.
The purpose of the Graduate Certificate in Health Care Administration is to enhance the capacity of its graduates to function effectively as managers in the healthcare system. The program includes the legal, financial, and policy dimensions of contemporary health care administration, critical management issues, strategic planning and evaluation, and critical issues in the delivery of health care services.

**Program requirements**

Each student will satisfactorily complete a program consisting of six three-credit hour courses (18 hours). Students select one course from each of Areas I, II, and III and three elective courses from at least two of Areas IV, V, and VI.

**Area I**

Legal Dimensions of Health Care Administration

FCL 688 Health Law Administration

FCL 689 Legal Problems of Health Care Organizations

**Area II**

Health Care Budgeting and Finance

PADM 652 Financial Management of Health Care Organizations

**Area III**

Health Care Environment and Policy Development

PADM 651 The Health Services Environment

PADM 653 Health Policy Analysis

**Area IV**

Management Issues in the Delivery of Health Care Services

PADM 655 The Administration of Health Services

PADM 679 Seminar on Current Issues in Health Services Management

MKTG 661 Healthcare Marketing

**Area V**

Health Planning and Evaluation

PADM 654 Planning Strategies in Health Care

MGMT 600 Health Care Strategy

PADM 678 Program Evaluation

**Area VI**

Special Topics

HHS 663 Ethical Issues in Human Services Professions

PHIL 534 Aesthetic and Philosophical Foundations of Health Care

ADA 680 Clinical Supervision in Substance Abuse Services

GRN 681 Program Planning and Development in Gerontology

SOC 640 Social Organization of the Health System

**Hippotherapy**

**Advisor:**

Susan Meyers

Room 448, Hoekje Hall

Western Michigan University offers a program for the training of certified/licensed/registered occupational therapists through the Graduate Certificate Program in Hippotherapy. The program is offered by the faculty of the Department of Occupational Therapy in conjunction with the Cheff Center located in Augusta, Michigan.

Students receive training in the use of the horse as a therapeutic modality in the treatment of individuals with handicapping conditions. Hippotherapy is a valuable therapeutic modality for a physical or occupational therapist working with patients having such movement dysfunction as cerebral palsy, cerebral vascular accidents (strokes), multiple sclerosis, traumatic brain injury, and spinal curvatures. Desired treatment outcomes of hippotherapy are improved vestibular reactions, increased sensory integration, improved muscle tone, coordinated movement, improved vertical head-to-toe neurological connections, and midline control. Improvements in postural control and trunk equilibrium reactions can be achieved more easily and more often on the horse than in the clinic. Occupational therapists and physical therapists who successfully complete the program will be eligible for the hippotherapy certification examination developed by the North American Riding for the handicapped Association (NARHA).

**Admissions requirements**

Prerequisites for admission will include a baccalaureate degree and certification or licensing as an occupational or physical therapist. Other characteristics considered for admissions include clinical and therapeutic riding experience. Selection will be based on grade point average (GPA), personal/professional resume, interview, application materials, and completion of equine skills through riding instructor certification awarded by NARHA. Selection will be completed by the hippotherapy faculty members. Admission materials may be obtained from the Office of Admissions and Orientation, Graduate Admissions.

**Program requirements**

The graduate specialty program in Hippotherapy consists of five courses totaling 16 hours and is designed to provide graduate education in hippotherapy theory and treatment techniques; screening, selecting, and evaluating appropriate clients for hippotherapy; selecting and training horses for hippotherapy; developing a hippotherapy program and management plan. A supervised fieldwork experience will follow the on-campus academic courses. Western Michigan University facilities and staff will provide ten hours of the program (HT 602, HT 605, and HT 712). The Cheff Center will provide three hours of the program (HT 603). Western Michigan University and the Cheff Center will both provide facilities for three hours of the program (HT 603).

**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 supplemented to graduate training in related fields such as counselor education and counselor psychology, psychology, social work, speech pathology and audiology, occupational therapy, blind rehabilitation, physical rehabilitation, and physical education and recreation. It also complements many other graduate areas such as business, public administration, theology, nursing, medicine, and recreation.

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...
Section III
Specialist Degree Programs and Requirements

General Requirements For A Specialist Degree

Admission
See Calendar of Events for application deadline.
1. See specific program description to determine the minimal entrance requirements.
2. Official transcripts of all courses taken beyond high school showing the degrees earned.
3. A point-hour ratio of at least 3.0 in the last two years of undergraduate work for a program permitting entrance with a bachelor's degree. A point hour ratio of at least 3.25 for all graduate work undertaken beyond the bachelor's degree.
4. Scores on standardized tests approved for each program by the Graduate Studies Council.
5. Acceptance by the academic unit offering the specialist program and endorsement by the graduate dean.
6. Admitted graduate students have active admission status for 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 canceled, and thereafter the student must complete an Application for Readmission to a Graduate Degree Program and be admitted anew by the appropriate program admission body before registration may occur.

Graduation
See Calendar of Events for application deadline.
1. Diploma Application: A diploma application must be submitted by August 1 for the December Commencement, by January 1 for the April Commencement, by February 1 for the June Commencement, and by April 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 or 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 the Office of the Vice President for Research, 387-8298.

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. See The Graduate Studies section of this catalog for additional information regarding the Specialist Project.

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.
Educational Leadership

Advisors:
Mary Anne Bunda, Chair, Zoe A. Barley, David J. Cowden, James Sanders, Catherine Slezko, Uldis Smldchens, and Charles C. Warfield.

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 Admission, and designate Educational Leadership. In addition to the Graduate College requirements, the Department of Educational Leadership requires the submission of an autobiography, 3 letters of recommendation, 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. The admission meetings are held in November and March.

Program Requirements

A program of study consists of a minimum of 60 credit hours beyond the baccalaureate degree and includes a Specialist in Education (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 662, School Business Management; EDLD 673, Supervision; EDLD 674, School Community Relations; EDLD 712, Professional Field Experience (6 credit hours); and EDLD 720, Specialist Project (6 credit hours).

In addition, 24 semester credit hours of elective courses will be selected, with 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.

School Psychology

Howard Farris, Program Director
Linda Rowen, Program Secretary
Room 239, North 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 then 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.)
5. Developmental and Physiological Psychology (8 hrs.)
6. Elective Coursework (3 hrs.)
7. Practicum in School Psychology (6 hrs.)
8. Professional Field Experience (6 hrs.)
9. Specialist Project (6 hrs.) or scholarly paper (0 hrs.). Students intending to complete the doctoral program in School Psychology will complete 720, Specialist Project; others will complete a scholarly paper.

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

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

Each student's program will be planned by a committee selected in consultation between the student and the graduate advisor of the program in which the student wishes to study. The exact distribution of courses, seminars, and research will depend upon the program and may vary from one student to another. Each program, however, will contain a significant amount of research, and each student will be required to complete a dissertation. A student will select two appropriate research tools. The decision regarding the specific research tools must be made by the student's doctoral committee. If the committee wishes to recommend research tools other than languages, computer programming, or statistics, the recommendation and standard of proficiency must be approved by the Graduate Studies Council. Appropriate competence in language, statistics, and computer programming has been established for each program and approved by the Graduate Studies Council.

After admission, all requirements for the degree must be completed within seven years preceding the date on which the degree is conferred. Under extenuating circumstances, additional time may be allowed by the graduate dean. A student will be expected to pass those examinations established by the unit in which he or she is studying. In all cases these examinations will include comprehensive examinations of the subject matter areas included in the student's program of study.

General Requirements For A Doctoral Degree

Admission
See Calendar of Events for application deadline.
1. See specific program description to determine the minimal entrance requirements.
2. Official transcripts of all courses taken beyond high school showing the degrees earned.
3. For students who have completed at least twenty hours of graduate work, 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.
4. Scores on standardized tests approved for each program by the Graduate Studies Council.
5. Acceptance by the academic unit offering the doctoral program and by the graduate dean.
6. Admitted graduate students have active admission status for 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 Application for Readmission to a Graduate Degree Program and be admitted anew by the appropriate program admission body before registration may occur.

Applicability
1. A student admitted with less than twenty hours of graduate study must request status as an applicant after completing two full semesters of graduate work at Western Michigan University or twenty semester hours of graduate work beyond those accumulated at the time of admission, whichever comes first. A student should present this request to the advisor who will submit a recommendation to The Graduate College.
2. A student admitted with more than twenty hours of graduate study must request status as an applicant after completing one full semester of graduate work at Western Michigan University or forty semester hours of graduate work, whichever comes first.
3. Criteria for being awarded status as an applicant include:
   a. An overall point-hour ratio of at least 3.25 in all graduate work completed.
   b. Commitment to a specific degree program.
   c. Appointment of a doctoral dissertation committee.
   d. A decision by the unit that the student should be permitted to continue study toward a doctoral degree.

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 for an overall point-hour ratio of at least 3.25. Honor point deficiencies acquired in credits earned at Western Michigan University can be made up by credits earned at another university. Transfer credit is approved by the graduate dean. 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.
2. Completion of the residency requirement.
3. After admission, completion of all requirements for the degree within seven years preceding the date on which the degree is conferred. Under extenuating circumstances, additional time may be allowed by the graduate dean.
4. Consultation with the Dissertation Assistant in The Graduate College before registering for 730, Doctoral Dissertation, in order to be informed about the regulations pertaining to the preparation and publication of the manuscript and to the requirements for research involving regulated subjects and hazardous materials. The Doctoral Dissertation, 730, varies in credit from a minimum of twelve hours to a maximum of twenty-four hours. The minimum and maximum number of hours of 750 required by each department in a student's program of study will be determined by the department in a proposal approved by the University's curriculum review process. A department may require all students within the program to register for a specific, common total of hours between twelve and twenty-four, or a program may require different students within the program to register for a variety of total hours between twelve and twenty-four. Following a student's first enrollment in 730, the student will enroll for a minimum of one credit in 730 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 credit hours stipulated in the student's approved program of study will be required to continue to enroll in 730. Only those credit hours in 730 stipulated in the student's approved program of study, however, will count toward meeting the program requirement for the dissertation. See the Graduate Studies section of this catalog for additional information regarding the doctoral dissertation.
5. Prior approval by the appropriate University board of any research proposal that involves human or animal subjects. For more information, call the Office of the Vice President for Research, 387-8298.
6. Approval of the dissertation by the Dissertation Committee, composed of a
Programs Leading To A Doctoral Degree

Biological Sciences
Graduate Advisor: Elwood Ehrle

The Doctor of Philosophy in Biological Sciences at Western Michigan University is designed to train individuals wishing to pursue teaching or teaching and 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.Ds. 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.
   d. Three letters of recommendation.

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.
   e. Cognate course work as given in 1c-iv above.

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 comprised of 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.

Candacy
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
of pass or fail. This exam may be retaken once
Candidacy will be approved or denied by the
the graduate advisor based upon successful
performance of the Comprehensive
Examination, a positive recommendation of the
Dissertation 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 assistantships.

Program Requirements
1. A minimum of 76 graduate semester hours. These hours shall consist of the following:
   a. 18 hours of distribution courses
      BIOS 611, Eukaryotic Cell Biology (3 hrs.)
      BIOS 612, Prokaryotic Cell Biology (3 hrs.)
      BIOS 613, Animal Physiology (3 hrs.)
      BIOS 614, Plant Physiology (3 hrs.)
      BIOS 615, Ecology (3 hrs.)
      BIOS 616, Evolution (3 hrs.)
   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 698 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.
4. Successful oral defense of dissertation and
   approval of the dissertation by the Doctoral
   Dissertation Committee.
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.

Comparative Religion
Graduate Advisor: E. Thomas Lawson
The Doctor of Philosophy in Comparative
Religion is designed to prepare students to
Teach in colleges and universities, and to
initiate new areas of research. It requires of all
students a breadth of knowledge in the
religious traditions of humankind, depth of
knowledge in at least two traditions, a
thorough grasp of the principal classical works in the history of the study of religion, and
sophisticated grasp of the central issues of
theory and method that underlie the discipline
as a whole. Ph.D. students will be expected to
complete the equivalent of Western Michigan
University's M.S. in Comparative Religion, with
thesis. Students will become candidates for
the Ph.D. after completing the course work,
foreign languages, and comprehensive examination requirements. The doctoral dissertation will demonstrate the student's ability to develop comparative approaches to
religious traditions, sophistication in method
and theory, and knowledge of specific
religious traditions.

Program Requirements
The Ph.D. in Comparative Religion requires a
minimum of 81 semester hours beyond the
bachelor's degree. This includes work at the
master's level and 15 hours devoted to the
doctoral dissertation. Proficiency in two foreign
languages (one in language of scholarship, the
other in a primary language of one religious
tradition) is also required but is not counted as
part of the minimum credit hours requirement.

Course Requirements
Students who are accepted into the program from a baccalaureate program must fulfill the following requirements:
1. REL 600 Classics I (3 credits)
2. REL 601 Classics II (3 credits)
3. REL 610 Theory and Method I (3 credits)
4. REL 611 Theory and Method II (3 credits)
5. REL 615 Survey of Religious of the World (3
   credits)
6. REL 616 Teaching Comparative Religion (3
   credits)
7. REL 620 Advanced Seminar in Comparative
   Religion (3 credits)
8. REL 696 Dissertation Tutorial (3 credits)
9. REL 700 Master's Thesis (6 hours) or
   equivalent
10. REL 730 Doctoral Dissertation (15 hours)
11. 36 credits of course work on religious
   traditions. In consultation with the student's
   advisor, some of this work may be taken
   outside the Department of Comparative
   Religion.

Cognate Courses
Approved cognate courses may be drawn
from related disciplines such as Anthropology, Philosophy, Sociology, Psychology, English,
History and Art History in consultation with the
student's advisor.
The Doctor of Philosophy in
Computer Science
Advisor: Alfred Boals
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 required 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,
Admission
Admission to a specific doctoral program or 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 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 affairs. Therefore, the department works to create an atmosphere conducive to the concerns of diverse populations, to integrate these concerns into programs and course offerings, and to fulfill its commitment 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, family costs, and course requirements for that program. A student may not change to another option without formal approval. Each student, upon admission to a doctoral program, must be 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 training model. The educational curriculum and practical experiences of the program are designed to ensure competency in all three dimensions 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 related experiences in four broad areas: (1) the science of psychology; (2) specialization in counseling psychology; (3) counseling psychotherapy; and (4) research. The program recognizes that counseling psychologists may be employed in a variety of professional settings such as academic departments, college and university counseling centers, mental health agencies, private practices, and business and industry. Consequently, the program provides both didactic and clinical experiences to accommodate the potentially diverse career interests of its graduates.

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

1. Basic scientific core (33 hrs.):
   a. Research design and statistics (15 hrs.)
   b. Communication/Applied Language in Research
   c. Biological basis of behavior (3 hrs.)
   d. Cognitive-afffective basis of behavior (3 hrs.)
   e. Social basis of behavior (6 hrs.)
   f. Individual behavior and human development (6 hrs.)

2. Scientific Inquiry Core (27 hrs.):
   a. Counseling Psychology (21 hrs.)
   b. Human Assessment (6 hrs.)
   c. Supervised Practica (12 hrs.)
   d. Recommended Electives (9 hrs.)

3. Doctoral Dissertation (12 hrs.)

4. Pre-doctoral Internship (4 hrs.)

Total Hours 100

Counseling Psychology students are expected to demonstrate competencies in psychological theory, practice, and research by passing a series of comprehensive examinations in the following areas:

1. counseling psychology theory and knowledge;
2. scholarly inquiry and communications;
3. professional work sample.

Counseling, Leadership, and Student Affairs
All students enrolled in one of the three options in this doctoral program must complete the following set of requirements in addition to coursework related to a particular specialty:

1. Professional Core (21 hrs.):
   a. Professional Seminar (3 hrs.)
   b. Supervision (3 hrs.)
   c. Advanced Theories (3 hrs.)
   d. Multicultural Counseling and Psychotherapy (3 hrs.)

2. Scientific Inquiry Core (27 hrs.):
   a. Research Design and Data Analysis (6 hrs.)
   b. Qualitative Research (3 hrs.)
   c. Elective in Research Design, Data Analysis, or Data/Program Evaluation (3 hrs.)
   d. Dissertation Seminar (3 hrs.)
   e. Graduation Skills Research Tool Competency
   f. Dissertation Seminar (3 hrs.)
   g. Doctoral Dissertation (12 hrs.)

Student Affairs in Higher Education
The student affairs in higher education option has been developed to prepare individuals to administer college and university student personnel programs. Students completing the graduate program should be prepared to administer programs related to or incorporating the services of 1) admissions; 2) housing and residential life; 3) academic and special advisement; 4) career development, planning, and placement; 5) financial aids; 6) campus organizations; 7) international student advisement; 8) student activities and organizations; and 9) other student support systems. Students desirous of emphasizing counseling careers in counseling centers should also consider the Counseling Psychology program, Department of Counseling Education and Counseling Psychology.

Competencies viewed as essential are:
1. a broad understanding of the history of higher education and specifically the history, philosophy, and current practices within the arena described as student services;
2. the ability to articulate the theories of student development and conceptualize the application of theoretical concepts to the administrative areas of student affairs;
3. a knowledge of organization models, budgetary systems, personnel practices, and administrative tools and techniques;
4. an understanding of methods and techniques related to assessment of student needs and program evaluation;
5. an awareness of the law and education as it relates 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:

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

In consultation with a doctoral advisor, some students entering this doctoral option may develop or enhance significantly their skills, attitudes, and competencies as they progress through doctoral course work designed to ensure that the students develop:

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, leadership and supervisory competencies relevant to the design, funding, organization, implementation, and evaluation of community mental health service delivery.

Other students, experienced school counselors, and guidance specialists may choose to prepare for administrative and leadership positions in public and private school systems and intermediate school districts. To administer an integrated and systematic program of guidance services, an individual needs to demonstrate
56 DOCTORAL DEGREE PROGRAMS AND REQUIREMENTS

1) competencies in guidance and counseling activities; 2) organizational and administrative skills; 3) competencies in personnel services, program conceptualization, budget development, accountability, evaluation, and research; 4) competency in public relations; 5) competencies in career development; 6) competency in program delivery systems; 7) competencies in planning, goal setting, role development, and coordination; and 8) competencies associated with being a professional educator. Doctoral students are expected to develop leadership skills by actively participating in professional organizations which promote and enhance the school counseling and related personnel fields.

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

Economics
Advisor: Paul Thistle
Room 5047 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 exist in traditional Ph.D. programs. In an early 1990's report commissioned by the American Economic Association, Dr. Anne O. Krueger reported that the proportion of new economics doctorates taking their first job in a 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 these needs.

The major requirement in economics Ph.D. program contains 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 city, county, or state government agencies, consulting or research firms and institutes; financial institutions; businesses; and hospitals. This internship is conducted under the aegis of an employee of the organization as well as a Department of Economics faculty member. The purpose of this internship is to give students the incentive and opportunity to apply their knowledge of economic 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 sets up the student for graduation into the job market with a somewhat different orientation than that of graduates from traditional economics Ph.D. 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 internship, and fifteen hours of doctoral dissertation.

Each student is required to take a core of nine courses:
- ECON 604 Mathematical Economics
- ECON 619 Introduction to Econometrics
- ECON 622 Economic Statistics
- ECON 655 Microeconomic Theory I
- ECON 656 Microeconomic Theory II
- ECON 675 Macroeconomic Theory I
- ECON 676 Macroeconomic Theory II
- ECON 605 History of Economic Thought
- ECON 570 Advanced Econometrics

At the beginning of the fall semester of the second year, students are administered a qualifying examination in economic theory. Upon passing the written examination, the student is considered a candidate for the Ph.D. degree. Each student is required to specialize in econometrics and in two of the following fields: Economic Development, Human Resource Economics, Public Finance, Business/Industrial Organization, and International Economics. (Only three of the five fields will be selected in any particular year.) To specialize in a field, students take a sequence of two courses. Students are required to pass a field qualifying examination in econometrics and 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 observe the research being conducted by the Department's faculty, economists from other institutions, and graduate students. An Applied Economics Workshop (ECON 744) 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 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 on the internship project. Advisors 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 additional year (year four) 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 the 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:
Mary Anne Bunds, Chair, Zoe A. Barley, David J. Cowden, James Sanders, Catherine Stiles, Daniel Stufflebeam, Uldis Smidchens, 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 (Ed.D.) or a Doctor of Philosophy (Ph.D.), depending upon the area of concentration selected.

At Western Michigan University the term concentration is a formal designation obtained through the curriculum review process. Transcripts and degrees, when granted, carry the formal designation of any concentration which has been adopted and approved.

In addition to the general degree (Ed.D.), the Department offers degree programs that lead to concentrations in Central Office Administration (Ed.D.), Superintendent (Ed.D.), and Educational Measurement, and Research Design (Ph.D.).

Admission to the Department requires that students meet the Graduate College criteria for admission, submit 3 letters of recommendation, and complete a Resume of Leadership Experience form (available in the Department). Each student will be interviewed by a minimum of two members of the faculty, and each application will be reviewed for acceptance by the entire faculty at a meeting scheduled to consider student admissions. Meetings are scheduled in November and March. After admission, a doctoral chair will be appointed from among the faculty advisors, and the student will work with this advisor to complete an appropriate 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
Advisors:
Room 5047 Friedmann Hall
The Department office is located in Room 3312, Sangren Hall.
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DOCTORAL DEGREE PROGRAMS AND REQUIREMENTS

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

Central Office Administrator
(Ed.D., 90 credit hours minimum)

This degree is designed for persons who wish to develop leadership skills and serve in administrative positions in the State of Michigan. Contact the Teacher Certification Officer at Western Michigan University for complete information on compliance for State of Michigan certification as a candidate in education to be sure that you meet the other requirements.

Required courses:
EDLD 602, Educational Leadership; EDLD 609, Theories of Leadership; EDLD 640, Introduction to Research; EDLD 645, Research Design and Data Analysis I; EDLD 646, Research Design and Data Analysis II; EDLD 665, Elementary Administrator or EDLD 670, Secondary Administrator; EDLD 661, School Law; EDLD 662, School Business Management-Traditional Development; EDLD 672, School Finance; EDLD 673, Supervision; EDLD 674, School Community Relations; EDLD 680, The Superintendent; EDLD 695, Dissertation Seminar; EDLD 712, Professional Field Experience (9 credit hours); and EDLD 730, Doctoral Dissertation (15 credit hours). In addition, 21 credit hours of elective courses are selected, with advisory committee approval, from related courses. A minimum of 6 credit hours will be selected from courses outside the Department of Educational Leadership.

Superintendent
(Ed.D., 90 credit hours minimum)

The following courses will lead to a doctoral degree (Ed.D.) in Educational Leadership with an endorsement as a superintendent. This degree is designed for persons who wish to be certified as 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:
EDLD 602, Educational Leadership; EDLD 609, Theories of Leadership; EDLD 640, Introduction to Research; EDLD 645, Research Design and Data Analysis I; EDLD 646, Research Design and Data Analysis II; EDLD 665, Elementary Administrator or EDLD 670, Secondary Administrator; EDLD 661, School Law; EDLD 662, School Business Management-Traditional Development; EDLD 672, School Finance; EDLD 673, Supervision; EDLD 674, School Community Relations; EDLD 680, The Superintendent; EDLD 695, Dissertation Seminar; EDLD 712, Professional Field Experience (9 credit hours); and EDLD 730, Doctoral Dissertation (15 credit hours). In addition, three courses will be selected, with advisory committee approval, from among EDLD 663, Personnel Administration; EDLD 681, Policy Development; EDLD 682, Computer Applications in Administration; and EDLD 685, Personnel and Facilities Planning. One course will be selected from among EDLD 641, Measurement Techniques in Education; 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.

Educational Evaluation, Measurement, and Research Design
(Ph.D., 90 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 assume 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 in 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 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 653, Educational Measurement; EDLD 654, Personnel Evaluation; and EDLD 673, Supervision, EDLD 695, Dissertation Seminar; EDLD 712, Professional Field Experience (9 credit hours); and EDLD 730, Doctoral Dissertation (15 credit hours). In addition, 9 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 outside the Department of Educational Leadership.

English
Advisor: Seamus Cooney
Room 618, Spraul Tower (816) 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 undergraduate institutions. The program requires all candidates to have broad knowledge of English and American literature, acquaintances with the major periods of traditional literature, practical and 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 writing in English, and will develop the breadth required of teachers in relatively small English departments.

Applicants must take the Graduate Record Examination with the General Test and the Subject Test in Literature in English, and forward their scores to the Department of English.

For more detailed information and for an application form, write to the graduate director or see the department’s pages on the World Wide Web at the following URL:
http://www.wmich.edu/english.

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; Research and Writing: The Nature of Poetry; and an approved English language course.
   b. For candidates in creative writing: Literary Criticism; an approved course in modern literary forms; a genre-specific course, an approved English language course.

2. Distribution requirement — 18 hours
   Six graduate level courses from the following list of areas, selected so that no two contiguous periods are skipped. Candidates in literature and writers, particularly those who intend to teach, and writers, particularly those who intend to

3. Area of specialization — 12 hours
   At least one course in literature in English by an ethnic 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 hours of credit elected from courses or practice 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 periods listed in the Distribution Requirement as well as English Language, and the Theory and Practice of Teaching English at the college level.

6. Cognate or support area — 6-9 hours
   An optional area to complement the specialization. May include courses from other departments.

7. Candidacy Examination
   After satisfying the distribution requirement, students will take four two-hour written examinations in a total of 10 credit hours in exercise in practical criticism. These examinations should be completed within three years of admission. May be repeated once.

8. Foreign Language Requirement
   Students must demonstrate by examination or by completion of two 400-level courses basic reading competence in at least one foreign language.

9. Doctoral Readings and Oral Examination — 3-6 hours
   Near the completion of course work and before beginning the dissertation, students will take ENGL 711, Readings in Doctoral Specialization, a course of readings designed by the candidate in conjunction with a faculty supervisor. An
oral examination over the chosen books will follow.  

10. 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 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 facility may also be appointed to the doctoral research committee. These members of the Graduate Faculty will facilitate and guide the students' development within the academic and research programs of the Department and University.  

Admission Requirements  

1. Master's degree in hydrogeology or related field, e.g., geology, geophysics, or geotechnical engineering 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 fluency 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 their 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, 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.  

15. 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 the 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 and approved upper division courses in chemistry, biology, physics, geology, geography or a combination of 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/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. The student will develop a "proper sequencing" of courses with his/her graduate committee.  

4. Sample program for a student entering with a master's degree in geology.  

Master's Degree component of program  

<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 508 Hydrogeological Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 525 Surface Geophysics</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 526 Principles and Practices of Aquifer Testing</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 527 Principles of Well Drilling and Installation</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 528 Principles/Practices of Groundwater Geology</td>
<td>3</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 Ground-water Modeling</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 525 Techniques in Water Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

Research  

GEOL 700 Master's Thesis | 6  

Entering students who do not have MAT 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>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 516 Geochronology and Global Change</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 608 Advanced Hydrogeochemistry</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 614 Environmental Regulatory Experience</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 617 Stable Isotope Geochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 666 Seminar in Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 524 Techniques in Water Analysis</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 600 Hydrogeochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 605 Ground-water Modeling</td>
<td>3</td>
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<tr>
<td>GEOL 608 Advanced Hydrogeochemistry</td>
<td>3</td>
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<tr>
<td>GEOL 611 Mineral Analysis</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 612 Quantitative Hydrogeology</td>
<td>3</td>
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<tr>
<td>GEOL 614 Environmental Regulatory Experience</td>
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<tr>
<td>GEOL 617 Stable Isotope Geochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 666 Seminar in Hydrogeology</td>
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</tr>
</tbody>
</table>

Research and professional field experience  

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 710 Independent Research</td>
<td>5</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.  

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>
<tr>
<td>GEOL 525 Techniques in Water Analysis</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 524 Techniques in Water Analysis</td>
<td>3</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 608 Advanced Hydrogeochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 611 Mineral Analysis</td>
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<tr>
<td>GEOL 612 Quantitative Hydrogeology</td>
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</tr>
<tr>
<td>GEOL 614 Environmental Regulatory Experience</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 617 Stable Isotope Geochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 666 Seminar in Hydrogeology</td>
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</tr>
</tbody>
</table>

Basic or core courses required of students in this program  

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CHEM 524 Techniques in Water Analysis</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 516 Applied Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 526 Surface Geophysics</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 528 Principles and Practices of Aquifer Testing</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 527 Principles of Well Driling and Installation</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 528 Principles/Practices of Groundwater Sampling/monitoring</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 600 Hydrogeochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 605 Ground-water Modeling</td>
<td>3</td>
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<td>GEOL 608 Advanced Hydrogeochemistry</td>
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<td>GEOL 611 Mineral Analysis</td>
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<tr>
<td>GEOL 612 Quantitative Hydrogeology</td>
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<td>GEOL 614 Environmental Regulatory Experience</td>
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<tr>
<td>GEOL 617 Stable Isotope Geochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 666 Hydrogeology Seminar</td>
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</table>

Elective courses  

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 516 Geochronology and Global Change</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 536 Glacial Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 561 Seismic Exploration</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 562 Gravity/Magnetics</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 563 Electrical Methods</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 564 Environmental Field Geophysics</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 565 Water Analysis</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 610 Geochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 611 Mineral Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>
The Doctor of Philosophy in History is designed to prepare candidates for careers in higher education, applied research, and historical administration. The program includes a core field of theory, research, and applications emphasizing cultural and social historical theory; multidisciplinary research techniques to develop a broad evidentiary base using elements of documentation and material culture; and applications and field experience to develop interpretive skills appropriate to a broad range of teaching and communication venues.

The research focus of the program is on material arts and culture, technology, social organization and the sociology of knowledge, and in historical theory and philosophy with a focus on the role of historical disciplines in public life.

Admission requirements
1. Admission normally requires a master's degree in a closely related discipline, or substantial prior coursework in history. Students holding baccalaureate degrees may be admitted directly to the program but must complete Master of Arts comprehensive examinations after approximately 18 hours of course work with a recommendation by the examining department-approved examination. Many department-approved examinations are available from the Department of Geology and from The Graduate College.

2. Graduate Record Examination (GRE) general aptitude test scores; applicants with a master's degree in a discipline other than history may be asked also to complete the GRE subject test in history.
3. Three letters of recommendation.
4. A brief essay concerning applicant's academic and professional objectives.
5. Reading proficiency in foreign languages appropriate to the proposed program of study is strongly recommended; any deficiency in this area must be met during the first year of doctoral study. Students whose native language is other than English must achieve a TOEFL score of 600 or an equivalent foreign language requirement. All required coursework must be completed prior to qualifying examinations.

Degree in History
The Doctor of Philosophy in History is based upon successful completion of qualifying examinations in several fields, and demonstration in seminars 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 History of Historiography 3 hrs.
- HIST 698 Teaching and Lecture Presentation 3 hrs.

Each candidate will do additional course work in theory and research techniques 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 and dissertation topic. Students holding baccalaureate degrees must complete the GRE subject test in history and a recommendation by the examining department-approved examination. Many department-approved examinations are available from the Department of Geology and from The Graduate College.

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. Students are required to complete a language examination within the first year of graduate study in the major field. Students whose native language is other than English must achieve a TOEFL score of 600 or an equivalent foreign language requirement. All required coursework 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:
Bob White,
2014 Kohrman Hall

The Doctor of Philosophy in Industrial Engineering, offered by the Industrial and Manufacturing Engineering Department at Western Michigan University, is designed to intensify the student's knowledge and comprehensive 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 research project, and complete a dissertation research project.

Admission requirements
Applicants must have a bachelor's degree in engineering or related discipline from an Accreditation Board for Engineering and Technology (ABET) accredited 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.

Applicability Requirements
The applicability requirements 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 and Manufacturing 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. The dissertation will be completed by 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.

Chemical Engineering
Advisor:
Bob White,
2014 Kohrman Hall

The Doctor of Philosophy in Chemical Engineering, offered by the Industrial and Manufacturing Engineering Department at Western Michigan University, is designed to intensify the student's knowledge and comprehensive 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 research project, and complete a dissertation research project.

Admission requirements
Applicants must have a bachelor's degree in engineering or related discipline from an Accreditation Board for Engineering and Technology (ABET) accredited 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.

Applicability Requirements
The applicability requirements 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 and Manufacturing 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. The dissertation will be completed by 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.
60 DOCTORAL DEGREE PROGRAMS AND REQUIREMENTS

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 500-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. 15 hours of core courses with 3 hours of MATH 725 required.
   b. 12 hours from the engineering management concentration area.
   c. 9 hours from one of the areas of specialization course groups.
   d. 18 hours of electives chosen from the graduate offerings of Industrial and Manufacturing Engineering or other departments appropriate to the student's research interest as mutually agreed upon by the student and the doctoral committee.
   e. 6 hours of electives chosen from the graduate offerings of Industrial and Manufacturing 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 IME 712, Professional Field Experience.
   g. 15 hours of IME 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 sessions.

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 and Manufacturing 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 Haieh, 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 pure mathematics or applied mathematics. The program is designed to give the student a broad but intensive background in a variety of fields of mathematics, with special emphasis on some selected areas of research in which the student will be prepared for, and participate in, creative mathematical research. More specifically, the area of specialization may be chosen from among algebra, approximation theory, college mathematics teaching, complex analysis, differential equations, graph theory, group theory, optimization theory, and topological graph theory.

Alternately, a student may pursue a Ph.D. with Concentration in Statistics. This program is described below.

Admission requirements

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

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 (Introductory modern algebra and Math 530), Real Analysis (Math 571) and General Topology (Math 622). In addition, each student must complete the following basic course requirements: (1) two-semester graduate sequences in Algebra, Real Analysis, and Topology, and a semester course in Complex Analysis; (2) an approved graduate sequence in some area other than those specified in (1); (3) one approved graduate course in 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. Following these 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 his/her program will consist of advanced courses, seminars, and research leading ultimately to a dissertation constituting a significant contribution to some field of mathematics.

Each student must pass the Departmental Preliminary Examination. For a student concentrating in Algebra, Analysis, or Topology, the Preliminary Examination will consist of a three-hour examination in each of two of these three areas; for a student concentrating in some other area, the Preliminary Examination will consist of a three-hour examination in his/her specialty, in Analysis, and in either Algebra or Topology (the choice being subject to the approval of the Department Doctoral Committee). For a student concentrating in the area of mathematics teaching, the Preliminary Examination will consist of a three-hour examination in each of the following: Mathematics Education, Algebra, and one other area. 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. If the student fails an examination, he/she may be permitted to take a second examination in that area at a time designated by the Committee. A student may not take any part of the Preliminary Examination more than twice. A second failure in any area results in dismissal from the doctoral program. After successfully completing this examination, the student is assigned a Dissertation Advisor and a Dissertation Committee who supervise him/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 foreign language.

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 the 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 the Outside Reader.

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

A dissertation defense should only be scheduled at a time when at least four Committee members (including the advisor) can be present. A defense can be held, however, unless three Committee members (including the advisor) are present. If a Committee member is not present at the defense, then this member must have submitted a written report to the Chair of the Committee at the time of the defense. The candidate for the Ph.D. will be introduced by the advisor, and the candidate will give a public lecture on his or
her dissertation. Following this presentation, a period of time will be allowed for questions to the candidate by those in attendance. After a brief break, the candidate will be examined on the dissertation and related topics by the Committee and 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 Statistics
Advisor: 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 Department Doctoral Committee.

The requirements for The Graduate College and the Department must be met. In addition, applicants should have completed (or be completing) a master's degree in statistics or a closely related field. Applications must include three letters of recommendation.

Advising
The Statistics Doctoral Subcommittee will be responsible for the advising of students in the doctoral program, Statistics Option. Upon acceptance to the doctoral program, Statistics Option, the student will be assigned an advisor by the Statistics Doctoral Subcommittee and the Department Doctoral Committee for planning the student's program until (s)he reaches the status of candidate. During the semester in which the student attains the status of candidate, with the approval and advice of the Departmental Doctoral Committee, (s)he will be assigned a dissertation advisor. The candidate and the dissertation advisor 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 Subcommitte and approved by the Departmental Doctoral Committee. The selection of preliminary exams shall be included.

Program requirements
1. Departmental Graduate Examinations: As early as possible, a student must pass Departmental Graduate Examinations in:
   a. Linear Algebra (530), and
   b. Real Analysis (571), and
   c. Statistics. The Statistics DGE shall consist of three, two-hour examinations in the areas of probability, theoretical statistics, and applied statistics. The material covered will be from the courses 560, 562, and 662. The Statistics DGE will normally be given twice a year. A student should usually take this DGE at the end of the first year of graduate study.

2. Coursework and Dissertation (minimum of 90 hours):
   a. Approved two-semester graduate sequences in: linear models and design, statistical inference, and analysis or algebra;
   b. An approved graduate course in mathematical statistics;
   c. An approved cognate of 15 credit hours in computer science and/or numerical analysis;
   d. Approved professional and/or statistical laboratory experiences (not to exceed 10 credit hours);
   e. Additional approved graduate courses and seminars;
   f. Research and dissertation (15 hours).

3. Departmental Preliminary Examination: Each student in the statistics concentration must pass Departmental Preliminary Examinations in three areas: Linear models and design; and two of the following—algebra, analysis, or statistical inference (the choice being subject to approval). 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 or pass an exam could cause a delay in their progress and possibly being dropped from the program.

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 the Statistics Option these will consist of demonstrated competence in computer usage and one foreign language, selected from French, German, and Russian.

Administration
This program will be jointly administered by the Departmental Doctoral Committee and the Statistics Doctoral Subcommittee. The Statistics Doctoral Subcommittee will be responsible for the scheduling, preparation, and grading of preliminary examinations in statistics.

Progress toward completion
Each year in February, the Statistics Doctoral Subcommittee will review the progress of all doctoral students in the Statistics Option. 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).

Mathematics Education
Advisors: Christian Hirsch, Robert Laing, Ruth Meyer
Room 3319, Everett Tower

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

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

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

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

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

Parviz Merati, Chair
Department of Mechanical and Aeronautical Engineering
2065 Kohrman 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 courses, which are prerequisites for success in doctoral studies in engineering, will also be considered in evaluating the applicant. 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 and successful accomplishment of the dissertation.

The doctoral student must acquire through course work and demonstrate in a qualifying examination both knowledge and understanding of mathematics and some 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.

A minimum of 45 graduate credit hours beyond the Master of Science is required, including a minimum of 30 credit hours of course work and 15 credit hours of Ph.D. dissertation (ME 730). 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 student, 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 requirements.

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

Details of the Ph.D. study process may be obtained from the office of the Department of Mechanical and Aeronautical Engineering.

Physics

Advisor: Gerald Hardie

The Department of Physics offers a program leading to the degree Doctor of Philosophy in Physics. The major objective of this program is to prepare students for careers in teaching and/or research at colleges and universities, and in research in industry. Research is an integral aspect of study and may be performed in either experimental physics or theoretical physics. The area of specialization may be atomic physics, condensed matter physics, or nuclear 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 acquired a bachelor’s degree in physics or at least an equivalent amount of experience and training (including training in mathematics at the appropriate level). Prospective students are required to take the Graduate Record Examination General Test. Performance on this examination will be used as one measure in the determination of admission and financial support. It is also recommended that students take the Physics Subject Test part of the Graduate Record Examination. The 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 work is supervised 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).
3. Additional courses chosen from:
   a. Research courses (PHYS 680, 681, or 682).
   b. Courses mutually agreed upon by the student and the graduate advisor or the research advisor.

The Graduate College requires an overall point-hour ratio of 3.25 in all graduate work.

The basic core courses are:
PHYS 610 Research Seminar
PHYS 615 Mathematical Physics
PHYS 622 Quantum Mechanics I
PHYS 623 Quantum Mechanics II
PHYS 624 Statistical Mechanics
PHYS 630 Classical Mechanics
PHYS 650 Relativistic Quantum Mechanics
PHYS 662 Electricity and Magnetism I
PHYS 663 Electricity and Magnetism II
PHYS 671 Nuclear Physics
PHYS 672 Condensed Matter Physics

The research tool requirements must be met by demonstrated competency in two of the following: (1) FORTRAN programming at the level of CS 506; (2) a non-native foreign language at the level of FREN 401, GER 401, and/or (3) differential equations at the level of MATH 574; or the use of physics research equipment at a level equivalent to PHYS 566.

The courses PHYS 615, 622, 624, 630, and 662 normally are taken during the student’s first year. Upon completion of these courses the student is required to take the Qualifying Examination. The Qualifying Examination consists of four tests designed to cover the contents of the five courses. This examination is a written examination; however, if deemed necessary for a more precise judgment, the student may be required to take an additional oral examination. The examination must be passed before any hours of research are taken. A student is allowed to take the Qualifying Examination only twice. It is recommended that the Qualifying Examination be taken at the end of the first year. This examination may not be taken later than the beginning of the student’s third year.

The grade awarded on the Qualifying Examination is based not only on the student’s performance on the written examination, but also on his or her performance in courses. The grade represents the faculty’s judgment, based on all available evidence, on whether or not a student should become a doctoral candidate.

After successful completion of the Qualifying Examination, the student will, upon counsel with the graduate advisor and with the consent of the faculty member selected as a research advisor. The advisor must be a member of the graduate faculty. 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 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 will be provided with copies of the dissertation at least one month in advance of the examination. The dissertation and the student’s knowledge of the subject area 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.

Political Science

Alan C. Isaak, Graduate Director
Room 3007, Friedmann Hall

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 Ph.D. program provides basic training in American politics, comparative politics, political theory and philosophy, and research methods. Students are expected to specialize in one of three research areas: citizen participation, political development, democratization and sustainability; or public policy and policy processes. Students may enter with either a B.A. degree or an M.A. degree.

Admission Requirements
Students must satisfy the general admission requirements of The Graduate College.
Students applying to the program with a bachelor's degree must have completed at least twenty-four hours of work in the social sciences or other relevant fields and have achieved a 3.25 grade point average in their last two years of course work. Students applying with a master's degree must have achieved a grade point average of at least 3.25 in their graduate work. Graduate Record Exam scores for the quantitative, verbal, and analytical parts are required for all students. Each applicant should arrange to have three recommendations sent (using WMU Graduate Application Forms) and submit a brief essay concerning their academic and professional objectives. All application materials for admission should be submitted by the following dates: July 1 for Fall Semester, November 1 for Winter Semester, March 1 for Spring Session, and May 1 for Summer Session.

Program Requirements

The doctorate requires a minimum of 90 credit hours of work beyond the baccalaureate. After successfully completing 30 hours in the program and passing the preliminary exam, students will be eligible for a Master of Arts degree. The basic requirements for the doctorate are as follows:

1. Prerequisites (non-credit): Students must have completed the following course or its equivalent with a grade of B or better: PSCI 395, Quantitative Methods for Political Scientists.

2. Required core courses: Each student is required to take the following thirteen core courses (33 hours) or their equivalent: PSCI 601, Foundations of American Politics I; PSCI 602, Foundations of American Politics II; PSCI 610, Comparative Politics I; Theories of Comparative Politics; PSCI 642, Comparative Politics II; Institutional and Contextual Issues; PSCI 682, Political Philosophy I; PSCI 693, Political Philosophy II; PSCI 664, The Nature of Political Inquiry and Analysis; PSCI 691, Political Analysis I; PSCI 692, Political Analysis II; PSCI 694, Teaching Political Science; PSCI 665, Teaching Excellence; PSCI 696, Research and Professional Skills; and PSCI 697, Proposal Workshop.

3. Annual review: In order to continue in the program, students must receive a positive annual review. In addition, first-year students must take and pass a preliminary examination upon completion of the required hours of approved coursework, satisfactory completion of the required Comparative Politics courses (PSCI 641 and PSCI 642) or the required Comparative Politics courses (PSCI 641 and PSCI 642) in order to continue in the program.

4. Research area: After passing the preliminary examination and completing the basic requirements, students will select their research area (either citizen politics; political representation, democratization, and sustainability; or public policy and policy processes). With the approval of the Graduate Director, they will: A. Take nine hours of courses from an approved list; B. Select 27 additional credit hours that relate to their research area and dissertation topic from approved cognates (9 hours required), research methods (6 hours), and electives (9 hours).

5. Language requirements and research skills: All doctoral program students are required to demonstrate mastery of two foreign languages or one foreign language and either research methodology or statistics.

6. Comprehensive examination: In order to continue in the program after the completion of their required core course work, students must take and pass written and oral examinations covering two of the following three fields: American politics; comparative politics; political theory and philosophy.

7. Dissertation: As the capstone to the Ph.D. degree program, the dissertation is awarded 21 credit hours. The dissertation is an original and substantive research requirement and will be developed and completed under the supervision of a dissertation advisor.

Psychology

R. Wayne Fuqua, Graduate Training Committee Chairperson
Linda Rowan, Program Secretary
Room 239, North Hall

The Doctor of Philosophy in Psychology is designed to provide intensive training in Experimental Analysis of Behavior, Applied Behavior Analysis, Clinical Psychology, or School Psychology. The Ph.D. degree is a research degree for persons intending to assume leadership roles in teaching, research, and service in a variety of professional and academic institutions.

In addition to meeting the entrance requirements of The Graduate College, applicants are expected to show evidence of interest in and aptitude for conducting research. Graduate students receive a personal appointment of a doctoral committee chairperson and two faculty sponsors to facilitate the full development of the student's academic interests within the research programs of the Department and the University. The program is arranged to encourage students to participate in the daily conduct of the Department's academic programs and research activities. The credit hour requirements of the Ph.D. program are arranged to prepare students for teaching and research. The minimum course work includes:

**Applied Behavior Analysis (84 hrs.)**

1. Principles of Learning and Motivation (3 hrs.)
2. Research Methods (6 hrs.)
3. Research 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.)

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 (84 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 of School 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 (18 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 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, research methods, or advanced statistics. The doctoral candidate will also show evidence of the 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 applicant 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 the satisfactory completion of the required course credit, demonstration of competence in two research tools, satisfactory completion of 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 conducted in partial fulfillment of degree requirements as well as academic, professional service or research activities which are not awarded academic credit but are completed during the student's formal tenure within the programs of the Department of Psychology at Western Michigan University. The members of the department faculty conduct an annual review of student progress and recommend to The Graduate College advancement from program applicant to candidacy for a degree within each program.
This evaluation includes a review of academic performance, professional responsibility and adherence to the accepted ethical and professional guidelines of the discipline and the profession as published by the American Psychological Association and, when relevant, the rules for licensure within the State of Michigan. Failure to meet these standards and ethical principles of the American Psychological Association and the State or failure to abide by ... "A Student Guide to Academic 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
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 strategic planning 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 and other program requirements for the DPA include those applicable to doctoral study at WMU contained in The Graduate College Bulletin, plus those outlined below:

Admission Requirements
1. Master's degree in Public Administration or related area.
2. At least four years of experience in a supervisory or administrative staff position.
3. Two academic references and two letters of recommendation 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 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:
     4. Six semester hours of electives.

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. Forty-four semester hours of graduate study to include SCI 615, 616, 617, 690 and 691 (617 and 690 must be taken at least twice),
2. Twelve semester hours of science education to include SCI 615, 616, 617, 690 and 691 (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.

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 to include SCI 615, 616, 617, 690 and 691 (617 and 690 must be taken at least twice),

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. Forty-four semester hours of graduate study to include SCI 615, 616, 617, 690 and 691 (617 and 690 must be taken at least twice),
2. Twelve semester hours of science education to include SCI 615, 616, 617, 690 and 691 (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 the 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 candidate requirements of doctoral programs in The Graduate College.

Sociology
Director and Advisor, Graduate Studies: Susan L. Caulfield
2509 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 in sociological criminology, medical sociology, social psychology, sociology of science, sociology of knowledge, comparative sociology, race relations and theory, as well as others approved by the student's doctoral committee. Course work in a cognate area, approved by the student's doctoral committee, is also
required. The areas of concentration are important and active ones in the field, and thus provide students with valuable specialties to augment the doctoral training in the discipline as a whole.

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

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 department, 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.

Special Education
Advisors:
Alizon Hannaford, Christine Bahr, Michael Bahr, Barbara Harris, George Haus, Dora Icebone, Troy Mariage, Howard Poole, Elizabeth Whitten
Office: 3506 Sangren Hall

The Doctor of Education in Special Education 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. Choices available in the cognate area allow the program to be designed to suit a variety of career interests.

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. Applications must include three letters of recommendation. Decisions on admission will be made by the Statistics Doctoral Committee.

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 and advisor by the Statistics Doctoral Committee for planning the student's program until he/she reaches the status of candidate. During the 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, he/she will be assigned a dissertation advisor. The candidate and the dissertation advisor will select, with the approval of the Statistics Doctoral Committee, 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, 660 and 662.
2. Course and dissertation work, at least 90 credit hours, including:
   a. Three approved two-semester sequences linear 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 science, 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. Failure to pass any 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 or 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 Statistics 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

Elise B. Jorgens, Interim Dean
Leonard Ginsberg, Associate Dean
James Peterson, Associate Dean

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

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 academe, government, and other institutions of society.


The College regards classroom attendance as an essential part of the educational experience of each student. Accordingly, the College has a strong expectation that students attend class, be punctual to class, and remain in attendance for the full class period unless there is a legitimate reason to be excused.

Anthropology (ANTH)

Professors Cremin, Helweg, Loeffler, Sundick; Associate Professor Simmons; Assistant Professors Miles, Nassaney.

Open to Upperclass and Graduate Students

ANTH 500 Topics in Archaeology 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 archaeological 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, (e.g., the Near East or Meso-America) 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 archaeological 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 foundations 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 Archaeology I 3 hrs.
Instruction in the archaeology 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.
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 hormones, 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 variations. 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 biomedical 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. Prerequisite: An introductory physiology course or consent of instructor.

BIOS 534 Virology
3 hrs. Winter
A study of the classification, structure and chemistry of viruses. The role of the virus in cell-cell 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 vivo and in vitro 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 with regard to our understanding of the cause of behaviors, and the possible reasons for their existence. Special 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 study of insects, their structure, classification, physiology, life histories, ecological relationships, and economic importance. Students will learn to identify common families of insects, and many individual collections. Prerequisite: BIOS 151.

BIOS 547 Ornithology
3 hrs.
An introductory course that explores both scientific and popular aspects of bird study. Life history, behavior, ecology, and identification are emphasized.

BIOS 549 Field Ecology
3 hrs.
Field studies of forest, native grassland, wetlands, and other local ecosystems. Plant and animal composition, geological history, human effects, succession, and other aspects of the structure and working of ecosystems are integrated. Field ecological methods are emphasized. Prerequisite: BIOS 301 or equivalent.

BIOS 553 Limnology
3 hrs.
Biological, chemical, and physical aspects of lakes, ponds, and streams. Ecological relationships of invertebrate animals and lower plants are emphasized. Prerequisite: BIOS 151.

BIOS 555 Marine Biology
4 hrs.
A survey of marine biology topics including: the physical marine environment and general principles of marine ecology; marine plants and animals, with emphasis on their special roles and adaptations; major marine communities; and marine biotic resource conservation and utilization. Selected topics of current research are included.

BIOS 556 Tropical Biology
4 hrs.
A travel study course providing an introduction to both terrestrial and marine ecosystems in the tropics. The course, consisting of lectures, field explorations, and investigative projects, examines the major life zones and biogeography of the region visited, from an ecological perspective. Tropical Rain, Montana, and Dry Forests and the biology of a coral reef will be studied. Human ecology, agriculture (tropical fruits and vegetables, sugar cane and coffee) and environmental issues will also be included. The course will be presented on one of the islands of the Caribbean and/or in Central America. Prerequisites: Two courses in biological sciences or consent of instructor.

BIOS 557 Water Pollution Biology
3 hrs.
A comparison of organisms which live in clean waters as contrasted with those in polluted waters. Streams, lakes and ponds will be studied. Water conditions will be analyzed, and the use of biological indicators will be studied. The course will include field trips, laboratory work and lecture presentations. Prerequisite: BIOS 202.

BIOS 570 General Pathology
4 hrs. Fall (alternate years)
An introduction to pathology which describes the structural and biochemical changes occurring in cells and tissues following injury or disease. 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 seminar topic to which 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. Prerequisites: None. These research seminars are required. May be repeated for a total of 2 hours. Graded on a "Credit/No Credit" basis. Prerequisite: Admission 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 emphases 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. Emphasis includes the relative roles of competition and trophic interactions in population dynamics and how communities are structured. Applications of ecological concepts will include 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
4 hrs.
A laboratory course emphasizing currently developing technology. This course is designed for graduate students who have a working knowledge of electron microscopy and its application to biologic problems. The course will be personalized 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 higher 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 studies in a research laboratory different from the laboratory where their thesis research is conducted. Open to Graduate Students Only—Please refer to The Grad 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 Graduata Research
2-10 hrs.

Black Americana Studies (BAS)

Earl Washington, 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 in all scientific and technological fields. 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 Multicultural Education
3 hrs.
This course is designed to prepare teachers and administrators who will work in a multicultural setting. The course is primarily aimed at helping teachers at any level who teach a social studies component, but teachers of other subjects (e.g., physical and biological sciences and special education and school administrators) will find the course useful. Students will learn how to compile data on the ethnic makeup and resources of the local community, develop instructional packages for use in multicultural courses, and evaluate materials prepared for multi-ethnic audiences.

BAS 598 Individual Study
2-4 hrs.
Independent research or investigation of a specific topic related to the Black experience. May be repeated for credit.

Open to Graduate Students Only

BAS 600 Black Americana Studies-Seminar
4-6 hrs.
In depth study of specific areas of Black American life and culture. Since Black Americans have been involved in the total life of the nation, special study is called for. There are at least two dimensions which lend themselves to special study. The first and most obvious is that of unusual achievement by persons of known and identifiable African ancestry. A second and more elusive dimension is Black "influence"—positively and negatively—in American life and culture.

Chemistry (CHEM)

Professors Berndt, Cooke, Harmon, Howell, McCarville; Associate Professional Schreiber, Stapleton, Warren; Assistant Professors Bertman, Dziewatkoski, Miller, Reinhold.

Open to Underclass and Graduate Students

CHEM 505 Chemical Literature
2 hrs.
An introduction to the use of various types of chemical literature such as journals, abstracts, monographs, government and institutional publications, and patents. Both manual and computer search techniques are employed in the course of completing assigned problems involving literature searches in analytical, biological, inorganic, organic, and physical chemistry fields.

Prerequisite: Twenty-three hours of chemistry.

CHEM 506 Chemical Laboratory Safety
1 hr.
A study of toxic, corrosive, flammable, explosive, electrical, mechanical, thermal, and radiant energy hazards frequently encountered in chemical laboratory work. Emphasis is placed on precautionary methods to avoid damaging accidents and on emergency procedures to apply when accidents occur.

Prerequisite: Twenty-four hours of chemistry.
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 chemistry nature and uses of drugs and pesticides. Abuses and potential toxicological hazards are also discussed in respect to biological-chemical properties and the behavioral-sociological implications. Prerequisite: 361 or 365.

CHEM 570 Polymer Chemistry
3 hrs.
The aspects of macromolecular chemistry which are significantly different from the chemistry of small molecules are studied. In particular, mechanisms and techniques involved in the synthesis of macromolecules, and the structure, composition, mechanical properties, and solution properties of polymers are studied in terms of the organic, physical, and analytical chemistry involved. Prerequisite: CHEM 361 or 355, and CHEM 431 or 535.

CHEM 580 History of Chemistry
3 hrs.
The history of chemical theory in which the development of deductive reasoning in the field of organic chemistry. Prerequisites: Sixteen hours of chemistry, including at least one semester organic.

CHEM 590 Special Problems in Chemistry
2 hrs.
Research work on a problem in chemistry in association with a faculty member. May be repeated for credit. Graded on a Credit/No Credit basis. Prerequisites: Twenty-four hours of chemistry, which includes CHEM 436, and approval of the department chairperson and a faculty director.

Open to Graduate Students Only

CHEM 601 Graduate Seminar
1 hr.
Graduate seminar in chemistry. Required of all candidates for advanced degrees in chemistry. Graded on a Credit/No Credit basis. (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 Inorganic Chemistry
3 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 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 (polarography, electromigration, 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 626 Instrumental 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, reactions in solution and on surfaces, complex reactions, application of kinetics to mechanisms, and photochemistry. Prerequisite: CHEM 431.

CHEM 650 Proteins and Nucleic Acids
3 hrs.

CHEM 661 Organic Reactions
3 hrs.
An intensive study of organic reactions with emphasis on preparative scope and utility. The following topics are considered: Aliphatic substitution, oxidation, reduction, condensation, etc. Prerequisite: CHEM 361.
Field of Telecommunications. Special attention will be given to such topics as libel, privacy, access to information, and right to reply, and copyright. A case study approach is used for the purpose of analysis. Some topics are announced in the Schedule of Classes; others 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 may be accumulated as credit toward a Master of Arts in Communication.

Communication (COM)

Gilchrist, Chairperson; Professors Northouse, Rhodes, Van Hoeven, Yelsma; Associate Professors Gershon, Lipkin; Assistant Professors Ford, Fox, Kayany, Shannon.

Open to Upperclass and Graduate Students

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 may be accumulated as credit toward a Master of Arts in COM.

COM 541 Communications Law and Policy 3 hrs.

Provides an overview of the essential regulatory and policy issues governing the field of 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.

COM 548 Telecommunication Management 3 hrs.

Examines three sectors of the telecommunications field, including radiowave, cable and telephony 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.

COM 551 Methods of Media Analysis 3 hrs.

An investigation of the approaches to media analysis (auteurist, internationalist, sociological, structural, historical, ideological, psychological) by intensive "reading" and shot sequence examination and evaluation of widely divergent works.

COM 554 Communication Technology 3 hrs.

This course provides an overview of telecommunications technology and services. The course is intended for the manager who requires a "practical" understanding of the design and performance characteristics of such telecommunication technology as satellite, optical fiber, PBX, and cellular telephone communications. In addition this course will include an appropriate measure of economic, regulatory, and policy issues as they pertain to the development of new and enhanced telecommunication services.

Open to Graduate Students Only

COM 600 Listening 3 hrs.

Explores the role of listening in learning. Research in the field is examined and appraised. Listening tests are taken and discussed. Class members design listening projects or research projects. Focus increases sensitivity to the impact of speech.

COM 601 Introduction to Graduate Study in Communication 3 hrs.

Introduces COM graduate students to the research literature, methodology and theoretical domains of the communication discipline. Students will learn the standards of scholarly writing and be introduced to the criteria for conducting and evaluating research methodologies.

COM 602 Communication Research 3 hrs.

This course is an introduction to the methods of conducting communication research. Although an overview will be provided of all methodologies, the primary focus of the course will be on those applied methods associated with organizational communication. A lecture/discussion/experimental format will be used.

COM 640 Seminar in Telecommunication 3 hrs.

Exploration of selected topics in telecommunications. Possible topics, each of which may be taken for credit, include:

a. Communication Technology
b. Effects of Mass Media

COM 641 Theories of Telecommunication Uses and Effects 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 643 Telecommunications and Organizational Planning 3 hrs.

An overview of the basic principles involved in the management and implementation of telecommunication services within public and private organizations. Participants are introduced to three sectors of the telecommunications field, including broadcasting, cable, and telephone communications.

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 relationship 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 basis 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. The role of the organizational television (OTV) department and the duties of an OTV producer are discussed. Students develop proposals for new OTV programs and criteria for judging the effectiveness of OTV videos. Teleconferencing, interactive video, and conventional delivery methods will be compared.

COM 670 Seminar in Interpersonal Communication 3 hrs.

Exploration of selected topics in communication theory. Possible topics, each of which may be taken for credit, include:

a. Nonverbal Communication
b. Personality and Communication
c. Family Communication
d. Health Communication
e. Female/Male Interaction
f. Intercultural Communication
g. Intergroup Communication

COM 671 Cognition and Emotion 3 hrs.

Examination of cognitive, affective, and psychomotor aspects of communication. Emphasis is on current research and theory pertaining to the information processing of the individual, particularly in areas of self-discovery, self-control, the creative self, the thinking self, the relating self, and the mediating self.

COM 673 Conflict Management 3 hrs.

Based on the assumption that conflict pervades human life, the course explores the strategies of productive and nonproductive interpersonal and social conflict within the organizational setting. Theories of conflict are examined, and an explanation of the sources that stimulate conflict in humans is made.

COM 674 Theories of Interpersonal Communication 3 hrs.

A study of the dynamics of interpersonal communication from various theoretical perspectives. Emphasis is on the assumptions, conceptualizations, and models which explain how people interact at the content and relationship levels.

COM 680 Seminar in Organizational Communication 3 hrs.

Exploration of selected topics in organizational communication theory. Possible topics, each of which may be taken for credit, include:

a. Organizational Communication Ethics
b. Communication and Organizational Culture
c. Advanced Organizational Communication

COM 681 Group Communication Processes 3 hrs.

A study of small group communication as it affects problem solving and decision making procedures. Emphasis will be on developing an understanding of how participants in problem solving groups work together and how they can be made more effective through leader facilitation. The student will have practical experience in studying problem-solving and decision-making methods.

COM 682 Organizational Communication 3 hrs.

This course examines the theoretical foundations and research methodologies of organizational communication. Students will apply this theory and research in analyzing a
functioning organization. The focus is on a system analysis in diagnosing communication problems and developing plans for change.

COM 683 Power and Leadership in Organizational Communication 3 hrs.
This course is designed to study power and leadership within the organization from a communication perspective of sender and receiver of messages. Students will examine research in power, leadership traits, styles, contingency theories and group leadership approaches and make application to individual cases.

COM 685 Special Topics in Organizational Communication 3 hrs.
Intensive group study of special topics in applied organizational communication.
Possible topics, each of which may be taken for credit, include:
   a. Communication Training and Development
   b. Interviewing for Managers
   c. Public Relations for Managers
   d. Communication Assessment and Consulting
   e. Communication Training Evaluation Methods
   f. Communications and Customer Service
   g. Organizational Communication Technology

Open to Graduate Students Only—Please refer to the Graduate College section for course descriptions.

COM 700 Master's Thesis 6 hrs.
COM 710 Independent Research 2-6 hrs.
COM 712 Professional Field Experience 2-6 hrs.

Comparative Religion (REL)
Lawson, Chairperson; Professors Earhart, N., Fahl, F. Gross, Light, Siebert; Associate Professor Ede; Assistant Professor Sik.

Open to Upperclass 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; Prerequisite: Junior standing, and two previous courses in Religion.

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. Prerequisite: Junior standing, and two previous courses in Religion.

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—but 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. Prerequisite: Junior or senior standing, and two courses (6 hours) in either Religion or Women's Studies. Prerequisite: Junior standing, and two previous courses in Religion.

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. Prerequisite: Junior standing, and two previous courses in Religion.

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. Prerequisite: Junior standing, and two previous courses in Religion.

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. Prerequisite: Junior standing, and two previous courses in 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. Prerequisite: Junior standing, and two previous courses in Religion.

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 601 Classics II 3 hrs.
A continuation of REL 600 with an emphasis upon more recent works in the humanities and the sciences that have precipitated new forms on inquiry about religious thought and practice. Special attention will be paid to the arguments about interpretive methods typical of the humanities versus explanatory theorizing typical of the sciences and their relevance for understanding religion in comparative perspective.

REL 610 Theory and Method I 3 hrs.
An examination of the major theoretical options for understanding and explaining religion in comparative perspective and the major methods employed by these options in their development of such theoretical options. Particular attention will be paid to intellectualist, symbolist, and structuralist, ideological, emotivist and cognitive method and theory.

REL 611 Theory and Method II 3 hrs.
A continuation of REL 610 with an emphasis upon case studies for specific historical and cultural contexts. The course will focus specifically on the contributions that the cognitive sciences have made and continue to make to causal explanations of religion. Particular attention will be paid to the developmental literature having to do with the conditions for the acquisition and the transmission of cultural knowledge.

REL 615 Survey of Religions of the World 3 hrs.
A survey of ten major religious traditions; each tradition will be studied through its historical development, its unified system (symbols, beliefs and rituals), and its dynamics (actual practices such as annual celebrations, rites of passage). While learning the content of individual traditions and exploring the comparative questions between/among traditions, students will focus on the issues of teaching about religion generally and the problems of presenting individual traditions. This course will balance content of religious traditions and pedagogical techniques as a way of preparing students to teach basic courses in religion.

REL 616 Teaching Comparative Religion 3 hrs.
A course introducing the content and pedagogy of comparative religion, focusing on ten major religious traditions and the teaching methods appropriate for the undergraduate classroom. Particular attention will be paid to learning theory, teaching methods, course preparation, syllabus design, computer use (especially the PASS program), audiovisual materials, and test selection. Students will be introduced to the classroom situation under the mentor ship of a faculty member by leading discussions, delivering lectures and preparing and grading examinations.

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.

REL 695 Dissertation Tutorial 3 hrs.
Planning and preparation for the dissertation, including selection of an appropriate topic. The student will work with an advisor to develop a dissertation proposal to be submitted to higher Ph.D. committee. The tutorial will entail preparation of a preliminary bibliography, readings in basic sources and examination of the ideas and materials related
to the subject, selection of essential sources, and sketching of the dissertation outline. (This course is a prerequisite for REL 730, Doctoral Dissertation).

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.

REL 730 Doctoral Dissertation
15 hrs.

Computer Science (CS)

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

Open to Upperclass and Graduate Students

CS 503 Programming the Microcomputer for Teachers
3 hrs.
A course in programming at an intermediate level for teachers. An introduction to file handling and graphics on small computers will be provided. Flowcharting, top-down design and the development of algorithms are stressed. Some programming projects in each teacher's area of interest will be assigned. Not for Computer Science majors or minors (except teaching). Prerequisite: CS 502 or equivalent paper on the physical design.

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.
This course provides an overview of both model development and computer simulation. A methodology is introduced which is generally applicable to simulation projects. The relationships between real systems, models, and simulation are presented, and the concept of experimental frames is discussed. General purpose simulation languages (e.g. Simscript, GPSS, CSMP, Simula) and the formalisms they support are presented. An introduction to random variables and elementary frequency distributions is provided. Simulation as a tool for exploring ill-defined systems will also be discussed. Several small 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 design algorithm, including 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 architecture, 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 differences, 2-d finite element techniques, 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 stressed. 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 network concepts, algorithms, and applications. A history of neural nets will be outlined along with some discussion of models of biological neural systems. The salient features of a neural net (architecture, activation functions, weighting scheme) will be characterized. Standard algorithms will be presented including Hopfield nets, linear associative models, bidirectional associative memories, and adaptive resonance models. The student will 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 531 Design and Analysis of Algorithms
3 hrs.
A continuation of the study of data structures and algorithms. It provides a theoretical foundation in designing algorithms. The focus is on the advanced analysis of algorithms and on how the selection of different data structures affect the performance of algorithms. Algorithmic paradigms such as divide and conquer, greedy method, dynamic programming, backtracking and branch, and bound are covered. B-trees and 2-3 search trees and a variety of graph structures are discussed along with their applications to algorithm implementation. Algorithms will be analyzed for their complexity. NP-completeness will be introduced. Prerequisites: MATH 145 and CS 331 or equivalent.

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, 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 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, files 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 network. 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 Church-Turing 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 adviser. Prerequisite: Approval of Department.

CS 599 Independent Study in Computer Science
1-3 hrs.
Advanced students with good scholastic records may elect to pursue an advanced 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.
discuss aspects of the complexity and number of algorithms on a computer.

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 focus on various VLSI design representations, tools and algorithms for the representation and manipulation of the 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, and on aspects of operating systems and language. 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 analysis of parallel numerical algorithms to solve problems such as singular value decomposition and the solution of linear systems for structured and sparse matrices; partial differential equations; and multivariate numerical integration. Applications may include the solution of wave equations, hydrodynamic flow, 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 computation are considered. Methods for proving program correctness and the related problems are identified. Students implement a number of algorithms on a computer and discuss aspects of the complexity and correctness of their programs. Prerequisites: CS 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: convex hulls, triangulation, 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 mathematical 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, data base machines and current query languages will be covered. Prerequisites: CS 531 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.

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 specification based on programming languages such as Ada, CLU, and Ada. Also discussed will be formal specification of real-time systems using Petri nets, PAUSELY, CSP, SF and others. Examples and exercises will use the use of several formal systems will be given. Student 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 developed, including heuristic search, Fourier analysis, Markov models, template matching, and grammatical inference. Computational aspects and efficiency of different methods and algorithms are emphasized. Students must complete a project using methods developed in the course. Prerequisite: CS 582.

CS 679 Theory of Computation II 3 hrs.
Recursive, partial recursive and primitive recursive functions, properties of recursive and recursively enumerable sets, decidability, Turing computability and reducibility are treated in depth, while certain problems 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 691 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 725 Professional Field Experience 2-6 hrs.

CS 730 Doctoral Dissertation 15 hrs.

CS 735 Graduate Research 2-10 hrs.

Opener to Graduate Students Only—Please refer to The Graduate College section for course descriptions.
Economics (ECON)

Professors Hoffman, Pozo, Sichel, Thistil; Associate Professors Alexander, Asefa, Huang, Kern, Meyer, Neill, Wheeler, Zhou; Assistant Professors Alvi, Higgins.

Open to Undergraduate 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 504 Mathematics for Economists
3 hrs.
This course presents the mathematical material necessary as background for the topics covered in graduate-level economics courses. Topics covered include differential calculus, optimization, comparative statics, and mathematical programming. These techniques are applied to selected economic problems. Prerequisites: ECON 201 and 202.

MATH 122 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, 300 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 economic reasons for lack of development and the steps necessary to promote economic progress. Prerequisites: ECON 201 and 202.

ECON 591, ECON 592 Guest Economist Seminar
1 hr.
Seminar series on a topic of current interest featuring invited visiting economists. Topics will vary and courses may be repeated. Prerequisites: ECON 201 and 202.

ECON 598 Readings in Economics
1-3 hrs.
An independent program of study for qualified students to be arranged in consultation with the instructor. 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 relationships 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 equilibrium 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 needed to undertake studies relating to human resource 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 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.
The course focuses on the theory and practice of testing hypotheses, statistical estimation theory, the basic theory underlying the linear model, and introduction to econometric models, and the nature of 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, market behavior, 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, and macroeconomics, 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 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 604, ECON 665.
ECON 670 Advanced Econometrics 3 hrs. The second course in the Econometrics sequence. A comprehensive survey of identification, estimation, and hypothesis testing in the context of simultaneous equations models. Prerequisites: ECON 604, ECON 619.
ECON 675 Macroeconomic Theory I 3 hrs. This course develops a general equilibrium macroeconomic model reflecting the recent developments in the literature. Prerequisites: MATH 122, MATH 123 or equivalents.
ECON 676 Macroeconomic Theory II 3 hrs. The second course in the Ph.D. level macro sequence. A rigorous analysis of macro theory and macro policy issues with an emphasis on empirical testing. Prerequisites: ECON 604, ECON 675.
ECON 680 International Economics I 3 hrs. In this course the interaction of the domestic economy with the international financial world will be studied. Topics include: Exchange rate determination, balance of payments, and the international monetary system. Prerequisites: ECON 622, ECON 662 or equivalents.
ECON 681 International Economics II 3 hrs. This course examines the reasons for and implications of international trade. Topics include: Models of international trade, policies used to influence trade and the welfare effects of international trade policies. Prerequisite: ECON 603 or equivalent.
ECON 688 Economic Development I 3 hrs. An intensive examination of a number of selected key topics in development economics, centering on issues of crucial importance to developing nations. Examples of such issues are primary products, capital formation, technological change, inflation, debt servicing, population, etc. Prerequisites: ECON 201 and 202.
ECON 689 Economic Development II 3 hrs. This course will concentrate on analysis of development theory and examine its relevance to the problems facing extant developing economies. Different approaches to economic development will be examined using advanced economic theory and methodology. Prerequisites: ECON 665, ECON 676, ECON 688.
ECON 699 Economics Workshop 3 hrs. A workshop designed to deepen a student’s understanding of theoretical and empirical economics by discussing the research being conducted by the Department’s faculty, economists from other institutions, and Ph.D. candidate graduate students. Prerequisites: ECON 666, ECON 670, ECON 676. Topics will vary and course may be repeated.
Open to Graduate Students Only—Please refer to The Graduate College section for course description.
ECON 700 Master’s Thesis 6 hrs.
ECON 710 Independent Research 2-6 hrs.
ECON 712 Professional Field Experience 2-12 hrs.
ECON 730 Doctoral Dissertation 15 hrs.

English (ENGL)
S. Scott, Chairperson; Professors Cooley, Cooney, Davidson, Dybek, Gauper, Gianikaris, Gordon, Jayne, A. Johnston, Jorgens, H. Scott, Seller, Stroppe, Syndergaard, Szamch, Weaver; Associate Professors Bailey, Bat-Ami, Brentkle, Douma, Eimers, Etter-Lewis, Gill, Hayden, P. Johnston, Joslin, Olsen, Raaberg, Taffy, Wardro; Assistant Professors Abron, Carey-Webb, Gamez, Larson, M. Richardson, Walker.
Open to Underclass 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 1500-1600.
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 grammar itself, 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 of 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 Spraw 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.
There will be study and practice in a course in writing in the various formats of speeches, brochures, newsletters, and other non-personal prose. Emphasis will be placed on the use of the underlying good modern prose. Prerequisite: A bachelor's degree.

A study of styles, techniques, forms, and sociolinguistics needed by large institutions, whether public reading or performance is required. Course may be repeated once with the permission of the graduate adviser. Prerequisite: Teaching experience.

A study of theories and methods of teaching language and composition. Prerequisite: ENGL 690 and prior completion of at least 21 hours of credit toward the Master of Arts in English.

An examination of psycholinguistic insights into the nature of the reading process, with emphasis on practical implications and applications for the classroom. No prerequisite.

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 poetry and prose, including Beowulf.

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 Middle English texts, both prose and poetic, Chaucerian and non-Chaucerian, stemming from various regions of English-speaking Britain.

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. Prerequisites: Teaching experience.

A study of theories and methods of teaching literature. Prerequisite: ENGL 681 Advanced Methods in Teaching Language and Composition.
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 term. 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 12-12 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, creative writing, or advanced composition. There will opportunity for both guided praxis and reflection on praxis. May be repeated. Prerequisite: Consent of advisor.
ENGL 730 Doctoral Dissertation 15 hrs.

Foreign Languages and Literatures
Benson, Chairperson; Professors Fiebels, Felkel, Griffin, Haenicke, Krawutschke, Reisch; Associate Professors Bigelow, Gardiner, Harris, Johnson, Nisula, Running-Johnson, Tatsende-Grabowski, Teichert, Torres, Vande Berg; Assistant Professors Blicke, Isea, Lopez, Lynde-Racchia, Sauret.

Language Courses (LANG)

Open to Upperclass and Graduate Students LANG 550 Independent Study in Classics 1-3 hrs.
Directed, individual study of a specific topic related to Classical languages, literature, and/or culture. Department approval required for admission. Prerequisite: Completion of four courses or equivalent in classics; minimum grade point average of 3.0 in the major; departmental approval required. May be repeated for credit.
LANG 580 Foreign Language for Special Purposes 1-12 hrs.
The study of or practice in a specialized area in the field of foreign language and culture such as court interpreting, medical or engineering terminology, or public school administration. The content of this course may vary from semester to semester. Students may repeat the course for credit, provided the subject matter differs. Prerequisite: Completion of four courses in area of specialization; departmental approval required.

Open to Graduate Students Only—Please refer to The Graduate College section for departmental description.
LANG 710 Independent Research 2-6 hrs.

Language Teaching Courses

Open to Upperclass and Graduate Students LANG 558 Modern Language Instruction (in French, German, Spanish, or other language) 3 hrs.
Required for modern language teaching majors and minors. This course will acquaint prospective language teachers with various approaches and strategies involved in modern language teaching. Specifically, in a performance-oriented program, students will learn theory and practice related to teaching the listening, speaking, reading, and writing skills, as well as the culture component. Students should complete this course before beginning directed teaching. This course will be offered regularly. The comparable methods course for Latin is LAT 557, Teaching of Latin; for Latvian, LATV 515, Methods of Teaching Latvian.

Translation Courses (TRNS)

Open to Upperclass and Graduate Students TRNS 510 Translation Seminar 4 hrs.
Intensive practice in translation, primarily of non-literate 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, or SPAN 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 hrs.
Topics of literary, cultural, or linguistic merit will be analyzed. Topics will vary from semester to semester. May be repeated for credit. Prerequisites: FREN 316, 317, 325, or permission of instructor

German (GER)

Open to Upperclass and Graduate Students GER 550 Independent Study in German 1-3 hrs.
Directed, individual study of a specific topic in a German literary or linguistic area. Departmental approval is required for admission. Repeatable for credit. Prerequisite: One 500-level course in the major; a minimum grade point average of 3.0 in the major.
GER 559 History of the German Language 3 hrs.
Survey of the development of the German language. Prerequisite: Six hours of 300-level German or above.
GER 560 Studies in German Literature 3 hrs.
Topic varies according to genre, author, or period and will be announced. Each of these courses carries separate credit, although all are listed under 560. Thus, a student may take any or all of the offerings at various times. Prerequisites: German 316, 317, 325 or 325 or equivalent. Representative topics which may be treated in this area include: The Novel—Survey of the development with representative selections; Lyric Poetry—Survey of the development with significant selections; Nineteenth Century Drama—Primarily Kleist, Grillparzer, Hebbel, and Hauptmann; Twentieth Century Drama—Representative selections.

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.

Latin (LAT)

Open to Upperclass and Graduate Students LAT 560 Directed Individual Study in Latin 1-3 hrs.
Directed, individual study of a specific topic in Latin. Prerequisites: LAT 315, 317, 325, or 325 or equivalent. Representative topics which may be treated in this area include: The Renaissance—Survey of the development with representative selections; Lyric Poetry—Survey of the development with significant selections; Nineteenth Century Drama—Primarily Kleist, Grillparzer, Hebbel, and Hauptmann; Twentieth Century Drama—Representative selections.
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.

**LAT 550 Independent Study in Latin**

Directed individual study of a specific topic in Latin 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**

4 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 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: Permission of Department and instructor.

**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. 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 510 Studies in Hispanic Culture**

3 hrs.
An intensive study of various aspects of Spanish and Spanish-American culture. Emphasis is on cultural understanding as an avenue to increased proficiency in the Spanish language. Since specific topics will vary each semester, this course may be repeated for credit. Prerequisites: SPAN 316, 317, either 322 or 323, plus one additional course at the 300- or 500-level.

**SPAN 526 Survey of Spanish Literature to the 18th Century**

3 hrs.
A survey of Spanish literature from its origin to, and including, the seventeenth century. Prerequisites: SPAN 316, 317, and 325.

**SPAN 527 Survey of Spanish Literature from the 18th Century to the Present**

3 hrs.
A survey of Spanish literature from the eighteenth century to the present. Prerequisites: SPAN 316, 317, and 325.

**SPAN 528 Survey of Spanish American Literature to Modernismo**

3 hrs.
A survey of Spanish American literature from its origin to the era of Modernismo (late 19th century). Prerequisites: SPAN 316, 317, and 325.

**SPAN 529 Survey of Spanish American Literature from Modernismo to the Present**

3 hrs.
A survey of Spanish American literature from the late 19th century to the present. Prerequisites: SPAN 316, 317, and 325.

**SPAN 560 Studies in Spanish Literature**

1-3 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—Major works of Lope de Vega through Calderon de la Barca.
- Nineteenth Century Literature—The Romantic Movement.
- Nineteenth Century Novel—Development of the regional novel from Fernan Caballero through Blasco Ibanez.
- Generation of '98—Thought and works of typical representatives such as Unamuno, Azorin, Baroja, and A. Machado.
- Contemporary Theater—Evolution and analysis of the characteristics.
- Spanish-American Short Story—Significant short stories along with the cultural and social background.

**Open to Graduate Students Only**

SPAN 600 Don Quijote

3 hrs.
An in depth study of Cervantes' masterpiece. Emphasis is on literary analysis, but attention will also be paid to Cervantes' language.

**SPAN 610 Topics in Hispanic Culture**

3 hrs.
The advanced study of selected aspects of Hispanic culture. Course varies according to topic and may be repeated with permission of adviser. Representative topics include:
- Non-Castillian Spanish Cultures: Galicia, Euskadi and Catalonia; The Way of St. James and Medieval Tradition; Contemporary Spanish Cinema; Women in Spanish Society; Hispanic Culture in the United States; Ideas and Ideology in Contemporary Latin America; Spanish-American Popular Culture.

**SPAN 620 Topics in Spanish Literature**

3 hrs.
The advanced study of selected aspects of Spanish literature. 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, Persiles 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 American Literature. 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.)

**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 scholarly 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 their language, as well as an examination of second language acquisition and the various aspects of bilingualism. Prerequisite: An introductory course in linguistics.

LING 690 Seminar in Linguistics—Variable Topics
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.
Study of processes and forms of urban geography.
GEOG 621 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 GEOG 244 or consent.

1. Agriculture. Describes and analyzes agricultural systems throughout the world, with emphasis 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 the role of the industry in the historic evolution of the United States.

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 related to historical processes given to cultural traits which strongly influence human occupation of the earth's surface.

2. Historical Geography. Studies of geographic and related features which have combined to influence the practice of historical development. This course will concentrate on a particular region and its people over a period of time during which a special geographical features are encountered. Each specialisation will be designated in the Schedule of Classes.

3. Political Geography. General survey of the principles and the applied aspects of political geography; primary emphasis on the physical and cultural resource bases and conflicts of national states, the assessment of location, boundary delimitation and the territorial sea, politically-organized territories within the administrative hierarchy, and electoral geography.

GEOG 553 Water Resources Management
3 hrs.
Examination of water resources management with emphasis upon on regional development and utilization of available supplies. Topics include supply and demand, methods of technological and geographical augmentation (destination, inter-basin transfers, etc.), water administration and policies, and various water problems and other difficulties 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, hiking, and fishing, etc.) with emphasis upon recreational planning. Topics include supply and demand for outdoor recreation, identification of present and future recreational needs, policy considerations, administration of recreational land uses, and various problems associated with outdoor recreation. Readings, discussion, and student-designed and executed individual studies provide professional orientation.

GEOG 555 Contemporary Issues in Resources Management
3 hrs.
Examination of selected contemporary natural resource and environmental problems, such as questions of natural resource adequacy, environmental pollution, energy shortages, political and economic problems related to resource management, and individual studies of local environmental problems. Prerequisite: GEOG 350 or consent.

GEOG 556 Studies in Urban and Regional Planning
3 hrs.
Each of the courses listed under this number focuses on a major aspect of planning, including a review of the objectives of the planning process, legislation pertaining to planning operations, and methods of and library investigation 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 policies relating to the preservation and development of government-controlled lands.

GEOG 557 Environmental Impact Assessment
3 hrs.
Alteration of the natural arena 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 assessments. Prerequisites: Senior standing and GEOG 350 or permission.

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. Each seminar emphasizes different subject areas, such as landscapes, soils, and vegetation, this seminar may be repeated. A final research project is required. Prerequisites: One of several advanced courses in physical geography, ecology 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 556a or 570.

REGIONAL GEOGRAPHY

Open to Graduate Students Only

GEOG 510 Anglo America 3 hrs.
Review of the physical, cultural, and economic geography of the United States and Canada.

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 380.

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 a 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 the student has received credit for GEOG 390.

GEOG 609 Studies in Regional Geography 2-3 hrs.
An investigation of selected topics in physical and human geography of a region, e.g., Latin America, Anglo-America, Europe. Regional concentration will vary from semester to semester, with the region being indicated at time of enrollment. May also be offered in conjunction with field studies to various areas, and may be repeated for credit. Prerequisite: An appropriate introductory course at either the undergraduate or graduate level.

GEOGRAPHIC METHODOLOGY AND RESEARCH

Open to Underclass and Graduate Students

GEOG 557 Environmental Impact Assessment 3 hrs.
Alteration of the natural and human environment for perceived economic and social benefits often has significant adverse consequences. Recognition of this problem is reflected in federal, state, and local laws and regulations requiring environmental impact statements. The course provides an introduction to the analysis and preparation of environmental impact statements. Prerequisites: Senior standing and Geography 350 or permission.

GEOG 566 Field Geography 2-4 hrs.
The theory and application of geographic techniques and instruments of field investigations: collection and analysis of field data, presentation and preparation of materials. The course is based primarily upon field observations. (One hour lecture and three hours laboratory) Prerequisites: GEOG 255 or 375 and 382 or consent of instructor.

GEOG 567 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 568 Quantitative Methodology 3 hrs.
Introduction to the application of quantitative concepts and methods in the analysis of geographic problems. Emphasis is placed on data base management, computer applications of common numeric and statistical methods, and utility assessment of various research designs and strategies. Prerequisite: GEOG 567 or consent.

GEOG 569 Geographic Information Systems 4 hrs.
This course focuses on the fundamental concepts and procedures of Geographic Information Systems (GIS), geographically-referenced information systems capable of assisting decision-making in a variety of situations. Course components include entering both spatial and non-spatial data into computerized form, examining alternative ways of organizing data for GIS computing, then integrating and analyzing mapped and non-mapped data using GIS software systems.

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 582 Remote Sensing of the Environment 3 hrs.
The student will acquire proficiency in the fundamental techniques and skills of photogrammetry and photointerpretation during the first part of the course. The remainder of the semester will be spent in interpreting photos dealing with such topics as geomorphology, 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.

Open to Graduate Students Only

GEOG 661 Geographic Research 4 hrs.
Problem formulation and research design are introduced in light of modern economic thought and current practices. Other course emphases are sources of geographic information, search strategies, and the written presentation of research materials. Graduate students in geography are urged to complete this course as soon as possible. Prerequisite: Consent of graduate adviser.

GEOG 665 Seminar in Geography 1-3 hrs.
Designed for the advanced student interested in analyzing problems related to various topics in geography. Prerequisite: Consent of instructor. May be repeated.

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 faculty and colleagues. This course cannot be repeated for credit. 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.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

GEOG 700 Master's Thesis 6 hrs.

GEOG 710 Independent Research 2-6 hrs.

GEOG 712 Professional Field Experience 2-12 hrs.
Geology (GEOL)

Straw, Chairperson; Professors Chase, Grace, Harrison, Keewy, Schmidt; Associate Professors Atekwana, Barnes, Hampton, Krishnamurth; Assistant Professor Smith.

Open to Upperclass and Graduate Students

GEOL 502 Problems in Geology and Earth Science
1-3 hrs.
Individual problems involving topical reading and/or research problems in earth sciences. May be repeated for credit. Prerequisite: Consent of instructor.

GEOL 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 to conduct a 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 movement and relation to the geographic environment. Prerequisites: GEOL 401 or GEOL 535; MATH 122, MATH 123 to be taken concurrently.

GEOL 515 Applied Hydrology
3 hrs.
Application of hydrologic 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 516 Geochronology and Global Change
3 hrs.
Application of the concepts of nuclear physics and chemistry to geological problems. Topics to include absolute and relative dating, formation of elements, global change and causes of global change.

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 and magnetic methods; and ground penetrating radar. Prerequisite: GEOL 412 or GEOL 512.

GEOL 526 Principles and Practices 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. Prerequisites: 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 ground-water 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 refractive, gravity, magnetics, electric, and electro magnetics. Prerequisites: Two semesters 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 exploration. Theoretical background, data collection, data processing and interpretation will be discussed. Prerequisites: GEOL 560 and MATH 123, or consent of instructor.

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 modelling, 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 and ground penetrating radar. 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 Environmental Field Geophysics
3 hrs.
Field studies utilizing seismic gravity, and magnetic, electromagnetic, georadar, and electrical resistivity methods for glacial geology and ground-water, engineering, and environmental problems in the Kalamazoo area. Course also includes field work at local sites. Prerequisite: GEOL 560, or consent of instructor.

Open to Graduate Students Only

GEOL 600 Hydrogeochemistry
3 hrs.
Geochemoical origin and characteristics of surface and ground-water; equilibrium thermodynamics, the carbonate system, redox processes, ion exchange, organic compounds and isotopes. Prerequisite: GEOL 512 or consent of instructor.

GEOL 605 Ground-water Modeling
3 hrs.
Study of ground-water 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 Geochernistry
3 hrs.
An introduction to the basic principles and theories of geochernistry. 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 ground-water flow and contaminant transport. Topics include well hydraulics, flow in unsaturated soils, multephase flow, and advection-dispersion. Prerequisites: GEOL 512, 605, and MATH 123.

GEOL 613 Wetlands Hydrology
3 hrs.
Introduction to hydrologic function of wetlands, wetlands classification, and the relationship between hydrology and soil and plants. Emphasis will be placed on the use of these parameters in wetlands delineation. Prerequisite: GEOL 512 or consent of instructor.

GEOL 614 Environmental Regulatory Overview
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 ground-water. Includes theoretical considerations, case histories, law, analysis of problems, and preparation of hydrogeological reports.

GEOL 617 Stable Isotope Hydrology
3 hrs.
Application of stable isotopes in the study of hydrologic cycle, global change, and atmospheric processes. Cosmochemical
implications of stable isotope systematics in extra-terrestrial samples.

**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 specimens to large map areas. Prerequisites: GEOL 430 and consent.

**GEOL 634 Research in Geology and Earth Science**
1-4 hrs.
Advanced reading 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 research, as well as theories and concepts of global tectonics. Prerequisite: GEOL 440 or equivalent.

**GEOL 645 Carbonate Petrology and Paleoclimatology**
3 hrs.
Identification, recognition, and analysis of carbonate rocks in hand specimen and thin section and environmental conditions under which they were formed, also, ecological relationships of organisms living in carbonate environments. GEOL 433 and 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 (hotel break) 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-hr. preparation per week. Prerequisites: GEOL 433, 435, or consent of instructor.

**GEOL 650 Topics in Geology and Earth Science**
2-4 hrs.
An intensive study of specific subjects in the area of Earth Science as listed. Prerequisite: Consent of instructor. Subject to be offered during a semester or term. Will be announced in advance.

**GEOL 655 Clastic Petrology and Basin Analysis**
3 hrs.
Examination, analysis, and interpretation of clastic rocks in hand specimen and thin section and the distribution of sediments in basinal settings. GEOL 635 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 Carlson, Dooley, Fricco, Gregory, Haight, Maier, Porter, Ross, Schmitt, Stone; Associate Professors Coryell, Elder, Norman, Xiong; Assistant Professors Borish, Gaines, Simon.

Open to Upperclass and Graduate Students

**HIST 500 Studies in History**
1-3 hrs.
Topics announced in Schedule of Classes. May be repeated under different topics.

**HIST 510 Colloquium**
1 hr.
Research presentations by department faculty, advanced graduate students and invited scholars. Specific topics may be listed in Schedule of Classes. May be repeated to a maximum of 3 hrs. Graded on a Credit/No Credit basis.

**HIST 515 Topics in Public History**
1-3 hrs.
Selected topics in aspects of public history including museology, historic preservation and cultural resource management; historic administration, information science, and applied research. Topics listed in Schedule of Classes. May be repeated under different topics.

**HIST 517 Topics in Economic and Social History**
1-3 hrs.
Selected topics in the history of economic and social conditions and change such as the development of world trade and world economy, development and modernization, urbanization, social and political movements, demography and migration, family structure, etc. Topics announced in Schedule of Classes. May be repeated under different topics.

**HIST 519 Topics in Intellectual and Cultural History**
1-3 hrs.
Selected topics in the history of ideas, literary and artistic expression, intellectual and cultural character of various periods and civilizations, examination of historical conditions through philosophy and the arts, etc. Topics announced in Schedule of Classes. May be repeated under different topics.

**HIST 530 Studies in Early American History**
3 hrs.
Topics listed in Schedule of Classes. May be repeated under different topics.

**HIST 535 Studies in Recent American History**
3 hrs.
Topics listed in Schedule of Classes. May be repeated under different topics.

**HIST 550 Studies in Medieval History**
3 hrs.
May be crosslisted with MDVL 500. Topics listed in Schedule of Classes. May be repeated under different topics.

**HIST 565 Studies in 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**
1-3 hrs.
Computer applications to historical and related research projects including manuscript analyses techniques, text-oriented databases, museum and historical agency database and registration systems, simulations, etc. Survey of applications in closely related disciplines. Maybe repeated. Prerequisite: CS 105 or equivalent.

**HIST 595 History Writing Workshop**
1-3 hrs.
Practicum in the writing of history: editing and publishing; preparation of written materials for lay readers and audiences outside the discipline. May be repeated to a maximum of six semester hours.

**HIST 596 Local History Workshop**
1-3 hrs.
Practicum in research techniques for problems in local and small community history, including oral tradition, genealogy, and interdisciplinary method. May be repeated to a maximum of six semester hours.

Open to Graduate Students Only

**HIST 600 Historical Method**
3 hrs.
Introduction to the field of history and its recent development. Practice in the use of oral and written communication skills for conveying historical knowledge to various audiences. Survey of major journals and bibliographical tools for general research. Examination of interaction between historical techniques and those of related disciplines.

**HIST 601 Historiography**
3 hrs.
Study of the major figures, ideas, and developments in historiography. Students may conduct research in their fields of concentration.

**HIST 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 602 Readings in Early United States History 3 hrs. Intensive study of historiography, 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, 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 Galobal 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 thesis 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 600, 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 announced in Schedule of Classes. May be repeated under different topics. Prerequisites: HIST 600 and 601.

HIST 672 Seminar in Local History Methodology 3 hrs. Research design and execution organized around interdisciplinary methodology. Presentations and research supervision by faculty with interest in exhaustive, small-scale historical reconstruction in a variety of time periods and geographical settings such as American, medieval African and non-Western traditional, etc. 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 Classes. 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.
MATH 522 General Topology 3 hrs.
Topics to be chosen from: Topological spaces and continuous functions, metric spaces, connectivity, separation axioms, compactness, product and quotient spaces, paracompactness, and manifolds. Prerequisite: MATH 330 or MATH 570

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 at least a "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 conceptual, computational, and graphical methods and to explore the connections between symbolic and graphic representations of mathematical ideas. Prerequisite: MATH 352 or 552 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 552 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 statistical 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, 662 of applied statistics which combines both theory and applications. Topics include: elementary theory of estimation and hypothesis testing; the use of the normal, binomial, chi-square, F and t distributions in statistics problems; means and variances; simple linear regression; correlation; one-way and two-way analysis of variance, fixed 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 BMDP. Statistical work treated will include: data entry, editing, statistical analysis of the one and two sample problems, analysis of variance, and regression analysis. Prerequisites: WMU's computer literacy requirement and an introductory statistics course.

MATH 565 Design of Experiments for Quality Improvement 3 hrs.
This course covers statistical methods useful for improving the quality of products and systems in an industrial setting. It provides a comprehensive set of tools to use in building better products and in reducing manufacturing and other costs. The focus will be on solving real engineering problems through case studies. Taguchi methods will be discussed along with modifications from standard statistical practice. Topics will include planning an experiment, experimental strategy, Analysis of Variance designs, factorial designs, orthogonal arrays, loss functions, signal-to-noise ratios, identifying significant factor effects, graphical methods, parameter design and tolerance design. Prerequisite: An introductory course in statistics.

MATH 566 Nonparametric Statistical Methods 3 hrs.
This course presents a broad overview of the 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 molded around the complete analysis of good applied problems. Prerequisite: An introductory statistics course.

MATH 568 Regression Analysis 3 hrs.
An applied course in regression analysis: simple and multiple linear regression; resolution of fit of a model, including residual analysis, precision of estimation, and tests of general hypotheses; model building; step-wise regression; use of indicator variables; non-linear regression. Prerequisite: An introductory statistics course.

MATH 570 Advanced Calculus 3 hrs.
Properties of real numbers, Cauchy sequences, series, limits, continuity, differentiation, Riemann integral, sequences and series of functions. Prerequisites: MATH 272 and 314. (330 recommended).

MATH 571 Real Analysis 3 hrs.
Topology if n-dimensional space, continuity and differentiability of functions of one variable; Riemann-Stieljes integral, convergence of sequences and series of functions; Fourier series; analysis of functions of several variables. Prerequisite: MATH 570 or approval of advisor.

MATH 572 Vector Calculus and Complex Variables 4 hrs.
Functions of several variables, implicit and inverse functions, Jacobians, multiple integrals, Green's theorem, line and surface integrals, 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.

Open to Graduate Students Only

MATH 600 Statistics for Public Administrators 3 hrs.
This course is designed to assist public administrators in understanding various statistical procedures which could be used to
MATH 609 Studies in Applied Math
3 hrs.
This course considers the methodology of modeling a series of practical problems. The mathematical tools used may include dimensional analysis, optimization, differential and difference equations, graph theory and network flow theory. The practical problems may include population dynamics, economic theory of prices and production, scale models, scheduling problems, pollution, social group interaction, epidemics, and facility location. Prerequisite: MATH 574 or consent of instructor.

MATH 605 Optimization
3 hrs.
Optimization methods including nonlinear programming, calculus of variations, and integer programming will be covered. Network flow problems and dynamic programming may also be covered. Applications to problems in business and industry will be included. Prerequisites: MATH 123 and 406 or 608 or IEGM 610.

MATH 607 Numerical Analysis II
3 hrs.
The analysis and use of numerical algorithms for the solution of ordinary and partial differential equations, and approximation theory. Prerequisite: MATH 507.

MATH 608 Linear Programming
3 hrs.
Linear inequalities; convex geometry; optimization in linear systems; zero-sum games; applications. Prerequisite: An introductory course in linear algebra.

MATH 609 Studies in Applied Math
3 hrs.
Advanced work organized around topics related to the field of study indicated at the time the course is scheduled. Students may take this course more than once.

The courses 611 through 619 are primarily for teachers and ordinarily will not apply towards the Master of Arts in Mathematics.

MATH 611 Mathematical Applications
3 hrs.
An introduction to the philosophy of, machinery for, and methodology in applications of mathematics. Topics will be chosen from graph theory, linear algebra, numerical approximation, optimization and graphical linear programming, probability, and linear differential equations. Prerequisite: Consent of the adviser.

MATH 615 Intermediate Analysis
3 hrs.
This course will include the following topics: limits, continuity, differentiation, integration, applications. It will stress concepts rather than techniques. Prerequisite: Consent of adviser.

MATH 616 Survey of Algebra
3 hrs.
This course will discuss groups, rings, integral domains and fields, including such topics as homomorphisms and isomorphisms, subalgebras and ideals, with examples involving permutation groups, transformation groups, polynomial rings and finite fields. Prerequisite: Consent of adviser.

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 621 Algebraic Topology – Fundamental Group
3 hrs.
Topics may include: Homotopy, the fundamental group, covering spaces, the classification of covering spaces, the Seifert-Van Kampen Theorem, and applications. Prerequisite: MATH 522.

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 625 Differential Topology
3 hrs.
Topics may include: Differentiable manifolds and smooth maps, tangent bundles, immersions, imbeddings, submanifolds, transversality, Sard’s Theorem, intersection theory, and additional topics. Prerequisite: MATH 522.

MATH 626 Algebraic Topology – Homotopy Theory
3 hrs.
Topics may include: Homotopy groups, fibrations, the action of the fundamental group, Hurewicz Theorem, Whitehead Theorem, Freudenthal Suspension Theorem, Eilenberg-MacLane Spaces, killing homotopy, and obstruction theory. Prerequisites: MATH 623 and MATH 624.

MATH 629 Studies in Topology
3-4 hrs.
Advanced work organized around topics related to the field of study indicated in the above title. Students may take this course more than once.

MATH 630 Abstract Algebra I
3 hrs.
A general study of groups, rings, and modules. A specific study of finite groups, polynomial rings, and Euclidean domains. Prerequisite: MATH 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 530.

MATH 632 Field Theory
3 hrs.
Algebraic and transcendental extensions of fields, Galois theory, and valued fields. Prerequisite: MATH 630.

MATH 633 Topics in Group Theory
3 hrs.
Advanced work organized around topics in the theory of groups. Possible topics include: Finite Groups, Groups and geometries, Group Representations, Infinite Groups or

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.

MATH 646 Studies in Geometry
3 hrs.
Advanced work organized around topics related to the field of study indicated in the above title. Students may take this course more than once.

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 and analyze recent experimental and commercial curricular materials. This course may be taken more than once with the approval of the student’s adviser. 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 teaching mathematics effectively to college students will be emphasized. Prerequisite: Consent of adviser.

MATH 657 Statistical Inference I
4 hrs.
A first course in mathematical statistics. Topics include: distributions of statistics; asymptotic distribution of estimators, functions of sufficient statistics; confidence intervals; tests of theory, uniformly most powerful tests; likelihood ratio tests; selected topics in statistical inference. Prerequisite: MATH 652.

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 means, homogeneity and covariance matrices; 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 model theory 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; $t$-tests, $F$-tests. Prerequisite: MATH 656.

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.

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, asymmetric distribution theory. Prerequisites: MATH 571 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 571, 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, 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 following courses.

MATH 670 Real Analysis I
3 hrs.
The first of a two semester sequence in real analysis. Topics covered in the two semesters will include topology and continuous functions, Lebesgue and general measure and integration, differentiation and the Radon-Nikodym theorem, Hilbert spaces, Banach spaces, and product spaces and Fubin's theorem. Prerequisites: MATH 522 and 571.

MATH 671 Real Analysis II
3 hrs.
The second of a two semester sequence in real analysis. Topics covered in the two semesters will include topology and continuous functions, Lebesgue and general measure and integration, differentiation and the Radon-Nikodym theorem, Hilbert spaces, Banach spaces, and product spaces and Fubin's theorem. Prerequisite: MATH 670.

MATH 676 Complex Analysis
3 hrs.
Topics include: Cauchy Theory, series expansion, power series, types of singularities, calculus of residues. Prerequisite: MATH 571.

MATH 677 Measure and Integration
3 hrs.
The basic theory of measure and integration, including such topics as Lebesgue measure, abstract measures, measurable functions, product measures, Lebesgue and Radon-Nikodym theorem. Prerequisite: MATH 571.

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 from selected tables, Monte Carlo studies; least squares computational procedures for linear and nonlinear models such as QR decompositions and iteratively weighted least squares; and robust estimating procedures. Additional topics may include generalized linear models, nonlinear models, and multivariate problems. Prerequisites: CS 308 or CS 201; MATH 662 or MATH 569 and MATH 239.

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 distributions), 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 identified models will be covered. The uses of these models for forecasting future trends and assessing interventions will be examined. Extensive data analysis using SAS, MINITAB, and BIOMED statistical packages are included. Topics include: autocorrelation function, partial autocorrelation functions, Yule-Walker equations, differencing, stationarity, autocorrelation models, moving average models, seasonality, invertibility, and Box-Pierce tests. Prerequisite: MATH 660 and MATH 662.

MATH 683 Robust Statistical Analysis
3 hrs.
Robust statistical procedures for inference in location, linear and multivariate models are presented. This will include broad classes of robust estimates, including R-., M-., L-., and L-estimates of both regular and bounded influence types. Concepts such as breakdown point, influence function, and asymptotic theory are used to obtain properties of these
procedures. Computational aspects of these estimates are discussed along with small sample properties and applications of these procedures. Prerequisite: MATH 660 and MATH 662.

MATH 884 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, response surface designs, partially balanced incomplete block designs, mixture models, analysis of models with missing data using Types I, II, III, and IV SAS sums of squares, analysis of large experiments with many crossed and nested factors, and some Taguchi methods. Prerequisite: MATH 664.

MATH 689 Studies in Number Theory 3 hrs.
Advanced work organized around topics related to the field of study indicated in the title. Students may take this course more than once.

MATH 690 Seminar in Applied Mathematics 1-3 hrs.
Opportunity to participate as statistical consultants on real projects. The student gains considerable experience in 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 569.

MATH 692 Seminar in Topology 1-3 hrs.

MATH 693 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 569.

MATH 694 Seminar in Applied Mathematics 1-3 hrs.

MATH 695 Seminar in Graph Theory 1-3 hrs.

MATH 696 Seminar in Mathematics Education 1-4 hrs.

MATH 699 Seminar in Probability and Statistics 1-3 hrs.

MATH 700 Seminar in Analysis 1-3 hrs.

MATH 698 Seminar in Topology 1-3 hrs.

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.

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.

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 530 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 3 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 612 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.

ENGL 677 Middle English 3 hrs.

RELIGION
REL 500 Historical Studies in Religion 3 hrs.

REL 620 Advanced Seminar in Comparative Religion 3 hrs.

MUSIC
MUS 565 Medieval Music 3 hrs.

MUS 566 Renaissance Music 2 hrs.

Philosophy (PHIL)

Baldner, Chairperson; Professors Bach, Ellin, A. Falk, Pisaneschi, Pritchard, Smith, Wright; Associate Professors , Dilworth; Assistant Professors Culp, McGrew, Newman.

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 507 The Continental Tradition in Philosophy
2-4 hrs.
An examination of the Continental tradition in philosophy, with a focus on major philosophers from term to term. Examples include: phenomenology, existentialism, postmodernism, structuralism, deconstructionism, critical theory, and hermeneutics. Prerequisite: 12 credit hours in Philosophy, including PHIL 301. May be repeated for credit, with advisor's approval, when topics vary.

PHIL 520 Philosophical Applications of Symbolic Logic
3 hrs.
This course is designed to expose graduate students to the range of philosophical applications of modern symbolic logic. Starting with the sentential and predicate calculi, the course explores various extensions which may include alethic modal logic, deontic logic, tense logic, relevance logic and counterfactuals. In addition, the course will address salient issues in the philosophy of logic and may include an investigation of the logical paradoxes and/or the controversy surrounding quantified modal logic. Prerequisites: 12 hours of philosophy including either PHIL 225 or PHIL 320.

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 aims to be such a theory of rationality. Attention will be given both to its mathematical development and to the issues it raises in the philosophy of science, the theory of knowledge, and action theory. A working knowledge of high school algebra is assumed. Prerequisite: PHIL 220, 225 or 320; and two other courses in philosophy, mathematics (above the level of MATH 110), or computer science (above the level of CS 105).

PHIL 534 Moral and Philosophical Foundations of Health Care
3 hrs.
In this course, philosophical reflection and biological science are combined in a critical examination of the nature and purpose of the health sciences. Topics to be considered include: the aims of the health sciences, the interplay of fact and value in health care, competing images of humankind embedded in health science, paten autonomy, dignity and medical paternalism. Prerequisite: 12 credit hours in philosophy and/or biological sciences or a health professional field.

PHIL 540 Philosophy of Mind
2-4 hrs.
A study of the philosophical problems surrounding our understanding of the nature of mind, mental states, and consciousness, and their relation to perception, and states of the brain and/or central nervous system. Possible topics include cognitive science, artificial intelligence, the relation of mind to body and/or brain, and the behavior of human and animal behavioral explanations of human behavior, the philosophical foundations of psychology, behaviorism, functionalism, the nature of intentionality, the concept of a person, the privacy of mental states, knowledge of other minds, and questions regarding free will and determinism. Prerequisite: 12 credit hours in Philosophy. May be repeated for credit, with advisor's approval, when topics vary.

PHIL 550 Philosophy of Science
2-4 hrs.
A detailed examination of some of the central problems in contemporary philosophy of science. Topics may vary from term to term. Typical topics include: nature of scientific explanation, theory structure and change, scientific realism vs. various anti-realisms, or issues in the special sciences, e.g., the physical, biological or social sciences. Prerequisite: 12 credit hours in Philosophy. May be repeated for credit, with advisor's approval, when topics vary.

PHIL 570 Philosophical Topics
1-4 hrs.
An examination of special philosophical topics. Topics to be listed in the Schedule of Classes. Prerequisite: 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. May be repeated for credit, with advisor's approval, when topics vary. May be offered in an accelerated format.

PHIL 598 Readings in Philosophy
1-4 hrs.
Research on some selected period or topic under supervision of a member of the Philosophy faculty.

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. Topics may vary from term to term.

PHIL 610 Seminar in the History of Philosophy
2-4 hrs.
close reading and discussion of selected classics written by major philosophers from the ancients, medieval, or modern period. Selections may vary from term to term.

PHIL 620 Philosophy of Language and Logic
2-4 hrs.
An examination of the relationship to the world, and/or the philosophical basis of standard and nonstandard logics. Possible topics include the nature of reference and predication, the distinctions between a priori and a posteriori, between analytic and synthetic, and between necessary and contingent propositions, the role of proper names, general terms, and pronouns, and the truth conditions of sentences, as well as questions concerning the philosophy of modal logic, tense logic, free logic, deontic logic, epistemic logic, paraconsistent logic, first and second order logics, and probability calculus. May be repeated with advisor's approval, when topics vary.

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 nature of perception, a priori and a posteriori knowledge, skepticism, epistemic foundations, epistemic justification, and other related topics.

PHIL 633 Metaphysics
2-4 hrs.
An examination of the underlying nature of reality. 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.

PHIL 650 Philosophy of Religion
2-4 hrs.
An examination of philosophical issues related to religion. Topics may vary from term to term.

PHYS 507 Master's Thesis
1-6 hrs.
PHYS 710 Independent Research
2-6 hrs.

Physics (PHYS)
Shamu, Chairperson; Professors Halderman, Hardie, McGunn, Oplinger, Tanim; Associate Professors Berrah, Chung, Kamber, Pancella, Rosenthal; Assistant Professors Burris, Mansour, Paulius.

Open to Upperclass and Graduate Students

PHYS 562 Atomic and Molecular Physics
3 hrs.
This course consists of some applications of quantum mechanics. Topics include the helium atom, multielectron atoms, the Raman, Zeeman, and Stark effects, stimulated emission, transition rates, selection rules, the diatomic molecule, Molecular Spectroscopy. Prerequisite: PHYS 460 or consent of instructor.

PHYS 563 Solid State Physics
3 hrs.
After an initial study of symmetry and crystal structure, quantum mechanics is used to describe the cohesion of solids, x-ray and neutron diffraction, the elasticity of solids, lattice vibrations, and the thermal and electrical properties of solids, with particular emphasis on metals. Prerequisite: PHYS 460 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 589 Selected Topics 1-4 hrs.
This course affords an opportunity for advanced students with good scholastic records in physics to pursue independently the study of some subject of interest to them. Prerequisite: consent of 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 electrodynamics, Feynman diagrams, and the properties of the strong and electro 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 relativity, relativistic dynamics, collisions between charged particles, bremsstrahlung, and multipole fields. Prerequisite: PHYS 662.

PHYS 671 Nuclear Physics 3 hrs.
This course covers nuclear models, nuclear matter, electromagnetic properties, reactions, and scattering. Prerequisite: PHYS 623 or consent of instructor.

PHYS 672 Condensed Matter Physics 3 hrs.
This course includes both static and dynamic properties of condensed matter with particular emphasis on transport properties, optical properties, magnetism, and superconductivity. Prerequisites: PHYS 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.

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)

Houghton, Chairperson; Professors Dahlberg, Isaak, McNab, Ranstrom, Ritchie, Rogers, Ziring; Associate Professors Butterfield, Datta-Sandhu, Tanner; Assistant Professors Clements, Corder, Hauptmann, Hegia, Lewis, Pinney.

Open to Upperclass 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. May be repeated for credit when topics vary.

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 532 Administration in Developing Countries 3 hrs.
This course compares public administration systems in a development context. It analyzes the role of the administrator in developing countries, notably the administrator's varied responsibilities as a career public official, and as an agent of change. The character of the development administrator as both a generalist and specialist is explored.

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 governmental 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 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.
This course is designed to provide students with an opportunity for advanced students with a foundation in computer concepts and arrangements made to suit the needs of individual students. Prerequisite: CS 105 or a term project. Prerequisite: Approval of the MDADirector required to enroll.

PSCI 600 Seminar: National Politics and Public Policy 3 hrs.
Research and study in selected topics in national politics and public policy. May be repeated for credit when topics vary.

A systematic examination of the constitutional foundations of American government, the primary institutions of government at the national level—Congress, the presidency, the courts, and the bureaucracy—and the policy-making processes from an institutional perspective.

PSCI 602 Foundations of American Politics II: Representation and Participation 3 hrs.
The course reviews analyses of the representation of citizen interests in the policy-making process through political participation including elections, voting behavior, political parties and interest groups, and public opinion.

PSCI 603 Seminar in American Political Behavior 3 hrs.
This 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.

PSCI 605 Comparative Public Policy 3 hrs.
This course focuses on the development of policy over time and across state and national boundaries. It deals with how and why policies emerge in particular forms in different countries. Selected substantive issues will be examined comparatively in greater detail.

PSCI 606 Public Policy Economy 3 hrs.
An examination of two models, the free market mechanism and national industrial policy, that examine the problems encountered in the modernization of developing countries. 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.

PSCI 607 Resources, Environment and Technology 3 hrs.
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 dependency, climate change, new biotechnologies or weapons) will be used to illustrate the dilemmas they create for policy makers at all levels.

PSCI 630 Seminar: Public Administration 1-3 hrs.
Study of selected topics in public administration. May be repeated for credit when topics vary.

PSCI 631 The Foundations of Public Administration 3 hrs.
This course is designed to introduce and review major developments in the field of public administration, to acquaint the student with the constitutional and legal basis of administration in public agencies, and to review the ethical and legal significance of accountability in the public service.

PSCI 632 Public Budgeting in Developing Countries 3 hrs.
Consideration of the theoretical and practical aspects of governmental budgeting and financial management in developing countries. Emphasis is placed on the role of budgeting in the development process, management of international aid for development projects, budgeting for state-owned enterprises, and basic tools for budget analysis.

PSCI 633 The Political Environment of Public Administration 3 hrs.
This course examines the interaction between the administrative agency and the social, economic, and political forces which constitute its external environment. Emphasizes the sources of bureaucratic power, the nature of administrative and political elites, and the strategies which agencies pursue in seeking to survive and expand their programs. Explores the impact of the political system on administrative decision-making and agency responsiveness.

PSCI 636 Seminar: Development Administration 3 hrs.
The seminar is devoted to research related to administration in developing areas. Topics may range from general subjects dealing with various aspects of bureaucracy in one or more countries to narrow problems at the level of a ministry or sub-ministry. The research experience and final papers will be shared with the other students in the seminar.

PSCI 637 Organization Development 3 hrs.
Organization Development (OD) is a planned, organization-wide attempt directed from the top to increase organizational effectiveness by encouraging certain behavior. Building on behavioral and humanistic theories of organizations, OD is concerned with human relations in the work group. The strategy is to make the organization work more effectively through having individuals become aware of what motivates others and through reduced tensions in the workplace.

PSCI 638 Seminar Implementing Development Policy 3 hrs.
As a capstone to the MPA program, this research seminar calls upon the student to examine the problems encountered in the implementation of a particular development policy. Attention will be given to socioeconomic, political and cultural impediments, and the strategies that are judged appropriate in circumstances where resources to change are limited. Permission of the MPA Director required to enroll.

PSCI 640 Seminar in Comparative Politics 3 hrs.
Research and study in selected topics in comparative politics. Topics will usually be thematic but may also encompass a regional or country study. In all cases significant issues in the study of the field will be stressed.

PSCI 641 Comparative Politics I: Theories of Comparative Politics 3 hrs.
An overview course for master's and Ph.D. students on the major theoretical and methodological approaches to the study of comparative politics and political development. Major topics may include major regime types, state-society relations, political...
economy, political development and change (including revolutions and reform), the state of the field, and other key topics in the literature.

PSCI 642 Comparative Politics II: Institutional and Contextual Issues
3 hrs.
A study of the state and its institutions and the various issues at the subnational and international level that impinge on the power of the state. Issues may include nationalism, regionalism, and social movements, international political economy, international regimes and organizations, resource availability and usage, and international security. Prerequisite: PSCI 641.

PSCI 643 Relations Between Subnational, National, and International Systems
3 hrs.
The course explores interdependencies between subnational, national, and international systems. Special consideration is given to the influences and demands of the international system on national and subnational affairs in both the materially developed and less developed areas of the world.

PSCI 644 Seminar: Comparative Strategies of Development
3 hrs.
The 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 645 National Political Systems and International Politics
3 hrs.
The course explores the interrelationships 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.

PSCI 647 Comparative Constitutionalism
3 hrs.
Constitutions are fundamental charters of government which define the extent and manner in which sovereign power is exercised. This course examines the constitutional foundations of representative political systems and evaluates the impact of basic constitutional provisions on contemporary governance practices.

PSCI 649 Sustainable Rural Development
3 hrs.
A seminar concerning changing perceptions of rural development in the academic world and in national and international development agencies. The links between rural development, agriculture, food security, health, population pressures, and resource availability are analyzed. The challenges of designing and/or reforming administrative structures to pursue effective rural development are reviewed.

PSCI 650 Third World Seminar
3 hrs.
Variable topics examining the course of political development among the developing countries, with special reference to the relationship between administrative needs and democratic objectives. May be repeated for credit when topics vary.

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. May be repeated for credit when topics vary.

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: How do we obtain knowledge of politics? 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 660 Seminar in Advanced Political Analysis
3 hrs.
Variable topics in advanced political analysis and research methods are addressed. Topics may include time-series analysis, experimental design, formal methods, game theory, and comparative methods. May be repeated for credit when topics vary. Prerequisite: Permission of the instructor.

PSCI 691 Political Analysis I
3 hrs.
Introduction to the research process in political science including research design, sampling and case selection, sources of data (e.g., surveys, interviews, archives, government agencies, etc.), and basic descriptive statistics.

PSCI 692 Political Analysis II
3 hrs.
The application of statistical and mathematical models to the analysis of political data with emphasis on methodological assumptions and problems: correlation; analysis of variance; and simple and multiple regression. Prerequisite: PSCI 691 or equivalent.

PSCI 694 Teaching Political Science
1 hr.
This course addresses the basics of teaching in higher education: class preparation, leading discussions, course materials, university policies, classroom management, dealing with problem 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 adolescent 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 writing 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 the student 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
21 hrs.
The preparation and completion of an original research project.

Psychology (PSY)
Farris, Chairperson; Professors Alesi, Brethower, Farris, Fuqua, Hultema, Lyon, Malott, Michael, Poling, Robertson, Spates, Ulrich; Associate Professors Dickinson; Assistant Professors Armstrong, Baker, Campbell, Ehhardt, Meinhold, White.

Open to Upperclassmen 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 Behavior Analysis) and PSY 330 (Methodology of Behavior 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 modern behavior theory. Emphasis will be upon human behavior, both normal and abnormal, with a significant portion of the course devoted to the higher cognitive processes. Recommended as a
cognitive 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-specific behaviors and their ecological significance, and forms of learning which are not easily explained by operant and respondent models.

PSY 517 Psychology of Learning for Teachers
3 hrs.
Designed to teach the principles of behavior and the application of these principles to teaching. Topics include the use of behavior principles in the development of objectives, selection and preparation of instructional material, classroom management and incentive motivation, behavior change, performance contracting and program evaluation. Practical application is stressed.

PSY 518 Stimulus Control and Perceptual Processes
3 hrs.
An examination of the literature surveying sensory and perceptual processes with an emphasis upon the research methodology in and theoretical interpretation of data from studies of stimulus control and discrimination in nonhuman organisms. Prerequisite: Twelve hours of Psychology or permission of Instructor.

PSY 519 Corrective and Remedial Teaching
3 hrs.
An introduction to and survey of various content skills, curriculum approaches, and special teaching techniques used in elementary school reading and mathematics instruction. Designed primarily for prospective school psychologists, focus is on academic skill content, sequencing of skill hierarchies, devising short term educational plans to teach specific skills, and evaluating the effectiveness of such plans. Graduate standing in psychology, education, or permission of instructor.

PSY 524 Human Sexuality
3 hrs.
Discussion of those human behaviors concerned with sex, sexuality, and reproduction. Consideration is given to the anatomical, physiological and psychological properties of sexual functioning in male and female. Emphasis is placed upon the sexual response cycle as described by Masters and Johnson. The course is not intended to provide supervised 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 which 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 regimen, and issues related to working in a medical setting.

PSY 570 A Behavior Analysis Approach to the Area of Mental Retardation
3 hrs. Fall
Topics will include: historical background, assessment, treatment, and legal implications of treatment.

PSY 578 Research Practicum: Developmentally Disabled Population
3 hrs.
Supervised experience at the Croyden Avenue School which offers an educational program for the developmentally disabled. This course involves a variety of problems in behavior change and learning which can be studied at the school. 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 origins and development of current behavioral approaches constitute a major focus.

PSY 697 Topical Studies in Psychology
1-4 hrs.
A survey and discussion of selected research topics of current interest. Topics may include both basic science and applied aspects of the discipline. Permission of Instructor. Courses may be repeated for credit, although the total number of credits may be limited by the degree program. Students should consult the program adviser.

PSY 598 Special Projects in Psychology
1-5 hrs.
This course provides the graduate student with the opportunity for independent 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 one hour of credit requires 100 clock hours. May be repeated for credit, although number of credits may be limited by program requirements. Written permission must be obtained from the department.

Open to Graduate Students Only

PSY 601 An Introduction to 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, and consider the behavior interview, as well as direct observation of behavior. The course will prepare the student to operate with sufficient understanding of assessment issues in the various clinical 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 characteristically addressed by these theoretical models will be outlined. Client populations most suitable and treated by various systems will also be identified. Considerable emphasis will be devoted to comparing and contrasting a radical behavioral model with contemporary conceptual schemes. Freudian analytical, cognitive, and behavioral approaches 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 considering 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 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 608 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 and the nature of scientific research endeavors. Topics include: the mission of science; behavioral assessment and measurement; experimental design, with emphasis on single-subject designs; scientific and ethical issues in research and, ethical issues in research. Students demonstrate their mastery of research issues through completion of a research project. Prerequisites: Courses in applied behavior analysis and 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) Research, conceptual and professional issues in applied behavior analysis; b) review, integration and critical analysis or research topics in psychology. 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.
The goal is to train students to solve problems. This course covers recent applications of settings. Specific OBM techniques are reviewed and analyzed in behavioral terms.

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 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.
This course examines drug effects from a behavior-analytic perspective. Emphasis is placed on general mechanisms of drug action, variables that modulate drug effects, strategies for studying those effects, and the behavioral actions of commonly encountered drugs. Prerequisite: PSY 610.

PSY 614 Motivation and Emotion 3 hrs.
An introduction to the experimental analysis of psychological aspects of motives, incentives, and emotions. Prerequisite: Permission of instructor.

PSY 620 Analysis of Abnormal Behavior 3 hrs.
An advanced study of behavioral disorders as characterized by the standard classification systems, the DSM-III-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 interpretations 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.
This course covers recent applications of behavior analytic strategies in organizational settings. Specific OBM 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.
This 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.
This 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 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.
This 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.
This course covers professional and ethical issues, including the American Psychology 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.

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 systems, 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 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 students 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 drawn from cognitive-based treatment models are examined both in terms of individual and group settings. Students are exposed to didactic discussions of the elements of different cognitive models as well as the practice of problem-solving techniques through supervised role-playing situations. Prerequisite: Permission of Instructor.
PSY 668 Analysis and Treatment of Developmental Disabilities
3 hrs.
This is a treatment course designed to familiarize students with pragmatic issues in the application of behavior management 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 normal, social, and behavioral problems of children. The course content emphasizes both the theoretical basis 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 with clients in 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.
This 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.
This 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, neuroltic 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.

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, philosophic, and social significance. Prerequisite: Nine hours of graduate credit in Psychology or permission of Instructor.

PSY 678 Behavior Analysis and Cognitive Psychology
3 hrs.
The first third of the course will consider behavioral approaches to the kinds of issues that are the major focus of cognitive psychology: complex human learning, memory, thinking, problem solving, imagery, language, and the self. The remainder will survey and analyze the approach to these issues taken by major cognitive psychologists: developments from the field of verbal learning, information theory, psycholinguistics, ethology, Piaget, and the cognitive behavioral model. 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 content is such that it 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, WPPSI, WISC-R, and WAIS. Prerequisites: PSY 601 or equivalent and degree program status. Not open to students completing PSY 683.

PSY 683 Norm Reference Testing: Interpretation and Administration
4 hrs.
A combined lecture and laboratory in individual assessment. Lecture focuses on basic psychometric concepts directly related to test administration and interpretation, as well as behavioral contingencies, and operational analyses of performance on specific test items, development of written personalized educational programs from collected assessment data, and writing of clear and useable reports. Recent issues in the intelligence controversy are also covered. Laboratory focuses on supervised experience in administering, scoring, interpreting, and developing short term educational plans using selected batteries of standardized individual assessment techniques, including but not limited to: Stanford-Binet Intelligence Scale (1972), McCarthy Scales of Children's Abilities (1972), Peabody Picture Vocabulary Test, Bayley Scales of Infant Development, ITTP, Columbia Mental Maturity Scale, WPPSI, WISC-R, and WAIS. Prerequisites: PSY 601 and graduate standing in school or clinical psychology or permission of instructor. Not open to students completing PSY 682.

PSY 684 Personality Assessment: Projectives
3 hrs.
A study of, and supervised practice in, the administration, scoring, and interpretation of the Rorschach, revised Bender Gestalt, TAT and other projective tests. The course emphasizes the selection and interpretation of an integrated projective test battery for clinical evaluations. Prerequisites: PSY 601, 681, and degree program status.

PSY 686 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 assessment systems, as well as in 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, Bessie (basic educational skills inventory) Criterion Test of Basic Skills, Assessment of children's language competency, Basic Concept Inventory, Key Math, and Woodcock Reading Mastery Test. Prerequisites: Graduate standing in school psychology, education, or permission of instructor; PSY 519.

PSY 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 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, examinations, 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.

PSY 697 Advanced Topical Studies in Psychology
2-4 hrs.
An in depth examination, discussion, and survey of selected research and/or professional topics. Permission of instructor. May be repeated for credit, although the total number of credits may be limited by the degree program. Students should consult the program adviser.

PSY 698 Clinical Practicum in Psychology I
3 hrs.
This is the entry-level practicum for students in the Clinical Psychology program. Students enrolled in this course will gain a range of therapy and assessment experiences in the Psychology Clinic under the supervision of licensed Clinical Faculty. Written permission must be obtained from the Department Clinical Committee. Prerequisites: PSY 664 and PSY 668.

PSY 699 Clinical Practicum in Psychology II
3 hrs.
Experience in a broad range of professional functions included in the practice of
psychology under the supervision of a licensed psychologist. The experience includes, but is not limited to, psychotherapy, diagnostic testing and consultation. The experience involves not less than 500 clock hours (15 weeks) in an organized health care setting. Written permission must be obtained from the Department Clinical Committee. Prerequisites: PSY 651 and PSY 656.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

PSY 700 Master’s Thesis
3 hrs.

PSY 710 Independent Research
2-6 hrs.

PSY 712 Professional Field Experience
2-12 hrs.

PSY 720 Specialist Project
6 hrs.

PSY 725 Doctoral Research Seminar
2-6 hrs.

PSY 730 Doctoral Dissertation
15 hrs.

PSY 732 Doctoral Clinical Internship
1-4 hrs.

PSY 735 Graduate Research
2-10 hrs.

Public Administration (PADM)

Professors Chandler, DeShon, Hannah, and Kobrak; Assistant Professors Dicker, Goggin, Peters, Reding, Ring, Visser.

Undergraduates with junior status and 12 hours of work in appropriate major fields, may enroll in 500-level courses with prior approval of the student’s advisor or have the consent of the program director.

PADM 572 Computer Applications in Administration
3 hrs.

Administrators at all levels increasingly rely upon computers to perform the tasks for which they are responsible. Whether to prepare reports, access data, or communicate with others, administrators at all levels of the organization are expected to possess a certain minimum facility with this technology. In this introductory managerial/technical core course, MPA degree candidates will become proficient in the administrative uses of computers.

PADM 598 Readings in Public Administration 1-3 hrs.

This course offers a program of independent study to provide well qualified MPA candidates with an opportunity to explore in depth a topic or problem of interest under the guidance of a faculty member. Planning a topic for investigation is the joint responsibility of the candidate and supervising faculty. Approval is contingent upon the merits of the proposal. Consent of both the supervising faculty member and the School Director is required prior to enrolling in this course.

PADM 599 Topics in Public Administration
1-4 hrs.

This changing topics course deals 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 prior to enrollment. The course may vary in the number of credit hours awarded and may last more or less than a semester’s or session’s length.

Open to Graduate Students Only

PADM 601 Economic Analysis for Administrators
3 hrs.

This managerial/technical core course will focus on those basic principles of applied economics which illustrate policy analysis and problems of resource allocation encountered by administrators. It is intended to provide participants with the tools of economic analysis necessary to address resource allocation and similar issues. Students 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 605 Managing Economic Development
3 hrs.

The course is intended for local and regional managers and professionals who have responsibility for economic development. Students will examine how economic development policies, programs, and techniques are used to manage local economic development successfully. The course integrates economic development into the broader context of community development in the areas of land use, housing, transportation, public facilities, utilities, and environmental concerns. It also addresses the economic, political, demographic and technological forces of conflict and change impacting local economic development.

PADM 610 Human Resources Administration
3 hrs.

A survey course that examines the concepts and practices of human resource management and reviews the functions performed by human resource administrators and other agency officials. Areas of consideration may include, but are not limited to human resource planning and recruitment, training and development, compensation, and benefits plans.

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 management process, including how to: formulate and promote a project concept; prepare the project proposal; submit the project proposal; and follow-up after acceptance or rejection of the proposal. Emphasis will be placed upon the project proposal as an integral component of agency planning, program management, and assessment activities, from both grantor and grantee perspectives. In the second part of this course each participant will prepare a project proposal.

PADM 622 Applied Research Methods
3 hrs.

This course will stress the formulation of applied research questions; the design and utilization of various survey research methods and techniques; the essential distinctions between qualitative and quantitative research methods; the collection, manipulation, interpretation, and presentation of data gathered; and the conclusions thus obtained in the solution of policy problems confronting professional administrators.

PADM 623 Principles of Budgeting
3 hrs.

This Managerial/Technical Core course examines the budgeting process; emphasis will be given to the preparation phase of the budgeting cycle. Line item and alternative budgeting techniques—including zero base and program budgeting—will be considered. Sources of revenue will also be examined to determine their sufficiency, ease of collection, reliability, and public acceptability.

PADM 624 Financial Decision Making
3 hrs.

The course examines basic principles of public accounting, sources of government revenue including intergovernmental transfers; risk management; insurance options; bonds and factors affecting bond ratings; cost benefit; cost revenue and cost effectiveness analysis; privatization; service costs; and retrenchment.

PADM 626 Administrative Law and Governmental Regulations
3 hrs.

This course examines how administrative laws and public regulations control and regulate the activities of state, local and federal government officials and the agencies by which they are employed. It will consider the requirements for, and limits on, the exercise of power by elected and appointed officials. Special attention is devoted to the development, adoption, and enforcement of administrative laws and government regulation.

PADM 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 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 elective 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.

Problems of management are analyzed in this course. It considers various communication and control mechanisms from the earliest days of scientific management to modern techniques of systems theory to modern techniques of retribution 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. Major emphasis is given to tracing the historical evolution of public administration in the United States through the thought and intellectual activity of the leaders who writings have most dramatically shaped the theory and practice of public administration in this country.

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 review policy leadership and to analyze the role of entrepreneurialism in bringing policy options to the arena of organizational and public debate.

PADM 633 The Political Environment of Public Administration 3 hrs.
This course examines the interaction between administrative agencies and the social, political, and economic forces which constitute their internal and external environment. It emphasizes the sources of bureaucratic power, the characteristics of administrative and political elites, and examines the strategies which administrators pursue in seeking both to ensure the survival of their agencies and to expand the programs which they direct. It also explores the influences of our political system on administrative decision making and attempts to evaluate agency responsiveness. This course should be taken as soon as circumstances permit.

PADM 634 Professional Issues Workshop 1 hr.
All MPA Professional Core degree components include three one credit workshops on different topics. These workshops ordinarily meet all day Friday and Saturday. Each workshop is valued at one credit hour and is graded on a credit/no credit basis. The students must attend throughout the workshop and actively participate to obtain credit for the workshop. These workshops are perceived as an innovative, flexible way to deal with a variety of interesting topics which do not lend themselves to consideration within the traditional course format. Experienced practitioners and academic specialists are frequently an important component of such workshops, as are simulations, role playing, and group discussions. These workshops have in the past been devoted to a board variety of topics including, but not limited to: effective interpersonal communications; woman in administration; public relations and the administrator; effective time management; performance measurement; appraisal; pension system administration; administrative behavior; grievance process, the effects of DRG's on the health care delivery system; and human relations skills managers, among others.

PADM 635 Project Paper Seminar 3 hrs.
This is a seminar the MPA candidates write their project paper (thesis) proposing a solution to a major problem or issue facing the agency by which in-career candidates are employed, or to which pre-career candidates have been assigned as intern (field experience). Except with the express prior approval of the MPA Academic Advisor, only candidates who have completed at least 30 semester hours of the MPA degree may enroll in PADM 635.

PADM 636 The Exercise of Power in Organizations 3 hrs.
This course addresses the need of managers and supervisors to understand how power in organizations is generated and exercised by ideas, by individuals, and by groups. Utilizing special literature and case studies, this course will examine the anatomy of power and how it is exercised.

PADM 637 Organization Development 3 hrs.
This course is an introduction to the theories, models, and intervention modalities of Organization Development (OD). Topics to be explored and discussed include: the underlying organizational philosophy of OD;
be asked to weigh such factors as the following on a case-by-case basis: economic costs and benefits, political stakes, organizational processes, interpersonal relationships, legal requirements, ethical obligations, and technological constraints.

PADM 677 The Public Administrator 3 hrs.
This course examines the following factors: expectation versus reality in the administrative world; the nature of managerial work; asserting authority; building commitment and motivation; building lateral relationships; gaining power; working the hierarchy; designing valid controls; initiating change; the skills of the project manager, 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 agency 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 topics 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 executive 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 bureaucratic and political impediments to implementing policy analysis. Finally, it considers how public executives manage research and analysis at various stages of the policy-making process.

PADM 682 Administrative Decision Making 3 hrs.
This course will examine the organization as a system of linked subsystems and analyze the elements of decision making as influenced by this environment. The impact of bureapathologies on communication and control patterns will be related to managerial processes. This course is 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 will pay particular attention to management strategy as reflected in 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.

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 how the budget and financial statements can be used to determine the financial health of an organization and to detect unintended public policy outcomes such as budget cuts in one area that lead to increases in another. Finally, alternative budget revenue projections and expenditure patterns are examined as tools for implementing strategic goals.

PADM 685 Bureaucracy and Society 3 hrs.
Bureaucracy has become the predominant organizational form within the public sector in all advanced industrial societies today. This course explores the growth of bureaucracy, the expansion of its political role, goals, and objectives, and several alternative bureaucratic models, including the Weberian and Maxist approaches. Attention is also paid to the relationship of bureaucracy presently to power, to constituency groups, and to the people.

PADM 686 State Agency Administration 3 hrs.
This course examines the organization and administration of state government agencies, with special emphasis on the functions performed by major departments and their associated subunits. Executive agencies in Michigan will be used as a basis for comparing and contrasting services provided by similar agencies in other states. Each course participant will be required to analyze the current status of services provided by a particular state agency and project service demand into the future. Course participants will develop a comprehensive understanding of administration in agencies of state government.

PADM 687 Legislative Relations for Public Administrators 3 hrs.
This course prepares participants to interact with policy making bodies: city councils, county commissions, or the state legislature. Participants will learn to estimate the possible impact upon their agency of legislation under consideration, to assess the probable 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 approaches. Students will present a research problem to the class and will be evaluated on originality and analysis of problem context.

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 those statistical procedures presented. Topics will include descriptive, difference, bivariate, association, and multivariate statistics.

PADM 693 Action Research Project 3 hrs.
A team research project in this course utilizes the skills acquired in the program evaluation and statistics courses. Teams are required to develop a research problem, review the relevant literature, collect and analyze data, and write a complete and scholarly report. Publication of the research results is encouraged where appropriate.

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, observational and intensive interviewing. This course will emphasize operationalism 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 projects. Those papers may become the research design chapters for the students' dissertations.

PADM 697 Dissertation Seminar 1-4 hrs.
Dissertation Seminar is intended to assist students in the preparation of a dissertation proposal and to facilitate the transition from coursework to dissertation. PADM 697 will be offered in two blocks over two semesters. The first block (2 hrs.) includes a review of proposal components, with particular emphasis on research design and literature review. The second block (1 hr.) is devoted to a review of the dissertation format and manuscript requirements, the psychological and time management demands of the dissertation, and a continuation of proposal development.

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 descriptions.

PADM 710 Independent Research 3 hrs.
Designed for highly qualified graduate students or small groups who wish to pursue independent studies or group under the direction of a Graduate Faculty member. An application form, signed by the Graduate Advisor and faculty supervisor, must be submitted to registration at the time of enrollment. Graded on a credit/no credit basis.
PADM 712 Professional Field Experience 3-6 hrs.
This practicum is designed for MPA degree candidates who wish to participate in a supervised professional field experience/internship in an agency setting. An application form, signed by the candidate’s academic advisor and internship supervisor, can be submitted to the Registration Office at the time of enrollment. This course is graded on a credit/no credit basis only.

PADM 730 Doctoral Dissertation 12 hrs.

Science Studies (SCI)
Professors Oppliger, R. Poel, Associate Professor R. Hatner, Assistant Professors J. Gobert, A. McConney, K. Sharma.

Open to Upperclass and Graduate Students
SCI 570 Life Science Workshop for Teachers 1-3 hrs.
This course will involve participants in several activities especially designed to help them achieve an understanding of some of the important concepts of biology. This course is designed and taught to address the needs of K-12 teachers. It is a variable topics course and may be repeated for credit if different topics are involved. It is intended for delivery in one to two week workshop format. Prerequisite: Teacher certification or baccalaureate plus work toward certification.

SCI 580 Chemistry Workshop for Teachers 1-3 hrs.
This course will involve participants in several activities especially designed to help them achieve an understanding of some of the important concepts of chemistry. This course is designed and taught to address the needs of K-12 teachers. It is a variable topics course and may be repeated for credit if different topics are involved. It is intended for delivery in one to two week workshop format. Prerequisite: Teacher certification or baccalaureate plus work toward certification.

SCI 585 Physics Workshop for Teachers 1-3 hrs.
This course will involve participants in several activities especially designed to help them achieve an understanding of some of the important concepts of physics. This course is designed and taught to address the needs of K-12 teachers. It is a variable topics course and may be repeated for credit if different topics are involved. It is intended for delivery in one to two week workshop format. Prerequisite: Teacher certification or baccalaureate plus work toward certification.

SCI 590 Earth Science Workshop for Teachers 1-3 hrs.
This course will involve participants in several activities especially designed to help them achieve an understanding of some of the important concepts of earth science. This course is designed and taught to address the needs of K-12 teachers. It is a variable topics course and may be repeated for credit if different topics are involved. It is intended for delivery in one to two week workshop format. Prerequisite: Teacher certification or baccalaureate plus work toward certification.

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 no more than four hours in all reading courses and work must be completed under a member of the graduate faculty.

Open to Graduate Students Only
SCI 601 Problems in Science Education 1-4 hrs.
This independent study course allows students to study various problems in Science Education under the direction of a supervising faculty member. Individual or small groups of qualified students may be involved in these problem areas reflecting the current concerns of Science Education. The course is designed to meet the needs of students for first-hand experience in field or laboratory research, pilot projects testing 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 those concepts to children. Science activities and learning by doing will be stressed, and resources for teaching science will be examined.

SCI 615 Science Education: Historical and Philosophical Foundations 3 hrs.
This course will familiarize students with the history of science education in the United States, leading up to current national reform efforts. This historical approach will provide a foundation to address curricular and literacy issues as well as the relevance of the history and philosophy of those concerns. The course will address two themes or "commonplaces" of education in a science education context—the social milieu and the curriculum.

SCI 616 Science Education: Models of Learning and Teaching 3 hrs.
This course will complement SCI 615 in addressing the remaining themes or "commonplaces" of education in a science education context, namely learning and teaching. The major models of learning and approaches to teaching which are compatible with those models will be examined, including their relevance to classroom practice.

SCI 617 Science Education: Research Traditions 3 hrs.
This course is designed to familiarize students with the more productive research traditions in science education and with their historical, philosophical, and methodological foundations. Each offering of the course will focus upon a particular tradition, for example, problem solving research or conceptual change research. This course may be repeated for credit. Prerequisites: SCI 615, SCI 616.

SCI 620 Topics in Science Education 2-6 hrs.
This course will present, analyze, and evaluate methods and techniques of teaching science. Topics may include new approaches for teaching science, new science curriculum, laboratory practices, science education research, motivational techniques, and other methodological problems confronting science teachers. Course content may vary, and the course may be repeated for credit provided different topics are involved.

SCI 621 Topics in Science 2-6 hrs.
This course is designed to examine various science concepts and new developments of science of interest to science teachers. Each course will be subtitled, and the content will vary to reflect the various sciences, new developments and emphases, and the needs of the science teaching community. This course may be repeated for credit provided different topics are involved.

SCI 625 Environmental Science Seminar 2-4 hrs.
Analysis of case studies of environmental problems. Covers the scientific, social, and political problems involved in environmental action and will include experiences with management of energy and material resources. May be repeated for credit up to a maximum of six hours.

SCI 690 Science Education Seminar 2-4 hrs.
Designed to provide an integrating experience for students in the Science Education doctoral program. The topics covered in the seminar will vary from one semester to the next. May be repeated for credit.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

SCI 700 Master's Thesis 6 hrs.

SCI 710 Independent Research 2-6 hrs.

SCI 730 Doctoral Dissertation 15 hrs.

SCI 735 Graduate Research 2-10 hrs.

Sociology (SOC)
Walker, Chairperson; Professors Carlingella-MacDonald, Kramer, Markie, Petersen, Sonnad, Tyler, VanWaley, Wagenfeld; Associate Professors Cauffield, Davidson, Assistant Professors Carlson, Ford, Snyder-Joy, Tourigny.

Open to Upperclass and Graduate Students
SOCIOLOGY 505 Computer Applications in Social Research 3 hrs.
An introduction to computer applications for graduate students in the social sciences. Since they all have utility in the research process, the full range of applications will be covered, including: word processing, spreadsheets, graphics, data base management, communications, and statistical processing. A hands-on course, it includes individual assignments relating to each of the application areas. Special attention will be paid to the use of SPSS (The Statistical package for the Social Sciences) in the analysis of quantitative data. Several assignments will relate to the use of this software package. Primarily for graduate students in the social and behavioral sciences with no special mathematical or computer experience. Undergraduates admitted only with the permission of instructor.

SOCIOLOGY 599 Independent Study 1-10 hrs.
Open to graduate students only. This course may be repeated for credit. Prerequisites: approval of the director and advisor of the student.

SCI 621 Topics in Science Education 2-6 hrs.
This course is designed to examine various science concepts and new developments of science of interest to science teachers. Each course will be subtitled, and the content will vary to reflect the various sciences, new developments and emphases, and the needs of the science teaching community. This course may be repeated for credit provided different topics are involved.

SCI 625 Environmental Science Seminar 2-4 hrs.
Analysis of case studies of environmental problems. Covers the scientific, social, and political problems involved in environmental action and will include experiences with management of energy and material resources. May be repeated for credit up to a maximum of six hours.

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SOCIOLOGY 599 Independent Study 1-10 hrs.
Open to graduate students only. This course may be repeated for credit. Prerequisites: approval of the director and advisor of the student.
SOC 510 Studies in Social Problems: Variable Topics 3 hrs
An examination of a selected area of concern in social problems not intensively covered in other courses. The focus of the course will be substantive, as well as theoretical and methodological. Topics may include such areas as poverty, mental illness, narcotic addiction, alcoholism, aging, and international tensions. May be repeated for credit with a different topic. Prerequisite: SOC 200 or 210, or consent of instructor.

SOC 515 Sociology of Mental Disorder 3 hrs
This course will be concerned with examining the historical evolution and contemporary meaning of concepts of mental health and mental disorder. This course will also consider the amount and kind of mental disorder in society, the structure of the mental health care delivery system, the nature of help-seeking for mental disorder, and sociological analysis of psychotherapy. Prerequisite: SOC 200, or Consent of Instructor.

SOC 520 Studies in Social Psychology: Variable Topics 3 hrs
Further analysis of selected topics in social psychology not intensively covered in other courses. Specific topic will be designated in the course title as scheduled. May be repeated for credit with a different topic. Prerequisite: SOC 320.

SOC 531 Studies in Social Change: Designated Areas 3 hrs
Analysis of social change in specific geographic or national areas designated in the course title as scheduled. Change is examined through perspectives from history, anthropology, and sociology. May be repeated for credit with a different area. Prerequisite: SOC 200.

SOC 540 Sociology of Medicine 3 hrs
A comprehensive survey of concepts and research findings in the field of the sociology of medicine. Topics to be covered include: the distribution of illness in society, relationships between social status and illness, illness as a social process, health care professionals, the sociology of health care delivery. Prerequisite: SOC 373 or graduate standing.

SOC 552 Sociology of Aging 3 hrs
An examination of the process of aging in American society, with particular emphasis on the periods of late maturity and old age. Consideration will be given to theories of aging and the social implications of age grading, the meaning of work and retirement, and the status and roles of the aged. Prerequisite: Six hours of sociology, including SOC 200 or consent of instructor.

SOC 560 Corporate and Governmental Crime 3 hrs
An examination of the crimes committed by business corporations and government agencies. The course describes the nature, extent, and costs of these organizational crimes, explains the structural and organizational forces which give rise to such crimes and analyzes the problem of controlling organizational offenders. The course also examines the political process whereby certain actions of governments come to be defined as deviant or criminal. Prerequisites: SOC 200 or SOC 210, SOC 260, and SOC 362 and one other 300- or 400-level course.

SOC 561 Violence and U.S. Society 3 hrs
This course analyzes the nature, extent and causes of violence associated with the United States. The forms of violence to be analyzed include interpersonal, institutional, and structural violence; recent theory and research on violence will be examined. Emphasis will be placed upon the relationship between the legal system and the society in which it functions. Prerequisite: SOC 200 or equivalent.

SOC 562 Victimology 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. Prerequisites: SOC 200 or SOC 210, SOC 260, and SOC 362 and one other 300- or 400-level course.

SOC 563 Gender and Justice 3 hrs
This course provided an overview of the relatively recent field of women, crime and justice, with a focus on current issues guided by an issues approach. A wide variety of current research and theory in this realm are critically examined. The specific subtopics covered in this course may be selected and tailored by the instructor. May be repeated for credit with a different topic. Prerequisites: Consent of department.

SOC 564 Family Life Education and Counseling 3 hrs
Provides the student with a working knowledge of the methods and materials appropriate in the school, the church, and other social situations for working with individuals and small groups who desire preparation for marriage and parenthood. Some attention will be given to the techniques for handling counseling opportunities arising out of these teaching situations. Prerequisite: SOC 200 or consent of instructor.

SOC 581 Logic and Analysis of Social Research I 3 hrs
Further analysis of selected topics in social research not intensively covered in other courses. Specific topic will be designated in the course title as scheduled. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

SOC 585 Research Methodology: Variable Topics 1-4 hrs
This course concentrates on specialized research techniques and topics such as sampling and survey design, interviewing, and the use of sociological computer software. It may be repeated for credit with a different topic. Prerequisite: Consent of department.

SOC 592 Family Life Education and Counseling 3 hrs
Provides the student with a working knowledge of the methods and materials appropriate in the school, the church, and other social situations for working with individuals and small groups who desire preparation for marriage and parenthood. Some attention will be given to the techniques for handling counseling opportunities arising out of these teaching situations. Prerequisite: SOC 200 or consent of instructor.

Open to Graduate Students Only
SOC 601 Advanced General Sociology 3 hrs
A comprehensive survey of trends in the major fields of sociology. Prerequisite: Open only to graduate students in sociology.

SOC 602 Classical Sociological Theory 3 hrs
An intensive and critical study of major sociological theories developed in the 19th and early 20th centuries. The course will examine the logical structure of classical theories, patterns of influence among theorists, and the central issues raised in their works. Theories will be examined with respect to both historical context and their influence on contemporary sociology.

SOC 603 Contemporary Sociological Theory 3 hrs
An intensive and critical study of contemporary perspectives and theories in sociology. Theories which exemplify functionalist, conflict, and interpretive approaches will be examined. The course will examine the logical structure of contemporary theories and the relevance of contemporary perspectives and theories to major substantive areas in sociology.

SOC 605 Studies in Sociological Theory: Variable Topics 3 hrs
Advanced study and exploration, following seminar format, of topics of interest to faculty and students, for example: various role theory formulations and their usefulness in understanding social behavior, ethnethodology, philosophy of science, experimental design, Marx, Weber, or other selected theorists. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

SOC 615 International Crimes 3 hrs
This course is designed to provide a thorough grounding in basic univariate and bivariate descriptive and inferential statistics for social sciences. Prerequisite: SOC 382 and 383 or graduate standing.
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 stressors 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 650 Seminar in Social Stratification 3 hrs. This seminar will deal with the sociological explanations of stratification. The functional, conflict and evolutionary paradigms will be used to analyze and explain the nature, causes and consequences of class and status within social systems. The usefulness of such concepts as power, prestige, social class and status within social systems. The usefulness of such concepts as power, prestige, social mobility and status inconsistency will be stressed. Prerequisite: SOC 200 or consent of instructor.

SOC 660 Seminar on Theories of Crime 3 hrs. This course will deal with the chronological development of criminology 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 466.

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 etiological approaches in different societies, and the applicability and tests of theories in these societies. Prerequisite: SOC 466.

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 665 Research Issues in Criminology 3 hrs. An advanced course emphasizing: (1) The examination of current issues in the measurement and analysis of crime, and (2) Development of research skills relevant to criminological research. Students will demonstrate their mastery of research skills by conducting their own analysis of crime data.

SOC 666 Seminar in Advanced Criminology 3 hrs. A detailed study of the theoretical basis of crime. This seminar takes into account the socio-historical and philosophical belief systems of classical and modern theories of crime. Property crime, violent personal crime and corporate crime are a few of the specific patterns that will be discussed and interpreted within various theoretical paradigms. Prerequisite: SOC 262.

SOC 667 Sociology of Criminal Justice 3 hrs. This course will review and evaluate the theoretical and empirical literature on the criminalization process. Particular attention will be paid to the various discretionary decisions that are made within the criminal justice process in the U.S.

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 basic multivariate descriptive and inferential statistics for social scientists. Prerequisite: SOC 581.

SOC 683 Research Design and Data Collection I
3 hrs.
This course is designed to provide experience with the formulation of research problems, the choice of data gathering techniques and the development of research proposals. Students will learn to do sociological research by collecting documentary, observational, sample survey and experimental data. Advantages and disadvantages of the different data collection techniques will be assessed. Prerequisite: SOC 581 or consent of instructor.

SOC 684 Research Design and Data Collection II
3 hrs.
This course focuses on problems and issues in the design of research and the collection of sociological data. Emphasis will be placed on the critical evaluation of current research designs and the development of research design skills. Topics will include: the internal and external validity of research designs, measurement and scaling, the uses of qualitative and historical data, and philosophical and ethical issues raised by various research designs and procedures. Prerequisite: SOC 683.

SOC 685 Advanced Multivariate Analysis II: Variable Topics
3 hrs.
The study of advanced statistical techniques which are important to systematic research in sociology. Suggested specialized topics include: factor analysis, advanced non-parametric techniques, path coefficient analysis, and regression analysis. May be repeated for credit with a different topic. Prerequisite: SOC 681 or equivalent.

SOC 687 Evaluation Research I
3 hrs.
The basic purpose of this course is to familiarize students with the various research techniques for evaluating action agencies through a survey of the literature, study of evaluation models, and study of techniques and procedures used in evaluation. Prerequisite: SOC 682.

SOC 688 Practicum in Social Research
3 hrs.
A research seminar structured to provide practical experience in various phases of research related to the student's major area of interest. Under faculty supervision, students will act as consultants to projects initiated by other agencies in the community or carry out their own supervised projects. May be repeated in different areas of concentration with permission of student's doctoral committee. Prerequisite: SOC 682.

SOC 690 Computer Applications for Sociologists
3 hrs.
This class is designed to provide doctoral students in sociology with essential skills in the use of mainframe computers and micro-computers to perform such professional tasks as project design, interviewing, budgeting, and data analysis. Competence in using operating systems, word processing and SPSSX should be attained before enrolling for this class. Prerequisite: SSCI 500, CS 501, or equivalent.

SOC 694 Professional Writing for Sociologists
3 hrs.
This course will examine three forms of professional writing: Proposals for funded research, technical research reports, and scholarly journal articles. Students will receive extensive experience in writing, critiquing, and rewriting proposals, reports, and journal articles.

SOC 695 College Teaching Practicum in Sociology
3 hrs.
A practicum in the teaching of sociology in college. Students will attend assigned lectures and seminars, prepare a syllabus for a course in sociology, and deliver at least two supervised lectures to a sociology class. Prerequisite: Fifteen hours of graduate sociology courses and consent of instructor. Graded on a Credit/No Credit basis.

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 Dykhofforn, Krauze, Newell, Sinning, Tang, Walke; Associate Professors Hines, Hodges, Morris, Rozelle, Schaeberle.

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). Prerequisites: 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 210 and 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 210 and 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 617 Seminar in Auditing Theory and Practice
3 hrs.
A critical study and examination of the theory of auditing and auditing practices including the demand and supply for auditing services and current issues facing auditors in the United States and elsewhere.

ACTY 621 International Accounting
3 hrs.
This course examines international dimensions of accounting and the uses of accounting information for decision making in a multinational environment. Major emphasis is placed upon accounting and managerial issues of multinational corporations: such as currency translation, financial reporting and disclosure, international taxation, transfer pricing, and current issues and developments. Prerequisites: ACTY 607 or BUS 611) MBA or
MA or MSA admission or equivalent. Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs.

ACTY 700 Master's Thesis
3 hrs.
This course is a study of the concepts and principles that apply to the United States taxation of the personal income earned by U.S. taxpayers and U.S. income earned by foreign taxpayers. Students will learn to analyze and apply fundamental international tax concepts to situations likely to be encountered by businesses and individuals. Prerequisites: ACTY 324, MBA or MSA admission or permission of College of Business Director of Graduate Programs.

ACTY 715 Legal, Regulatory and Political Aspects of Business
2 hrs.
This course will examine the role of law in society: the structure of the American legal, regulatory, and political systems; and basic legal principles governing business conduct. The course reviews major legal problems encountered by business managers. The manager's role in dispute resolution, and factors affecting the organization of business are also examined. Students cannot receive credit for both BUS 604 and an equivalent course(s). Prerequisite: Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs.

BUS 602 Corporate Finance
2 hrs.
This course will introduce students to financial principles and techniques which are essential for understanding effective financial management. Prerequisite: BUS 601 or an equivalent course(s). Students cannot receive credit for both BUS 602 and an equivalent course(s).

BUS 603 Information Management
2 hrs.
This is a conceptual course emphasizing managerial aspects of information handling concerning information as a vital resource of an organization. Topics include: a) the conceptual understanding of information management, b) practical insight into information management, and c) problem solving through information management. Students cannot receive credit for both BUS 603 and an equivalent course(s). Prerequisite: Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs.

BUS 604 Legal, Regulatory and Political Aspects of Business
2 hrs.
This course provides an introduction to the legal, regulatory, and political environments of business. The course will examine the role of law in society: the structure of the American legal, regulatory, and political systems; and basic legal principles governing business conduct. The course reviews major legal problems encountered by business managers. The manager's role in dispute resolution, and factors affecting the organization of business are also examined. Students cannot receive credit for both BUS 604 and an equivalent course. Prerequisite: Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs.

BUS 610 Communications and Inter cultural Aspects of Business
3 hrs.
An advanced examination of the principles of business communication, including writing, presentations, technology, and working in teams, within the context of inter cultural and domestic issues. Case studies and/or simulations will form the basis for individual and group projects designed to provide practical experience in the development and application of effective communication strategies to business situations. Prerequisite: Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs.

BUS 611 Accounting Management
3 hrs.
The use of accounting information for planning, control and decision making is emphasized. The course will emphasize managerial accounting topics including job order costing, process costing, and operations costing, activity-based costing, standard costing, transfer pricing and international issues. Prerequisites: BUS 601 or equivalent. Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs.

BUS 612 Financial Management
3 hrs.
This course will focus on a contemporary study of issues and problems in financial management. Issues to be examined will include short-term financing, capital budgeting, asset pricing theory, sources of long-term capital, optimal capital structure, corporate restructuring and international dimensions of corporate financial management. Prerequisites: BUS 602 or equivalent. Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs.

BUS 613 Customer-Driven Marketing Management
3 hrs.
An examination of marketing theory, concepts, and processes used by organizations to create customer value, achieve and sustain competitive advantage and accomplish their strategic mission and objectives. Emphasis on planning, implementing, and evaluating customer-driven marketing strategies to respond effectively to complex global, cultural, technological, competitive, and other market or environmental factors. Prerequisite: Completion of all MBA basic core requirements or written approval of Marketing chairperson.

BUS 614 Operations and Technology Management
3 hrs.
An understanding of the concepts involved in operations management and their applications in manufacturing and service sectors. Also, developments in the management of existing technologies and processes will be discussed. Topics covered include: process/product strategies and capacity planning, just-in-time philosophy, material requirements planning, project management, scheduling, forecasting, productivity and process management, and management of technology. Prerequisite: Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs.

BUS 615 The Global Aspects of Business
2 hrs.
This course examines how the environment affects global business practices and policies. Principle elements of the political, legal, socio-cultural and environmental environments will be examined from the perspective of corporate managers. This will provide a foundation for subsequent courses in international accounting, business law, finance, marketing, and management. Prerequisites: Graduate level standing. Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs.

BUS 616 Social Responsibility and Ethics in Business
2 hrs.
This course introduces students to the concepts of social responsibility and ethics in the business setting, both domestic and international. Differing viewpoints regarding the nature of limits or corporate social responsibility will be explored, as well as examples of a range of socially responsible actions. Students will gain an understanding of the conceptual tools used to analyze behaviors and situations in the context of all the functional areas of business, with a view toward identifying ethical alternatives. It is not the purpose of the course to moralize or preach. Rather, the hope is that individual awareness may lead to a heightened sense of professionalism and integrity. Prerequisite: Admission to the MBA or MSA program consent of the HCOB Director of Graduate Programs.

BUS 617 Human Behavior in Organization
2 hrs.
Work is a dominant theme in the lives of most people. The way people are managed and relate to one another affects the quality of their lives and the effectiveness of their organizations. Understanding individual differences, sources of behavior, choices people make, and how issues come together in groups and organizations is imperative for today's manager. Prerequisite: Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs.
BIS 699 Corporate Strategy
3 hrs.
An advanced examination of the tasks of formulating long-run strategy for the organization. Using strategic cases and/or simulations, the course includes methods of (1) developing opportunities from analyses of environmental and market trends, (2) understanding company strengths, weaknesses, and competencies, and (3) directing the integration of strategy with operating plans through formal and informal networks. This is an integrative capstone course designed to provide a total business perspective. Prerequisite: Admission to the MBA or MSA program or consent of the HCOB Director of Graduate Programs. Completion of Phase II integrated MBA core.

Business Information Systems (BIS)

Bowman, Chairperson; Professors Athappilly, Targowski; Associate Professors Allen, Mascolini, Rooney, Yaeger; Assistant Professor Halvas.

Open to Upperclass and Graduate Students

BIS 555 Topics in Computer Information Systems
3 hrs.
Special topics appropriate to business applications such as data base management; structured concepts; networking; programming documentation and efficiency; planning, organizing, and directing management information systems. May be repeated for credit.

BIS 560 Office Systems and Procedures
3 hrs.
A study of paperwork systems and procedures. Emphasis is placed on office systems and the techniques of systems development including fact gathering and recording, work analysis, and office work simplification and measurement. Prerequisite: BIS 102.

BIS 596 Independent Study
1-4 hrs.
A directed independent project in an area of administrative systems, business communication, or computer information systems. Prerequisite: Consent of department chair.

BIS 596 Readings
1-4 hrs.
A series of direct readings in the area of administrative systems, business communication, or computer information systems. Prerequisite: Consent of department chair.

Open to Graduate Students Only

BIS 600 Seminar in Business Information Systems
3-4 hrs.
Intensive problem solving in the area of administrative systems, business communication, or computer information systems. May be repeated for credit.

BIS 602 Computer Information Systems
3 hrs.
The design, implementation, and use of computer information systems for decision making. Included are recent hardware and software developments, systems architecture, and systems procedure techniques. Hands-on experience with mainframe and micro computers using a variety of statistical routines, PERT/CPM, VISICALC, word processing, and other software packages. Prerequisite: BIS 102 or equivalent.

BIS 630 Data Administration
3 hrs.
Emphasizes the administrative aspects of managing data resources in organization. Orientation of the course is towards developing specific skills in MBA students that will empower them to administer challenges of using Data Base Management Systems effectively. Prerequisites: BIS 260, 261, 360, and 602.

BIS 643 Report Writing for Management Decisions
3 hrs.
The focus of Report Writing for Management Decisions is on planning, researching, writing, revising, and presenting effective written and oral management-based reports. The course will emphasize management report writing in the context of organizational decision making. Prerequisite: Graduate standing.

BIS 662 Managing the System Development Project
3 hrs.
Course focuses on project management while reviewing and reinforcing students' understanding of system development methodology. Major emphasis of course will be managing those projects which involved SDLC methodology. Prerequisites: BIS 260, 261, 360, and 602.

BIS 664 Expert Systems in Business
3 hrs.
Objectives of course are to familiarize students with ES/KBS and how this information technology can be applied to solve common business problems. Designed to show how such systems can assist managers in setting and achieving organizational objectives effectively and efficiently. Prerequisites: BIS 260, 360, and 602.

BIS 666 Managing Data Communications
3 hrs.
This course provides students with a managerial perspective of data communication and computer networks. The intent of this course is to provide students with the necessary skills to accurately evaluate recommendations about data communication needs and manage the data communication activities of a business organization. Prerequisites: BIS 360 and 602.

BIS 674 Information Systems Planning
3 hrs.
Course applies principles of managerial planning to information systems. Covers strategic, tactical, and operational planning of IS, with special emphasis on linkage between strategic plans of organization as whole and those of IS. Prerequisites: BIS 260, 261, 360, and 602.

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. Prerequisite: ED 621.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

BIS 700 Master's Thesis
6 hrs.

BIS 710 Independent Research
2-6 hrs.

BIS 712 Professional Field Experience
2-12 hrs.
for operations and for capital projects, and the
development and implementation of group
insurance and pension programs.
Prerequisite: Advisor'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 mechanics, markets, institutions,
and instruments important to the investment
process. Not open to students with credit
earned in FCL 351 or its equivalent.
Prerequisite: FCL 608 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 index 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 medicare
reimbursement programs are examined.
Prerequisite: FCL 320 or equivalent.
FCL 691 Seminar in Finance
3 hrs.
The analysis of specialized financial problem
areas (e.g., financial futures markets, financial
forecasting, commodities, and similar
contemporary problems). Topics will vary from
semester to semester. Prerequisite: FCL 608.
Law Area
Professors Grossman, McCarty; Associate
Professors Batch, Stevenson; Assistant
Professors Hawkerm, Van Auken-Haigent.
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 agent, mortgages, land contracts,
leases, zoning, condemnation and urban land
development problems. 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 the business enterprise.
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 controls
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 684 International Business Law
3 hrs.
A study of private international law and
selected regional and national laws affecting
foreign investment, licensing, and trade are
reviewed. International sales, financing,
transportation, intellectual property, and
taxation topics are discussed.
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, statutes and regulations 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,
legal obligations imposed upon and risks
assumed by the seller are emphasized.
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
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
capital markets, insurance and pension programs.
Prerequisite: FCL 380 or consent.
participants to a first-hand knowledge of business operations abroad through on-site
inspection of foreign manufacturing,
marketing, financial, and governmental
organization, supplemented 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: Accountancy, 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 698 Readings and Research in Finance
and Commerical 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
Open to Graduate Students Only
FCL 700 Master’s Thesis
6 hrs.
FCL 710 Independent Research
2-6 hrs.
FCL 712 Professional Field Experience
2-12 hrs.
Management (MGMT)
Professors Aile, Beam, Deshponde, Farrell,
Gohar, Rizzo; Associate Professors Carey,
Verser.
Open to Graduate Students Only
MGMT 600 Seminar in Management (Topic)
0 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
strategies. Values, as they relate to the
managerial process, will be considered.
MGMT 610 International Management
3 hrs.
The purpose of this course is to develop the
skills, knowledge, and sensitivities necessary
to manage successfully in an international
environment. Students will learn why and how
companies internationalize their operations,
and the implications of managing in diverse
environments worldwide. Prerequisite:
 Admission to MBA program or permission of
instructor.
MGMT 632 Incentive Compensation
3 hrs.
Incentive compensation covers pay related
incentives useful for implementing business
strategies. Topics covered include: executive
compensation (e.g., stock options), special
group incentives, gain sharing, and ESOP’s.
Students are expected to develop an incentive
plan for an existing organization. Prerequisite: Admission to the MBA program or prior permission of instructor.

MGMT 640 Advanced Statistics
3 hrs.
A second course in statistics complete enough to be used as 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-parametrics tests. Prerequisite: MATH 216.

MGMT 650 Managing Change
3 hrs.
The process of change inside organizations with particular emphasis on managerial actions that influence effectiveness is investigated. Change is examined at the strategic, organizational and behavioral levels. Prerequisite: Admission to MBA program or consent of instructor.

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, 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.
Theories, models, and applications relevant to the structure of complex organizations and their subunits. Emphasis on alternative designs, their causes and consequences.

MGMT 656 Behavior Analysis Applications
3 hrs.
Applications of behavior analysis and the principles of behaviorism to management problems in public and private organizations. Emphasis is placed on maintenance of performance reliability, effectiveness, and efficiency. Students will apply principles to the improvement of an existing organization. Prerequisite: Consent of instructor.

MGMT 658 International Human Resource Management
3 hrs.
The purpose of this course is to investigate issues in the management of human resources on a global basis. It includes topics such as globalization and business strategy, culture, employment law, expatriate staffing, performance appraisals, cross-cultural training, and international labor relations. Prerequisite: Admission to MBA program or permission of instructor.

MGMT 659 Managing a Diverse Workforce
3 hrs.
"Workforce 2000" is creating as challenge and opportunity for managers in Corporate America. The entrants into the workforce over the next decade will come from different cultural backgrounds, physical abilities, gender, ages, lifestyles, and ethnic groups. This course examines these issues and challenges that managers will face while managing a diverse human resource. Prerequisite: Admission to MBA program or consent of instructor.

MGMT 661 Introduction to Management Science
3 hrs.
A systematic study and application of the scientific method to management decision-making. Introduction to techniques of linear programming, inventory theory, scheduling theory, and other optimizing decision models. For students who will take more specialized courses as well as those in other disciplines desiring a limited exposure to the field. Prerequisite: MGMT 200 or equivalent.

MGMT 664 Simulation
3 hrs.
A systematic study and application of the methodology of system simulation including system identification and description, model development, computer implementation, experimental design and validation. Special attention is given to model classification, especially deterministic vs. probabilistic and discrete vs. continuous, and how it relates to computer input and output fields of application. Prerequisites: MGMT 360 or equivalent and BIS 602 or equivalent.

MGMT 665 Advanced Simulation
3 hrs.
Analysis, design, and implementation of computer-based simulation models. Emphasis on effective use of simulators for training system managers and workers. Prerequisite: MGMT 664.

MGMT 666 Inventory Management
3 hrs.
The theory of scheduling and inventory control, including both deterministic and probabilistic models beyond the introductory level. An intermediate course in management science. Prerequisite: MGMT 463 or equivalent.

MGMT 680 Management of Innovation and Technology (MOIT)
3 hrs.
An understanding of the concepts involved in developing core technological competencies, managing existing technologies, and developing new technologies through innovation. Focus will be on the management dimension of technology and innovation. Topics covered will include: technology and strategy (including technological forecasting), management of technology (including development of core technical competencies and technology acquiring options), management of innovation (including internal entrepreneurship and organizational change, and managing R&D), the economics of innovation, and the relevance of Management of Innovation and Technology in helping a firm win the next round competition. Prerequisite: Admission to MBA Program or consent of instructor.

MGMT 685 Quality Management Strategies
3 hrs.
The purpose of this course is to investigate strategic quality management issues as they apply to the management of business in today's competitive environment where the customer satisfaction and continuous improvement have become requirements. Topics covered will include product and process quality, leadership, benchmarking, employee participation and empowerment, quality function deployment, and process innovation. Students will be assigned materials from the latest textbooks and journals. Practice and application will result from participation in group projects conducted in local firms. Prerequisites: MGMT 300 and MKTG 250.

MGMT 685 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 689 Policy Formulation and Administration
3 hrs.
This course focuses on the job of the general manager in formulating short and long run strategy. Using cases drawn from actual situations, the course develops ways of (1) perceiving specific opportunities from an analysis of evolving environmental trends, (2) understanding company strengths and (3) integrating strengths and opportunities in setting strategy and detailed operating plans. This is an integrative capstone course in that the tools and skills learned in other core courses are needed to develop practical, company-wide general management decisions. Prerequisites: Completion of MBA core courses.

Open to Graduate Students Only—Please refer to The Graduate College section for course description.

MGMT 700 Master's Thesis
6 hrs.

MGMT 710 Independent Research
2-6 hrs.

MGMT 712 Professional Field Experience
2-12 hrs.

Marketing (MKTG)

Brogowicz, Chairperson; Professors Belonax, Crow, Delene, Lindquist, Lugman, Mayo, Quraeshi; Associate Professors Gambino, Lane, Lee, Reck.

Open to Graduate Students Only

MKTG 607 Marketing Management
3 hrs.
Analysis of marketing activities from management point of view. Includes study of decision-making relative to competition, demand analysis, cost analysis, product analysis, product design, promotion, pricing, and channels of distribution. Prerequisite: MKTG 370.

MKTG 661 Healthcare Marketing
3 hrs.
This course presents the field of marketing and its application to the healthcare industry. Emphasis is on the design and use of marketing analyses in areas of patient and client satisfaction, critical path and performance models, continuous quality improvement, and the managerial application of market research findings. A range of healthcare provider services are researched using marketing techniques such as segmentation, fail point and boundary analyses for healthcare services.

MKTG 671 Advanced Marketing Research
3 hrs.
Applications of marketing research methods for marketing management using a variety of analytical techniques. Required for all MBA marketing concentrations; may be waived for those having MKTG 471 or its equivalent.

MKTG 672 Distribution Strategy
3 hrs.
The design and implementation of distribution channels emphasizing customer service, least-total-cost design, and time-based competition. The course will include particular attention to the application of information technology; the integration of important strategic issues; the coordination of activities impacting channel efficiency; and the strategic issues; the coordination of activities impacting channel efficiency; and the management of channel relationships. Prerequisite: MKTG 607.
MKTG 673 New Product Management  
3 hrs.  
A systematic examination of market-driven processes for developing and launching new products and managing them over their life cycles. Includes application of marketing research along with consideration of organizational, technological, competitive, and societal issues. Prerequisite: MKTG 607.

MKTG 674 Promotional Strategy  
3 hrs.  
A decision-making course, taught using the case method; includes exposure to communications, demand analysis, promotional objectives, budget determination, personal selling resource management, reseller support, and promotional campaigns. Prerequisite: MKTG 607.

MKTG 675 Services Marketing  
3 hrs.  
The study of services marketing with an emphasis on service quality and customer satisfaction. Topics will include the nature and environment of services, customer expectations and satisfaction, TQM, competitive benchmarking, service quality measurement and gap analysis, relationship marketing, and strategy planning for services.

MKTG 676 Multinational Marketing Management  
3 hrs.  
Managerial analysis of the global marketing environment and evaluation of market entry strategies including exporting, licensing and direct investment; developing and assessing multinational product, pricing, promotional, and distribution strategies; critical discussion of contemporary international marketing issues.

MKTG 677 Buyer Behavior  
3 hrs.  
A decision-making course, taught using the case method; includes analysis of variables affecting buyer behavior. Course focuses on the consumer decision process and such influences on the process as culture, social status, economic condition, personality, the family, and mass communications. Prerequisite: MKTG 607.

MKTG 678 Special Topics in Marketing  
3 hrs.  
Critical examination of advanced topics within the marketing discipline. The course topic will be indicated in the student record. Prerequisite: MKTG 607.

MKTG 679 Market Planning and Strategy  
3 hrs.  
Emphasis on developing comprehensive customer-driven marketing strategies and plans within dynamic competitive environments. Experiential application of advanced marketing concepts and techniques to marketing problem-solving situations. Prerequisite: MKTG 607.

MKTG 680 Global Sourcing and Logistics  
3 hrs.  
This course will examine concepts in international purchasing and logistics to provide and in-depth understanding of the international supply chain. This course will examine how sourcing and logistics activities change and become more complex in the global environment. These aspects will be discussed in terms of opportunities, challenges and changing customer requirements presented by trading blocs, emerging markets and developing countries. Prerequisite: BUS 615.

MKTG 687 Special Problems in Marketing  
3 hrs.  
Special problems based on individual and/or group need or interest under the director on a member of the graduate faculty. Student application must be submitted to the individual faculty member and approved by the department chair prior to election of the course. May not be repeated for credit.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

MKTG 700 Master's Thesis  
6 hrs.

MKTG 710 Independent Research  
2-6 hrs.

MKTG 712 Professional Field Experience  
2-12 hrs.
Counselor Education and Counseling Psychology (CECP)

Morris, Intern Chairperson; Professors Betz, Geisler, Gullickson, Hovestadt, Trembly; Associate Professor Crooteau; Assistant Professors Blasure, Hedstrom, Talbot, Vacha-Haste.

Open to Underclass 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.
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 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 advisor.

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 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-educative assessment and intervention.

CECP 623 College Student Development 3 hrs.
Explores the nature and development of college students pertaining to student affairs. Theories of college student development, administrative strategies and techniques of program implementation are studied.

CECP 624 College Students and the Educational Environment 3 hrs.
This course is designed to help participants understand the impact of campus environments on students, faculty, and staff. Theories and concepts to assist student affairs professionals with understanding the interaction between students (and others) and collegiate environments will be presented. Opportunities for theory-to-practice experiences will be provided. Prerequisites: CECP 623 and 633 or the permission of the instructor.

CECP 625 Legal Issues in Higher Education 3 hrs.
The litigious nature of American (U.S.) society has made knowledge of legal issues related to liability, contracts, hiring and firing, free speech, disabilities, discrimination and many other topics a necessary skill for college administrators. Legal issues, legal enactments and precedents, constitutional provisions, court decisions and case law that impact higher education will be the focus of this course. Current legal issues affecting higher education will be monitored and discussed throughout the course. Prerequisites: CECP 623 and 633 or permission of the instructor.

CECP 626 Applications of Student Affairs Administration 3 hrs.
Emphasis will be upon administration/management aspects of student affairs in higher 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 827 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 to be 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 pupil 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 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, 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 in Higher Education 4 hrs.
The introductory course in student affairs will include a section on the history and development of U.S. higher education. The second phase of the course will focus on the following areas in student affairs: (1) history of the profession; (2) philosophical foundations; (3) professional organizations; and (4) functional areas.

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 use of tests of achievement, 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 intelligence, development, neuropsychological assessment, test bias, and procedures for non-biased assessment. Prerequisite: CECP 603.

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 Millon, 16-FP, 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 and 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 655 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 systemic 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 668.

CECP 673 Advanced College Student Development Theory
3 hrs.
This course continues the examination of student development theories and their application to student affairs practice. The course will increase the complexity of understanding about the development of college students. Traditional theories and new theories will be critically reviewed for their inclusion of diverse populations and their applicability to the range and diversity of current and future students. Prerequisite: CECP 623 or equivalent.

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 counselor issues; diverse populations; counseling psychology-related organizations: training issues; and the future of counseling psychology.

CECP 681 Professional Seminar in Counseling, Leadership, and Student Affairs
3 hrs.
This seminar explores current professional issues such as professional identity, career options, professional organizations, and professional practice literature for doctoral students in Counseling Leadership and Student Affairs options. Prerequisite: Admission to a CLASA doctoral option in the department.

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, roles 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 participant will be accompanied 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
1 hr.
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, their application 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 692.

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 and arranged with the 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
12 hrs.

CECP 732 Doctoral Clinical Internship
1-4 hrs.

CECP 735 Graduate Research
2-10 hrs.

Education and Professional Development (ED)

J. Kretovics, Chair; Professors Bosco, Brinkerhoff, Burns, Fisk, Harring, C.P. Smith; Associate Professors A. Anderson, D. Anderson, Crowell, Farber, Gilley, Holm, Nations Johnson, Lisovskyi, Wilson; Assistant Professors Davis, D. Dynak, J. Dynak, Fager, Pilisbury, Ray, A. Smith.

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 advisor. Graded on a 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 technological development 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 preserve and inservice professionals. Prerequisite: ED 502. The courses presume subject matter knowledge on the part of the students. Normally scheduled in one-credit-hour blocks, the ETA offerings bring students with specific needs to instructors with unique expertise and facilities with appropriate resources together for intensive and highly-focused learning experiences.
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 problems as the changing role 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 stresses. Emphasis will be placed on the identification of patterns of lifelong learning leading to a more fruitful and fulfilling life.

ED 505 The Adult Learner 3 hrs.
This course provides an in depth look at the learning adult from approximately age 22 through old age with special emphasis on human variability, unique learning styles, and characteristics of the adult learner. Theories of adult learning, studies of intelligence and memory, learning capabilities, abilities, approach, and speed of learning will be considered. Motivation as a 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 techniques of interpersonal communication with adults, as well as 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 considered will include such topics as grief and loss through death, divorce, or separation; special needs and contributions of multicultural parents; parents as resource persons and paraprofessionals in the schools; and problems identified by members of the seminar. Members of the seminar will report on the current literature available through libraries and community resources and work toward potential solutions of problems.

ED 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 literacy development. In addition, the course will provide a brief overview of current reading programs 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, process, and disseminate instruction, such as computers, camcorders, CD-ROM,

CDI (compact-disc interactive), video editing equipment, scanning and digitizing equipment, satellite and cable, etc. will be examined. Emphasis will be on the software used for production and presentation will also be examined, and skills in using such software acquired. Particular emphasis will be placed on interactive technologies. 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 courses. Emphasis will be placed on the production of instructional media. Students will be expected to produce one prototype application of interactive media which could be used in an instructional setting. The course will also examine the use of instructional technology within the roles, rules, procedures, and customs of the organization. Students will also examine emerging technologies which are expected to have an 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 processes. 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 FCS 575.)

ED 577 Reading and Related Language Experiences 3 hrs.
A study of the current research on language related skill acquisition and literacy development.

ED 586 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, analyzes the decision factors stemming from societal forces, psychological, cultural, and developmental needs and perceptions of learners; and internal structures of the discipline as guidelines for a curriculum emerging from and serving a democratic society.

ED 603 Social and Philosophical Foundations 3 hrs.
A cultural approach to the development of American educational policy and practice in its broad social setting. Consideration is given to historical, economic, social, and philosophical factors which influence educational thought and practice. The need for historical perspective and sound analysis of conflicting points of view is emphasized in the interpretation of current educational issues and the alternative solutions of present educational problems.

ED 604 Psychological Foundations of Education 3 hrs.
An overview of the psychological forces that influence 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 presenting learning 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. Prerequisites: Admission to the master's program in Early Childhood Education and 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. Prerequisites: ED 606 and 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
identifications, pre-natal development,
language acquisition, psychomotor
development, and parent education.
Prerequisites: ED 606 and ED 607 and
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. Prerequisites:
ED 606, ED 607, and ED 608 and 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 the 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.
This course helps teachers observe, evaluate,
and guide young children's growth while
developing their skill in informal observation
techniques. Teachers will learn about their
children from new perspectives, recognizing
and meeting children's needs. Evaluation
procedures will help account for children's
psychological and social growth while creating
classroom conditions to maximize this growth.

ED 612 Literacy 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 literacy. This
course will provide opportunity for the
production of original materials to be used in
the classroom at the elementary level.
Participation in classrooms will be required.
Prerequisite: ED 516.

ED 613 Early Childhood Problems and the
Teacher
3 hrs.
Deals with the concepts of discipline and
questions of behavior. Teachers will acquire
practical knowledge of research concerning
children's social behavior and will review and
apply systems for promoting prosocial
behavior in their classrooms.

ED 614 Parent Education for Teachers of
Young Children
3 hrs.
Presents a variety of techniques for teachers
teaching and 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 of play in
humankind, and of the relationship of play
to humanity's artistic endeavor, invention, and
problem-solving, and will look at play from
historical and cultural 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.
This course 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 disabilities. Interviewing
techniques and examination procedures will
be the basis 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 disabled
readers. Students will become familiar with
testing instruments, their use, administration,
and interpretation. Students will also learn
techniques of therapy and recognize those
factors necessary for effective therapy.
Prerequisites: ED 312 or 321 and 619.

ED 621 The Early Adolescent Learner
3 hrs.
Theoretical background and research related
to the intellectual, emotional, perceptual,
social, and personal development and
personality development are presented and explored. Emphasis is placed
upon problems teachers face with early
adolescent learners and appropriate
strategies for helping these students realize
their potential.

ED 622 Middle School Curriculum
3 hrs.
This course examines the historical and
philosophical development 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
college educators are examined, including
learning 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
teaching methods and strategies for teaching reading and
writing at the middle/junior high school
level. The primary focus will be on reading,
comprehending and learning from texts. A
secondary focus will be the examination of
exemplary reading programs in the middle
school.

ED 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 and
practices of schooling, and to bring this critical
reflection to curriculum planning and
evaluation, and to their own teaching
practices.

ED 629 Culture and Schooling
3 hrs.
The purpose of this course is for students to
examine culture as a system for organizing
thought and perception and to explore its
influences on the content and methods
of schooling in the United States. Particular
attention is given to cultural dissonance
among students, teacher, and text, and to
culturally grounded ways of knowing that
erode from schooling experiences.

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 rise of
the professional educator; and the shift and
progress toward educational goals.

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 in the context of
courses and units of instruction. Students follow
a system of instructional development
procedure from task analysis to evaluation,
working together with their own students or as
assistants and consultants to other
professionals. Prerequisite: ED 548 or
equivalent.
ED 643 Practicum in Clinical Studies in Reading 3 hrs.
This course is intended to give students experience from observing informal and formal standardized instruments and techniques necessary for the diagnosis and treatment of the disabled reader. The course emphasizes the use of various measurements pointing out their capabilities and limitations. Skills in interviewing, observing, diagnosing, planning treatment, and working with parents and school personnel are 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 Gaming, Computer Applications in instruction, and Diffusion and Adoption of Innovative Practices in Education. This course may be repeated for credit as different topics are offered. Prerequisite: ED 645 or equivalent experience.

ED 652 Language, Reading, and the Young Child 3 hrs.
The course focuses on language and the nature of literacy processes in a child from birth through the primary grades. Teachers will explore contemporary literacy and language programs from this point of view. Deeper understanding of language-reading and writing processes will enable teachers to arrive at more effective literacy development 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. The course will provide graduate students practice in setting up prescriptive instructional objectives, selecting materials in terms of needs, and carefully designing instructional procedures for disabled readers. Prerequisites: ED 619, 620, 643.

ED 656 Organization and Administration of Reading Programs 3 hrs.
This course affords an opportunity for the individual to investigate the processes and procedures which may be employed in organizing and administering reading programs at the elementary and secondary levels. Emphasis is placed on the examination of existing programs and practices with a view toward improving reading education for all students. The course is intended to help students understand the development and management procedures of a reading program, kindergarten through adult basic education.

ED 660 Principles of Human Resources Development 3 hrs.
The course provides an overview of the human resource development (HRD) function in an organization. This includes the role of HRD professional, the nature of HRD structure and function, and the planning and operation of HRD. Special emphasis in the course is devoted to analysis of the HRD function in any organization to identify those elements and characteristics of HRD associated with successful, state-of-the-art and worthwhile operations. The course is a prerequisite for all HRD concentration students, and a good choice for any other person who wishes to gain a critical understanding of the HRD (staff development, inservice education) function.

ED 661 Fundamentals of Needs Analysis 3 hrs.
Development of skills in identifying organizational needs for performance improvement related to human resources development. The course is intended for persons whose current or future professional roles involve them in the development of learning strategies and interventions to promote individuals and organizational change. The course will emphasize a holistic, performance oriented problem solving approach to needs analysis. The goals of the course are: 1) to familiarize students with principles and strategies related to needs analysis, and 2) to provide students with opportunities to develop skill in applying needs analysis concepts and methods.

ED 662 Evaluation of Human Resources Development Transfer and Impact 3 hrs.
The course addresses the theories, methods, and issues addressed by human resources development (HRD) personnel as they recommend, design, install, and assess HRD interventions to meet needs in organizations. Evaluation of HRD interventions is viewed from a macro level (an individual or institutional design level) to help students develop an understanding of the larger range of organizational and human performance factors that impinge on successful HRD efforts. Students analyze one or more major HRD interventions for a real or hypothetical organization, including plans for creating the pre- and post-training organizational environment needed to impact effective performance and design and evaluation approaches to assess and the quality of the intervention.

ED 663 Project Management in Human Resources Development 3 hrs.
This course responds to both general project management concerns as well as the particular demands and problems associated with managing human resources development and other educational projects. Students will develop an understanding of project management needs, problems, concepts and strategies. They will be introduced to and practice particular project management skills, such as project definition, work flow analysis, dependency charting, budgeting, planning, etc. Emphasis in the course is on acquisition of practical skills and knowledge. The course is intended especially for persons who have recently or will in the near future assume responsibility for managing a project and have had little previous management experience.

ED 664 Learning and Organizational Effectiveness 3 hrs.
Examination of characteristics and elements of effective organizations that can be positively impacted by educational concepts and interventions, with special attention to the roles of individual and organizational learning in organizational effectiveness, development of skills in conducting organizational planning, and designing the use of human resources development (HRD) to improve organizational effectiveness efforts in real and hypothetical settings. Prerequisite: Completion of HRD required core, or permission of instructor.

ED 665 Practicum in Human Resources Development 3 hrs.
This course is a supervised practicum integrated with a class meeting component. Students work together on human resources development projects with real clients in the Kalamazoo area. The bulk of work takes place in the field, in project teams. Class meeting sessions will be spent in project reviews and group problem solving. Students will develop consultation skills and gain experience in solving HRD application problems.

ED 670 School Climate and Discipline 3 hrs.
This course is designed for teachers and administrators who wish to develop or change school or classroom climate to promote learning and minimize discipline problems. Emphasizes new approaches to working successfully with problem students and classes.

ED 671 Structuring Classroom Dialogue 3 hrs.
This course is designed to assist 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 videotaped and critiqued for each presentation. Some ethnographic research methods are presented and applied during this course. Specific methods are the use of fieldnotes, journals, and transcription as well as observation and self-observation methods. In addition, the course is designed to instruct the student about the ancient historical roots of dialogue, its transmission throughout the history of the western world, and the role that dialogue has played and continues to play in human interaction and learning. Students must be teaching or have access to a classroom for necessary application of course content.

ED 673 Education and Socialization 3 hrs.
This course centers on the systematic study of the socialization of students in schools. The course will focus on the role of the formal and hidden curricula, organizational structure, teachers and student peer groups in the process of socialization. It will also 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 infuse 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 will be taught as a seminar where methodological issues,
such as reliability and validity, will be discussed as they arise in the work of students. Ethnographic research on educational issues, with an emphasis on teaching, will be read concurrently.

ED 679 Capstone Research Project 3 hrs.
Completion of advisor approved research or application project; includes production of final report or other product(s) suitable for student portfolio. Project must reflect a synthesis of skills and knowledge from concentration core coursework, but at the same time represent a practical application product which can be completed in a one semester time frame. Students will identify and define the nature and scope of the capstone project prior to enrollment in this course, and enroll when completion of the project is planned. Prerequisites: Completion of all or most of concentration core and electives and advisor permission.

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 standardization 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 curricular issues with an emphasis on integrative approaches to organizing knowledge and then identify topics for study based on their professional interests and goals. These topics are explored along with a variety of middle level education issues and their policy implications. Students identify a culminating project and conduct a review of literature pertaining to the project. Projects are completed in ED 694.

ED 694 Middle School Project 3 hrs.
Students continue their investigation of middle level education issues identified in ED 693. The main focus of the course is the completion of the previously identified culminating project. Students work independently on their projects with periodic class sessions designed to discuss education issues and project progress. Students present their projects at a 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 literacy. 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 6 hrs.

ED 710 Independent Research 2-6 hrs.

ED 712 Professional Field Experience 2-12 hrs.

Educational Leadership (EDLD)

Advisors:
Mary Anne Bunda, Chairperson; Zoe Bailey, David J. Cowden, Frank Rapley, James Sanders, Catherine Siekle, Uldis Smidchens, Daniel Sufliebeam, Donald 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 curriculum and instruction. May be repeated. May not be applied to degree programs in educational leadership. Total credits not to exceed six hours.

EDLD 602 Educational Leadership 3 hrs.
Foundations and perspectives of leadership and career planning for leadership in educational programs and institutions.

EDLD 604 Contemporary Educational Scene 3 hrs.
Study and critical analysis of issues and trends influencing design, funding, and delivery of educational programs. Special emphasis on changes in societal expectations and values. Discussion of multicultural and international issues and needs of special populations and groups. Prerequisite: EDLD 602.

EDLD 609 Theories of Leadership 3 hrs.
Critical examination of principles of leadership theory construction, practice with and development of skills in evaluating contending theoretical perspectives regarding leadership. Prerequisite: Admission to the doctoral program.

EDLD 640 Introduction to Research 3 hrs.
This course is designed to develop skills in the fundamentals of research design and the uses and interpretations of research findings. Each student is expected to prepare a review of literature and a design for a research study.

EDLD 641 Measurement Techniques in Education 3 hrs.
The criteria by which instruments are selected and developed serve as the central focus of this course. Information regarding the theory and practice of measurement and testing are applied to educational settings. Students are expected critically to evaluate instrumentation as well as develop a plan for evaluation of an instrument. Prerequisite: EDLD 640.

EDLD 642 Program Evaluation 3 hrs.
Emphasis is on the theory of program evaluation, techniques used in program evaluation, and the standards of quality professional practice. Students are expected to apply the principles of evaluation to design problems. Prerequisite: EDLD 640.

EDLD 643 Personnel Evaluation 3 hrs.
Concepts and standards for design of personnel evaluation systems. Course requires design of a personnel evaluation system and an evaluation of the personnel evaluation system. Prerequisites: EDLD 640 and permission of advisor.

EDLD 645 Research Design and Data Analysis I 3 hrs.
The study of the principles of research design and data analysis is pursued at both the conceptual and applied levels. Emphasis is on the development of the conceptual skills of design analysis and interpretation. Techniques of statistical analysis include the use of computer programs for data analysis. Prerequisites: Admission to a doctoral program and EDLD 640.

EDLD 646 Research Design and Data Analysis II 3 hrs.
A continuation of the study of the principles of research design and data analysis techniques. Advanced skills in design and analysis are developed in addition to an examination of design issues in educational settings. Skills in the use of computer programs for data analysis are required. Prerequisites: Admission to a doctoral program and EDLD 640.

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 651 Advanced Applications of Measurement Methods 3 hrs.
Intensive study of applications of educational measurement theory and methodology to specific needs for instrumentation in education. Students will engage in development, validation, and application of new instruments for collecting educationally important data. Prerequisites: EDLD 641 and EDLD 646.

EDLD 652 Evaluation Practicum 1-6 hrs.
Planned field applications of principles of program evaluation. Approved application and permission of instructor required. May be repeated for credit to a maximum of six hours. Graded on a Credit/No Credit basis.

EDLD 655 Research Methodology Seminar 3 hrs.
A seminar for students seeking advanced theoretical understanding and skill development in educational research methodologies. New methodologies and current research dilemmas are the central focus of the seminar. Prerequisites: EDLD 646 and permission of 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. Development of awareness and knowledge of legal parameters related to education. Completion of EDLD 662 before enrollment in EDLD 661 is recommended.

EDLD 662 School Business Management 3 hrs.
Development of knowledge and skill in management of business operations in schools: budget planning, budget management, standardization, accounting, inventorying of equipment and supplies, use of standard budget forms, preparation of required reports. Prerequisite: EDLD 602.

EDLD 663 Personnel Administration 3 hrs.
Systematic study of personnel administration tasks and functions as applied to education and training. Subtopics include recruitment, selection, orientation, supervision, appraisal, and development of personnel. Emphasis placed on understanding of standards for legal and valid personnel administration practices. Effects of style and behaviors on employee satisfaction and/or productivity are studied. Prerequisites: EDLD 602 and 640.

EDLD 664 Curriculum Development 3 hrs.
Principles of curriculum design, study of value premises, practices, and skills necessary for organization and administration of the scope and sequence of curricular offerings in educational institutions. Study of the process of curriculum implementation and of forces which influence curriculum development. Prerequisites: EDLD 602 and 640.

EDLD 665 The Elementary Administrator 3 hrs.
Systematic study of the tasks and functions of elementary and middle 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 667 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 formulas and practices for funding public schools. Consideration of patterns of fiscal resource development other than public funds as a means of financing public or private education. Completion of EDLD 662 before enrollment in EDLD 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 Superintendent 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 advisor.

EDLD 681 Policy Development 3 hrs.
The content of this course includes examination of policy issues, purposes, functions, methodologies, 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 advisor.

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 advisor.

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 instructional program and 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. Prerequisites: Successful completion of departmental core comprehensive examination. Must co-enroll in one hour of EDLD 730 and approval of advisor.

EDLD 698 Readings in Educational Leadership 1-4 hrs.
Directed individual study of topics or bodies of knowledge not otherwise treated in department courses. A maximum of four hours earned in EDLD 698 is applicable on degree programs. Prerequisite: Permission of advisor.

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.

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**Family and Consumer Sciences (FCS)**

Dannison, Chairperson; Professor Woloszyk; Associate Professors Gassler, Petersons, Steinhaus; Assistant Professors Benne, Chinhod, Wilson.

**Open To Upperclass and Graduate Students**

**FCS 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.

**FCS 524 The Socio-Psychological Aspects of Clothing**  
3 hrs. Winter—Even Years  
Study of dress and adornment as related to human behavior. An interdisciplinary approach to clothing-related research and non-verbal communication, person perception, and group conformity.

**FCS 565 Problems in Nutrition**  
3 hrs.  
A discussion of current problems in nutrition. Not open to dietetics majors. Prerequisite: FCS 260 or equivalent.

**FCS 568 Gender, Culture, and Families**  
3 hrs.  
Study of the implications of gender and cultural orientation for family, work, social interactions and therapeutic interventions. Includes an examination of sexism and racism in the media, advertising, educational institutions, and social policies.

**FCS 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.)

**FCS 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.

**FCS 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.

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**Open to Graduate Students Only**

**FCS 600 Clothing Techniques**  
2 hrs.  
Meets the needs of the advanced student in clothing construction techniques.

**FCS 610 Nutrition in the Life Cycle**  
3 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: FCS 460 or 565.

**FCS 614 Nutrient Metabolism I**  
3 hrs.  
Study of the functions, requirements, and interrelationships in metabolism of energy, protein, carbohydrate, and lipids.

**FCS 615 Nutrient Metabolism II**  
3 hrs.  
Study of the functions, requirements, and interrelationships in metabolism of vitamins and minerals.

**FCS 616 Consumer Education**  
2 hrs.  
Marketing problems and consumer credit. Students work on individual problems which concern the buying of consumer goods.

**FCS 618 Teaching of Specific Subjects in Family and Consumer Sciences**  
2-4 hrs.  
Intensive study of teaching techniques unique to specialized subject matter offered in variety of curricula in consumer resources and technology.

**FCS 622 Occupational Laboratory Experience**  
2-3 hrs.  
A supervised experience program in a specific occupational area.

**FCS 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.

**FCS 649 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.

**FCS 652 Family Life Education**  
3 hrs.  
Current issues, trends, and methods in teaching family life education.

**FCS 660 Studies in Family Relationships**  
3 hrs.  
Concentrated study of specifics in family relationships.

**FCS 664 Seminar in Home Economics**  
2 hrs.  
Investigation and discussion of current research and literature in specified home economics topics.

**FCS 666 Studies in Home Economics Education**  
2-6 hrs.  
Investigation of certain areas in home economics education selected to meet individual needs of the students. May be taken more than once if subject matter is different. Maximum credit is six hours.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

**FCS 700 Master's Thesis**  
6 hrs.

**FCS 710 Independent Research**  
2-6 hrs.

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**Career and Technical Education Courses (CTE)**

The following courses are designed for professional preparation in Career and Technical Education programs.

Open to Upperclass and Graduate Students

**CTE 510 Special Populations in Career and Technical Education**  
3 hrs.  
Special populations enrolled in Career and Technical Education programs and the identification of appropriate learning strategies, materials, and support services for effective teaching and learning.

**CTE 512 Principles of Career and Technical Education**  
3 hrs.  
Explanation, identification, investigation of the history, philosophy, principles, programs, and services in career and technical education.

**CTE 513 Technical Education Methods**  
3 hrs.  
Analysis and methods of organizing instruction in career and technical education. Advanced teaching plans and methodologies.

**CTE 514 Workshop in Career and Technical Education**  
1-3 hrs.  
Investigation, research, and development of a particular topic or area of interest for career and technical education. (Students may enroll for more than one topic, but in each topic only once, to a maximum of three hours credit. Prerequisite: Vocational certification or consent.)

**CTE 542 Advanced Curriculum Development**  
2 hrs.  
Social, political, and economic factors which influence curriculum change, curriculum innovations, trends, implementation, and evaluation.

**CTE 543 Work-site Based Education Programs**  
3 hrs.  
Study of work-site based education programs, including the organization and establishment of training programs, supervision of trainees on the job, development of individual training plans and programs. Emphasis on establishing working relationships between school, business, and the community, including cooperative education, work experience, apprenticeship, work-study, and work exploration programs for Career and Technical Education.

Open to Graduate Students Only

**CTE 612 Studies in Technology**  
1-4 hrs.  
Designed to permit students to take advantage of opportunities offered through technical workshops, seminars, short courses, or field research offered on campus or in approved off-campus settings under the supervision of a member of the graduate faculty. Prerequisite: Consent of instructor and department chair prior to registration.

**CTE 614 Administration and Supervision of Career and Technical Education**  
3 hrs.  
Emphasizes functions of administration and supervision, and problems involved in organizing and operating career and technical education programs. For teachers, administrators, and supervisors of career and education programs and those preparing for such positions.

**CTE 615 Trends and Developments in Career and Technical Education**  
2 hrs.  
A review and exploration of contemporary trends and developments in career and technical education.

**CTE 616 Occupational Selection and Training**  
3 hrs.  
Primarily designed for career and technical education teachers and administrators.
Special emphasis on adapting instruction to individual needs.

CTE 617 Seminar in Career and Technical Education
2-6 hrs.
An intensive study of problems related to career and technical education. Topics vary from semester to semester, and a student may take more than one topic up to a maximum of six hours.

CTE 643 Measurement and Evaluation in Career and Technical Education
2 hrs.
Preparing and using written, performance, and alternative assessments for career and technical education.

CTE 645 Lab Planning and Organization in Career and Technical Education
2 hrs.
Planning a laboratory and selecting equipment and supplies for the facility including selection, development, and preparation of instructional materials and instructional media for multiple activities in instruction at the junior and senior high school levels.

CTE 646 Teaching Issues in Career and Technical Education
2 hrs.
Advanced individual or small group study of teaching methods, techniques, and issues. Emphasis placed on problem solving, teamwork and instructional delivery.

CTE 650 Business/Industry/Education Work-based Learning
3 hrs.
Current practices and future prospects of national and international work-based learning. Applies school-business partnerships, federal and state regulations, changing work place skill requirements, labor market information, and assessment to work programs. Prepares the student to develop and evaluate transition models between secondary and post secondary institutions, business, industry and the community.

Health, Physical Education, and Recreation (PEGR)

Berkey, Chairperson; Professors Cheatum, Dawson, Zabik; Associate Professors Bryinsky, Frauenknecht, Frye, Gross, Meyer, Moss; Assistant Professors Bensley, Cool, Powell.

PEGR 500 Studies in Health, Physical Education, and Recreation
1-2 hrs.
In depth study of selected topics in HPER. Format can include clinics, workshops, seminars, travel and/or mini-courses, and provide opportunity to acquire skills and teaching techniques. State, national, and international authorities or consultants may be involved. Topics include: Aesthetics of Sport; Nutrition and Fitness; Outdoor Education; Physical Fitness; Relaxation; Special Physical Education Activities; Therapeutic Recreation.

Open to Upperclass and Graduate Students

PEGR 510 Modern Health for Teachers and Health Professionals
3 hrs.
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 interpersonal relationships 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, social 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 580 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, PEP 390.

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.
Assists 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.
interest. Prerequisite: Approval of graduate director in Physical Education.

Open to Graduate Students Only

PTEGR 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 PTEGR 630 and 633 combined toward the master's degree program.

PTEGR 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.

PTEGR 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.

PTEGR 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.

PTEGR 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.

PTEGR 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. Topics include: Play Theory, Psychology of Sport, Mainstreaming, Aquatic Programs in Special P.E. 

PTEGR 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.

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.

PTEGR 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.

This course will offer comprehensive material regarding anatomy and physiology and their implications in sports medicine. The course will concentrate on functional components of anatomy and physiology and utilize cadavers in lab.

PTEGR 682 Sports Trauma Assessment and Management 3 hrs.
This course will offer comprehensive material regarding assessment and management of sports trauma. An applied, advanced approach utilizing the most up to date techniques will be presented.

PTEGR 690 Research Procedures in Health, Physical Education, and Recreation 2 hrs.
Research procedures in health, physical education, and recreation sport; introduces principles of scientific inquiry, research methods applicable to these fields, evaluation of published research, and procedures for developing a research design.

PTEGR 691 Psychological Foundations in HPERS 2 hrs.
An overview of the application of psychology to physical education and sport with special emphasis on transcendent experiences in sports and the consciousness of sports.
variety of instructional experiences is provided, including conferences. Credit not applicable toward a graduate degree in Special Education.

SPED 527 Learners with Disabilities in General Education and Middle School Programs 3 hrs. This course is designed for prospective and practicing elementary and middle school teachers. Emphasis is placed on meeting the needs of learners with disabilities in elementary and middle school programs. Required adaptations and modifications, and available resources and services for these learners are addressed. Prerequisite: Consent of department. Not acceptable for Special Education majors.

SPED 530 Introduction to Special Education 3 hrs. This course introduces students to the characteristics and needs of learners with sensory, physical, mental, emotional, and learning disabilities. Students develop an understanding of the psychological, sociological, philosophical, legal, and educational aspects of each type of disability. Prerequisite: Consent of department.

SPED 531 Classroom Practicum in Special Education 1 hr. This course provides students with an opportunity to work in an elementary, middle school, or secondary classroom with learners who have disabilities. It is intended to provide students with an awareness of the nature and needs of these pupils and the role of the teacher in working with such learners. Graded on a credit/no credit basis. Prerequisites: Consent of department and concurrent enrollment in SPED 530.

SPED 533 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 learners with disabilities. Prerequisites: Consent of department and concurrent enrollment in SPED 504/534 or SPED 506/536.

SPED 534 Curriculum and Instruction in Special Education: Elementary 3 hrs. This course focuses on application of the Clinical Teaching Model to the education of elementary and preadolescent learners with mild and moderate disabilities. Emphasis is placed on implementation and evaluation activities. Additional topics include: service delivery systems, roles of teachers and ancillary personnel, legal requirements, and major issues confronting the field of elementary special education. Prerequisites: Consent of department and concurrent enrollment in SPED 504 and SPED 533.

SPED 536 Curriculum and Instruction in Special Education: Secondary 3 hrs. This course focuses on application of the Clinical Teaching Model to the education of preadolescent, adolescent, and young adults with mild and moderate disabilities. Topics include understanding the needs of learners with disabilities; education, curricular, and instructional interventions; and transition programming. Prerequisites: Consent of department and concurrent enrollment in SPED 506 and SPED 533.

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 learners with disabilities. Prerequisite: Consent of department.

SPED 538 Introduction to Classroom Management 3 hrs. This course deals with methods of managing classroom behavior and dealing with specific behavior problems. Classroom management strategies will be discussed and related to the establishment of a positive classroom climate. Diagnostic and prescriptive techniques will be applied to problems of aggression, conduct, withdrawal, hyperactivity, distractibility, and impulsivity. Prerequisite: Consent of department.

SPED 539 Consultation and Communication in Special Education 3 hrs. This course will provide an introduction to consultation and communication skills needed by special educators as they work with other professionals and parents. Prerequisite: Consent of department.

SPED 540 Introduction to Mental Retardation 3 hrs. This course provides an introduction to the field of mental retardation. Historical perspectives, definitions, service delivery systems, evaluation procedures, and major issues are examined. Prerequisites: Consent of department and concurrent enrollment in SPED 545.

SPED 541 Program Practicum in Special Education: MR 1 hr. This course provides the student with guided observations of school and community agencies serving individuals with mental retardation. It provides an awareness of a continuum of special education placements and the role of non-school agencies serving persons with mental retardation and their families. Graded on a credit/no credit basis. Prerequisites: Consent of department and concurrent enrollment in SPED 540.

SPED 542 Introduction to Severe Impairments 3 hrs. This course provides basic knowledge about individuals with severe mental, physical, emotional, and/or sensory disabilities. Biomedical, legal, sociological and educational perspectives are examined. Special emphasis is placed on organization and management of educational programs, as well as assessment and instruction of pupils. Prerequisite: Consent of department.

SPED 544 Educating Individuals with Severe Impairments 3 hrs. This course develops specific skills in the assessment, prescription, implementation, and evaluation of educational programs for persons with severe impairments. Course content focuses on the areas of mobility, communication, sensorimotor development, self-help skills, cognition, and adaptive behavior. Prerequisite: Consent of department.

SPED 545 Education of Learners with Moderate and Severe Retardation 3 hrs. This course focuses on understanding the ways in which teachers organize curriculum and implement assessment and instruction to insure maximum learning for students with moderate and severe mental retardation. Prerequisites: Consent of department and concurrent enrollment in SPED 540.

SPED 570 Introduction to Emotional Impairments 3 hrs. This course provides an introduction to the field of emotional impairment. Historical perspectives, definitions, service delivery systems, evaluation procedures, and major issues are examined. Prerequisites: Consent of department and concurrent enrollment in SPED 575.

SPED 571 Program Practicum in Special Education: EI 1 hr. This course provides the student with guided observations of school and community agencies serving individuals with emotional impairments. It provides an awareness of a continuum of special education placements and the role of non-school agencies serving persons with emotional impairments and their families. Graded on a credit/no credit basis. Prerequisites: Consent of department and concurrent enrollment in SPED 570.

SPED 575 Education of Learners with Emotional Impairments 3 hrs. This course focuses on understanding the ways in which teachers organize curriculum and implement assessment and instruction to ensure maximum learning for students with emotional impairments. Prerequisites: Consent of department and concurrent enrollment in SPED 570.

SPED 580 Introduction to Learning Disabilities 3 hrs. This course provides an introduction to the field of learning disabilities. Historical perspectives, definitions, service delivery systems, evaluation procedures, and major issues are examined. Prerequisite: Consent of department.

SPED 585 Advanced Theory and Practice in Learning Disabilities 3 hrs. This course examines several theoretical perspectives which attempt to explain why students with learning disabilities fail to learn. Within each perspective, the application of selected theories to the Clinical Teaching Model is addressed. Emphasis is placed on the validity of interventions derived from each theory. Prerequisite: Consent of department.

SPED 591 - Braille and Other Communication Methods 2 hrs. This course provides students with a basic knowledge of the braille literary code—reading and writing, and an overview of other communication methods available to students with visual impairments. Prerequisite: Consent of department.

SPED 592 - Methods and Techniques of Teaching Braille and Other Areas of Communication 3 hrs. This course explores various methods and techniques of teaching essential communication skills—braille, typing, social communication, handwriting, abacus computation, the use of electronic devices and other media to students with visual impairments. Opportunity for supervised practical application of methods are afforded.
to the students. Prerequisite: Consent of department.

SPED 598 Readings in Special Education 1-4 hrs.

This course is designed for advanced students interested in independent study. Topics chosen must be approved by the instructor and the department chairperson. May be repeated for credit. Prerequisite: Consent of department.

SPED 601 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, 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, induction 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 covered by this course includes: Parent Relations, Collaboration, Community Resources, Advocacy, Interdisciplinary Concerns and Inservice Training. Prerequisites: SPED 602 and consent of department.

SPED 620 Advanced Assessment of Learners with Disabilities 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-referenced and criterion-referenced assessment techniques. Prerequisites: Consent of department and SPED 603.

SPED 621 Curriculum Development for Learners with Disabilities 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 accommodation to state and national curricular trends and issues. Prerequisites: Consent of department and SPED 603.

SPED 622 Development and Assessment of Preparatory Learners with Disabilities 3 hrs.

This course is designed to provide teachers with an in-depth understanding of normal and abnormal developmental patterns of primary children (birth to five years of age) as related to mental subnormality, neurologic dysfunction, communication disorders, physical and sensory impairments, and emotional disturbance. Emphasis will be placed on developmental assessment and the collecting and reporting of diagnostic information. Prerequisite: Consent of department.

SPED 623 Curriculum and Methods for Preparatory Learners with Disabilities 3 hrs.

This course is designed to provide teachers with skills in translating diagnostic information into a meaningful educational plan for children from birth to five years of age. Emphasis will be placed on situation-specific teaching roles as well as curricular and methodologic strategies in preprimary special education. Prerequisite: Consent of department.

SPED 630 Clinical Practice in Special Education 3 hrs.

This course serves as a clinical/practical experience within the Master Teacher Program, the Clinical Teacher Program, and the Special Education Technology Program. Students will apply theories of learning and skills in a clinical setting with youngsters with varying handicapping conditions. This 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 selecting and programming for gifted, talented, and creative individuals. Prerequisite: Consent of department.

SPED 636 Topical Seminar in Special Education 1-4 hrs.

This course provides a survey or in-depth coverage of topics directly related to the education of learners with disabilities. 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 designs, observations and measurement instruments, statistical analysis, and report writing. Students will be expected to design and carry through 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 learners with disabilities. 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 Services for Learners with Disabilities 3 hrs.

This course examines the principles and practices of organization and administration of special education programs at the state, intermediate, and local levels. Prerequisite: SPED 603 & consent of department.

SPED 641 Supervision of Special Education Programs and Services 3 hrs.

This course is designed to provide the experienced special educator with specific knowledge and skills necessary for the supervising personnel who are providing both direct and indirect services to learners with disabilities. Emphasis is placed on 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: SPED 603 & consent of department.

SPED 643 Legal and Financial Aspects of Special Education 3 hrs.

The current legislative and financial basis for special education national, state, and local levels will be examined in relation to the development and modification of special education programs. The basic concept of budgeting of resources and expenditures will be discussed. Prerequisite: SPED 603 & 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. Prerequisites: SPED 603 & consent of department.

SPED 655 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 Learners with Disabilities 3 hrs.

This course provides an overview of theories of learning as they apply to learners with disabilities. An in-depth analysis of selected theories is conducted in order to compare and contrast the relationship of each to the development of long-term goals for learners.
with disabilities. Prerequisites: Consent of department and SPED 603.

SPED 661 Consultation Skills for Special Education Personnel
3 hrs.
This course is designed to provide the student with those 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: SPED 603 & consent of department.

SPED 674 Intern Teaching in Special Education
6 hrs.
This final field experience is open only for special education graduate students who have completed all of their special education endorsement requirements. It will consist of full-time intern teaching in an appropriate educational setting serving students with disabilities. Students will participate in all phases of the school program to which they are assigned. This course is graded on a credit/no credit basis. Prerequisite: Consent of department.

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: SPED 603 & 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, SPED 603 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, SPED 603 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: SPED 537 or equivalent, SPED 603 and 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. This course will provide students with authoring experience using Apple, Macintosh, and IBM hardware. Prerequisites: SPED 537 or equivalent, SPED 603 and 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.
The College of Engineering and Applied Sciences includes the School of Aviation Sciences and the Departments of Construction Engineering, Materials Engineering, and Industrial Design; Electrical and Computer Engineering; Industrial and Manufacturing Engineering; Mechanical and Aeronautical Engineering; and Paper and Printing Science and Engineering.


Course descriptions: Numbers following course title indicate hours of lecture and laboratory per week during a semester (lecture hours-laboratory hours).

Graduate Offerings:

Construction Engineering, Manufacturing Engineering, and Industrial Design (CMD)

Construction Engineering, Materials Engineering, and Industrial Design (CMD)

Graduate Offerings:

Construction Engineering, Manufacturing Engineering, and Industrial Design (CMD)

Industrial and Manufacturing Engineering

Mechanical and Aeronautical Engineering

Paper and Printing Science and Engineering

Professor Rabiei, Associate Professors Azizkan, Rod, Tsukruk; Assistant Professors Abou-Zeid, Mwakasisi, Olowe, and Sawhney.

Open to Upperclass and Graduate Students

CMD 532 Wood Science and Engineering (2-2) 3 hrs.

Scientific study of dendrology and forest products industry: A study of the relationship between the macro and microscopic structure in wood and wood based composites as they relate to Engineering Design. Laboratory activities will involve machining theory, wood fluid relationships and wood stabilization. Prerequisites: MATH 374, PHYS 207, ME 250, and consent of instructor.

CMD 559 Physical and Mechanical Properties of Polymers (3-0) 3 hrs.


CMD 565 Ceramics: Structure and Properties (2-2) 3 hrs.

Ceramic crystalline structure. Structure imperfections, deformation and failure of ceramic materials. Processing, properties, and toughening mechanisms. Design with and applications of ceramic materials. Prerequisites: PHYS 307, PHYS 207, ME 250, and consent of instructor.

Open to Graduate Students Only

CMD 651 Corrosion Science and Engineering (3-0) 3 hrs.

Corrosion and environmental degradation of metals, alloys, ceramics and polymers. Causes, theoretical background, methods of protection and design for prevention. Prerequisites: MATH 374, PHYS 207, ME 250 and consent of instructor.

CMD 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 metallographic techniques. Prerequisites: MATH 374, PHYS 207, ME 250, and consent of instructor.

CMD 657 Analysis of Metal Forming and Cutting Operations (3-0) 3 hrs.


CMD 658 Structure of Polymers and Composites (3-0) 3 hrs.


CMD 695 Advanced Topics in Materials Science 3 hrs.

A specialized course dealing with some particular advanced area of materials science not included in other course offerings. May be repeated for credit with different topic up to 6 credits. Prerequisite: Consent of advisor.

CMD 697 Problems in Materials Science and Engineering 1-6 hrs.

Special problems based on the 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 election of the course.

Open to Graduate Students Only—Please refer to the Graduate College section for course description

CMD 700 Master's Thesis 6 hrs.
Electrical and Computer Engineering (ECE)

Professors Mousavinezhad, Faltokowski, Vandervoorst, Associate Professors Geei, Gesink, Johnson, Mason, Severance, Taylor; Assistant Professors Greenwood, Hu.

ECE 501 Introductory Power Systems (3-0) 3 hrs.
An introduction to electrical power systems for non-electrical engineering students. Prerequisite: ECE 211, MATH 374.

ECE 515 Introduction to Real-Time Systems (3-0) 3 hrs.
Characterizing, modeling and specifying real-time systems. Designing, programming and verifying sequential and concurrent real-time systems. Case studies using Ada, OCCM, RTL, and Z. Introducing students to problems specific in the engineering of real-time systems with a number of tools used to analyze these systems. Prerequisite: Consent of instructor.

ECE 520 Solid-state Devices (3-0) 3 hrs.
Semiconductor materials and solid state devices, atomic structure, quantum mechanics, crystalline structures, transport phenomena, thermal effects and recombination. Devices include P-N junctions, tunnel diodes, IMPATT diodes, BJTs and JFETS. Prerequisites: ECE 361 and ECE 221.

ECE 530 Power System Analysis (3-0) 3 hrs.
Modern systems, control, optimization, network theories, matrix language, computer methods, steady state. Prerequisite: ECE 430.

ECE 551 Application Specific Integrated Circuit Design (4-0) 4 hrs.
Design, analysis and implementation of application-specific circuits (ASIC). Emphasis will be placed on programmable design (including field programmable gate arrays (FPGA) and programmable logic devices (PLD). Custom-semiconductor design will also be discussed and full-custom design will be briefly introduced. Introduction to contemporary CAD systems.

ECE 552 Switching and Automata Theory (4-0) 4 hrs.

ECE 555 Advanced Digital Signal Processing (3-0) 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. Prerequisite: ECE 455 or equivalent.

ECE 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: ECE 361.

ECE 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: ECE 371.

ECE 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.

ECE 605 Advanced Microprocessor Applications (4-0) 4 hrs.
Selected topics on designing high-performance microprocessor systems. System design for contemporary RISC and CISC processors. Interfacing to high-speed parallel system bus. Shared memory and cache memory design. Prerequisite: ECE 451 or equivalent.

ECE 610 Network Synthesis (3-0) 3 hrs.
Synthesis of active and passive networks. Prerequisite: ECE 310.

ECE 630 Power Systems Analysis II (3-0) 3 hrs.
Continuation of ECE 530, with emphasis on transient analysis of power systems. Prerequisite: ECE 30.

ECE 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: ECE 320, ECE 371, ECE 251.

ECE 650 Advanced Computer Architecture (3-0) 3 hrs.
An introduction to the problems involved in designing and analyzing current computer architectures. Simulation and design automation of digital systems. The completion of a substantial design project is required. Prerequisites: ECE 355, ECE 357.

ECE 660 Antenna Theory and Design (3-0) 3 hrs.

ECE 661 Electrodynamics of Plasma (3-0) 3 hrs.
An introductory course in plasma fundamentals covering both gaseous and solid state plasmas. Topics covered in the course will be macroscopic properties of plasmas, thermodynamics and statistical mechanics of plasmas, plasma models, wave propagation and interaction in plasmas, kinetic equations of plasmas, transport phenomenon, and plasma stability. Prerequisite: ECE 560.

ECE 662 Numerical Methods in Electromagnetic (3-0) 3 hrs.
Solution of electromagnetic field problems by finite difference, finite element, moment and interactive methods. Applications include topics in Electrostatics, Waveguides, Scattering, Machines and Transformers. Prerequisite: ECE 660.

ECE 683 Fourier Optics (3-0) 3 hrs.
Electromagnetic optics and optical information processing. Fiber optic communications and optical waveguide propagation. Scalar diffraction, lenses, optical imaging, and holography. Prerequisite: ECE 560.

ECE 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: ECE 371 or permission of instructor.

ECE 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: ECE 670.

ECE 680 Design Factors for Distributed Systems (4-0) 4 hrs.
An introduction to distributed computing systems operation and design including interprocessor communication techniques, consensus, distributed control, and fault tolerance with an emphasis on real-time environments. Current publications on distributed computing systems will be surveyed.

ECE 690 Computer Engineering Seminar (1-0) 1 hr.
This seminar provides students with opportunities to meet with engineering and scientific experts and discuss the theory and practice of real-time embedded system design and implementation. It is also an opportunity for students to present technical RTES materials to a peer group and faculty. Prerequisite: Graduate standing in computer engineering.

ECE 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.

ECE 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.

ECE 700 Master's Thesis 0 hrs.

Industrial and Manufacturing Engineering (IME)

Munsterman, Chairperson; Professors Atkins, Balina, Houshyar, Lambreros, White, Wolf, Wygant; Associate Professors Bringelson, Engelmann, Gupta, Lyth, Sithik, Tanner; Assistant Professors Mallak, Nallakatla, Ramrattan.

Open to Upperclass and Graduate Students

IME 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: IME 402 or permission of instructor.
IM 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 engineering. Prerequisites: MATH 200, 260 or 360 or equivalent.

IM 502 Manufacturing Engineering Fundamentals
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&T), EIA/ISO format (G&M code) Numerical Control (N/C) programming, graphical N/C programming systems, and Statistical Process Control (SPC). The laboratory includes hands-on experiences with commercial CAD/CAM systems, N/C machines, and instruments of precision measurement. This course cannot be applied for credit toward the Master of Science degree in Manufacturing Science. This course may be used to meet the stated prerequisite requirements normally satisfied by ET 246, ET 358, and ET 481 in the graduate program.

IM 503 Manufacturing Materials Fundamentals
3 hrs.
The course is focused upon the study of identification, properties, processing, applications, and testing techniques of industrial materials. Topics discussed include: plastics, metals, ceramics, wood, and composites materials. Analysis and property definition utilizing standardized (appropriate) testing techniques will be carried out for selected industrial materials. Processing of plastics and composites will be investigated. This course cannot be applied for credit toward the Master of Science degree in manufacturing Science. This course may be used to meet the stated prerequisite requirements normally satisfied by ET 246 and ET 256 in the graduate program.

IM 505 Continuous Improvement in Operations (3-0)
3 hrs.
The purpose of this course is to introduce business and engineering students as well as managers to the process of kaizen (Continuous Improvement) and Total Employee Involvement.

IM 507 Computer Integrated Manufacturing (3-0)
3 hrs.
Topics related to computer integrated manufacturing. Topics include computer process control, robotics, group technology, CNC, CAD, FMS. Hands-on experience with miniature computer controlled equipment will be included. Prerequisite: Course in computer programming.

IM 508 Advanced Quality Management (3-0)
3 hrs.
Analysis and application of new concepts in the fields of quality control. Tests of significance, probability studies, and other uses of statistics as applied to quality control. Prerequisite: IM 316 or 326 or permission of instructor.

IM 512 Management of Service Operations (3-0)
3 hrs.
An analysis of service industries exploring differences in planning and controlling operations. Emphasis will be on service system design, service quality, and comparing customer experiences with their perceptions.

IM 516 Design of Experiments and Regression Analysis (3-0)
3 hrs.
Topics related to experimental design and regression analysis. Topics include randomized blocks, latin squares, factorials, multiple correlation and regression, and its application to response surfaces. Prerequisite: IM 261 or equivalent.

IM 542 Human Factors Engineering (3-0)
3 hrs.
The process of designing for human use. The course covers the study of the interactions between the individual, equipment, products, and the environment in any human-task-Environment System. Topics include human capabilities and limitations; human input, output, and control; work space design; and the work environment. (Cross listed with PSY 542).

IM 546 Concurrent Engineering (3-0)
3 hrs.
The synthesis of automated design, analysis, and manufacturing processes through integrated computer systems. Topics in automated graphics, wire-frame, surface, surface and solids modeling, boundary element analysis, and manufacturing process generation will be investigated. Prerequisites: IM 246 and IM 358 or IM 500.

IM 550 Advanced Plastics Processing 3 hrs.
Identification, testing, and control of process variables within molding and extrusion systems. Isolation of the causes of process instability through the use of instrumentation, data gathering and analysis techniques. Strategies for establishing process capability and shot-to-shot repeatability critical for zero-defect parts. Prerequisites: IM 250 or IM 501 and IM 350 or IM 581.

IM 557 Special Topics in Industrial Engineering (3-0)
3 hrs.
Group study of special topics in industrial engineering and technology. The specific topic will be chosen in the course title when scheduled. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

IM 558 CAM Applications 3 hrs.
Custom design of post-processors. Creation of CNC programs through graphical-based systems. Strategies and techniques -- including Computer-Aided Processing Planning (CAPP) -- to integrate data from CAD to CAM systems. Computer hardware and software requirements for integrated manufacturing. Prerequisite: IM 358 or IM 500.

Open to Graduate Students Only

IME 600 Concepts and Principles of Engineering Management (3-0)
3 hrs.
To study the concepts of supervision with particular design for those who have had little or no previous academic orientation to the principles, concepts, and philosophy of industrial supervision.

IME 604 Facilities Planning and Design (3-0)
3 hrs.
An analytical approach to the planning and design of manufacturing facilities and material handling systems. Prerequisite: IME 404, 414, or permission of instructor.

IME 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, basic economic models, effect of taxation and depreciation on economic decision, and capital allocation.

IME 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: IME 261 and 262 or MATH 362.

IME 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.

IME 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 IME 610. Prerequisite: MATH 362.

IME 612 Productivity and Operations Management (3-0)
3 hrs.
Topics relating to the planning and control functions of manufacturing systems are presented. These topics include management of the production system, strategies of product design and process selection, design of production systems, plant location, shop floor control, purchasing, quality management, and productivity improvement. Prerequisite: IME 326 or equivalent.

IME 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.

IME 622 Industrial Supervision Seminar (3-0)
3 hrs.
An analysis of the writings, literature, and philosophy concerning line supervision and employee direction in manufacturing industries. Prerequisite: IME 600 or permission of instructor.

IME 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: IME 606 and 610.

INDUSTRIAL AND MANUFACTURING ENGINEERING 125
IME 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: IME 430 or equivalent.

IME 642 Ergonomics and Occupational Biomechanics (3-0) 3 hrs.
Topics related to work physiology and biomechanics. Topics include anthropometry, skeletal system and muscle, neuromuscular control system, biomechanics, respiratory system, circulatory systems, and metabolic system.

IME 642 Design for Manufacturability 3 hrs.
Production methods and materials will be applied to product development projects that will relate to the design of efficient and cost effective manufacturing. Topics include the design of part families, geometric classification coding for storage and retrieval, database transfer compatibility standards, process influence on functional product design, statistical determination and the application of linear and geometric tolerancing. Prerequisite: IME 481 or IME 500.

IME 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.

IME 650 Plastics Processing Improvement 3 hrs.

IME 654 Non-Traditional Manufacturing Processes 3 hrs.
Non-traditional manufacturing processes may use electric currents, amplified light, gases, loose abrasives, 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. Prerequisite: IME 358 or IME 500.

IME 656 Material Selection and Processing 3 hrs.

IME 657 Studies in Industrial Engineering (3-0) 3 hrs.
Advance 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.

IME 681 Process Manufacturing and Control 3 hrs.
The study of process improvement techniques which will ultimately lead to quality products. Process improvement includes the reduction of variability in process during the manufacturing stage resulting in improved product quality. A team problem solving approach utilizing data acquisition systems and statistical methods are emphasized. Practical industrial applications of process monitoring and control are reviewed.

IME 683 Thesis Proposal 1 hr.
Study of research methodologies including review and synthesis of previous work, and strategies for conducting investigation. Discussion of format and expectations of the master's thesis. An approved thesis proposal is required for the completion of this course. Prerequisite: Approval of advisor preceding enrollment.

IME 697 Problems in Industrial Engineering 3 hrs.
Special problems of individual need or interest under the direction of a member of the graduate faculty. May be elected with approval of department chairperson and faculty member. Application must be submitted and approved prior to the election of the course.

Open to Graduate Students Only—Please refer to The Graduate College section for course description.

IME 700 Master's Thesis 6 hrs.

IME 712 Professional Field Experience 2-12 hrs.
IME 725 Doctoral Research Seminar 2-6 hrs.
IME 730 Doctoral Dissertation 15 hrs.

Mechanical and Aeronautical Engineering (ME)

IME 520 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.

IME 531 Energy Management (3-0) 3 hrs.
Theory and numerical implementation of industrial energy audits. Energy conservation and waste heat recovery. Prerequisite: ME 232 or consent.

IME 540 Automatic Control of Flight Vehicles 3 hrs.
Synthesis of basic auto pilot and stability augmentation systems for flight vehicles. Advanced flight control structures including integrated flight/fire control, control of inertial cross-coupling, Human pilot plus airframe and the relationship with flying qualities requirements. Extensive use of commercial software tools. Prerequisites: ME 360.

IME 542 Flight Simulation 3 hrs.
Introduction to nonlinear, non-real-time six degree-of-freedom computer simulations of aircraft. Modeling and buildup of aerodynamic and thrust data bases and modeling of control surfaces, actuators, and power plants. Implementation of continuous and sampled-data flight control laws. Some use of commercial software tools. Prerequisites: ME 360 and AAE 460.

ME 545 Computational Fluid Dynamics I 3 hrs.
Basics of Computational Fluid Dynamics (CFD) including classification of partial differential equations, finite difference formulations, parabolic partial differential equations, stability analysis, elliptical equations, hyperbolic equations, scalar representations of the Navier-Stokes equations and grid generation. Prerequisites: ME 356; CS 201 or CS 306.

IME 553 Advanced Product Design (3-0) 3 hrs.
An engineering design project from concept to adoption. Static and dynamic analysis. Mechanical systems design and layout. Prerequisite: ME 360, 453.

ME 555 Intermediate Dynamics (3-0) 3 hrs.
Three dimensional kinematics and dynamics of rigid bodies; equations of motion; Lagrange's equations; work and energy; impulse and momentum; virtual work; stability; computer simulation; introduction to vibrations. Prerequisites: ME 258, MATH 374.

IME 558 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. Prerequisites: 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.

IME 561 Finite Element Method (3-0) 3 hrs.
Weighted residual methods, finite element techniques in one-, two-, and three-dimensional problems of heat transfer, fluid flow, structures and elasticity, time dependent problems, higher order elements, non-linear problems. Prerequisites: MATH 506 or equivalent.

IME 562 Application of Numerical Methods in Engineering (3-0) 3 hrs.
Finite difference methods for initial value and boundary value problems; 2D finite differencing; and boundary element method applications to differential equations of heat transfer, fluid flow, and solid mechanics. Prerequisites: MATH 506 or equivalent.

IME 563 Structural Vibrations (3-0) 3 hrs.
Vibration response of coupled and uncoupled structures. Wave propagation, transmission, and reflection. Effects of external and external damping, impedance discontinuities, and curvature. Four-pole parameter techniques for vibration isolation system design, modal analysis, sound generation. Prerequisite: ME 555 or ME 558.

IME 564 Engineering Noise Control (2-3) 3 hrs.
Introduction to basic concepts of noise control, nature of sound and its effect on outer environment. Indoor and outdoor sound...
ME 571 Gas Dynamic (3-0) 3 hrs. Basic equations of compressible flow, isentropic relationships, normal and oblique shocks, Prandtl-Meyer expansion, Fanno Line and Rayleigh Line flow. Applications to nozzles, diffusers, supersonic wind tunnels; and linearized flows and method of characteristics. Prerequisites: ME 431, 432.

ME 572 Advanced Thermodynamics (3-0) 3 hrs. Conditions of equilibrium, process and thermodynamic engines, the extremum principle, Maxwell relations, stability of thermodynamic systems, phase transitions, chemical thermodynamics, irreversible thermodynamics, and introduction to the statistical thermodynamics. Prerequisites: ME 431, 432.

ME 573 Engineering Materials (3-0) 3 hrs. Spring-Odd yrs. Material selection for resistance to both load and environment. Design parameters for material selection and various metallic systems, corrosion, service failures and mechanical behavior or engineering alloys at high and low temperatures. Prerequisite: ME 250.

ME 575 Tribology-Principles and Applications (3-0) 3 hrs. Surface chemistry, topographical measurement and description, contact mechanics, wear mechanisms, lubrication and film formation, hydrodynamic theory and application in bearings, application to friction and wear in machine elements. Prerequisites: ME 356, ME 365.


ME 585 Topics in Mechanical Engineering 1-4 hrs. A specialized course dealing with some particular area of mechanical engineering not included in other course offerings. This course may be repeated for credit with a different topic to a total of six credit hours. Prerequisite: Consent of department.

Open to Graduate Students Only


ME 630 Advanced Fluid Dynamics (3-0) 3 hrs. Modern developments in fluid dynamics of compressible and incompressible fluid flow. Includes kinematics of fluid motion, laminar and turbulent flow, vortices, fluid machinery, and supersonic flow. Prerequisites: ME 356, 432, and MATH 374.

ME 631 Elastic and Inelastic buckling of Bars and Frames (3-0) 3 hrs. Elastic and inelastic stability of prismatic and non-prismatic columns. Failure of beam-columns, multiply loaded columns, non-prismatic bars under varying axial forces, and systems of bars. Prerequisite: ME 457.

ME 632 Energy Resources and Conversion (3-0) 3 hrs. Fall Availability and economic utilization of energy resources. Technical, economic, and thermodynamic limitations. Energy conversion applications: Fission and fusion. Applications of solar, water, wind, and geothermal energy. Prerequisite: ME 232 or consent.

ME 633 Advanced 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 645 Computational Fluid Dynamics II 3 hrs. Advanced topics in Computational Fluid Dynamics (CFD) including transformation of the equations of fluid motion from physical space to computational space, the Euler equations of gasdynamics, the Navier-Stokes equation of gasdynamics, finite volume methods and turbulent flows. Prerequisite: ME 545.

ME 651 Advanced Strength of Materials, Elasticity and Plasticity (3-0) 3 hrs. Torsion of non-circular cross sections, shear center, curved beams, beams on elastic foundations, flat plates, and an introduction to two-dimensional elasticity and plasticity. Prerequisites: ME 453.


ME 654 Composite Materials 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. Fracture mechanics, fatigue, 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 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. System design, bounding, and distribution approximations are made using direct and Monte Carlo techniques. Series and parallel systems are evaluated using component reliabilities estimated through data analysis and case studies. Process conscious system synthesis with consideration of various optimization goals such as reliability, the cost, weight, and efficiency are considered. Prerequisites: ME 362, 453.


ME 660 Boundary Element Methods 3 hrs. The use of boundary element methods to solve engineering problems. In particular, application to potential problems and elastostatics problems in two and three dimensions. prerequisite: ME 561.


ME 664 Acoustics 3 hrs. Principles of acoustics, stressing the physical concepts underlying the derivations, associated assumptions and solutions to the wave equations in bounded and unbounded
Fluids and solids. Topics include: acoustic wave equations; integral equations; attenuation; acoustics of pipes, ducts, cavities, wave guides and resonators; environmental, architectural, underwater acoustic transducers. Prerequisite: ME 555 or ME 564.

ME 665 Sound and Structure Interaction 3 hrs.

ME 670 Advanced Heat Transfer 3—Radiation 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 676 Phase Change Phenomena 3 hrs.

ME 677 Heat Transfer 3 hrs.

ME 678 Absorption Space-Conditioning 3 hrs.

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 different topics 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)

Professors Bytle, Janes, Joyce; Associate Professors Aravamuthan, Cameron, Darling, Peterson, Wouch; Assistant Professor Scheller.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

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, electokinetic potential, swelling and shrinkage of gels, ion exchange, surface active agents, detergency, and retention of particles.

PAPR 620 Paper, Printing, and Ink (2-3) 3 hrs.
A detailed analysis of the interrelationships of paper and the printing process. Testing methods for printing smoothness, ink receptivity, picking and runnability are the major areas of concentration. Printing problems and quality are also considered as they are influenced by paper, coating, ink, and press conditions and operations.

PAPR 640 Coating Rheology (2-3) 3 hrs.
The theories of flow of non-Newtonian liquids are discussed as they apply to pigmented coating systems. Further theories are formulated and evaluated in the lab to attempt to explain the behavior of coating under heat and 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 viewpoints. 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 693 Environmental Systems Engineering 3 hrs.
The course will focus on the environmental issues associated with the pulp and paper industries. Air, water, solid waste, thermal, and noise emissions, control processes, economic, and legal issues will be studied in concert with the operation of pulp and paper manufacture.

PAPR 695 Graduate Topics in Paper/Printing (1-4) 1-4 hrs.
A special course dealing in some particular subject of interest in pulp and paper and/or printing. May be repeated with different topics. Prerequisite: Permission of the instructor.

A study of the control of pulping and papermaking processes with emphasis on computer control strategies and the selection of control systems and control equipment. Various control strategies and other hardware devices of control loops.

PAPR 688 Pulp and Bleaching 3 hrs.
The course will cover principles of Kraft and sulfite pulping, use of other pulping chemicals such as anthraquinone, boric acid, and polysulfides. It will also cover all types of high-yield pulps and bleaching of both chemical and high-yield pulps. Bleaching chemicals that will be discussed 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 2-12 hrs.
Graduate Offerings:

Art
Dance
Music
Theatre

ART  (ART)
Vander Weg, Chairperson; Professors Carney, Depeaux, Harkness, Hennessy, Keaveny, King, LaVergne, Link, Rhodes, Rizzolo, Robbert; Associate Professors Jones, Naftel; Assistant Professors Clark, Kubiski.

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 351.
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, DeVinci, Michelangelo, Titian, Van Eyck, Brueghel, and Durer. Prerequisite: ART 221.

ART 586 History of Baroque Art
3 hrs.
Art of the late 16th, 17th, and early 18th centuries. Major artists and architects discussed are: Caravaggio, the Carracci, Rembrandt, Rubens, Poussin, Velasquez, Bernini, Borromini and Neumann. Prerequisite: ART 221.

ART 587 History of American Art, Colonial to 1900
3 hrs.
Art in the United States from the Colonial Period to 1900. Emphasized are Federal and Georgian 18th Century styles; 19th Century Realism, Romanticism and Naturalism; and development of distinctly "American" consciousness and styles. Prerequisite: ART 221.

ART 588 History of 19th Century European Art
3 hrs.
Major developments, such as Neo-Classicism, Romanticism, Realism, Impressionism, and Post-Impressionism, are discussed. Key figures whose works lie at the roots of modern art are considered in relationship to their times. Prerequisite: ART 221.

ART 589 History of European Art: 1900-1945
3 hrs.
Emphasis is placed upon the roots of contemporary trends and the contributions of the individuals to new modes of presentation. Major developments including Fauvism, Cubism, Expressionism, and Surrealism are discussed. Prerequisite: ART 221.

ART 590 History of 20th Century Art: 1945 to Present
3 hrs.
Major trends in art since World War II are discussed. Included are Abstract Expressionism, pop art, the new realists, and conceptual art. Prerequisite: ART 221.

ART 591 History of Prints
3 hrs.
Major developments in printmaking, including origins of woodcut and engraving. Renaissance and Baroque master etchers and engravers (Durer, Rembrandt).

ART 592 20th Century Design History
3 hrs.
Major trends in design in the past 100 years, beginning with the arts and crafts movement through post modernism. Major developments include Art Nouveau, Art Deco and the Bauhaus. Art forms include architecture, interior design, graphics, illustration and crafts. Prerequisite: ART 221.

ART 593 History of American Art: 1900-1945
3 hrs.
Art of the United States and Canada from 1900 to present; Realism, introduction of European Modernism; Nativist and American Modernist traditions of the 20's, 30's, and 40's. Prerequisite: ART 221.

ART 597 History of Modern Architecture
3 hrs.
Major developments in architecture since c. 1750 with emphasis on late nineteenth century and twentieth century developments in domestic and commercial architecture and city planning in the West and in Asia. Especial consideration given to the works and influences of Wright, LeCorbusier, and Mies van der Rohe.

Open to Graduate Students Only

ART 610 Advanced Drawing
1-6 hrs.
Graduate level work in drawing. Prerequisite: ART 510 and official admission to an Art graduate program. Repeatable for credit.

ART 613 Graduating Presentation
2 hrs.
Preparation and presentation of graduating exhibition, portfolio, and oral examination with the assistance of the student's major adviser. Evaluated by a departmental reviewing committee. Prerequisite: Last year of graduate study.

ART 620 Independent Study in Art History
1-3 hrs.
Problems in art history from ancient times to the present selected by the individual student in consultation with the instructor. Prerequisites: ART 220, 221, and a 500-level course in the area of interest or the equivalent; permission of department. Repeatable for credit.

ART 621 Graduate Topics in Art History
3 hrs.
Graduate level seminar in art history covering varying topics, ranging from prehistoric to modern periods.

ART 625 Graduate Art Seminar
1 hr.
A survey, investigation, discussion, and evaluation of selected topics in contemporary art and associated practical activities. Topics for investigation may include: Exhibition Preparation in Galleries and Museums; the Artist and the Market; Technology and Computers in Art; Funding Artists and Art Programs; Artists and Society: The Audience and Formation of Taste; Moral Philosophy and Art; Graded on a Credit/No Credit basis. Prerequisite: Art major status.

ART 630 Advanced Ceramics
1-6 hrs.
Graduate level work in ceramics. Prerequisite: ART 530 and official admission to an Art graduate program. Repeatable for credit.

ART 631 Advanced Sculpture
1-6 hrs.
Graduate level work in sculpture. Prerequisite: ART 531 and official admission to an Art graduate program. Repeatable for credit.

ART 635 Advanced Multi-Media Art
1-6 hrs.
Graduate level work in Multi-Media Art. Prerequisite: ART 535. Repeatable for credit.

ART 640 Advanced Painting
1-6 hrs.
Graduate level work in painting. Prerequisite: ART 540 and official admission to an Art graduate program. Repeatable for credit.

ART 641 Print Workshop/Seminar
1-6 hrs.
Advanced research in development of personal concept, method, and uses of graphic processes. Emphasis on personal expression; exploration toward an individual and mature imagery. Prerequisite: ART 541 and official admission to an Art graduate program.

ART 642 Advanced Watercolor
1-6 hrs.
Graduate level work in watercolor. Prerequisite: ART 542 and official admission to an Art graduate program. Repeatable for credit.

ART 645 Advanced Graphic Design
1-6 hrs.
Graduate level work in graphic design. Prerequisite: ART 545 and official admission to an Art graduate program. Repeatable for credit.

ART 648 Advanced Photography
1-6 hrs.
Graduate level work in photography. Prerequisite: ART 548 or equivalent experience and official admission to an Art graduate program. Repeatable for credit.

Dance (DANC)
Professors Cornish, Stillwell; Associate Professors Baas, 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)


Open to Upperclass and Graduate Students

MUS 501 Master Class 2 hrs.
The study of literature, performance practices, and techniques for a specified musical medium (instrumental or vocal). 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 1 hr.
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. Prerequisite: MUS 261 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, vocals 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 chord and scale construction and recognition, harmonic function, chord-scale relationships, and basic blues and popular song forms. All students will be required to develop aural and performance skills relative to those theory skills. Prerequisite: MUS 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 216 Jazz Ensemble or concurrently.

MUS 560 Counterpoint 2 hrs.
A study of the contrapuntal techniques of the 18th, 19th, and 20th centuries. Written assignments are closely correlated with the contrapuntal styles of significant composers. Prerequisite: MUS 161 with a grade of C or better.

MUS 561 Counterpoint 2 hrs.
A continuation of MUS 560. Prerequisite: MUS 560.

MUS 564 Electronic Music Composition 2 hrs.
Original music composition with digital and analog synthesizers and computers. Creation of studio 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 during 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 early 15th century to the early 17th century. Developments in the major musical genres of the era will be examined with emphasis on a comparison of the Franco-Flemish tradition with the emerging national styles. Performance practice options will be explored. Prerequisites: MUS 270 and MUS 271.

MUS 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 predominately a technique course, areas which affect the creative aspects of the final recording will be discussed (such as microphone placement, tasteful vs. inappropriate editing, etc.) In addition to the recording aspects, other electronic instruments used in performances will be surveyed, including synthesizers of various types (both keyboard and non-keyboard) and traditional electronic instruments (guitars, electronic organs, electronic 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. Prerequisite: MUS 594 or department's consent. Students also study the music 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 concentration study.

MUS 617 Opera Workshop
2 hrs.
A production experience in acting, singing, accompanying, and producing of musical theatre. The class is offered each semester and culminates in the performance of an opera or operatic scenes. Open to advanced singers, pianists, and persons interested in production techniques. Admission is by personal interview with the instructor.

MUS 640 Band Techniques and Organization 2 hrs.

MUS 641 Choral Techniques and Organization 2 hrs.
The study of choral activities in relation to organization, repertoire, style, diction, singing technique, balance, 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 requirement.

MUS 691 Special Project in Music Education
2 hrs.
A research project in the area of the teaching of music. The nature of the special project is to be determined in consultation with the Graduate Adviser and appropriate members of the graduate faculty. Projects must be approved prior to registration. When this course is the culminating project for the master's degree, an oral examination on the project and related areas is an integral part of the requirements. May be repeated for credit.

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 adviser.

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, Roehrick, Washington; Associate Professors Daniels, Luscombe, Nagle, V. Stillwell.

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, Lee, Leja, S. Ponchillia, Weessies.

Open to Upperclass and Graduate Students

BLRH 584 Computer Technology in Rehabilitation
3 hrs. This course is designed to introduce the student to computer technology, as it relates to persons with disabilities. 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 input and output are investigated.

BLRH 588 Psycho-Social Aspects of Disability
3 hrs. This course presents an overview of the vocational rehabilitation process and its service delivery systems. Included are the origins of rehabilitation, historical development, legislative history, and philosophy. The emphasis of the course is on the social, psychological, education, recreational, and vocational effects of disability on individuals and their families.

BLRH 589 Medical and Functional Aspects of Rehabilitation
2 hrs. This course presents an interdisciplinary approach to the study of multi-handicapping conditions in rehabilitation. It includes information on the major disabling conditions such as traumatic brain injury, orthopedic, neuromuscular, visual, learning, speech and hearing, cardiovascular, mental and emotional disabilities, and other selected disabilities. Emphasis is placed upon the cumulative effects of concomitant disabilities with additional emphasis on visual impairment.

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 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 Introduction to the Education of Visually Impaired Children
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, and 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. It examines theories of orientation and human movement, psycho-social aspects of mobility, the conceptual understanding of the environment, the history of the profession, and the use of various travel aids.

BLRH 595 Introduction to Orientation and Mobility
4 hrs. The content of this course relates to problems of independent travel which result from reduced vision. Simulated experiences are provided which emphasize the sensory, conceptual, and performance levels needed for independent travel in a variety of environments.

BLRH 596 Electronic Devices
1 hr. This course provides systematic instruction in use of fundamental electronic travel aids. An overview of major electronic devices is also explored. Prerequisite: BLRH 595.

BLRH 597 Principles and Practices of Low Vision
3 hrs. This course deals with assessment and remediation of functional problems encountered by low vision persons. Emphasis is placed on optical, non-optical, and electronic aids which increase visual functioning. In addition, the nature and needs of low vision persons and the interprofessional nature of low vision services are stressed. A laboratory is included to present experiences in initial intake procedures, assessment of near and distance visual acuity, assessment of near and distance visual field, color testing, evaluation of sunwear, evaluation of optical aids, training in the use of optical and non-optical aids, and use of equipment such as the lensometer and tonometer.

BLRH 598 Readings in Blind Rehabilitation
1-4 hrs. This course is arranged on an individual basis to provide students an opportunity to
independently pursue an in-depth study of special areas of interest.

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. This course explores standard group research design, single subject and small numbers design. The emphasis is placed upon providing 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. Prerequisite: Enrolled in Graduate Specialty Program in Gerontology.

BLRH 604 Issues in Travel 1 hr. This course is taken concurrently with BLRH 595. 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 610 Assisted Research 2-6 hrs. This course requires a semi-independent research project related to blind rehabilitation. The student contributes a project that has been developed by a faculty member and is conducted by more than one student.

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 interpersonal skills which are essential in instructing visually impaired adults in skills of independent living.

BLRH 691 Practicum in Rehabilitation Teaching 1-2 hrs. (Repeatable) 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. Included in this course is a weekly seminar to discuss procedures of assessment, principles of professional practice and effective strategies. Graded on a Credit/No Credit basis.

BLRH 697 Clinical Practice in Low Vision 3 hrs. The course will familiarize the student with current practice and resources in the administration of a comprehensive low vision service. Further, the course allows for a practicum to be 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 699 Job Analysis and Job Placement 2 hrs. This course applies career choice and job placement concepts to persons with disabilities. It includes occupational aspects of disability, pertinent laws and regulations including ADA and sections 501-504, labor market analysis, job analyses, rehabilitation engineering, job development, and work modification strategies. It provides experience in making employer contacts, overseeing clients' job seeking efforts, and training in job-related social skills.

BLRH 710 Independent Research 2-8 hrs. This course requires the completion of a creditable research project related to 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 Forstleff, Howard, Page-Robin, Pisaneschi, Simpson; Associate Professor Vass; Assistant Professor Kendrick.

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 dexterity 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 covers 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 GRE 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 665 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 is under direct supervision by faculty and clinical supervisors. Graded on a Credit/No Credit basis. Prerequisite: Admission to certificate program and permission of instructor.

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, affective, 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 advisor. May be repeated up to a maximum of 4 hours in a program of study. Prerequisite: consent of instructor and program advisor.

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 these drugs.

ADA 631 Seminar in Substance Abuse I 3 hrs.
An interdisciplinary seminar designed to reflect broadly conceived intervention strategies ranging from primary prevention to rehabilitation of the addict. (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 for 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 particular emphasis on the diverse experiences, challenges, and social and economic conditions of older women. The course will explore the roles and values 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 topic, 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.

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, etiologic, 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 advisor. May be repeated up to a maximum of 4 hours in a program of study. Prerequisite: Admission to certificate program and consent of instructor.

Open to Graduate Students Only

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. Prerequisite: BLRH 599.

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 1-6 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.

ADA 710 Independent Research 2-6 hrs.
ADA 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 Care 3 hrs.
The primary purpose of this course is to provide an introduction to the philosophies, concepts, principles and approaches involved in holistic health care. It is meant to serve both as a general educational experience for persons wishing to become familiar with holism and as essential basic instruction for persons wishing to apply for admission to the graduate specialty program in Holistic Health Care. Prerequisite: Senior undergraduate or graduate status.

HOL 532 Holistic Approaches to Relationships 3 hrs.
The purpose of this course is to provide an understanding of relationship development. In order to do this students will acquire knowledge in self-concept formation, social systems theory, values development, and communication models. A major emphasis in the course will be on how to assist people in establishing and maintaining healthy relationships.

HOL 533 Holism and Community 3 hrs.
A course designed to help students better understand the dynamics of community and the potential for holistic growth and health through the investment of self in a common and purposeful experience with others.

HOL 534 Holistic Health and Spirituality 3 hrs.
This course helps students better understand the spiritual dimensions of each individual and the relationship of spirituality to the meaning of health. Various spiritual traditions, philosophies and practices will be explored with the primary emphasis on the implications of these teachings for everyday living. The course will address the role of spirituality in the therapeutic process for health care professionals and resources available for practitioners and educators. The format for the course will include lecture, discussion, experiential activities, and audio/visual presentations.

HOL 535 Holistic Approaches to Stress 2-3 hrs.
This course will focus on the nature, sources, and symptoms of stress, and provide a holistic approach for the management of stress. The relationships between stress and personality, life-style, health, illness, work and academic performance will be explored. In addition, the reasons for and management of professional and organizational "burnout" will be presented.

HOL 536 Counseling Skills for Health Professionals 3 hrs.
This course is an introduction to basic counseling approaches for students and professionals working in the health and human services fields. This course is designed to provide basic information on the counseling process and techniques as they apply to health care. This course is designed for health care professionals in allied health professions and for majors in Counselor Education and Counseling Psychology in Social Work.

HOL 570 Field Education in Holistic Health 1-6 hrs.
This registration is designed to give the student a total learning experience during which the student can apply some of the knowledge and information obtained in the health and human services academic setting and further develop and refine his/her professional counseling approaches for students and further develop and refine his/her professional counseling approaches for students and the guidance and assistance of those professionals currently working in the health and human service area. Graded on a Credit/No Credit basis.

Prerequisite: Admission to the graduate certificate program or permission of instructor.

HOL 598 Readings in Holistic Health 1-4 hrs.
This course provides individualized, independent study and reading under guidance of a faculty member. Initiative for planning topic for health care and seeking the appropriate faculty member comes from the student, with consultation from the advisor. May be repeated up to a maximum of 4 hours in a program of study. Prerequisite: Consent of instructor.

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 models and modalities into a health care 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. 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.
The purpose of this course is to provide advanced students in a health care related area an opportunity to become familiar with the "holistic" approach to health care. While using their own discipline as a take-off point, each student will become acquainted with different approaches to health care from both traditional and non-traditional perspectives. The principal goal is to encourage a perception of clients as whole persons whose symptoms represent an underlying disequilibrium in mind, emotions, and body. Prerequisites: HOL 531, 650, 651.

HHS 511 The Health System and Its Environment 3 hrs.
This course provides a descriptive analysis of the organization of the health system. The student who participates can expect to gain an understanding of the structure of health services as well as the processes of operation of the service system and the way in which consumers make decisions for their health care. 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 performance of 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 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 enables 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. Prerequisites are among the possible areas of study. The specific areas are announced with each semester. Prerequisite: Consent of instructor.

HHS 561 Problem Solving in Health and Human Service Organizations 1-4 hrs.
This seminar covers variable topics relating to problem solving in health and human services. It is a skills development course which helps students to become proficient with theoretical constructs and specific procedures for application in the health and human services system. Technology for health planning, the health system and its environment, organization of health practice teams, and financial problem solving in the health agency are among the topics covered. The specific topics to be discussed are announced with
each semester offering. Prerequisite: Consent of instructor.

HHS 599 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 team taught by faculty and others in a variety of fields.

HHS 570 Field Education 1-6 hrs.
This registration is designed to give the student a total learning experience during which the student can apply some of the knowledge and information obtained in the health and human services academic setting and further develop and refine his/her professional skills with the guidance and assistance of those professionals currently working in the health and human service area. By permission of instructor.

HHS 598 Readings in Health and Human Services 1-6 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 advisor. Prerequisite: Consent of instructor and Program Advisor.

Open to Graduate Students Only

HHS 603 Ethical Issues in Human Service Professions 3 hrs.
This course provides knowledge about the contribution of ethics and moral values to the development of one's professional competence. The course will cover ethical problems which exist at different levels of society: (a) in direct practice with clients and their families; (b) within human service agencies; and (c) state and national levels of socio-political policy debate. Consideration will be given to such issues as client rights and confidentiality, professional advocacy and liabilities, and distribution of scarce resources.

Open to Graduate Students Only—Please refer to The Graduate College section for course description.

HHS 712 Professional Field Experience 2-12 hrs.

Hippotherapy (HT)

Open to Graduate Students Only

HT 602 Equine Therapeutic Evaluation and Procedures 3 hrs.
This course is an introduction to the medical use of the horse with respect to the fields of occupational and physical therapy. Emphasis will be on screening, selecting, and evaluating appropriate clients for hippotherapy; planning client treatment, selection of appropriate equipment; documentation and communication. Prerequisite: Admission into Hippotherapy program.

HT 603 OT/PT Application and Theory 3 hrs.
This course will focus on integrating rehabilitative techniques and equine assisted techniques in a practicum setting. Special attention will be directed toward coordination of a hippotherapy team and safety procedures. Prerequisites: HT 602, HT 604 and HT 605.

HT 604 Advanced Equine Treatment Skills 3 hrs.
This course will provide students with a more advanced approach to the understanding and training of the hippotherapy horse. Emphasis will be on dressage theory and skills, lunging, long reinine, and backing. Prerequisites: Admission to Hippotherapy Program; concurrent with HT 602.

HT 605 Education and Administration 3 hrs.
This course will develop the leadership skills necessary to direct a hippotherapy team. Students will develop and conduct in-service training as well as assess and videotape treatment sessions. Emphasis will also be on program administration including personnel, marketing, reimbursement, and record keeping systems. Prerequisites: HT 602, HT 604 concurrent with HT 603.

HT 697 Independent Study 2-4 hrs.
Independent study provided for the qualified student in the Hippotherapy Program under the guidance of a program faculty member. Prerequisites: Consent and HT 603 or concurrent.

HT 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 advisor and the faculty supervisor, must be submitted to the Graduate College prior to registration. Prerequisites: OT 660 or equivalent, HT 602 and HT 603 or concurrent.

HT 712 Professional Field Experience 4 hrs.
A prospective hippotherapist will participate in a six-week professional experience in a riding program designed for persons with handicapping conditions. The riding program will include hippotherapy and at least ten hours a week will be directly related to hippotherapy. The student will be supervised by a hippotherapist. Course coordinated by Western Michigan University. Prerequisites: Consent and completion of HT 605.

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 organizations and/or legislative processes related to their 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 applications 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 PTR, 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 PTR, or consent of instructor.

OT 639 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 institute 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 therapy, and the effect of theory development on occupational therapists will also be covered. Prerequisites: All required undergraduate
PHYSICIAN ASSISTANT

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Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

OT 453 Medical Research I
6 hrs.
Prerequisite: OT 450 or departmental permission.

OT 454 Medical Research II
6 hrs.
Prerequisite: OT 453 or departmental permission.

OT 455 Medical Research III
6 hrs.
Prerequisite: OT 454 or departmental permission.

This 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 I and II.

OT 660 Research in Occupational Therapy I
3 hrs.
Independent study provided for the qualified occupational therapy student under the guidance of a departmental faculty member. Prerequisites: 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

Physician Assistant (MDSC)

MDSC 611 The Diagnostic Process I
2 hrs.
This is the first in a series of three courses designed to develop the knowledge, attitudes and skills requisite for medical history taking, physical examination, clinical problem solving, diagnostic assessment, treatment implementation, and for counseling and educating patients. Learning methods include lecture format, skills performance, clinical decision making, role playing, individual research, and problem solving to integrate and synthesize these competencies. Prerequisite: Admission to the Physician Assistant Program or departmental permission.

MDSC 612 The Diagnostic Process II
2 hrs.
This is the second in a series of three courses designed to develop the knowledge, attitudes and skills requisite for medical history taking, physical examination, clinical problem solving, diagnostic assessment, treatment implementation, and for counseling and educating patients. Learning methods include lecture format, skills performance, clinical decision making, role playing, individual research, and problem solving to integrate and synthesize these competencies. Prerequisite: Admission to the Physician Assistant Program or departmental permission.

MDSC 613 The Diagnostic Process III
2 hrs.
This is the summative offering in this series of three courses designed to develop competence in both the art and the science of patient evaluation. This course will continue to assess patients utilizing history taking and physical examination skills. Students will master special examinations such as for the pediatric patient, as well as the pregnant patient. Further emphasis will be placed on formulating diagnoses, therapeutic and patient education plans. Students will develop competencies in prevention strategies, and recording and communicating information in a medical team model. Prerequisite: Successful completion of the prior semester P.A. coursework or departmental permission.

MDSC 621 Medical Pathophysiology I
1 hr.
This is the first in a three part sequence designed to provide the Physician Assistant student with a foundation for understanding human diseases. Students will review clinically relevant physiology and acquire a working knowledge of pathophysiology. Emphasis will be on the cellular mechanisms of disease and the body's reactions to them. Topics covered will parallel those in concurrent clinical science courses. Prerequisite: Successful completion of the prior semester P.A. coursework or departmental permission.

MDSC 622 Medical Pathophysiology II
1 hr.
This is the second in a three part sequence designed to provide the Physician Assistant student with a foundation for understanding human diseases. Students will review clinically relevant physiology and acquire a working knowledge of pathophysiology. Emphasis will be on the cellular mechanisms of disease and the body's reactions to them. Topics covered will parallel those in concurrent clinical science courses. Prerequisite: Successful completion of the prior semester P.A. coursework or departmental permission.

MDSC 623 Medical Pathophysiology III
1 hr.
This is the third in a three part sequence designed to provide the Physician Assistant student with a foundation for understanding human diseases. Students will review clinically relevant physiology and acquire a working knowledge of pathophysiology. Emphasis will be on the cellular mechanisms of disease and the body's reactions to them. Topics covered will parallel those in concurrent clinical science courses. Prerequisite: Successful completion of the prior semester P.A. coursework or departmental permission.

MDSC 631 Primary Care Medicine I
6 hrs.
This is the first of three Primary Care medicine courses. This series of courses introduces the PA student to the practice of medicine. The course will cover disease states and issues using a systems approach. Within each system, a lifespan approach will be used to look at the common disorders of each system. It also provides the basis for the selection, utilization and interpretation of clinical laboratory, imaging and other diagnostic tests to evaluate each system's principal functions. Prerequisite: Admission to the Physician Assistant Program or departmental permission.

MDSC 632 Primary Care Medicine II
7 hrs.
This is the second of three Primary Care Medicine courses. This course is a continuation of the Primary Care Medicine I course. This series of courses introduces the PA student to the practice of medicine. The course will cover disease states and issues using a systems approach. Within each system, a lifespan approach will be used to look at the common disorders of each system. It also provides the basis for the selection, utilization and interpretation of clinical laboratory, imaging and other diagnostic tests to evaluate each system's principal functions. Prerequisite: Successful completion of the prior semester P.A. coursework or departmental permission.

MDSC 633 Primary Care Medicine III
5 hrs.
This is the third of three Primary Care Medicine courses. This course is a continuation of the Primary Care Medicine II course. This series of courses introduces the PA student to the practice of medicine. The course will cover disease states and issues using a systems approach. Within each system, a lifespan approach will be used to look at the common disorders of each system. It also provides the basis for the selection, utilization and interpretation of clinical laboratory, imaging and other diagnostic tests to evaluate each system's principal functions. Prerequisite: Successful completion of the prior semester P.A. coursework or departmental permission.

MDSC 641 Procedures and Diagnostic Testing I
1 hr.
This is the first in a three course series. The series presents a foundation for understanding the appropriate uses and interpretations of clinical diagnostic testing. Through exploration of each of the major body systems, this course presents instruction in medical procedures used in the diagnosis or treatment of the common disorders of each system. It also provides the basis for the selection, utilization and interpretation of clinical laboratory, imaging and other diagnostic tests to evaluate each system's principal functions. Prerequisite: Admission to the Physician Assistant Program or departmental permission.

MDSC 642 Procedures and Diagnostic Testing II
1 hr.
This is the second in a three course series. The series presents a foundation for understanding the appropriate uses and interpretations of clinical diagnostic testing. Through exploration of each of the major body systems, this course presents instruction in medical procedures used in the diagnosis or treatment of the common disorders of each system. It also provides the basis for the selection, utilization and interpretation of clinical laboratory, imaging and other diagnostic tests to evaluate each system's principal functions. Prerequisite: Admission to the Physician Assistant Program or departmental permission.
Testing III
Successful completion of prior semester P.A. system's principal functions. Prerequisite: diagnostic tests used to evaluate each course's principal functions. This course sequence will present the pharmacology, pharmacokinetics, side-effects, complications, dosages, and contraindications using a systems approach. Prerequisite: Admission to the Physician Assistant Program or departmental permission.

MDSC 651 Health Promotion and Patient Counseling I
1 hr.
This is the first in a series of two courses presented sequentially through the pre-clinical year of training. This course will focus on the knowledge, skills and attitudes requisite for counseling and educating patients. These courses will emphasize counseling techniques, with application to clinical problems such as crisis intervention, substance abuse, human sexuality, multiculturalism, and patient/practitioner transference/counter transference. Theories of personality and psychopathology will be investigated as they relate to patient and practitioner coping styles and effectiveness. Students will also develop expertise in educating patients in wellness and disease prevention. Students will investigate the care-giver role and become insightful regarding their own needs and limitations. Prerequisite: Admission to the Physician Assistant Program or departmental permission.

MDSC 652 Health Promotion and Patient Counseling II
1 hr.
This is the second in a series of two courses presented sequentially through the pre-clinical year of training. This course will continue to focus on the knowledge, skills and attitudes requisite for counseling and educating patients. The course will emphasize counseling techniques, with application to clinical problems such as crisis intervention, substance abuse, human sexuality, multiculturalism, and patient/practitioner transference/counter transference. Theories of personality and psychopathology will be investigated as they relate to patient and practitioner coping styles and effectiveness. Students will also develop expertise in educating patients in wellness and disease prevention. Students will investigate the care-giver role and become insightful regarding their own needs and limitations. Prerequisite: Successful completion of prior semester P.A. coursework or departmental permission.

MDSC 655 Professional Issues for Physician Assistants
1 hr.
This course examines the role of the Physician Assistant and the place and relationships of the PA profession in society. It also examines the legal aspects of PA practice including licensure, malpractice, supervision, delegation, and prescribing. Finally it addresses the ethical and practice standards which society expects of a medical professional. Prerequisite: Admission to the Physician Assistant Program or departmental permission.

MDSC 661 Pharmacotherapeutics I
2 hrs.
This is the first of a sequence of three courses that focus on the concepts of pharmacotherapeutic principles necessary to provide a rational basis for clinical prescribing decisions. This course sequence will present the pharmacology, pharmacokinetics, side-effects, complications, dosages, and contraindications using a systems approach. Prerequisite: Successful completion of prior semester P.A. coursework or departmental permission.

MDSC 662 Pharmacotherapeutics II
2 hrs.
This is the second of a sequence of three courses that focus on the concepts of pharmacotherapeutic principles necessary to provide a rational basis for clinical prescribing decisions. This course sequence will present the pharmacology, pharmacokinetics, side-effects, complications, dosages, and contraindications using a systems approach. Prerequisite: Successful completion of prior semester P.A. coursework or departmental permission.

MDSC 663 Pharmacotherapeutics III
2 hrs.
This is the third of a sequence of three courses that focus on the concepts of pharmacotherapeutic principles necessary to provide a rational basis for clinical prescribing decisions. This course sequence will present the pharmacology, pharmacokinetics, side-effects, complications, dosages, and contraindications using a systems approach. Prerequisite: Successful completion of prior semester P.A. coursework or departmental permission.

MDSC 671 Advanced Clinical Anatomy I
2 hrs.
This is the first in a two semester human anatomy sequence designed to parallel and support clinical science courses in the Physician Assistant curriculum. Emphasis will be on achieving an understanding of anatomical concepts and complex regional relationships as they pertain to clinical problem solving and physical diagnosis. A laboratory component involving the study of cadaver prosections is included. Prerequisite: Admission to the Physician Assistant Program or departmental permission.

MDSC 672 Advanced Clinical Anatomy II
1 hr.
This is the second in a two semester human anatomy sequence designed to parallel and support clinical science courses in the Physician Assistant curriculum. Emphasis will be on achieving an understanding of anatomical concepts and complex regional relationships as they pertain to clinical problem solving and physical diagnosis. A laboratory component involving the study of cadaver prosections is included. Prerequisite: Successful completion of prior semester P.A. coursework or departmental permission.

MDSC 680 Research Concepts for Physician Assistants
3 hrs.
This course will prepare students to understand methods and limitations of various types of research that will impact their practice of medicine. Topics included are a review of statistics and epidemiology, study design, methods and measures, critical evaluation of medical literature, and medical informatics as it relates to research. Emphasis will be placed on the clinical relevance and applications in clinical decision making skills. Prerequisite: Successful completion of prior semester P.A. coursework or departmental permission.

MDSC 681 professional Field Experience - Women's Health
4 hrs.
This course will place the student in a structured obstetrics/gynecology medicine clinical rotation under the direct supervision of a qualified preceptor. Students will be expected to become proficient with a variety of clinical presentations and procedures, subject to site limitations, and develop competence in diagnosing, evaluating, monitoring, treating, educating and/or referring patients. Selected readings will also be assigned to the students. These readings will change frequently to reflect current medical literature. Prerequisite: Completion of the pre-clinical year of the Physician Assistant Program or departmental permission.

MDSC 682 Professional Field Experience - Pediatrics
4 hrs.
This course will place the student in a structured, pediatrics medicine clinical rotation under the direct supervision of a qualified preceptor. Students will be expected to become proficient with a variety of clinical presentations and procedures, subject to site limitations, and develop competence in diagnosing, evaluating, monitoring, treating, educating and/or referring patients. Selected readings will also be assigned to the students. These readings will change frequently to reflect current medical literature. Prerequisite: Completion of the pre-clinical year of the Physician Assistant Program or departmental permission.

MDSC 683 Professional Field Experience - Surgery Rotation
4 hrs.
This course will place the student in a structured surgery medicine clinical rotation under the direct supervision of a qualified preceptor. Students will be expected to become proficient with a variety of clinical presentations and procedures, subject to site limitations, and develop competence in diagnosing, evaluating, monitoring, treating, educating and/or referring patients. Selected readings will also be assigned to the students. These readings will change frequently to reflect current medical literature. Prerequisite: Completion of the pre-clinical year of the Physician Assistant Program or departmental permission.

MDSC 684 Professional Field Experience - Medical Psychiatry
4 hrs.
This course will place the student in a structured mental health clinical rotation under the direct supervision of a qualified preceptor. Students will be expected to become proficient with a variety of clinical presentations and procedures, subject to site limitations, and develop competence in diagnosing, evaluating, monitoring, treating, educating and/or referring patients. Selected readings will also be assigned to the students. These readings will change frequently to reflect current medical literature. Prerequisite: Completion of the pre-clinical year of the Physician Assistant Program or departmental permission.

MDSC 685 Professional Field Experience - Emergency Medicine
4 hrs.
This course will place the student in a structured, clinical emergency medicine clinical rotation under the direct supervision of a qualified preceptor. Students will be expected to become proficient with a variety of clinical presentations and procedures, subject to site limitations, and develop competence in diagnosing, evaluating, monitoring, treating, educating and/or referring patients. Selected readings will also be assigned to the students.
MDSC 686 Clinical Practice Issues II - Internal Medicine

This course will place the student in a structured, clinical internal medicine rotation under the direct supervision of a qualified preceptor. Students will be expected to become proficient with a variety of clinical presentations and procedures, subject to site limitations, and develop competence in diagnosing, evaluating, monitoring, treating, educating and/or referring patients. Selected readings will also be assigned to the students. These readings will change frequently to reflect current medical literature. Prerequisite: Completion of the pre-clinical year of the Physician Assistant Program or departmental permission.

MDSC 687 Professional Field Experience - Internal Medicine

4 hrs
This course will place the student in a structured, clinical internal medicine rotation under the direct supervision of a qualified preceptor. Students will be expected to become proficient with a variety of clinical presentations and procedures, subject to site limitations, and develop competence in diagnosing, evaluating, monitoring, treating, educating and/or referring patients. Selected readings will also be assigned to the students. These readings will change frequently to reflect current medical literature. Prerequisite: Completion of the pre-clinical year of the Physician Assistant Program or departmental permission.

MDSC 691 Clinical Practice Issues I

1 hr
This is the first course of a three course, seminar series designed to present and discuss various topics relevant to current clinical practice. The topics will be generated by the challenges the students will encounter in the practice of medicine. The course will also address the evolutionary trends in the healthcare arena and will facilitate the student's transition to professional practice. Prerequisite: Completion of the pre-clinical year and concurrently enrolled in MDSC 712 or departmental permission.

MDSC 692 Clinical Practice Issues II

1 hr
This is the second course of a three course, seminar series designed to present and discuss various topics relevant to current clinical practice. The topics will be generated by the challenges the students will encounter in the practice of medicine. The course will also address the evolutionary trends in the healthcare arena and will facilitate the student's transition to professional practice. Prerequisite: Successfully completed MDSC 691 and concurrently enrolled in MDSC 712 or departmental permission.

MDSC 693 Clinical Practice Issues III

1 hr
This is the third course of a three course, seminar series designed to present and discuss various topics relevant to current clinical practice. The topics will be generated by the challenges the students will encounter in the practice of medicine. The course will also address the evolutionary trends in the healthcare arena and will facilitate the student's transition to professional practice. Prerequisite: Successful completion of MDSC 692 or departmental permission.

MDSC 710 Research Project/Professional Experience

6 hrs
This course will ensure that students are qualified in applying the lessons learned in MDSC 680 in a professional manner. This is the culmination course of the master's curriculum, and requires a paper of publishable quality and presentation of the same. Several permutations are possible, including research under faculty supervision, clinical elective field experience focus on a research topic, clinical case investigation and others. Prerequisite: Completion of the pre-clinical year and at least one MDSC 712 or departmental permission.

Social Work (SWRK)

Professors Blakely, Halseth, Judd, Mathews, Pawlak, Poppie, Reeser, Reid, Thompson, Werkin; Associate Professors Cooney, Lish, MacDonald, Phillips; Assistant Professors Cousins, Mabrey, Wengter.

SWRK 562 Community Organization in Urban Areas

3 hrs
Social welfare planning and social action methods are studied as approaches for preventing and resolving aspects of social problems. Emphasis is placed on the organizing of neighborhood and consumer groups in order to increase social interaction and 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 interventionary means are explored. Prerequisite: Consent of instructor.

SWRK 572 Community Agency Resources

2 hrs
A study of community agencies and resources for those concerned with family and personal problems. Emphasis is placed upon the availability of these resources and their effective use by business and industry, speech therapist, guidance counselors, teachers, etc. May not be used as credit toward the M.S.W. degree.

Open to Graduate Students Only

SWRK 610 Foundations of Social Welfare Policy

3 hrs
This is the first course in the graduate program offered in the social welfare policy sequence of courses. Its general purpose is to introduce the subject area of social welfare policy as a central concern of social work. The goals of the course are to identify evolving socio-cultural bases of social welfare in America, to gain understanding of the substance of particular social policy areas, and to learn to approach the study of social welfare policy within the context of analytic frameworks. 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. Attention is paid to object relations theory, cognitive theory, and role concept as they affect social work assessment, planning and interventions. Human growth and development are viewed in terms of epigenetic stages, each of which entails specific tasks and skills. Attention is paid to the implications of such aspects of human diversity as race, ethnicity, gender, sexual orientation, family structure and socioeconomic status. Prerequisite: Consent of instructor.

SWRK 633 Implications of Race and Culture in Social Work Practice

3 hrs
This course explores 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 reactions to those differences; and 3) discover ways in which those differences can be bridged within 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 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 interventions, ethical and value issues, and relevant research will receive some consideration.
SWRK 662 Social Work Practice: Groups and Organizations
3 hrs.
This course focuses on knowledge and skills related to social work practice with groups and organizations. Attention is paid to interpersonal, interorganizational, and organizational levels of intervention. Practice skills in working with groups and organizations are developed. Prerequisite: SWRK 661. Concurrent enrollment in SWRK 672 is required.

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. 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 topics 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 and their 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 661.

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 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 focus. Concepts from communications theory and related interventions are also covered. Aspects of human diversity are discussed 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 679, or consent of instructor.

SWRK 670 Seminar in Social Policy Practice
3 hrs.
This course is an integrative seminar in the policy planning and implementation process 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. This 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 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. Concurrent enrollment in SWRK 661 is required.

SWRK 672 Field Education in Social Work Practice II
3 hrs.
This is the second of two field practice courses in the 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 662.

SWRK 676 Field Education in Social Treatment
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. Campus- or field-based seminars may supplement the field experiences. Prerequisites: SWRK 665, 672, and concurrent enrollment in SWRK 636, and/or SWRK 668, or consent of the instructor. Graded on a Credit/No Credit basis.

SWRK 677 Field Education in Social 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 exercise practice skills for designing, maintaining, and changing social systems. Field placements in social welfare organizations and special programs are arranged in accordance with student courses and abilities. Graded on a Credit/No Credit basis. Prerequisites: SWRK 672 and concurrent enrollment in SWRK 667, or consent of instructor.

SWRK 678 Advanced Field Education in Social Treatment
3 hrs.
Continuation of SWRK 676. Students will remain in field placement, and direct service experiences and other activities will continue. Campus- or field-based seminars may
supplement the field experience. Prerequisite: SWRK 676 an concurrent enrollment in a course from the 690 series, 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. Students remain in the same field work setting and work under the direction of the same field instructor. During the 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. The course provides students with an experience in the conceptualization of a research problem, the design of a methodology, the collection and analysis of data, and the development of a report of the findings. The research is designed to further the development of research and practice competencies 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 provides 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 668, 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 636, 666.

SWRK 692 Advanced Social Treatment: Children 3 hrs. This course provides 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 636, 666, 668.

SWRK 693 Advanced Social Treatment: Groups 3 hrs. This is an advanced course for social treatment students that prepares them for therapeutic intervention in group treatment. The course will examine interpersonal relations, transference, counter-transference, communication, group processes, problem-solving, authority and leadership in groups, and group development from both an affective and cognitive perspective. The course 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, Theory and Practice of Group Treatment, and meets the requirement for advanced practice in social treatment.. 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 are examined. Meets requirement for advanced practice course in social treatment. 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. Meets requirement for advanced practice course in social treatment. Prerequisite: SWRK 661 or consent of instructor.

SWRK 696 Advanced Social Treatment: Families at Risk 3 hrs. This course provides students with the opportunity to broaden and deepen their knowledge of advanced clinical social work with families. Builds on SWRK 688, 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 of children involved in social work practice, and seen as being at risk for problems in social and emotional functioning. The course meets the requirements for an advanced practice course in social treatment. Prerequisites: SWRK 636, SWRK 666.

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, specialization, 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 advisor 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, Hillenbrand, Nelson; Associate Professors Bedrosoin, Boersma, Clark, Katbamna, Lawson, Oas, Seelig; Assistant Professors Carlson, Warner.

Open to Upperclass 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, 353, 354, 358.

SPPA 556 Rehabilitative Audiology 3 hrs. Orientation to the clinical management of communication problems associated with auditory impairment.

SPPA 595 Oral Language Development and Dysfunction 2 hrs. This course provides the student preparing to be a classroom or special teacher with information about the nature of oral language, its development, conditions associated with dysfunction, and the principles and methods of treatment for children with specific speech or language disorders. Not applicable toward the master's degree in Speech Pathology and Audiology.

SPPA 597 Topics in Speech Pathology and Audiology 1-4 hrs. Selected topics in speech pathology and audiology are systematically explored through lectures, laboratory experiences, and student projects. Possible areas of study are instrumentation in audiology, manual communication, electrophysiologic audiometry, computer applications to speech
pathology and audiology, augmentative communication, and contemporary professional issues.

a. Autism ........................................... 3 hrs.
b. American Sign Language I .................. 3 hrs.
c. American Sign Language II ................. 3 hrs.

SPPA 598 Readings in Speech Pathology and Audiology
1-4 hrs.
Arranged on an 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 electronic 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. Instrumentation, procedures, and techniques employed in perceptual, physical and physiological analyses of normal speech and hearing are among the areas considered. Topics vary from semester to semester and are announced in advance. 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 medicolegal 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, geriatric 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 apraxia as manifested in children and adults. Prerequisite: Department approval.

SPPA 645 Augmentative and Alternative 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 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.
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 (GRAD)

Open to Graduate Students Only

A graduate student should register for 700-level courses in his or her instructor's department. If the appropriate 700-level course is not offered by that department, the student should seek permission to register for it as a Graduate College (GRAD) course. All 700-level courses are graded on a Credit/No Credit basis.

PLEASE NOTE: Students conducting research in any 700-level course that involves human or animal subjects, 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, 387-8296.

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 and publication of the manuscript and to the requirements for research involving regulated subjects and hazardous materials.

Master's theses involving research with protected or regulated subjects must include documentation indicating compliance with federal, state, and University requirements for the protection of human/animal subjects or appropriate use of genetic or radioactive materials and chemical hazards. Written approval from the board/committee/office must be included as an appendix to the thesis. The use of Guidelines for the Preparation of Theses, Projects, and Dissertations is required. This publication is available for purchase in Western's Campus Bookstore. 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. In case a student wishes to appeal a negative decision by the student's master's thesis committee, the student shall first take the appeal to this same committee, which shall hear the appeal and render a decision. In case a master's thesis committee cannot reach unanimous agreement and the student wishes to appeal further a negative decision, a Review Committee shall be established consisting of the Dean of The Graduate College, the appropriate academic dean, and the chairperson or director of the unit. The Review Committee shall seek to resolve the controversy without passing on the thesis. The Review Committee handling such a case is limited to procedural actions, such as reconstituting the thesis committee if the case merits it.

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.
Designed for superior graduate students who wish to pursue independent reading or research in a specialized area. Students wishing additional guided reading may register a second time. The student will master the works independently and, in consultation with faculty members, select a representation list of approximately 20 works on which to focus study. The student should register for 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. Because the work for a 712 is ordinarily a culminating experience, students may enroll for 712 only when the departmental graduate advisor or director deems that they have completed all appropriate coursework and any other requirements that should precede the field experience. 712 should not supplant required or expected courses in the graduate program.

If a graduate program has a required internship or field experience, approved by the university curricular review process, a maximum of 12 hours of 712 may be applied to the graduate degree. In other programs, which allow an internship or field experience but do not require one, no more than six hours of 712 may be applied to the degree. Permission to elect 712 can be granted only when the graduate advisor, director, and/or department chairperson deem that the project is integral to the student's program of study. 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 regulations pertaining to the preparation of the manuscript and to the requirements for research involving regulated subjects and hazardous materials. Specialist projects involving research with protected or regulated subjects must include documentation indicating compliance with federal, state, and University requirements for the protection of human/animal subjects or appropriate use of genetic or radioactive materials and chemical hazards. Written approval from the board/committee/officer must be included as an appendix to the project.

The use of Guidelines for the Preparation of Theses, Projects, and Dissertations is required. This publication is available for purchase in Western's Campus Bookstore.

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.

In case a student wishes to appeal a negative decision by the student's project committee, the student shall first take the appeal to the same committee, which shall hear the appeal and render a decision. In case a project committee cannot reach unanimous agreement and the student wishes to appeal further a negative decision, a Review Committee shall be established consisting of the Dean of The Graduate College, the appropriate academic dean, and the chairperson or director of the unit. The Review Committee shall seek to resolve the controversy without passing on the project. The Review Committee handling such a case is limited to procedural actions, such as reconstituting the project committee if the case merits it.

GRAD 725 Doctoral Research Seminar

2-6 hrs.
Units offering doctoral programs may use this number to designate their research seminars. Such seminars may be taken more than once by the student. Permission of instructor is required. Graded on a Credit/No Credit basis.

GRAD 730 Doctoral Dissertation

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 and publication of the manuscript and to the requirements for research involving regulated subjects and hazardous materials. Doctoral dissertations involving research with protected or regulated subjects must include documentation indicating compliance with federal, state, and University requirements for the protection of human/animal subjects or appropriate use of genetic or radioactive materials and chemical hazards. Written approval from the board/committee/officer must be included as an appendix to the dissertation.

The use of Guidelines for the Preparation of Theses, Projects, and Dissertations is required. This publication is available for purchase in Western's Campus Bookstore.

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.

In case a student wishes to appeal a negative decision by the student's doctoral dissertation committee, the student shall first take the appeal to this same committee, which shall hear the appeal and render a decision. In case a doctoral dissertation committee cannot reach unanimous agreement and the student wishes to appeal further a negative decision, a Review Committee shall be established consisting of the Dean of The Graduate College, the appropriate academic dean, and the chairperson or director of the unit. The Review Committee shall seek to resolve the controversy without passing on the dissertation. The Review Committee handling such a case is limited to procedural actions, such as reconstituting the doctoral dissertation committee if the case merits it.

All doctoral dissertations will be microfilmed by University Microfilms Inc. The student is also required to prepare an abstract of the dissertation for publication in Dissertation Abstracts International.

GRAD 732 Doctoral Clinical Internship

1-4 hrs.
Designed for doctoral students pursuing a program-required 2,000 clock-hour internship at an approved professional site. Enrollment is approved for students with the prerequisite academic preparation by the department committee supervising the area of the student's training. Permission of department is required. Graded on a Credit/No Credit basis.

GRAD 735 Graduate Research

2-10 hrs.
Units offering doctoral programs may use this number to designate research projects for their doctoral students. Such projects may be taken more than once by the student. Permission of instructor is required. Graded on a Credit/No Credit basis.
Section VI
The Graduate Faculty

Members

Abou-Zeid, Azza, 1993, Assistant Professor of Construction Engineering, Materials Engineering, and Industrial Design
B.S., M.S., Cairo; Ph.D., Wisconsin-Madison
Mase, Neil, 1958, Professor of Mathematics and Statistics
B.S., M.S., Ph.D., Michigan State
Alvarez, Alan J., 1974, Professor of Psychology
B.A., M.A., College of William and Mary; Ed.D., Western Michigan
Alexander, Donald L., 1991, Associate Professor of Economics
B.S., Bowling Green; M.A., Ph.D., Penn State
Alla, Raymond E., 1960, Professor of Management
B.A., M.A., College of William and Mary; Ed.D., Western Michigan
Allen, Roberta M., 1979, Associate Professor of Business Information Systems
B.A., M.A., Ed.D., Western Michigan
Alvi, Estander, 1984, Assistant Professor of Economics
B.A., Dhaka (Bangladesh); M.A. De Paul; M.A., Ph.D., John Hopkins
Anderson, Ariel L., 1986, Associate Professor of Education and Professional Development
A.B.Ed., Michigan; M.A., Ph.D., Michigan State
Anderson, DeWayne, 1987, Associate Professor of Education and Professional Development
B.A., Concordia College; M.A.T., Ph.D., Indiana
Apar, William C., 1965, Professor of Music
B.S. State Teachers of Indiana (Pa.); M.Mus, Indiana
Av. 1986, Associate Professor of Paper and Printing Science and Engineering
B.S., M.Sc., Technion-Israel Institute of Technology
Art Armstrong, Kevin, 1991, Assistant Professor of Psychology
B.A., Carleton; Ph.D., Illinois Institute of Technology
Arndt, Craig, 1992, Associate Professor of Music
B.S., St. Olaf; M.M., Illinois; D.M.A., Eastman School of Music/Aesla, Sisy, 1980, Associate Professor of Economics
B.A., Central College (Pella); M.S., Ph.D., Iowa State
Atkawna, Estella A., 1990, Associate Professor of Geology
B.S., M.Sc., Ph.D., Dalhousie
Athappilly, Kurlakosse K., 1979, Professor of Business Information Systems
M.S., B.S., University of Kerala (India); M.B.A., Union; Ph.D., Yale
Atkins, Michael B., 1971, Professor of Industrial and Manufacturing Engineering
B.S., M.S., Texas A&M
Azrlik, Dmitry, 1993, Associate Professor of Construction Engineering, Materials Engineering, and Industrial Design
B.S., Polytechnical Institute (Azerbaijan); Ph.D., Ali-Union Design Research Institute (Moscow)
Baa, Jane Thornbury, 1981, Associate Professor and Chair, Department of Dance
B.S., M.A., Western Michigan; M.F.A., Cese Western Reserve
Bach, Shirley, 1964, Professor of Philosophy
B.S., Queens College; Ph.D., Wisconsin
Bafna, Kalilsh M., 1979, Professor of Industrial and Manufacturing Engineering
B.S., Banaras Hindu (India); M.S., Mississippi; Ph.D., M.B.A., P.E., Bah, Christine M., 1968, Associate Professor of Special Education
B.A., Fortbonne; M.S., Southern Illinois; Ph.D., Ithaca
Bair, Michael W., 1989, Associate Professor of Special Education
B.A., University of Missouri; M.Ed., Missouri (St. Louis); Ph.D., Indiana
Ball, Thomas C., 1970, Associate Professor of English
B.A., Oberlin; M.A., Missouri; Ph.D., Washington University
Bak, Lisa, 1991, Associate Professor of Psychology
B.A., SUNY ( Oswego); Ph.D., Vanderbilt
Baldner, Kent, 1990, Associate Professor and Chair, Department of Philosophy
B.A., California State (Northridge); M.A., Ph.D., California (Irvine)
Balls, Robert, 1965, Associate Professor of Finance and Commercial Law
B.S., B.A., Western Michigan; M.A., Purdue; P.E, Bahr, Christine M., 1988, Assistant Professor of Physics and Commercial Law
B.S., Loras College; M.A., Utah; Ph.D., Iowa
Barley, Joe A., 1989, Assistant Professor of Educational Leadership
A.B., Radcliffe; M.A., Ph.D., Colorado
Bernasek, David A., 1986, Associate Professor of Geology
B.A., San Francisco State; Ph.D., California (Santa Barbara)
Bert-AMI, Miriam, 1989, Associate Professor of English
B.A., Hebrew University; M.A., California, State (L.A.); Ph.D., Pittsburgh
Betch, Nicholas, 1972, Associate Professor of Finance and Commercial Law
A.B., Michigan; M.B.A., Western Michigan; J.D., Wayne State
Bate, Harold L., 1964, Professor of Speech Pathology and Audiology
B.A., Butler; M.A., Florida; Ph.D., Wisconsin
Baem, Henry N., 1975, Professor of Management
B.S.E., Princeton; M.S.E., M.B.A., Ph.D., Michigan
Bedroes, Jan L., 1993, Associate Professor of Speech Pathology and Audiology
B.A., M.A., California (Santa Barbara); Ph.D., Wisconsin
Beach, George T., 1965, Professor of History
B.A., Michigan State; Ph.D., Johns Hopkins
Belonak, Joseph J., 1976, Professor of Marketing
B.S., M.B.A., Northern Illinois; Ph.D., Nebraska
Bene, Max E., 1969, Associate Professor Family and Consumer Sciences
B.S., M.S., Ed.D., Michigan State
Bennett, Robert J., 1990, Assistant Professor of Health,Physical Education, and Recreation
B.S., Western Michigan; M.A., Central Michigan; Ph.D., Utah
Benson, John William, 1974, Professor of Spanish
B.A., M.B.A., Wisconsin
Berkey, Debra S., 1985, Associate Professor and Chair, Department of Health, Physical Education, and Recreation
B.S., Slippery Rock Military, Ed.D., West Virginia
Berndt, Donald C., 1962, Professor of Chemistry
B.S., Ph.D., Ohio State
Berrah-Mansour, Nora,
B.A., M.A., University of Bhopal (India); Ed.D., Illinois-Urbana
Biagiewicz, Gary E., 1978, Associate Professor of Spanish
B.A., Franklin and Marshall; M.A., Ph.D., Pittsburgh
Blakely, Peter, 1995, Assistant Professor of German
B.A., Western Michigan; M.A., Ph.D., Michigan
Blazak, Alfred, 1985, Professor of Computer Science
B.S., Western Michigan; M.S., Ph.D., Michigan State
Boerema, Susan K., 1974, Associate Professor of Speech Pathology and Audiology
B.S., Northern Illinois; M.A., Michigan State
Boothroyd, Gregory W., 1970, Professor Counseling
B.A., M.A., Western Michigan; Ph.D., Cincinnati
Borla, Linda J., 1991, Assistant Professor of History
B.A., Skidmore; M.A., Ph.D., Maryland
Bosco, James J., 1965, Professor of Education and Professional Development
B.Ed., Duquesne; M.Ed., Pittsburgh; Ed.D., Columbia
Bowman, Joel, 1975, Professor and Chair, Department of Business Information Systems
B.A., M.A., Ph.D., University of Illinois
Breisach, Ernst A., 1957, Professor of History
B.A., M.A., Ph.D., Illinois; Dr. rer. occ., Wirtschaftsuniversitat, Vienna
Breitwiser, Dale, 1977, Professor of Philosophy
A.B., Kennes; A.M.; Harvard; Ph.D., Michigan
Bringelson, Liana S., 1991, Associate Professor of Industrial and Manufacturing Engineering
B.S., Kearney State; M.S., Ph.D., Purdue
Brinkhroth, Robert, 1978, Professor of Education and Professional Development
B.A., Colgate; M.A., Ed.D., Virginia
Brinkley, Ellen H., 1989, Associate Professor of English
B.A., Morris Harvey College; M.A., Western Michigan; Ph.D., Michigan State
Brongwa, Andrew A., 1979, Professor and Chair, Department of Marketing
B.S.B.A., M.B.A., Wayne State; Ph.D., Michigan State
Brown, Christie, 1968, Associate Professor of Mathematics and Statistics
B.S., M.A., Ph.D., Ohio State
Brynak, Jody, 1991, Associate Professor of Health, Physical Education and Recreation
B.S., M.Ed., Slippery Rock State; Ph.D., Minnesota
Buckley, Joseph T., 1970, Professor of Mathematics and Statistics
B.S., Boston College; Ph.D., Indiana
Bunda, Mary Anne, 1974, Professor and Interim Chair, Department of Educational Leadership
B.S., M.Ed., Loyola University of Chicago; Ph.D., Illinois (Urban)
Bumla, David A., 1987, Associate Professor of Finance and Commercial Law
B.A., Queens; M.B.A.; Windsor; Ph.D., Syracuse
Burns, Clement, 1994, Assistant Professor of Physics
B.A., Princeton; M.S., Ph.D., California (SanDiego)
Burns, James W., 1966, Professor of Education and Professional Development
B.S., Central Connecticut; M.Ed., Ed.D., Pennsylvania State
Busch, Mary Anne, 1974, Professor of Occupational Therapy
B.S., Central Michigan; M.A., University of Chicago; Ph.D., Illinois (Urban)
Butlerfield, James M., 1988, Associate Professor of Political Science
B.S., M.A., Indiana; Ph.D., Notre Dame
Byrne, Ardon, 1963, Professor Paper and Printing Science and Engineering
B.S., M.A., Western Michigan; Ph.D., Michigan State
Davis, Henry V., 1990, Associate Professor of History
B.A., Western Michigan; M.A., Ph.D., Michigan
Dieker, Richard J., 1966, Professor of Communication
B.S., M.S., Emporia State; Ph.D., Michigan State
Dietz, David K., 1970, Assistant Professor of Health, Physical Education, and Recreation
B.S., Michigan State; M.A., Western Michigan
Ealy, Clifton, 1966, Professor of Communication
B.S., M.S., Emporia State; Ph.D., Michigan State
Egan, Philip J., 1984, Associate Professor of English
B.A., College of the Holy Cross; Ph.D., Kansas
Egan, Philip J., 1984, Associate Professor of English
B.A., College of the Holy Cross; Ph.D., Kansas
Egan, Philip J., 1984, Associate Professor of English
B.A., College of the Holy Cross; Ph.D., Kansas
Ferguson, Stephen M., 1982, Accelerator Physicist
B.S., Montana State; M.S., Ph.D., Washington
Flanagan, David, 1994, Assistant Professor of Management
B.S., Illinois; Ph.D., Indiana
Forrest, J. Patrick, 1982, Associate Professor of Accountancy
B.A., Michigan State; M.B.A., Western Michigan; D.B.A., Kentucky
Gardner, Wayland D., 1964, Professor of Economics
B.A., Doane; M.A., Ph.D., Wisconsin
Giola, Anthony A., 1965, Professor of Mathematics and Statistics
B.A., Connecticut; M.A., Ph.D., Missouri
Grugala, Stephen, 1991, Director of Marching Band
B.M., B.M.E., Ohio State; M.M., Northwestern
Haines, Maryellen, 1971, Associate Professor of English
B.A., Brooklyn College; M.A., Bowling Green State
Harris, Bassem E., 1979, Associate Professor of Economics
B.A., American (Beruit); M.A., Ph.D., Wayne State
Havira, Barbara S., 1969, Associate Professor of History
B.A., Webster; M.A., Western Michigan; Ph.D., Michigan State
Hazl, Debra Lindstrom, 1992, Assistant Professor of Occupational Therapy
B.S.Ed., Northern Illinois; MOT, Western Michigan
Hinkle, Robert, 1968, Associate Professor of English
B.A., Washington and Lee; M.A., Ph.D., Northwestern
Hoadley, Arthur W., 1975, Professor of Mechanical and Aeronautical Engineering
B.S., M.S., Ohio State
Hobbs, George W., 1965, Associate Professor of Health, Physical Education, and Recreation
B.A., Michigan State; M.A., Michigan
Kotecki, Robert G., 1962, Assistant Professor of Education and Professional Development
B.A., Western Michigan; M.A., Michigan
Landeros, Robert, 1989, Assistant Professor of Management
B.S., Pepperdine; Ph.D., Michigan State
Langham, Sheldon, 1988, Associate Professor of Accountancy
B.S., Ohio; M.S., SUNY-Albany; Ph.D., Arkansas; C.P.A., Michigan and New York
Laskey, Hank A., 1993, Associate Professor of Marketing
B.Sc, M.Sc., Clemson; Ph.D., Georgia
MacDonald, Richard R., 1967, Assistant Professor of Sociology
B.A., Michigan State; M.A., Ph.D., Missouri
Melocha, Martin, 1993, Assistant Professor of Marketing
B.B.A., Walsh College; M.A., Central Michigan; Ph.D., Kentucky
Miller, John T., 1963, Assistant Professor of Health, Physical Education, and Recreation
B.S., M.S., Western Michigan
Miltman, Claudio, 1994, Assistant Professor of, Management
B.A., M.A., Indiana; M.A., Miami; Ph.D., Ohio State
Murphy, John M., 1962, Assistant Professor of English
B.A., Western Michigan; M.A., Bowling Green State
Opel, Patricia, 1989, Associate Professor of Art
B.F.A., Western Michigan; M.F.A., Northern Illinois
Pagel, Thomas F., 1970, Associate Professor of Communication
B.A., Wayne State; M.A.C., Pennsylvania; Ph.D., Denver
Plank, Richard E., 1992, Associate Professor of Marketing
B.S., St. Peters College; M.B.A., Seton hall; Ph.D., City University of New York
Robeck, George, 1968, Associate Professor of Communication
B.A., Pennsylvania State; Ph.D., Michigan State
Ruttinger, Jacquelyn, 1966, Associate Professor of Art
B.F.A., School of the Art Institute of Chicago; M.F.A., Northern Illinois
Shriver, Ellsworth H., 1966, Research Associate, Papar and Printing Science and Engineering
B.S., Ohio State; M.S., Institute of Paper Chemistry; M.B.A., Cincinnati; Ph.D., Institute of Paper Chemistry
Still, Thomas J., 1967, Associate Professor Communication
B.S., M.S., Ph.D., Southern Illinois
Stoddart, Arthur W. J., 1967, Associate Professor of Mathematics and Statistics
B.S., M.S., Olago (New Zealand); Ph.D., Michigan
Tang, Hung-Lian, 1992, Associate Professor of Business Information Systems
B.S., National Chengchi (Taiwan); M.B.A. Kansas; Ph.D, Nebraska-Lincoln
Wait, Robert F., 1971, Associate Professor of Sociology
B.S, M.A, Ph.D, Indiana
Watson, Archie E., 1970, Assistant Professor of Education and Professional Development
B.A., M.A., Michigan State
Winter, Ronald J., 1976, Associate Professor of Health, Physical Education, and Recreation
B.A., M.A., Michigan State
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