1988

Western Michigan University Graduate Catalog 1988-1990

Western Michigan University

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Western Michigan University is located in Kalamazoo, midway between Chicago and Detroit. Three major highways and numerous bus routes connect the city with other midwestern cities. The population of Kalamazoo is 79,146 and of Kalamazoo County is 217,630.

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

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

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

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

Academic calendars are subject to change without notice.

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

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

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

Cover and text format of this catalog were designed by the Office of University Publications.

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University Officials

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Appointment expiration date
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Ann Arbor
Term Expires December 31, 1988
Maury E. Reed,
Kalamazoo
Term Expires December 31, 1988
Carol Waszkiewicz,
Kalamazoo
Term Expires December 31, 1990
Geneva Jones Williams,
Detroit
Term Expires December 31, 1990
Winifred D. Fraser,
Northville
Term Expires December 31, 1992
Barry L. Howard,
West Bloomfield
Term Expires December 31, 1992
James S. Brady,
Grand Rapids
Term Expires December 31, 1994
Richard Y. St. John,
Kalamazoo
Term Expires December 31, 1994
Diether H. Haenicke,
University President
Ex-Officio

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Carol A. Waszkiewicz, Vice Chairman
Chauncey J. Brinn, Secretary
Robert M. Beam, Treasurer
and Assistant Secretary
Gerald C. Schwemmin, Assistant Treasurer

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Robert H. Luscombe, Dean, College of Fine Arts
Norman C. Greenberg, Dean, College of General Studies
Laurel A. Grotzinger, Dean, The Graduate College
William A. Burian, Dean, College of Health and Human Services
Faith Gabelnick, Dean, Honors College
Charlene Renner, Dean, University Libraries

The Graduate College
Laurel A. Grotzinger, Dean
Rollin Douma, Associate Dean for Program Development
Siham Fares, Administrative Assistant and Dissertation Assistant
Paula Boodt, Director, Admissions and Records
### Spring Session

- **Classes Begin**: May 2, 1988
- **Final Day to Add Classes**
- **Applications for Admission to The Graduate College**
- **Due for the Summer Session**: See Class Schedule
- **Memorial Day Recess**
- **Applications Due for August Commencement**: See Class Schedule
- **Session Ends**: See Class Schedule

### Summer Session

- **Classes Begin**: June 26, 1988
- **Final Day to Add Classes**
- **Applications for Admission to The Graduate College**
- **Due For Fall Semester**: See Class Schedule
- **Independence Day Recess**
- **Approved Theses, Projects, and Dissertations Due in The Graduate College for June Graduation**: See Class Schedule
- **Session Ends**: See Class Schedule
- **NO COMMENCEMENT EXERCISES**

### Fall Semester

- **Advising Day**: August 29, 1988
- **Classes Begin**: August 30, 1988
- **Labor Day Recess**
- **Final Day to Add Classes**
- **Applications Due for December Graduation**: See Class Schedule
- **Classes Dismissed 2 P.M. Friday Only (Labs excepted)**
- **Homecoming**: See Class Schedule
- **Thanksgiving Day Recess Begins at Noon**
- **Approved Theses, Projects, and Dissertations Due in The Graduate College for December Graduation**: See Class Schedule
- **Final Exam Week**
- **Semester Ends**: See Class Schedule
- **Commencement**: See Class Schedule

### Winter Semester

- **Advising Day**: January 3, 1989
- **Classes Begin**: January 4, 1989
- **Final Day to Add Classes**
- **Final Day to Drop Classes**
- **Applications Due for April Graduation**: See Class Schedule
- **Applications for Fellowships and Associateships**: See Class Schedule
- **Applications for Admission to The Graduate College**
- **Due for Spring Session**
- **Semester Recess**
- **Classes Resume**: See Class Schedule
- **Applications Due For June Graduation**: See Class Schedule
- **Recess (All Day)**
- **Classes Resume**: See Class Schedule
- **Approved Theses, Projects, and Dissertations Due in The Graduate College for April Graduation**: See Class Schedule
- **Final Exam Week**
- **Semester Ends**: See Class Schedule
- **Commencement**: See Class Schedule

### 1988 Calendar

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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 1987, was 23,336, with 5,785 enrolled in seventy graduate programs.

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

In 1960 programs leading to the Specialist in Education degree were introduced. This degree is offered in Educational Leadership and 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 eight areas. The Doctor of Education degree is offered in Counseling Education and Counseling Psychology, Educational Leadership, and Special Education. The Doctor of Philosophy degree is offered in Mathematics, Psychology, Science Education, and Sociology. The newest doctoral program, initiated in 1980, is the Doctor of Public Administration.

Admission Dates

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

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

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

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

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

A graduate student who no longer has active admission status may request it by submitting a re-entry application to The Graduate College at least one month before registering for classes. The student will be re-entered to his/her previous graduate curriculum, with departmental approval. If more than six years have passed since a student last had active admission status, new admission materials (application, fee, transcripts, test scores, etc.) must be submitted to The Graduate College.

Admission Application Fee

A non-refundable application fee of $15 must accompany each application for admission to The Graduate College.

Admission Procedures

Admission to The Graduate College is secured through the following steps:

1. Request an "Application for Admission" from The Graduate College.
2. Determine from The Graduate College Bulletin the degree sought and the curriculum to be studied.
3. Return the "Application for Admission" and the $15 application fee before the published admission dates.
4. Request the Registrar of each college previously attended, except Western Michigan University, to send an official transcript of credits to The Graduate College. The transcripts are due in The Graduate College prior to the published admission dates.
Types of Admission

The admission of students to all graduate programs is a two-step process. The first step involves admission to The Graduate College; the second involves admission into a program by a department or unit. Both steps must be taken before admission is granted; one step alone does not lead to admission. The process is followed by a student acquiring either regular degree admission or probationary non-degree admission.

Regular admission—Degree status

1. Admission is granted to the student who has a bachelor’s degree with an acceptable academic record, who has passed the required entrance examinations, and who has met the admission requirements of the program. The student plans to pursue. Acceptance to a definite program of study leading to a degree is dependent upon the approval of the department or unit in which the student plans to study. For further information see the admission requirements of that graduate program.

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

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

Probationary admission—Non-degree status

Probationary admission on non-degree status 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 point hour ratio of at least 2.3 (2.5 effective fall 1989) in the final two years of undergraduate study, as well as the approval of the department or unit in which the student plans to pursue graduate study, is required for probationary admission. A student admitted on non-degree status must establish eligibility for regular admission to a degree program by completing the specified departmental prerequisites, by securing grades of “B” or better in each adviser-approved course in the first six to nine graduate credits, by passing the English Qualifying Examination, and by securing departmental approval.

Permission To Take Classes

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

English Qualifying Examination

Students in all graduate programs who do not already possess an earned graduate degree must demonstrate competency in English by passing the English Qualifying Examination. Students are encouraged to meet this requirement prior to admission or during their first enrollment period. The examination is composed of 195 multiple choice and true or false questions covering punctuation, spelling, sentence structure, word usage, and reading comprehension. Students have one hour and forty-five minutes to complete the test. A score of 109 is passing. A study guide for the examination is available at the Campus Bookstore. Schedules for the English Qualifying Examination showing dates, times, and locations are available from The Graduate College.

Admission of Foreign Students

A foreign applicant with a degree from a U.S. institution will be expected to meet the same academic standards required of U.S. citizens for degree admission. Applicants with foreign educational backgrounds must meet the minimum admission standards interpreted by the Office of International Student Services (OISS) and enforced by The Graduate College. Additionally, all foreign applicants must prove that they have sufficient financial resources to cover the educational and living expenses incurred by a typical non-resident graduate student. When the first or primary language of a foreign applicant is not English, the applicant will be required to demonstrate proficiency in English. Proficiency may be established by submitting scores from the Test of English as a Foreign Language (TOEFL) or Michigan Test of English Language Proficiency (MTELP) (see section of Office of International Student Services for specific score requirements). Applicants who have already successfully completed at least one year of full-time academic study at another accredited U.S. institution also may be required to submit English proficiency scores at the time of application.

Foreign students wishing to apply for admission to Western may secure an application from the OISS. Credentials will be evaluated and referred to the appropriate department for an academic admission decision. Final decisions will be reported by the OISS.

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 Western.

Michigan Intercollegiate Graduate Studies (MIGS)

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

Any graduate student in good standing in a master's, specialist, or doctoral program at a participating institution is eligible to participate. The student's good standing at the home institution affords the opportunity to study at the host institution, providing the proposed program of study is approved by a departmental officer and MIGS liaison officer at both the home and host institutions. The officers of the home institution determine whether the experiences sought are unique or not available at the home institution; the officers of the host institution determine whether space and other necessary resources are available at the host institution. This type of enrollment is limited to one term for master's or specialist degree students, or two terms for doctoral degree students. For further information, contact a graduate adviser or the MIGS liaison officer in The Graduate College.
8 GENERAL POLICIES AND PROCEDURES

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

Student Load
The maximum number of semester hours that may be elected by a full-time graduate student is fifteen in a semester and eight in a session. Any enrollment in excess of these maximums must be made with the written approval of the student's graduate adviser and be reviewed by The Graduate College. The normal full-time load for a graduate student during the Fall and Winter semesters is three or four courses (9-13 hrs.) with at least nine hours needed to be classified as a full-time student. During the Spring and Summer sessions, the normal full-time load is two courses (5-8 hrs.) with at least five hours needed to be classified as a full-time student. The normal load for a student with a Graduate Assistantship or Associateship is two or three courses (6-9 hrs.) An employed student should reduce the course load accordingly. The normal load for a student employed full time is one course per semester or session.

Course Numbering System
Two levels of courses are offered in The Graduate College: (1) Those numbered 600 and above are open only to graduate students, and (2) those numbered 500 through 599 are open to both advanced undergraduate and graduate students. In all courses open to both undergraduates and graduates, a distinction is made between the work expected from graduate students and that from undergraduates. The work expected from undergraduates may be of higher quality or greater quantity or both.

No graduate credit is given for correspondence work.

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

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

Graduate Credit By Examination
Each academic unit responsible for offering a graduate program may, with the approval of its Dean, establish a procedure for granting credit by examination for any course numbered 500 through 699. All credit by examination 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 its 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 graded "Credit" or "No Credit." "Credit" will be posted on the transcript as "Credit earned by examination" without letter grade or honor points. Students who do not achieve a sufficient score to receive "Credit" will have no entry made on their transcripts.
4. Credit by examination can be used to meet all other University graduation requirements except the residency requirement.
5. Credit by examination can be earned only by those students admitted to a specific graduate program and who have current enrollment.
6. Credit by examination earned at another university may transfer in accordance with the current policies of The Graduate College governing the transfer of credit.
7. Examination fees shall be assessed by the academic unit. It is expected that students will pay the examination fee in advance of taking the examination.

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

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

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

Specialist degree: A student with a master's degree from another university who completes the remaining credits for a specialist degree at Western Michigan University may transfer up to thirty-six credits. A student with a master's degree who completes the credits for a specialist degree at Western Michigan University may transfer up to twelve credits.

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 have been domiciled 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 continues 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.

Questions concerning residency should be directed to the Controller's Office, 3082 Sebest Administration Building, Telephone: 387-2966.

Student Fees
During 1987-1988, the following fee schedule was used for graduate study on campus:
Resident, $75.00 per credit hour
Non-Resident, $181.25 per credit hour
The above rates include $2.75 per credit hour facility fee for all students.
The fee for graduate study in courses offered off campus through the Division of Continuing Education was $83.50 per graduate credit hour.
Resident Study: Any graduate student who has previously registered for and received a grade of “Incomplete” for Master’s Thesis, Specialist Project, or Doctoral Dissertation and wishes to use the services of University staff and facilities to complete the work necessary to remove the “Incomplete” must, if not otherwise enrolled, pay a resident study fee of $25.00 for the semester, or $12.50 for a session.

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

Other fees: Application fee, $15.00 English Qualifying Examination fee, $2.00 Computer fee, $25.00 (less than seven hours of registration) or $50.00 (seven or more hours of registration) for on campus enrollment only. Late Registration Fee, $70.00 Graduation fee (assessed when the application for graduation is submitted to Bursar’s office), $30.00 Publication of master’s thesis and specialist project, $40.00 Student government assessment, $3.00 each semester Transcript fee, $3.00

Student Health Fee— For Study on Campus Per Semester, for 7 or more credit hours, $36.00* Per Session, for 4 or more credit hours. $18.00* Plus appropriate user fees or the option to pay the full fee.

Refunds And Change Of Class Load
All changes in registration or complete withdrawal must be made in accordance with the procedures published in the Schedule of Classes. A student may not withdraw from graduate courses beyond the midpoint of each semester or session. A student who withdraws from the University or who reduces a credit hour load, resulting in lower fees, will be granted a partial refund of the total paid, subject to the following conditions:
1. Changes in student credit hour load prior to the end of the final day for adding a course are considered to be reassessments, and a refund will be granted, in full, for any net reduction in such credit hour load. Alternatively, an increase in credit hour load will result in an upward adjustment of the fee assessment.
2. Reductions in credit hour load after the final day to add a class are not subject to any refund.
3. Complete withdrawal from all courses after the final day to add a course and up through the fifth week of classes in a semester or second week in a session will result in a 50 percent refund. The refund date is determined by the date the Registrar’s Office receives a change in enrollment form from the student.

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

<table>
<thead>
<tr>
<th>Grade Definition</th>
<th>Honor Points Per Credit Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Outstanding, Extraordinary</td>
</tr>
<tr>
<td>B</td>
<td>Very good, High pass</td>
</tr>
<tr>
<td>CB, C</td>
<td>2.5, 2.0</td>
</tr>
<tr>
<td>DC</td>
<td>1.5</td>
</tr>
<tr>
<td>D</td>
<td>1.0</td>
</tr>
<tr>
<td>E</td>
<td>Failing</td>
</tr>
<tr>
<td>X</td>
<td>Unofficial</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>0.0</td>
</tr>
<tr>
<td>Incomplete Withdrawal</td>
<td>0.0</td>
</tr>
<tr>
<td>W</td>
<td>0.0</td>
</tr>
<tr>
<td>CR</td>
<td>Credit</td>
</tr>
<tr>
<td>NC</td>
<td>No Credit</td>
</tr>
<tr>
<td>AUD</td>
<td>Audit</td>
</tr>
</tbody>
</table>
| E—Failure: A student admitted to a degree program must secure three hours of “A” to offset each hour of “E” on the graduate record. X—Unofficial Withdrawal: The symbol “X” is used to indicate that a student has never attended class or has discontinued attendance and does not qualify for the student’s honor-point ratio as hours attempted with zero honor points. I—Incomplete: This is a temporary grade given for work which is passing in quality but lacking in quantity to meet course objectives. It is assigned when an instructor, in consultation with a student, concludes that extenuating circumstances prevent the completion of course requirements. Incompletes, except those given in Master’s Thesis, Specialist Project, and Doctoral Dissertation, and courses directly related to them, which are not removed within one calendar year will remain part of the student’s permanent record. 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, BA, B = credit; CB, C, DC, D, E = 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, “INC” when incomplete, and “NC” when failed. AUD—Audit: 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.

Honors Points
The number of honor points earned in each course is the number of semester hours credit given by the course multiplied by the number of honor points per hour of credit corresponding to 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. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.

Graduated with Honors: A student attaining a point-hour ratio of 4.0 at the conclusion of a degree program at Western Michigan University will be “Graduated with Honors.” All graduate courses completed, including those not specifically in the student’s program, will be computed in the student’s overall grade point average.

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

The following appointments are available: 1. Graduate College Fellowships of $5,600 for two semesters are offered to outstanding students entering master’s degree programs. An entering student is defined as one who will have earned no more than six graduate credits by the beginning of the fall semester. Awards are made on the basis of scholarship and leadership potential.
2. Doctoral Associateships of $7,250 for two semesters are offered to students enrolled in the following doctoral degree programs: Counselor Education and Counseling Psychology, Educational Leadership, Mathematics, Psychology, Science Education, Special Education, and Sociology.
3. Thurgood Marshall Assistantships up to $6,900 for three semesters are offered to students admitted to degree programs. They are awarded to students from minority groups on the basis of scholarship and financial need. Participation in the professional activities of a department is required.
4. Dean’s Research Assistantships of $2,800 for one semester are offered to graduate students to assist graduate faculty members in their research projects. Assistantships will be selected on the basis of their research skills and interests. (The deadlines for these assistantships are November 1 and June 1.)
5. Teaching and Research Assistantships of up to $7,500 for two semesters are available in many departments of the University. Inquiries should be sent to the chairperson of the department.

Policies Governing Graduate Appointees
1. Definitions A graduate appointee is a student enrolled in a program leading to a graduate degree and receiving a University-administered stipend or salary which is not less than one-third of the prevailing full amount set by the
10 GENERAL POLICIES AND PROCEDURES

University for that particular type of appointment.

Although graduate appointments differ in many important ways, each can be classified as either an assistantship or a fellowship. The critical difference between an assistantship and a fellowship lies in the primary intent of the awarder— payment for service (salary) or as a gift (stipend) to help the awardee achieve an educational goal.

Although there may be some aspect of service connected with a Fellow’s particular educational activity, this activity is part of the training designated for all participants in the Fellow’s academic program, and the service rendered is secondary to the educational goal. Although all, or nearly all, of an assistant’s service to the department should also be part of the learning experience in the discipline, the primary thrust is in doing part of the work of the department.

More than one fractional appointment may be held simultaneously in the same department. However, in no case shall one person hold more than the equivalent of one full appointment at one time in the same department or hold more than one position. A student with a full appointment is not permitted to have other employment.

2. Types of Appointments

a. Assistantships Graduate Assistants are apprentices in the profession. Although the service aspect is emphasized in the definition in order to make a distinction, Graduate Assistants, first and foremost, are students and valued members of the departmental community of scholars. They are chosen for their scholarship and manifest interest in the discipline as well as for their ability to perform the needed service.

1) The service of Graduate Teaching Assistants (T.A.s) consists of activities directly related to students in the teaching enterprise.

2) The service of Graduate Research Assistants (R.A.s) consists of research activity under the supervision of a faculty member.

3) The service of Graduate Non-Teaching Assistants (N.T.A.s) includes all other work in the department not falling under the other categories but generally accepted as appropriate.

4) Associateships are assistantships awarded to outstanding students in doctoral programs. Service may involve teaching, research, or other appropriate activity.

b. Fellowships Fellows are students who have distinguished themselves by outstanding academic achievement or special abilities. Fellowships are provided by the University or by another donor with the approval of the University. The fellowship grant (stipend) is a gift to help the Fellow achieve an educational goal, rather than a payment for services.

3. Service Requirement

The kinds of service required of Graduate Assistants may vary among departments, each of which determines its own range of appropriate possibilities subject to administrative review. Whatever kinds of service are expected, however, a full assistantship in any department consists of twenty hours of service per week or its equivalent and precludes other employment. 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 range of salaries for full-time Assistants in each type of appointment is established by the Provost and Vice President for Academic Affairs.

Fractional awards are made for fractional appointments.

5. Affirmative Action

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

6. Professional Ethics

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

7. Notification of Status

At the time of their appointment, graduate appointees shall be informed in writing of the specific conditions of the appointment. They should be informed that the offer of the appointment is contingent upon acceptance into a graduate degree program at the University, and continuation of the appointment depends in part on satisfactory academic progress in that program and satisfactory performance of assigned duties. The letter should also state the amount of the award, whether a remission of non-resident fees is involved, the probable assigned activities, the length of the appointment, and, if appropriate, the criteria for renewal. Any other conditions peculiar to an individual appointment shall be contained in the letter of appointment.

Each appointee shall be provided with information prepared by The Graduate College concerning current University-wide procedures, practices, privileges, and responsibilities that relate to graduate appointees. Each department is responsible for providing any supplemental information on these matters that is institution and special.

8. Professional Development

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

9. Enrollment Status

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

10. Evidence of Status

a. Tuition fees: Graduate appointees who are not residents of Michigan may, at the discretion of the University, be granted partial tuition remission for the non-resident portion of their tuition fees. The remitted tuition will be considered “in-kind” earnings and taxable income for students on appointments requiring service.

b. University housing: Graduate appointees will be accorded the same priority in securing University housing in residence halls or family housing apartments (if deadlines are observed and 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 discount privileges on purchases at the Western Michigan University Bookstore in the same manner and degree as faculty and staff members.

f. University facilities: Graduate appointees will be accorded the use of University facilities (e.g., student offices, research facilities, etc.) authorized by the director of the facilities on the same basis that they are authorized for part-time faculty.

Graduate Student Research Fund

The Graduate College has established a Graduate Student Research Fund to encourage research by currently enrolled graduate students and to assist them in presenting their findings to professional groups. Grants range from a minimum of $500 to a maximum of $2,000.

Two basic types of proposals are considered for support:

1. The extraordinary or unusual costs incurred in research projects.

2. Travel costs incurred in presenting study reports and research findings at professional meetings.

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

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

Other Financial Assistance

FEDERAL, STATE AND INSTITUTIONAL FINANCIAL AID PROGRAMS BASED ON NEED

Western Michigan University participates in various federal- and state-funded financial aid programs. The criteria are set by federal and state Departments of Education and are subject to periodic revision. Application procedures for both the federal and state College Work-Study Program, the Perkins Loan Program (formerly National Direct Student Loan
Program), the Guaranteed Student Loan Program, the Michigan State Direct Student Loan Program, and the Federal Student Aid Funds Program, the Michigan Adult Part-Time Grant Program, and for the WMU Nontraditional Student Scholarship: Submit a Family Financial Statement (FFS) to the appropriate address on the statement. The FFS may be obtained from college financial aid offices or from WMU Student Financial Aid.

Students applying for a loan through the United Student Aid Fund may obtain the USAF application form, which is required in addition to the FFS, from WMU Student Financial Aid.

Students applying for the Michigan Adult Part-Time Grant program must complete the Non-Traditional Application for Student Financial Aid and submit it to Self-Instructional Programs.

Students applying for all programs listed above must also submit a Financial Aid Statement. The deadlines for Michigan Adult Part-Time Grant applications are August 1 and December 12.

Description of Programs

College Work-Study Programs

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

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

Perkins Loan Program (formerly National Direct Student Loan Program)

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

Repayment of the loan plus interest begins six months after the student ceases to be enrolled at least half time, carrying four graduate credit hours each semester. The minimum repayment is $30 a month. A portion of the student’s loan, both principal and interest, may be canceled for each year the student teaches full time in:

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

Note that:

1. Fifteen percent of the loan (principal and interest) may be canceled for each year that the student teaches full time in the Headstart Program, up to the whole loan amount.
2. The student’s loan can be canceled at the rate of 12½ percent for each complete year of service in the Armed Forces of the United States (in an area of hostilities that qualifies for special pay) up to 50 percent of the loan amount.
3. The student’s total disability or death cancels the loan.
4. The student may defer payments up to three years for service:
   - in the Armed Forces (Army, Navy, Air Force, Marine Corps, or Coast Guard),
   - as an officer on full-time duty in the commissioned corps of the U.S. Public Health Service,
   - as a volunteer under the Peace Corps Act.
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.

Guaranteed Student Loan Program

The federal government guarantees loans made by private lending institutions to graduate students who are enrolled at least half-time. A cumulative maximum of $54,750 may be borrowed including both undergraduate and graduate loans. The maximum graduate loan is $7,500 every nine months or for each graduate classification. The student pays no interest on the loan while in school at half-time status or better or for six months thereafter provided the student can demonstrate financial need according to the criteria set by the U.S. Department of Education.

Repayment begins six months after the student ceases to be enrolled at least half time. The interest rate for first-time borrowers in 1987 is 8 percent. For those who were former borrowers as of January 1, 1981, or thereafter, the interest rate is 9 percent. For those who have an unpaid loan balance on a loan received prior to January 1, 1981, the interest rate is 7 percent.

1. The student may defer payment up to three years for service:
   - in the Armed Forces (Army, Navy, Air Force, Marine Corps, or Coast Guard),
   - as an officer on full-time duty in the commissioned corps of the U.S. Public Health Service,
   - as a volunteer under the Peace Corps Act.

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

Note that:

1. Fifteen percent of the loan (principal and interest) may be canceled for each year that the student teaches full time in the Headstart Program, up to the whole loan amount.
2. The student’s loan can be canceled at the rate of 12½ percent for each complete year of service in the Armed Forces of the United States (in an area of hostilities that qualifies for special pay) up to 50 percent of the loan amount.
3. The student’s total disability or death cancels the loan.
4. The student may defer payments up to three years for service:
   - in the Armed Forces (Army, Navy, Air Force, Marine Corps, or Coast Guard),
   - as an officer on full-time duty in the commissioned corps of the U.S. Public Health Service,
   - as a volunteer under the Peace Corps Act.
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.

Michigan State Direct Student Loan

Under this program graduate students who are enrolled as at least half-time students. A cumulative maximum of $18,000 including undergraduate loans is available. The minimum repayment is $30 a month.

The student may defer payments up to three years for service:

1. As an officer on full-time duty in the Armed Forces of the United States (in an area of hostilities that qualifies for special pay)
2. As a single deferment for a period of not more than one year is provided for students who are unable to find full-time employment.

General Policies and Procedures

For the purposes of this program, a Michigan resident is defined as a Michigan resident who resides in and is legal residents of Michigan at the time of application for the loan, or (3) is independent of the support of parents or guardians. A Michigan resident who resides in Michigan for not less than twelve consecutive months immediately prior to application for the loan. Recent federal regulations designate all graduate students who will not be claimed by parents as independent students.

The Michigan State Direct Loan is, in effect, a guaranteed student loan from the State of Michigan. The application process and form are the same as for the Guaranteed Student Loan; the difference is that instead of hometown lenders, the state issues the funds.

United Student Aid Fund

Students unable to qualify for a Perkins Loan (formerly National Direct Student Loan) and unable to obtain a Michigan Direct Student Loan or Guaranteed Student Loan, or non-resident students unable to obtain a federally guaranteed loan in their own state, may apply to their local lender or any local lender or any lender authorized to participate in the Guaranteed Student Loan Program. For the purposes of this program, a Michigan resident is defined as a Michigan resident who resides in and is legal residents of Michigan at the time of application for the loan, or (3) is independent of the support of parents or guardians. A Michigan resident who resides in Michigan for not less than twelve consecutive months immediately prior to application for the loan. Recent federal regulations designate all graduate students who will not be claimed by parents as independent students.

The Michigan State Direct Loan Loan is, in effect, a guaranteed student loan from the State of Michigan. The application process and form are the same as for the Guaranteed Student Loan; the difference is that instead of hometown lenders, the state issues the funds.

Supplemental Loan for Students application forms are available from the student’s hometown bank, savings and loan association, or credit union. Students should submit the SLS application form to WMU Student Financial Aid. Should the student’s bank not participate in the SLS Program, the student may apply for the SLS through the United Student Aid Fund. The student must obtain the application form from WMU Student Financial Aid.

Payment Plans

The Academic Management Services Plan allows parents and students to pay tuition, fees, and on-campus housing costs on a monthly basis. The plan involves no interest.
Veterans Assistance Administration are obtained at the Academic Records Office. The Academic Records Office of the Seibert Administration Building 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.

Veterans' Assistance

The areas of assistance include, but are not limited to, veterans' educational benefits, vocational rehabilitation benefits, and tutorial assistance. If difficulties or questions arise in receiving benefits, the veteran should contact the Veterans Administration through the toll free number 344-0156.

Veterans may contact this office for immediate certification. A 3.25 grade point average is required of student's degree at all times for continued certification.Continued certification requires the student to complete 24 credits in residence each year, with a minimum of 15 credits per semester. Extensions may be authorized by the appropriate counselor. Students who fall below these standards must seek the appropriate counseling from the Director of Records before reactivation 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 programs.

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 not to have accessible or otherwise disclosed 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 education records, which include admissions, personal, academic, employment, financial, and financial records, as well as academic, cooperative education, and placement records. Students wishing to review their education records must make written requests to the Registrar. Only records covered by the Act will be made available within forty-five days of the request. Students may have copies made of education records with certain exceptions, (e.g., a transcript of an original or source document which exists elsewhere). These copies would be made at the students expense at the prevailing rate of ten cents per page. Education records do not include records of instructional, administrative, and educational personnel—which are the sole possession of the maker and are not released to any individual except a temporary substitute—records of the law enforcement, student health records, employment records, or all records of Health records, however, may be reviewed by physicians of the students’ choosing. Students may not inspect and review the following as outlined by the Family Educational Rights and Privacy Act: confidential letters and recommendations associated with admissions, employment or job placement, or honors to which they have waived their rights of inspection and review, or education records containing information about more than one student, in which case the institution will permit access only to that part of the record which pertains to the inquiring student. The institution is not required to permit students to inspect and review confidential letters and recommendations placed in their files prior to January 1, 1975, provided those letters were collected under established policies of confidentiality and were used only for the purposes for which they were collected.

Students who believe that their education records contain information that is inaccurate or misleading, or is otherwise in violation of their privacy or other right may discuss their problems informally with the person in charge of the records involved. If the decisions 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 the 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 decision, and will be made available to all parties concerned. The educational records will be corrected or amended in accordance with the decisions of the hearing officer if the decisions are in favor of the student. If the decisions are unsatisfactory to the student, the student may place with the educational records statements commenting on the information in the records or statements setting forth any reasons for disagreeing with the decisions of the hearing officer. The statements will be placed in the educational records, maintained as part of the student's records, and released whenever the records in question are disclosed.

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

**Student Academic Rights**

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

   a. **In the Classroom**

      The professor in the classroom and in conference should encourage full discussion, inquiry, and expression. Student performance should be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards.

   b. **Protection Against Improper Academic Evaluation**

      Students should have protection through orderly procedures against prejudiced or capricious academic evaluation. At the same time, they are responsible for maintaining standards of academic performance established for each course in which they are enrolled.

   c. **Protection of Freedom of Expression**

      Students should be free to take reasonable objection to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.

2. **Policy and Procedures**

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

   b. **Procedures for Reviewing Student Grievances Related to Grading**

      1) Students have the right to have all their examinations and other written, graded material made available to them with an explanation of the grading criteria.

      2) The student has the opportunity to question a grade or grade change, or an administrative official may wish to question a grade or grade change. In all such cases, these procedures, beginning with review by the Ombudsman, shall be available to them.

   c. **Procedures for Reviewing Student Grievances Related to Grading**

      1) Students have the right to have all their examinations and other written, graded material made available to them with an explanation of the grading criteria. Faculty should retain all such material not returned to the student for at least one full semester after the course was given. Faculty are not required to return such material to the student but must provide reasonable access to it.

      2) Whenever a student believes he/she has a grievance regarding a grade, he/she should first arrange a meeting with the instructor who may be able to explain the reasons for the grade or recommend a change, if warranted.

      3) If the student believes that he/she has not received a satisfactory resolution of the grievance from the instructor, he/she should then go to the department chairperson or head, who may effect a satisfactory resolution.

      4) If the student is still dissatisfied after seeing the department chairperson or head, the student should next see the University Ombudsman. The function of the Ombudsman in this situation is to collect information from both the student and the faculty member and then to make a decision that (a) the student's grievance is unwarranted and should not be considered further, or (b) there is sufficient evidence that the situation be considered by the Graduate Committee on Academic Fairness.

      5) If the student's grievance is determined and enforced by the Graduate Committee on Academic Fairness.

      6) The Graduate Committee on Academic Fairness consists of three faculty and three graduate students.

   3) Every department shall provide systematic procedures for students to express their views on matters of program and curriculum.

   4) University policy and implementation of such policy should not be determined and enforced according to the needs of computer programming or records. Special care should be taken to ensure that no individual is treated unfairly because of computer problems.

   5) The University Ombudsman will have the authority to investigate complaints and recommend or negotiate fair solutions on behalf of the student.

**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 authorized to make thorough investigations and has access to all University offices and records, reports, and other documents in the University. No person shall suffer any penalty for seeking assistance from the Ombudsman. The Ombudsman is appointed by and reports directly to the President. The Office is located in 218 Bernhard Student Center. Telephone: 387-5300.

**University Libraries**

The University Libraries consist of the Dwight B. Waldo Library, the Business Library, the Music and Dance Library, the Education Library, the Physical Sciences Library, the Cistercian Studies Library, and the University Archives and Regional History Collection.

The main collection is housed in the Dwight B. Waldo Library, which is named for the first president of the University. Built in 1969, it was enlarged in 1967 to almost double its original size. A new addition is in the planning stage and is expected to be completed by 1990. At that time the Business Library and the Cistercian Studies Library will be integrated with the main library.

The total collection, which numbers over two and a half million items, includes books, bound periodicals, music scores, recordings,
maps, documents, and materials in microform. About 10,000 periodical and serial titles are received. Through the use of various approval and gathering plans—as a part of the acquisitions program—the Libraries place an emphasis on building a strong collection of current imprints in the main (Waldo) library; in addition, each branch carries a large collection of current imprints. The Libraries also hold a wide variety of materials on Africa south of the Sahara. Started more than two decades ago, the collection has grown rapidly to become a noteworthy resource for scholars and researchers. 

2. Library holdings on Southern Asia represent an area of special strength. Together with the Kercher African collection, they help support the University's commitment to area studies.

3. Another area of collection strength is the history, religion, philosophy, and culture of the medieval period—holdings which help support the programs of the University's Medieval Institute.

4. The Randall Frazier Memorial Collection, honoring a notable alumnus, has a collection of 180,000 items includes Army and U.S. Geological Survey maps, which are cataloged and readily available for use. In addition to the maps, the Map Library also possesses more than 1,000 atlases.

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

6. The Leslie H. Wood memorial Collection is a special collection of books in the fields of geography and geology.

7. The Map Library is the second largest academic map library in the State of Michigan and the third largest of all academic map libraries in the state. The present collection of 180,000 items includes Army and U.S. Geological Survey maps, which are cataloged and readily available for use. In addition to the maps, the Map Library also possesses more than 1,000 atlases.

8. The Business Library, located in North Hall, has a collection of more than 87,000 items which include special microform collections, annual reports from businesses and industries, and current subscriptions to periodical and newspaper titles.

9. The Music and Dance Library is located in the new Dorothy U. Dalton Center. In addition to a collection of some 29,000 books and scores, and extensive holdings in music periodicals, this branch contains a collection of 10,000 phonodiscs and tapes, and extensive listening facilities.

10. The Physical Sciences Library contains 69,000 volumes in the fields of mathematics, astronomy, physics, and geology and has subscriptions to periodical and serial titles. This branch is located on the third floor of Rood Hall.

11. The Education Library in Sangren Hall has some 477,000 monographic items and receives over 600 periodical titles.

The Cistercian Studies Library located in Hillside West is a collection of books in the areas of medieval history, spirituality, and general church history which supports the research and programs of the Institute of Cistercian Studies and the area of medieval studies at the University. The collection includes rare books, manuscripts, and incunabula, most of which are on indefinite loan to the University from the Abbey of Genesee. Over 700 of the some 8,000 volumes in the library are rare items of interest to medieval scholars from all over the world.

The University Archives and Regional History Collections are located on the ground floor of Waldo Library. The staff collects, preserves and makes accessible records of the University. It is a depository for official University records, papers, publications, and photographs documenting Western's history. Its staff also collects, preserves, and manages the Regional History Collection of books, manuscripts, ephemera, oral history tapes, photographs, local public records, and other informational sources that document the history of southwestern Michigan. In addition, local public records from southwestern Michigan are on deposit from the State Archives. Holdings in all of the University Libraries are recorded in the union card catalog in the main (Waldo) library; in addition each branch maintains a special card catalog of its own holdings.

General and specialized reference service is provided at the main Reference Desk, the Science Reference Desk, and in the Documents and Maps Department in Waldo Library. Reference collections of indexes, abstracts, dictionaries, handbooks, bibliographies, etc. are maintained in each of the University Libraries, and reference librarians offer personal assistance in finding the books, information, and other resources needed for class or research related problems. The library has recently implemented the use of CD-ROM computerized indexing services for numerous periodicals and for articles in some 450 U.S. newspapers. In addition, the reference staff offers a credit course, Library Resources, in the General Studies curriculum. The course is designed to introduce the student to the use of our library system and especially to the bibliographic tools and methods necessary to find information in the various subject fields.

An on-line automated retrieval system (OARS) offered by the Library accesses many data bases in a wide variety of subject fields. The computerized operation allows users to shorten significantly time spent on literature searches for research projects. It is available to faculty, staff, and students on a cost retrieval basis. Inquiries about this service may be made at the Reference Desk in the main library and at all branch libraries.

Research materials which are not in our collections can usually be obtained from another library through interlibrary loan. The University Library System participates in online interloan systems, in reciprocal loan arrangements, and are a member of multitype library networks. They also hold membership in many computerized research libraries, a multi-million item collection located in Chicago. The Center operates as a cooperative venture for less-used but important research materials. Loan copies of the Center's Handbook, describing the contents of the collection are available in our Interlibrary Loan Center.

Self-service photocopiers and microform service are located throughout the library system. These machines operate with $1.00 coins and have adding and reducing capabilities. An attendant-operated copy service is located at the Waldo Library. 

Graduate students engaged in projects requiring extensive use of library resources may apply in writing to the circulation Office of Waldo Library for assignment of a special locker or a locked study carrel in Waldo Library.

Students enrolled in off-campus classes are always welcome in the University Libraries on campus, where they may use the libraries and borrow materials using the same procedures as any other student. They are also provided library services through arrangements with libraries or schools in the local area where the classes are taught.

Housing

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

Residence Halls

Fourteen residence halls in a variety of locations on campus accommodates 10,000 students each fall and winter semesters. These individuals come from all walks of life and possess diverse academic interests. Many of the 50 states and several foreign countries are represented.

Assignments to a hall are based on the preferences of the individuals if space is available. Halls are available where space is not available when it is

Kalamazoo make their own alternative housing arrangements during these periods. Residents are permitted to remain in their assigned rooms during the Thanksgiving and Spring Break recess periods. 

Each residence hall varies slightly in its construction. The following services are available in most halls: reception desk with mail and message services, formal lounges; all purpose meeting rooms for meetings, aerobics, etc., saunas, television viewing areas, some 46" television exercise areas, rental refrigerators; paint-your-own-room opportunities, study rooms; and academic computer terminals. Third floor residents creatively enhance their room with personal items which supplement the University-supplied beds, desks, study chairs, and dressers.

The award winning Residence Hall Dining Service enjoys an excellent reputation with
During the fall and winter semesters and the spring session, dining halls are open from 7 a.m. to 6:15 p.m. six days a week and from 8 a.m. to 1 p.m. on Sunday. Dining services are available during the fall and winter semesters and the spring session. A continuous dining plan is available. Requests received after all halls have been filled to capacity will be placed on a waiting list.

For further information or details, contact Residence Services, Faunce Student Services Building, or call (616) 387-4735.

Appointments may be received after all halls have been filled to capacity, and an extensive menu developed in covering all meals except Sunday evening.

Medical Center
The Health Center provides continuously available medical services to students, the University community. The Health Center offers all immunization updates and immunizations required for overseas travel. Additional information regarding off-campus health services can be obtained by contacting the University's rental listing service, Faunce Student Services Building, or call (616) 387-2175.

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

Laboratory Services
The Center’s full-service laboratory performs most standard diagnostic tests. These are often received while you wait, so that you receive prompt treatment, saving you both time and money. Electrocardiograms, interpreted by a cardiologist, are also available.

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

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

Appointment Information
You are encouraged to choose a physician or physician assistant with whom you feel comfortable and to request this clinician by appointment whenever you need health care. Appointments may be scheduled from 7:45 a.m. to 4:45 p.m. Monday through Friday.

Allergy Injections
If you receive allergy injections, all you need to do is provide the Health Center with your antigen and an injection schedule from your allergist. Then all your injections can be administered at the Health Center while you’re attending school.

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

Tuberculosis Testing
Routine tuberculosis testing, required for some classes and jobs, is available.

Sports Medicine Clinic
The Sports Medicine Clinic provides comprehensive diagnosis and treatment of sports-related injuries, as well as any physical therapy services you may need. If you’ve paid your Student Health Fee and you’re referred to the clinic by a Health Center clinician, there’s no charge for clinic services except for professional evaluation. The clinic is headed by an orthopedic surgeon and staffed by two orthopedic surgeon-consultants, a physical therapist, a certified athletic trainer, and a podiatrist consultant. These professionals serve all of southwestern Michigan, in addition to the University community.

Health Center Hours
Appointments 8:00 a.m. to noon and 1:00 p.m. to 5:00 p.m., Monday through Friday.

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

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

All Western students carrying seven or more credits a session are assessed a prepaid Student Health Fee. Except for a small fee charged for services, the cost of medications from the Health Center pharmacy, the fee covers all health care requested by Health Center clinicians and provided at the Center. Students enrolled for fewer than the above hours may "buy in" to the Student Health Fee plan or use the Health Center on a fee-for-service basis.

**The Student Health Fee complements your hospital and medical insurance.** Many students have health insurance that protects them from the costs of hospitalization. Your fee protects you against the majority of costs you face outside the hospital, which are not covered by most insurance programs. Any student who has paid the fee is eligible for Health Center services. Eligibility extends from the first day of the applicable semester for which the fee has been paid, to the first day of the next semester or session.

**Uncovered Costs**

Visits to medical specialists outside the Health Center, or to hospital emergency rooms or immediate care centers, and transportation to and from the health center by ambulance are not covered by the fee. Services not ordered by health center personnel, but requested by clinicians outside the University, can be provided by the Health Center, but will be charged to you according to the current fee schedule. Charges that are not covered by the student health fee or your insurance may be paid in cash, by check, or by MasterCard or Visa credit cards. However, all fees under $1 must be paid in cash. You may also charge your health care costs against your student account, but this must be paid in full prior to registering for the following semester or session. The University assesses a service charge for any costs that are not paid within sixty days.

**Optional Hospital, Medical, and Surgical Insurance**

All students are urged to carry some form of medical and accident insurance that covers medical, surgical, and hospitalization expenses not covered by the student health fee. Some insurance companies offer coverage for expenses only when you're hospitalized. Other companies pay for diagnostic procedures performed by specialists outside the Health Center, as well as hospitalization. It's important to verify the services included in any insurance policy you purchase. If you are covered by your parent's insurance, you should know the name and address of their company and all policy numbers as they appear on the insurance identification card. Be sure to carry this information with you at all times.

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

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**Student Health Advisory Committee**

The student Health Advisory Committee gives you the chance actively to help plan ways in which the health center can offer high-quality health services at the lowest possible price. The committee participates in policy formation, program review, and program development for the Health Center. Seven undergraduate and two graduate students (selected by committee interview), and five faculty and staff members serve on the committee. Membership in the group, which meets throughout the calendar year, is open to any interested students. For more information regarding meeting times or application for committee membership, contact the committee's recording secretary in the Health Center director's office.

**University Wellness Programs**

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

- A Wellness Resource Center, located in the front lobby of the Health Center, containing written information on a variety of health promotion and disease prevention topics.
- Total Fitness Programs, designed to help you achieve fitness using exercises set to music. This coed program focuses on flexibility, muscle tone and strength, and cardiovascular endurance. In addition to improving fitness, it provides a health outlet for reducing stress and tension.
- The Zest for Life Fitness Room, located in the Gary Center, contains a full line of weight equipment, exercise bicycles, rowing machines, hand weights, a nordic skier, and exercise mats. Evening fitness room hours for students are scheduled through the Office of Campus Recreation.
- Computerized Nutrition Assessment to help you analyze your diet and suggest food sources that can help you achieve a balanced nutrient intake for high-level wellness.
- Weight Management Programs to help you increase your skills in eating and nutrition management, stress management, thought management, behavioral techniques, and commitment to increased physical activity.
- Managing Stress Programs, because feeling overstressed and out-of-control can affect your emotional stability, your relationships, your ability to concentrate and think clearly, and your sense of purpose in life. In addition, stress is known to play a significant role in many physical illnesses and to contribute to lower resistance to all infections and disease. None of us can escape stress, but how we perceive it and deal with it can become a life-long habit. The Health Center offers stress management information and workshops to help you increase your ability to manage and minimize distress in your life.
- Quit-For-Life Stop Smoking Program to help you develop skills for a lifetime of freedom from smoking. We offer group workshops and materials to assist and support you in developing a new nonsmoking self-image and healthy alternatives to smoking.

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**Career Planning and Placement Services**

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

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**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 with active admission status with the University.

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

3. **Career Development Program** To assist students in the exploration of individual career possibilities and 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 International Association of Counseling Services, Inc., and is staffed by professionally trained counselors and psychologists.

Staff members maintain confidentiality of client information in a manner consistent with professional standards of ethical practice and conduct.
Appointments may be made by telephone or by stopping at the Counseling Center reception desk between 8:00 a.m. and 5:00 p.m., Monday through Friday. Graduate students unable to use the Counseling Center service during regular hours may make arrangements for Thursday evening appointments by calling the Center office, (616) 387-1850.

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

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

Testing and Evaluation Services has the largest selection of test files in Michigan. These tests may be obtained in the Testing Office. A fee is charged to faculty members for informational purposes, class projects, research purposes, or almost any other valid reason. If the student is working on a research project, survey, or collecting data for any valid reason, the same response/answer sheets used by faculty members are available. Testing staff members can assist in the planning of the project and advising on data output.

Testing and Evaluation Services is located in Hillside West, Room D-4.

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 students entering the U.S. on an F1 visa. Those with F2 or B2 (visitor’s) visas and U.S. residents, however, may elect to take from one to four classes per day. A progress report that evaluates the student’s capabilities in each English skill area is issued at the end of each term. The Certificate of Eligibility, allowing a student to apply for a visa (Form 1-20 AB or IAP-66), is issued by CELCIS for admission to the CELCIS program. Admission to CELCIS does not, however, imply admission to the University for academic study. For further information and application forms, contact Career English Language Center for International Students, Western Michigan University, Kalamazoo, Michigan 49008. Telex 687099 WEST MICH UNIV. Telephone (616) 387-4800.

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

The Office of International Student Services was established to assist international students by processing applications for admission, conducting orientation programs for 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 study.

English Competency of Students from Non-English Speaking Backgrounds
Prospective students whose native language is not English and who have not successfully completed at least one year of full-time academic study at another U.S. accredited institution will be required to demonstrate proficiency in the English language prior to enrollment in an academic program at Western Michigan University. The University strongly prefers examination through the Test of English as a Foreign Language (TOEFL), the Michigan Test of English Language Proficiency (MTELAP), or the Michigan English Language Assessment Battery (MELAB). Exceptions to these standard tests require special approval. International students who are exempted from the English TOEFL/MTELAP requirement must attain a satisfactory score on the Western Michigan University institutional English Qualifying Examination. To be eligible for unrestricted fulltime enrollment in an academic program, a minimum total score of 550 must be achieved in the TOEFL examination. For the MTELAP/MELAB, a minimum score of 85 percent is required. Within certain limits, a prospective student who has achieved less than the minimum score for unrestricted enrollment may be allowed to register for courses on a restricted basis, which will include a course of study designed to improve the student’s ability to use the English language. Limitations for such qualified enrollment will be established and applied by the Office of International Student Services.

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

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

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

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

General Requirements For A Master's Degree

Admission
See Calendar of Events for application deadline.
1. Bachelor's degree from an accredited institution, indicated on an official transcript.
2. Transcripts of all courses taken beyond high school.
3. A point-hour ratio of at least 3.0 (A = 4.0) is required. No undergraduate credit is computed in the graduate point-hour ratio. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.
4. Acceptance by both The Graduate College and an academic unit for a definite program of study.
5. Meet any additional admission requirements as stated in the individual program descriptions.

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

Graduation
See Calendar of Events for application deadline.
1. Diploma Application: A diploma application must be submitted by October 1 for the December Commencement, by February 1 for the April Commencement, by April 1 for the June Commencement, and by June 1 for the August graduation. The University has no commencement ceremony in August.
2. Minimum Credit Hours: Completion of a minimum of thirty hours of accepted credit in an approved program of study. Normally only courses numbered 600 or above are acceptable. One-half of the credits earned must be in courses numbered 600 or above. Each course included in the program must be completed by the day of graduation.

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.
6. Transfer Credit: Six semester hours (three and four quarter or term hours are transferred as two semester hours) of graduate credit may be transferred from other schools provided:
   - The credits were earned in institutions accredited for graduate study and are of "B" grade or better. The student's average for all graduate work taken at another institution is also "B" or better.
   - The Graduate College approves the credits for transfer.
   - The student's adviser verifies that the credits contribute to the student's program of study.
6. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.

Research Subject Protection: Students conducting research that involves human or animal subjects must have prior approval of the research proposal by the appropriate University board, thus assuring compliance with the regulations for the protection of such subjects. For more information, call Research and Sponsored Programs, 387-3670.
8. Master's Thesis: A student who intends to register for the Master's Thesis (6 hrs.) is required to meet with the Dissertation Assistant in The Graduate College before registering for the class so that the student is informed about the regulations pertaining to the preparation of the manuscript.

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

General Requirements For A Graduate Specialty Program
A Graduate Specialty Program is a fifteen- to twenty-hour, normally, aggregate of cohesive, topical graduate level courses and, as a unit, independent of any single degree program. Students who wish to pursue a Graduate Specialty Program must have already completed, or be currently enrolled in, a graduate degree program. There may be some overlap in courses between a student's program of study for a Graduate Specialty Program and the program of study for a graduate degree. However, since a Graduate Specialty Program is distinct from the student's degree program, the entire aggregate of courses in a student's Graduate Specialty Program cannot be applied to the degree program. To signify that a student has satisfactorily completed an approved curriculum in a Graduate Specialty Program, a certificate is awarded; however, the certificate is not an award of license, accreditation, or certification to render professional services. The certificate is to be awarded at the completion of the Graduate Specialty Program for those students who have already received their graduate degree. For those students concurrently enrolled in a graduate degree program, the certificate will be awarded at the same time the graduate degree is awarded.

Regular admission to The Graduate College and to the unit offering the Graduate Specialty Program is required. A student must complete the requirements of the Graduate Specialty Program with a "B" or better average within a six-year period. The Graduate Specialty Programs offered by Western Michigan University are described beginning on page 39.
Programs Leading To The Master's Degree

In order to earn a degree, students are required to complete a program of study. Degree candidates must choose a graduate program that is compatible with their objectives. The programs listed on the following pages have been developed to provide students with the basic experiences that implement these objectives. Through the counseling process, graduate advisers will help the students choose courses to meet their individual needs. Courses and experiences should be chosen so that the graduate student becomes a person with greater professional skill, increased ability to analyze and interpret life situations, and greater insight into problems involved in professional leadership.

Anthropology
Program Adviser
Room 102, Moore Hall

The Master of Arts in Anthropology is intended to provide the student with a sound understanding of the discipline as a whole. In addition it requires a concentration, appropriate to its academic level, in one of the major branches of Anthropology. These may be identified as archeology, socio-cultural anthropology (including ethnology), physical anthropology, and linguistics (in cooperation with the Department of Linguistics). Research experience in archeology and ethnographic field schools is available.

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

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

Art
Adviser:
Nita Clarkson, Advising Coordinator
Room 1406, Sangren Hall

The Department of Art offers two graduate programs. The Master of Arts in Art is a one-year program for professional artists and art educators. This program requires 30 credit hours. The Master of Fine Arts is a two-year program with 60 credit hours required. The following are the major areas of concentration in both programs: Ceramics, Graphic Design, Multi-Media, Painting, Photography, Printmaking, Sculpture, and Textile Design.

Admission requirements for both programs
1. An undergraduate degree with a major in art or its equivalent.
2. A portfolio of art works or slides must be submitted directly to the graduate adviser of the Department of Art. It should include twenty to thirty examples of work in the student's area of concentration and other related areas.
3. A statement indicating the reasons for seeking admission to a graduate program and the specific area of concentration.
4. Three letters of recommendation for admission or a graduate assistantship.
5. A current resume is recommended.

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

Program requirements
1. Twenty-four hours in one area of concentration.
2. Six hours in advanced art history.
3. Two hours in ART 625, Graduate Seminar.
4. A review of all art work by a graduate committee before the end of the first semester.
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. Five additional hours in art or art history.
7. Three hours in an approved cognate.

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. The Department of Art provides graduate students with studios and encourages them to work independently under the advice of one or more faculty members. An extensive schedule of exhibitions and visiting artists is an important part of the graduate program.

Western Michigan University is an accredited member of the National Association of Schools of Art. The M.F.A. program requirements meet or exceed the recommendations of the College Art Association of America.

Program requirements
1. Work twenty-four hours in the major area of concentration.
2. Nine hours in art history.
3. Fourteen hours in electives, of which nine must be in art.
4. Three hours in ART 610, Advanced Drawing.
5. Two hours in ART 625, Graduate Seminar.
6. Six hours in courses outside the Department of Art.
7. Reviews of all art work by a graduate committee before the end of the first and third semesters.
8. Minimum of one year residence on campus.
9. Two hours in ART 613, Graduating Presentation. This course includes a final exhibition and oral presentation which must be approved by a graduate committee before the M.F.A. degree is granted.
Adviser: Gyuila Fiscor Room 5060, McCracken Hall

The Master of Science in Biology and Biomedical Sciences is designed to enhance the student's ability to plan, carry out, analyze, and report original research. It increases scientific preparation and supports the student's research. This degree may serve as a foundation for continued graduate or professional study or may lead to positions in the private or public sector. Areas of available specializations include Aquatic Biology, Botany, Cell and Molecular Biology, Ecology, Genetics, Immunology, Human Physiology, Microbiology, Morphology, Physiology (Plant and Environmental), and Zoology (especially Invertebrate and Ornithology).

Admission Requirements
Separate applications for admission must be made to The Graduate College (for application materials contact The Graduate College; international students should contact the Office of International Student Services) and to the Department of Biology and Biomedical Sciences (obtain application forms from the Graduate Adviser of this department). The application to the department requires three letters of recommendation. The following requirements must be met for admission to the program:

1. Admission to The Graduate College:
2. A bachelor's degree from an accredited college or university.
3. The minimum requirements for admission to the graduate program are:
   a. A science grade point average of 2.8 or greater
   OR
   b. A combined score of 1000 (verbal and quantitative) on the Graduate Record Exam.
4. All students are required to take the Graduate Record Exam.
5. Course admission categories:
   a. Appropriate courses in biology as determined by the Graduate Adviser.
   b. Chemistry through organic
   c. Two sequential courses in general physics
   d. Two appropriate courses in mathematics as determined by the Graduate Adviser.
6. Availability of a potential Major Adviser in at least three of the following four areas—ecology (BIOL 301), genetics (BIOM 250 or BIOL 302), physiology (BIOM 350 or BIOL 317 or BIOL 527), microbiology (BIOM 212) or sufficient undergraduate course work so that three 500-level biology courses or three 500-level biomedical sciences courses can be taken in the graduate program.
7. Financial Assistance
   a. Students should contact the Office of Financial Aid for information about financial support.
   b. The Biostatistics Admission Committee will admit candidates to the program based on the following criteria:
      a. Strength and breadth of the undergraduate course work, and
      b. Availability of internships. (Admission to the program is limited by the number of internship opportunities available.)
8. Students are urged to submit scores received on the Graduate Record Exam (GRE).

Biological and Biomedical Sciences

Adviser: Michael R. Stoline Room 3319, Everett Tower

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

Admission requirements
For admission to this program a student should have completed successfully an undergraduate program with a major in mathematics or statistics and a minor in biology or biomedical sciences, or a major in biology or biomedical sciences and a minor in mathematics or statistics, or the equivalent. Most specifically the undergraduate program should have included the following (numbers refer to WMU courses that would be acceptable):
1. Biology or Biomedical Sciences: Courses in at least three of the following four areas—ecology (BIOL 301), genetics (BIOM 250 or BIOL 302), physiology (BIOM 350 or BIOL 317 or BIOL 527), microbiology (BIOM 212), or sufficient undergraduate course work so that three 500-level biology courses or three 500-level biomedical sciences courses can be taken in the graduate program.
2. Mathematics and Computer Science: Multivariate calculus (MATH 272), differential equations (MATH 274), elementary linear algebra (MATH 230), probability (MATH 460 or MATH 560), intro. FORTRAN programming (CS 306), chemistry: Organic chemistry (CHEM 360 or 365), biochemistry (CHEM 450).

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

Program requirements

1. Statistics Component (14 credit hours):
   a. MATH 562 (Statistical Analysis), MATH 660 (Statistical Inference I), MATH 662 (Applied Linear Models), MATH 664 (Design of Experiments I)
2. Statistical Computing Component (3 credit hours): MATH 680 (Topics in Statistical Computing)
3. Biology or Biomedical Science Component (6 credit hours): Two approved 500-level biomedical science courses. These courses are chosen to fit a student's individual interest.
4. Elective Component (3 credit hours): An approved 500-600 level course from Statistics, Biology, or Biomedical Science.
5. Internship Component (5 credit hours): A professional field experience internship with a health-related industry. (Normally this is taken as MATH 712.)
6. Final Examination: Before beginning the internship each intern should have successfully passed a written comprehensive examination covering the material of MATH 562, 660, and 662.
7. Final Report: At the completion of the internship each candidate must submit a final report on the internship project.

Biostatistics

Adviser: Michael R. Stoline Room 3319, Everett Tower

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

Admission requirements
For admission to this program a student should have completed successfully an undergraduate program with a major in mathematics or statistics and a minor in biology or biomedical sciences, or a major in biology or biomedical sciences and a minor in mathematics or statistics, or the equivalent. Most specifically the undergraduate program should have included the following (numbers refer to WMU courses that would be acceptable):
1. Biology or Biomedical Sciences: Courses in at least three of the following four areas—ecology (BIOL 301), genetics (BIOM 250 or BIOL 302), physiology (BIOM 350 or BIOL 317 or BIOL 527), microbiology (BIOM 212), or sufficient undergraduate course work so that three 500-level biology courses or three 500-level biomedical sciences courses can be taken in the graduate program.
2. Mathematics and Computer Science: Multivariate calculus (MATH 272), differential equations (MATH 274), elementary linear algebra (MATH 230), probability (MATH 460 or MATH 560), intro. FORTRAN programming (CS 306), chemistry: Organic chemistry (CHEM 360 or 365), biochemistry (CHEM 450).

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

Program requirements

1. Statistics Component (14 credit hours):
   a. MATH 562 (Statistical Analysis), MATH 660 (Statistical Inference I), MATH 662 (Applied Linear Models), MATH 664 (Design of Experiments I)
2. Statistical Computing Component (3 credit hours): MATH 680 (Topics in Statistical Computing)
3. Biology or Biomedical Science Component (6 credit hours): Two approved 500-level biomedical science courses. These courses are chosen to fit a student's individual interest.
4. Elective Component (3 credit hours): An approved 500-600 level course from Statistics, Biology, or Biomedical Science.
5. Internship Component (5 credit hours): A professional field experience internship with a health-related industry. (Normally this is taken as MATH 712.)
6. Final Examination: Before beginning the internship each intern should have successfully passed a written comprehensive examination covering the material of MATH 562, 660, and 662.
7. Final Report: At the completion of the internship each candidate must submit a final report on the internship project.

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

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

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

**Orientation And Mobility**

**Advisor:**

Marvin Weessies, Room 3410, Sangren Hall

An orientation and mobility instructor teaches visually impaired children and adults the conceptual and physical perception skills in the following areas: independent living, efficiently and safely in their homes and communities. The instructor is employed by public or private schools and agencies.

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

**Rehabilitation Teaching**

**Advisor:**

Susan Ponchillia, Room 3403, Sangren Hall

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

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

**Business**

Darrell G. Jones, Dean
Pamela S. Rooney, Assistant Dean
Michèle M. Moe, Admissions Officer
Room 250, North Hall

The degree programs leading to the Master of Business Administration, the Master of Science in Accountancy, and the Master of Science in Business are offered within the framework of the objectives of the 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 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 College of Business, personal programming for the participant is provided.

**Admission requirements**

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

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

1. Prerequisites: In order to provide students with the background of the common body of knowledge in business and administration required by the American Assembly of Collegiate Schools of Business, study in the areas of Accountancy, Economics, Finance, Business Information Systems, Law, Management, Marketing, and Statistics is required. This requirement may be satisfied by waiver (in case of prior completion of appropriate undergraduate courses, the WMU MBA core courses, the equivalent), by examination, or by taking Introduction to Information Processing 102, Principles of Accounting 201, 202, Business Finance 200, Legal Environment 340, Management Fundamentals 300, Marketing 370, and Statistics 200. A minimum grade of “C” is required in all prerequisites.

2. MBA Core: The core consists of Applied Economics for Management 600, Computer Information Systems 602, Legal Controls 607, Accounting Control and Analysis 607, Financial Management 608, Marketing Management 607, and Policy Formulation in the Area of Administration 659. MBA students with undergraduate majors/minors in Business Administration areas will be advised about proper upper-level discipline substitutes for core courses with the prior approval of their area advisers.

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

**Master of Science In Accountancy**

**Advisers:**

Jerry G. Kreuze, Gale E. Newell, William R. Welke, Room 150, East Hall

The Master of Science in Accountancy is a thirty-hour graduate program of which at least fifteen hours are in accounting. The program prepares the student for professional careers in industry, commerce, finance, government, and public accounting. The degree meets the Michigan educational experience requirement to sit for the uniform examination for Certified Public Accountant (C.P.A.).

Knowledge and understanding of the theory, literature, controversial concepts, and professional practice of accounting are developed. The student’s understanding of the relationship of accounting to other fields in business and to other disciplines is also stressed. Course work will be selected from the areas of Financial Accounting, Cost and Managerial Accounting, Auditing, Taxation, Not-For-Profit, Systems, and Accounting Theory.

**Admission requirements**

Admission to the program is obtained through the Admissions Committee of the Department of Accountancy. The following criteria are used in the evaluation of applications:

The applicant must have attained a satisfactory score on the English Qualifying Examination.

The applicant must have an undergraduate degree and an acceptable academic record as evidenced by official transcripts from all colleges and universities attended. Attention is given to overall grade averages, especially to grade trends and areas of scholastic strength.

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

**Prerequisites**

Undergraduate prerequisites are Principles of Accounting, Income Tax Accounting, Management, Marketing, Statistics, Finance, Business Law, and a course in Computer Usage.

**Program requirements**

Each individual program must include twenty-one graduate credits earned in courses numbered 600 and above and must have prior approval of a department adviser. In addition to the Accountancy major requirements, the student must elect a minimum of six graduate courses outside the Department of Accountancy.
Master of Science
In Business
The Master of Science program permits the student to specialize in a specific area of business such as Administrative Systems, Finance, Management, or Marketing. The program is designed primarily to permit exceptional students to work on individualized programs, generally in preparation for further academic studies. It is a departmental program and specific admissions and course requirements are determined by the department.

Admission requirements
Applicants must submit scores for the Graduate Management Admission Test (GMAT) prior to consideration for admission to the program. Students admitted to the University on a conditional Status (PTG) 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-four 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 grade point average is required for graduation. A 3.0 average is also required for all courses required for the MSB program.

Chemistry
Advisers:
Ralph Steinhaus,
Room 3302, McCracken Hall
Lin Foote,
Room 5180, McCracken Hall

The Master of Arts in Chemistry has two options: Option A—General Communication, and Option B—Organizational Communication. The Option in General Communication provides for a highly flexible program designed to fit a wide variety of student needs in several areas of communication. The more specialized option in Organizational Communication is designed for those students whose vocational interests involve using communication in an organizational setting. Individual programs are designed in consultation with the graduate adviser based on the student's needs, interests, and vocational objectives.

Admission requirements
The primary criteria for admission are based upon answers to the following questions: Does the applicant have a recognized understanding of his/her educational objectives? Will the graduate curriculum and organization fit the student? Will the graduate student's educational experience for him/her? Undergraduate records, letters of recommendation, evidence of academic interest and ability, and a personal interview—when appropriate—are requested of each applicant. Undergraduate work in communication, speech, or allied disciplines is expected of all applicants. Academic deficiencies or reservations may be determined at the time of application.

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

Program requirements
1. A minimum of thirty-six hours of graduate work, including up to six cognate hours selected in consultation with the graduate adviser.
2. COM 501, Introduction to Graduate Study in Communication
3. One approved course in organizational communication
4. One approved course in interpersonal communication
5. One approved course in mass communication or public relations
6. One approved course in small group communication
7. Electives, selected in consultation with the graduate adviser

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

This program is also designed for those currently in the field of organizational communication—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.

Program requirements
1. A minimum of thirty-three hours of graduate work, including up to six cognate hours selected in consultation with the graduate adviser.
2. COM 601, Introduction to Graduate Study in Communication
3. The Organizational Communication Core:
   A. COM 581 Communication in Organizations
   B. COM 673 Conflict Management
   OR
   C. COM 670 Power and Leadership Seminar on Organizational Communication Theory (Prerequisite: Twelve hours of graduate work in communication, including COM 581)
4. One approved course in interpersonal communication*
5. One approved course in mass communication or public relations*
6. One approved course in small group communication*
7. Electives selected in consultation with the graduate adviser*
8. Each semester the student is enrolled, he/she must consult with the graduate adviser.

*See the graduate adviser for the list of approved courses. The approved courses for the Organizational Communication option include only those courses with a specific relevance to organizational communication. Students who elect to write a thesis are required to take COM 591 and six hours of COM 700 as part of the thesis program. Students who elect to do a professional internship are required to complete 3-6 hours of COM 712 Professional Field Experience. See the adviser for details and procedures. Exceptions to these requirements may be approved by the graduate adviser.

Computer Science
Advisers:
Ellise deDoncker-Kapenga,
Dionysios Kountanis,
Dalia Motzkin, lyad Natour,
Kenneth Williams

The Master of Science in Computer Science is primarily a professional program that emphasizes computer software development. It is designed to prepare students for computer organization and systems development positions in industrial corporations, government service, or computer service companies. Graduates will also be well prepared to teach computer courses in two-year colleges or to undertake more advanced training in Computer Science.

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 the 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 abstract algebra, and one in discrete structures. Students without this background will be asked to complete appropriate coursework, such as MATH 122, 123, 230, and 310 as admission requirements.
Candidates should have Computer Science course work including a thorough knowledge of a computer assembly language, computer organization, data structures, file structures, and structured programming. Students without this background will be asked to complete course work which will be approximately equivalent to an undergraduate Computer Science minor. Applicants are urged to submit Graduate Record Examination aptitude scores and TOEFL scores, if appropriate.

Students entering the M.S. program who are not familiar with the University's computing facilities should attend the non-credit workshops on the use of the System Monitor Commands and editing languages offered early each semester by the WMU Academic Computer Center.

Program requirements
Each student must complete an approved program consisting of at least 33 hours of graduate work including the following:
1. CS 542, 544, 554, 580, 625, and 631.
2. Two approved courses from CS 632, 643, 655, 660, 681, or 682.
3. Additional approved electives from COM 518, 527, 555, 581, 582, 603, 632, 643, 655, 680, 681, 682, 691, 710, 712, MATH 560, 567, 640, PHIL 520, or MGMT 664.

Students who, with the approval of their adviser, elect the Thesis option will register for 6 credits of work in CS 700.

A final examination covering the basic courses of the student's program is required of all students who do not elect the Thesis option.

Prospective students should realize that the general requirements for a Master's degree include the attainment of a satisfactory score on the English Qualifying Examination.

Every graduate of this program, in addition to receiving a strong theoretical grounding, should also be a competent programmer and have practical experience in computer consultation and computer systems.

There are a variety of channels available for financial support of graduate students. Graduate Fellowships are available through the Graduate College. A number of Assistantships and Research Fellowships are also available. The Department office is located in Room 3102, Sangren Hall.

Counselor Education And Counseling Psychology
Advisers:
Alan J. Hovestadt, Chairperson;
The Department office is located in Room 3102, Sangren Hall.

The Master of Arts programs in Counselor Education and Counseling Psychology are offered in three areas of concentration with seven options:

1. Community Agency Counseling
   a. Counseling in Community Agency Settings

2. Counseling in Clinical Mental Health Settings
   a. Counseling in Elementary Education
   b. Counseling in Secondary Education
   c. Counseling in Post-Secondary Education

3. Student Personnel Services
   a. Administration of Student Personnel Services
   b. Counseling in Post-Secondary Education

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

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

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

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

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

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

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

Development Administration

Adviser: Claude S. Phillips, Room 3007, Friedemann Hall

The graduate program in Development Administration is offered by the Department of Political Science and leads to the degree of Master of Development Administration (MDA). The program is designed for students who plan to pursue careers in public administration in Africa, Asia, the Middle East, Latin America, or other areas usually described as “developing.” The objective of the program is to provide graduate students with professional training in public administration, with special attention given to the problems of countries attempting to develop economically, politically, and socially. In this context, public administration bears the exceptional burden of translating public policy into successful sequences of change. Public administration becomes the bridge between modernizing elites in politics and traditional masses in their struggle to survive. A major strength of this program is the highly qualified faculty specialists who have devoted many years of research, residence, and travel in the developing areas and who apply their knowledge of these areas to the problems of public administration. By combining these faculty with appropriate courses, students will get a good grounding not only in public administration, but in techniques for analyzing and coping with the special problems of developing areas.

Admission requirements

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

Program requirements

The Master of Development Administration requires forty-two (42) semester hours of study. Full-time students will ordinarily take sixteen (16) to twenty (20) calendar months to complete the program. The basic requirements are as follows:

1. Prerequisites (non-credit): The following courses or their equivalents: PSCI 330, Introduction to Public Administration, and ECON 201 or 202, Principles of Economics.
2. The General Program.
   a. Core requirements. Seven (7) courses: PSCI 532, Personnel Administration; PSCI 534, Administrative Theory; PSCI 535, Politics of Budgeting and Finance; PSCI 536, Comparative Public Administration; PSCI 542, Administration in Developing Countries; PSCI 646, Seminar: Development Administration; and Econ 588, Economic Development.
   b. Tools or Skills. One course in PSCI 572, Computer Applications; PSCI 590, Research Methods, or PSCI 591, Statistics.
   c. Specialization. Two courses from among PSCI 637, Organization Development; PSCI 644, Seminar: Political Modernization: Rural Development; PSCI 644 Seminar: Political Modernization: Urban Development; PSCI 644 Seminar: Political Modernization: Political Development; ANTH 542, Development Anthropology; and BIS 556, Office Management.
   d. International and Comparative Studies. One course from among various courses: PSCI 552, Studies in International Relations; PSCI 553, United Nations; PSCI 555, International Law; PSCI 557, Studies in Foreign Policy; PSCI 541, Comparative Political Systems; and PSCI 650, Seminar: International Relations: Third World Problems.
   e. Electives. Three courses from among at least two dozen in eight different Departments: Communication, Economics, Management, Marketing, Political Science, Psychology, Sociology, and Social Work. All elective courses may be selected by the student with the approval of the Graduate Adviser.

Earth Science

Advisers: Richard N. Passero, Room 1125, Rood Hall
W. Thomas Straw Room 1129, Rood Hall

The Master of Science degree program in Earth Science is interdisciplinary with geology as a core. Two options are available.

Earth Science Teaching

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

Admission requirements

Students should have completed an undergraduate major in Earth science or its equivalent and one semester each of college chemistry and physics.

Program requirements

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

Earth Science

The Master of Science in Earth Science permits students to design programs of study, in consultation with the program adviser, that are compatible with their individual 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; a core of eighteen semester hours in geology is required, including GEOL 539 (or equivalent).
2. May include satisfactory completion of four hours of GEOL 710 (Independent Research) or three hours of GEOL 712 (Field Experience), or both, but not to exceed seven hours.
3. Pass a comprehensive oral examination. If the first attempt at the oral exam is not considered satisfactory, then a second oral exam or a written exam will be required.

Economics

Adviser: Werner Sichel Room 5075, Friedemann Hall

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

Two tracks for the M.A. program are offered: an Applied Economics track and a Traditional/Research track. The applied Economics track is designed for those who expect to pursue a career in business, government, 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 a graduate adviser. The required classes are: Introduction to Mathematical Economics, 504; Econometrics, 509; Applied Economics for Management, 600; Applied Economics, 602; Advanced Price Theory, 603; National Income Analysis, 662; Professional Field Experience, 712.
The Traditional/Research track is for those who have the objective of further graduate study at another institution leading to a doctorate, or who desire a strong theoretical/research orientation leading to research-oriented business or government jobs. The degree is awarded on the basis of 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 adviser. The exceptions are:

1. 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 adviser.
2. At least an overall “B” average in the Economics courses that the student takes in an adviser-approved program of study.
4. Pass comprehensive examination.

Program requirements for the Applied Economics track:

1. The satisfactory completion of thirty-three hours in a planned program prepared in consultation with the graduate adviser.
2. At least an overall “B” average in the Economics courses that the student takes in an adviser-approved program of study.
3. ECON 504, Introduction to Mathematical Economics; ECON 509, Econometrics; ECON 600, Applied Economics for Management; ECON 602, Applied Economics; ECON 603, Advanced Price Theory; ECON 662, National Income Analysis, and ECON 712, Field Experience, are required.
4. Pass comprehensive examination.

Education

The College of Education offers Master of Arts degree programs in Counselor Education and Counseling Psychology, Early Childhood Education, Educational Leadership, Physical Education, Reading, Special Education, Teaching in the Elementary School, and Teaching in the Middle or Junior High School. Descriptions of these programs can be found elsewhere in this section of the Bulletin.

Two other master's programs, Teaching of Geography and Teaching of Music are offered by the Department of Education and Professional Development in cooperation with departments in the College of Arts and Sciences and the College of Fine Arts.

The curricula are planned to provide professional preparation for students who are interested in teaching, counseling, administration, and certain specialized positions in elementary and secondary schools, institutions of post secondary education, community agencies, and related human service systems. With the exceptions noted above, students applying for candidacy in the programs within the College of Education are expected to have completed a minimum of fifteen hours of undergraduate work in professional education. In some instances, students may present equivalent preparation which meets the minimum requirements for Michigan teacher certification, when such preparation is approved by the College of Education.

The exceptions are:

1. The fifteen hours of undergraduate preparation in professional education are not required of those interested in leadership positions in higher education and those who enter selected programs offered by the Department of Educational Leadership.
2. The fifteen hours of undergraduate preparation in professional education are not required in programs offered by the Department of Counselor Education and Counseling Psychology.

Admission requirements

1. Satisfactory completion of a minimum of twelve undergraduate hours in economics or in equivalents approved by the graduate adviser.
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 satisfactorily ECON 303 and 306.
3. An overall average of at least 3.0 in the last 60 hours of undergraduate work.
4. Pass comprehensive examination.

Program requirements for the Applied Economics 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 adviser.
2. At least an overall “B” average in the Economics courses that the student takes in an adviser-approved program of study.
3. ECON 504, Introduction to Mathematical Economics; ECON 509, Econometrics; ECON 600, Applied Economics for Management; ECON 602, Applied Economics; 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

Office of Admissions, Advising, and Certification
Ms. Wendy Asmus, Adviser
Ms. Maxine Gilling, Adviser
Ms. Diane Pelc, Certification Officer
2504 Sangren Hall

Those seeking information on graduate study at another institution leading to a doctorate, or who desire a strong theoretical/research orientation leading to research-oriented business or government jobs. The degree is awarded on the basis of 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 adviser.

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 adviser.
2. At least an overall “B” average in the Economics courses that the student takes in an adviser-approved program of study.
3. ECON 504, Introduction to Mathematical Economics; ECON 509, Econometrics; ECON 600, Applied Economics for Management; ECON 602, Applied Economics; ECON 603, Advanced Price Theory; ECON 662, National Income Analysis, and ECON 712, Field Experience, are required.
4. Pass comprehensive examination.

Education

The College of Education offers Master of Arts degree programs in Counselor Education and Counseling Psychology, Early Childhood Education, Educational Leadership, Physical Education, Reading, Special Education, Teaching in the Elementary School, and Teaching in the Middle or Junior High School. Descriptions of these programs can be found elsewhere in this section of the Bulletin.

Two other master's programs, Teaching of Geography and Teaching of Music are offered by the Department of Education and Professional Development in cooperation with departments in the College of Arts and Sciences and the College of Fine Arts.

The curricula are planned to provide professional preparation for students who are interested in teaching, counseling, administration, and certain specialized positions in elementary and secondary schools, institutions of post secondary education, community agencies, and related human service systems. With the exceptions noted above, students applying for candidacy in the programs within the College of Education are expected to have completed a minimum of fifteen hours of undergraduate work in professional education. In some instances, students may present equivalent preparation which meets the minimum requirements for Michigan teacher certification, when such preparation is approved by the College of Education.

The exceptions are:

1. The fifteen hours of undergraduate preparation in professional education are not required of those interested in leadership positions in higher education and those who enter selected programs offered by the Department of Educational Leadership.
2. The fifteen hours of undergraduate preparation in professional education are not required in programs offered by the Department of Counselor Education and Counseling Psychology.

Admission requirements

1. Satisfactory completion of a minimum of twelve undergraduate hours in economics or in equivalents approved by the graduate adviser.
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 satisfactorily ECON 303 and 306.
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:
   b. ED 602. School Curriculum
   c. ED 603. Social and Philosophical Foundations of Education
   d. ED 804. Psychological Foundations of Education

2. The Reading Concentration—Twenty-one hours
   Twenty-one hours in reading, fifteen to eighteen of which must be in the candidate’s selected concentration: elementary, secondary, or special services. Three to six hours may be selected from the various reading electives. All courses must be approved by the candidate’s program advisor.

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

Teaching In The Middle or Junior High School
Advisers: Mary Strubbe, 2425 Sangren Hall

The thirty-hour Master of Arts in Teaching in the Middle or Junior High 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 deficient in their subject-matter background to strengthen that area.

Admission requirements
Applications must hold or be eligible for teacher certification and meet the admission requirements of The Graduate College.

Program requirements
Thirty-six semester hours of required courses, to be 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.), and subject matter concentration (9 hrs.).

Educational Leadership

The Master of Arts is awarded in curricula designed to prepare persons in (1) educational leadership, (2) K-12 school administration, (3) human resource development, and (4) measurement, research, and evaluation.

Admission requirements
Regular admission in The Graduate College. Michigan Teaching Certificate or equivalent.

Program requirements
1. At least 15 hours must be in courses at the master’s degree program with the consent of the advisor, except that the Math 651 may not be included in the nine credits.

Teaching In English
Adviser: Mary Strubbe, 2425 Sangren Hall

The thirty-hour Master of Arts in Teaching in English is designed to provide students with an academic specialty to build an understanding of the teaching/learning process or, conversely, for those deficient in their subject-matter background to strengthen that area.

Admission requirements
Applications must hold or be eligible for teacher certification and meet the admission requirements of The Graduate College.

Program requirements
Thirty-six semester hours of required courses, to be 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.), and subject matter concentration (9 hrs.).

Electrical Engineering
Advisers: Cassius A. Hesselberth, Chairperson; Gurbux S. Ailag, Raghvendra R. Gejji; John W. Gesink; Dean R. Johnson; John L. Mason; S. Hossein Mousavizadeh; Lambert R. Vander Kooi.

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

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

English
Adviser: Seamus Cooney, 618, Sprau Tower

Master Of Arts In English
The Master of Arts in English provides advanced study of the literary history, literary theory, and other literary concerns. A student desiring to enter the program should present a thirty-hour graduate major with a grade point average of 3.0. At least
twenty hours of the major must be in courses in literature; no more than fifteen of the thirty should be at the freshman-sophomore level. Students should consult with the adviser at the earliest opportunity concerning their programs of study.

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

Master of Arts in English With an Emphasis On Professional Writing

The Master of Arts in English with an Emphasis on Professional Writing is a thirty-eight hour degree program designed to meet the increasing demand for people with liberal arts educations skilled in the writing of non-fictional prose. Those entering with liberal arts educations skilled in the field other than English (8-12 hours); and students with the skills and 2) to enable the student to develop a concentration in a particular aspect of the field.

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

Admission requirements

Experience indicates that geography majors/minors, or social/biological/physical science majors with some geography normally can meet program requirements. Before the completion of ten graduate hours, all geography graduate students must meet the following requirements:

1. Successful completion ("B" grade or better) or enrollment in Principles of Cartography (GEOG 375) or approved equivalent.
2. The attainment of passing scores on the comprehensive qualifying examinations in physical and human geography.

Program requirements

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

1. Completion of 34 hours of graduate-level courses.
2. Completion of at least 20 hours of 500- and 600-level geography courses.
3. Completion of ED 601 (Fundamentals of Educational Research) or GEOG 661 (Geographic Research).
4. Completion of at least six hours of graduate-level education courses (not including ED 601).
5. Completion of GEOG 666 (Professional Development Seminar).
6. Completion of a two- or three-hour capstone experience, consisting of either GEOG 710 (Independent Research) or GEOG 712 (Professional Field Experience).

Geography

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

Master of Arts in Geography

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

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

Admission requirements

Experience indicates that geography majors/minors, or social/biological/physical science majors with some geography normally can meet program requirements. Before the completion of ten graduate hours, all geography graduate students must meet the following requirements:

1. Successful completion ("B" grade or better) or enrollment in Principles of Cartography (GEOG 375) or approved equivalent.
2. The attainment of passing scores on the comprehensive qualifying examinations in physical and human geography.

Program requirements

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

- Completion of 34 hours of graduate-level courses.
- Completion of at least 20 hours of 500- and 600-level geography courses.
- Completion of ED 601 (Fundamentals of Educational Research) or GEOG 661 (Geographic Research).
- Completion of at least six hours of graduate-level education courses (not including ED 601).

Geology

Adviser:
Ronald B. Chase,
Room 0039, Rood Hall

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

Admission requirements

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

Program requirements

- Completion of 34 hours of graduate-level courses.
- Completion of at least 20 hours of 500- and 600-level geography courses.
- Completion of ED 601 (Fundamentals of Educational Research) or GEOG 661 (Geographic Research).
- Completion of at least six hours of graduate-level education courses (not including ED 601).
- Completion of GEOG 666 (Professional Development Seminar).
- Completion of a two- or three-hour capstone experience, consisting of either GEOG 710 (Independent Research) or GEOG 712 (Professional Field Experience).

Master of Fine Arts in Creative Writing

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

The program requires that students take four writing courses (ENGL 630, Research and Writing, ENGL 631, Essay Writing, ENGL 632, Article Writing, and ENGL 633, Professional Writing); several courses in a field other than English (8-12 hours); and other graduate-level courses in English to bring the total hours taken to thirty-eight. Students should consult with the adviser at the earliest opportunity concerning their individual program of study. For more detailed information about the Professional Writing program see the pamphlet titled "Graduate Programs Offered by the English Department at Western Michigan University," which is available from the Department of English or the English graduate adviser.

Master Of Fine Arts In Creative Writing

Advisers:
George Vulich, Room 322, Wood Hall
Joseph Stoltzman, Room 330, Wood Hall

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

Admission requirements

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

Program requirements

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

1. Completion of 34 hours of graduate-level courses.
2. Completion of at least 20 hours of 500- and 600-level geography courses.
3. Completion of ED 601 (Fundamentals of Educational Research) or GEOG 661 (Geographic Research).
4. Completion of at least six hours of graduate-level education courses (not including ED 601).
5. Completion of GEOG 666 (Professional Development Seminar).
6. Completion of a two- or three-hour capstone experience, consisting of either GEOG 710 (Independent Research) or GEOG 712 (Professional Field Experience).

Geology

Adviser:
Ronald B. Chase,
Room 0039, Rood Hall

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

Admission requirements

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

Program requirements

1. Thirty semester hours (excluding deficiencies) of graduate credit in Geology and related areas (in other sciences and mathematics), with at least twenty-one hours in Geology. Up to nine hours in related areas may be chosen with the consent of the graduate adviser. Areas of specialization in the Geology Department include Sedimentary Geology-Paleontology, Structural Geology, Petrology-Mineralogy, Environmental and Surficial Geology, Hydrogeology, and Geophysics.
2. All students are expected to attend Departmental seminars and are required to give one presentation in residence.
Students may enroll for credit in GEOL 660 for seminar presentations.

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

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

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

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

### History

**Adviser:**

H. Nicholas Hammer,

Room 4005, Friedmann Hall

The Master of Arts in History is designed to amplify and augment the training of students who completed concentrations in history at the undergraduate level. The program qualifies students for further graduate work in History. It also helps prepare students for such fields as teaching, government, and administration of historic agencies.

**Admission requirements**

An undergraduate major in History, or extensive preparation in the social sciences including at least fifteen hours of History. In the absence of such preparation, the departmental graduate committee may require appropriate remedial course work.

**Program requirements**

The program has three parts:

1. **Required courses:** HIST 690, Historical Method (3 hours); HIST 691, Historical Sources* (3 hours); HIST 692, Historiography (3 hours); two seminars (HIST 693 or 694), 12 hours. *In cases approved by the Graduate Adviser students may substitute HIST 695, Readings in Selected Fields, for HIST 691.

2. **Field of concentration:** Nine hours of advanced course work in European history (HIST 549-563) or United States history (HIST 520-527).

3. **Completion of course work with one of the following options:**

   a. Master's Thesis in the field of concentration (6 hours).

   b. Master's Essay in the field of concentration (4 hours).

   c. Minor field: six hours of course work chosen from European history (HIST 549-563), United States history (HIST 520-527), or public history (HIST 505-513).

   d. Other programs of additional course work approved by the Graduate Adviser.

**Home Economics**

**Advisers:**

Sue Coates, Linda Dannison

Department of Consumer Resources and Technology

Room 3018, Kohman Hall

**Master Of Arts In Home Economics**

Graduate programs in Home Economics, offered through the Department of Consumer Resources and Technology, are designed to provide a comprehensive program of studies in Home Economics or an in depth program of studies for the person desiring to strengthen specialized interest areas.

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

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

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

**Program requirements**

1. All master's programs include a minimum of 30 semester hours, fifteen of which must be of 600-level or higher and at least two hours of CRT 710, Independent Research.

2. Complete a total of twenty hours in Home Economics in graduate level courses in two or more areas, planned in consultation with departmental adviser.

3. Complete a minimum of ten hours at the graduate level in allied areas, planned in consultation with departmental graduate adviser.

Assistantships may be available to those wishing to pursue fulltime graduate study.

**Industrial Engineering**

**Program Adviser**

2007 Kohman Hall

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

**Master of Science in Engineering (Industrial)**

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 disciplines for advanced level professional practice in Industrial Engineering.

2. To prepare students for formal post-master's and doctoral programs, as their inclination and professional growth require.

Graduates of the program can look forward to career opportunities with higher levels of responsibility and remuneration. These include jobs at a variety of levels in manufacturing and service-related industries.

**Admission requirements**

1. Possess a baccalaureate degree in engineering or a related discipline.

2. Have an undergraduate grade point average of 3.0 for regular admission. Probationary admission may be granted to students with a grade point average of not less than 2.6.

3. 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 is 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 IE 697, Problems in Industrial Engineering 15 hours of electives, at least 6 of which will be from the Department of Industrial Engineering.

   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 3 hours of IE 697, Problems in Industrial Engineering 15 hours of electives, at least 6 of which will be from the Department of Industrial Engineering.

   b. A written report and oral presentation for IE 697.

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

**Core requirements common to both Options**

The core consists of 8 courses from which the student must elect any 6 (18 hours).

These courses have been selected to prepare students in advanced concepts in different areas of industrial engineering. The core courses are:

IE 507: Computer Integrated Manufacturing

IE 516: Design of Experiments and Regression Analysis

IE 606: Capital Budgeting and Cost Analysis

IE 611: Operations Research for Engineers

IE 612: Productivity and Operations Management

IE 630: Advanced Simulation Modeling and Analysis

IE 642: Ergonomics and Occupational Biomechanics

IE 604: Facilities Planning and Design

**Electives**

The specified number of elective courses may be taken at any level (500 or 600) from courses offered within the Department of Industrial Engineering or elsewhere in the University unless restricted by program requirements. No more than half of the credit hours needed for graduation can be at the 500 level.
Master of Science in Engineering Management

The objectives of the graduate program leading to a Master of Science in Engineering Management are:
1. To augment the professional and technical skills of students in specific areas.
2. To develop the capabilities to deal appropriately with resources available in commerce and industry (i.e., people, time, and money).
3. 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.

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.
2. Show evidence of completion of at least eight semester hours of mathematics and eight semester hours of physics and/or chemistry with a minimum overall grade average of 2.5 in these areas, as well as a 2.6 overall for the last 45 hours of undergraduate work.
3. Wherethe student’s background is deficient, foundation courses will be required.

Program requirements
1. Complete a minimum of thirty hours of graduate work, including 21 hours of required core courses and 9 hours of electives as follows:
   a. Required core of seven courses (21 hours):
      - IE 507, Computer Integrated Manufacturing
      - IE 508, Advanced Quality Management
      - IE 600, Principles of Manufacturing Administration
      - IE 606, Capital Budgeting and Cost Analysis
      - IE 612, Productivity and Operations Management
      - IE 614, Project Management
      - IE 697, Problems in Industrial Engineering
   b. A minimum of nine hours to be selected from graduate courses available in the Department of Industrial Engineering, or any other department within the University. The elected courses must be compatible with the overall program and the career objectives of the student. These courses must be approved by the Program Adviser prior to registration.
   c. The IE 697 project will be developed around a significant topic resulting from graduate study interest and will be written as a formal project report. This report will form the basis of the candidate's oral presentation.
   d. A 3.0 overall grade point average will be required for all graduate courses on the student’s permanent program.

Master of Science in Operations Research

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

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

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

Program requirements
1. Complete a minimum of thirty hours of graduate work distributed as follows:
   a. Seven hours of Mathematics:
      - MATH 560, Applied Probability
      - MATH 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.
2. A 3.0 overall grade point average will be required for all graduate courses on the student's permanent program.

Mathematics

Coordinator, Graduate Programs
Yousef Alavi,
Room 3319, 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 Biostatistics, the Master of Science in Statistics, and the Doctor of Philosophy in Mathematics.

Master Of Arts In Mathematics

Advisor:
Anthony Gioia,
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 elect additional courses or otherwise satisfy the requirements of the department.

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

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

The specific requirements for an M.A. in Mathematics with concentration in Statistics are listed under the master's degree program in Statistics. Students interested in a M.S. program in Applied Mathematics, 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's Degree Programs and Requirements

Master of Arts in Mathematics Education
Adviser: Christian Hirsch, 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 560 Number Theory
   - MATH 611 Mathematical Applications
   - MATH 615 Intermediate Analysis
   - MATH 616 Survey of Algebra
   - MATH 619 Computer Methods in Secondary Mathematics
   - MATH 649 Studies in Geometry
2. Complete nine semester hours of approved mathematics education courses selected from:
   - MATH 653 Studies in Teaching Secondary Mathematics
   - MATH 654 Curriculum Studies in Algebra and Geometry
   - MATH 695 Seminar in Mathematics Education
3. Complete six semester hours of approved electives, usually selected from:
   - CS 503 Programming the Microcomputer for Teachers
   - CS 504 Advanced Microcomputer Concepts 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 concepts and skills related to central themes in secondary school mathematics programs. These themes are given substance in courses that deal with topics enabling students to review and build on their previous course work, to explore new areas, to develop thorough understandings of concepts that are initiated in secondary school mathematics courses, and to achieve a high level of mastery of skills associated with these concepts.

Financial Assistance
The Department of Mathematics and Statistics offers 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 Applied Mathematics
Advisers: John Petro, Jay Treiman
Room 3319, Everett Tower

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

Program Requirements
1. Complete the following 26 semester hours of specified courses:
   - MATH 507 Numerical Analysis I
   - MATH 510 Applied Matrix Algebra
   - MATH 562 Statistical Analysis I
   - MATH 574 Ordinary Differential Equations
   - MATH 602 Mathematical Modeling
   - MATH 637 Numerical Linear Algebra
   - MATH 667 Optimization
   - MATH 699 Reading and Research Seminar (1 hr.)
2. Complete at least six 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 and Complex Variables
     - MATH 605 Optimization
     - MATH 607 Numerical Analysis II
   - Computer Science
     - CS 527 Theory of Computer Graphics
     - CS 580 Theory of Computation
     - CS 631 Advanced Data Structures
     - CS 680 Mathematical Theory of Formal Languages

Electrical Engineering
- EE 530 Power System Analysis
- EE 611 Operations Research for Engineers

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.

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
Advisers: John Petro, Jay Treiman
Room 3319, 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.

Program 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, a course in linear algebra, a course in probability, a course in advanced calculus, a knowledge of the programming languages PASCAL and FORTRAN, some experience with numerical methods, and a course in data structures. The courses at WMU which satisfy the admission requirements are: MATH 122, 123, 272, (374 or 230 and 274), (362 or 560), 570, and CS 111, 112, (201 or 306), 506. A promising student may be admitted with some deficiencies in these admission requirements. The missing work would then become extra program requirement.

The entering student will be expected to have two years of calculus, including multivariate calculus and differential equations, a course in linear algebra, a course in probability, a course in advanced calculus, a knowledge of the programming languages PASCAL and FORTRAN, some experience with numerical methods, and a course in data structures. The courses at WMU which satisfy the admission requirements are: MATH 122, 123, 272, (374 or 230 and 274), (362 or 560), 570, and CS 111, 112, (201 or 306), 506. A promising student may be admitted with some deficiencies in these admission requirements. The missing work would then become extra program requirement.

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, a course in linear algebra, modern algebra, probability, advanced calculus, numerical analysis, a knowledge of the programming languages FORTRAN and Pascal, and a course in data structures. The courses at WMU which satisfy the admission requirements are: MATH 122, 123, 272, (230 and 274) or 374, 330, (362 or 560), 570, 507, and CS 111, (201 or 306), 506, 112, (alternatively CS 331 recommended).
The Department of Mathematics and Statistics offers opportunities for financial support of graduate students through Graduate Assistantships and Fellowships.

**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 608** Linear Programming
   - **MATH 609** Studies in Applied Mathematics
   - **MATH 637** Numerical Linear Algebra
   - **MATH 673** Real Analysis

*MATH 690 Applied Mathematics Seminar (1 hr.)

**Admission requirements**
Applicants must have:
1. Bachelor of Science degree in Mechanical Engineering from an approved program.
2. Grade point average of 3.0 (A=4.0) or better in the last two years of undergraduate work. Applicants with degrees in other engineering fields or related disciplines may be considered for admission after they have satisfactorily completed the necessary undergraduate prerequisite courses prescribed by the department's graduate adviser.

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

**Program Requirements**
The Master of Science in Engineering (Mechanical) includes two areas of concentration: Solid Mechanics and Energy Analysis. The required program of study consists of thirty hours, of which six hours may be taken as a thesis option. A specific program of study for each student is determined in consultation with and is subject to the approval of the student's adviser.

The program of study includes the following six hours of mathematics, fifteen hours in the area of concentration, and nine hours of electives. Elective courses may be selected from mechanical engineering, other engineering departments in the College of Engineering and Applied Sciences, or in mathematics and the physical sciences. At least eighteen of the thirty hours must be from the Department of Mechanical Engineering. If the thesis option is selected and approved, three hours will be counted toward the area of concentration and three hours will be counted as elective.

A student with a baccalaureate degree who wishes to enroll in courses but does not plan to pursue a program leading to a master's degree, may enroll in courses for which prerequisite requirements are satisfied with permission to take classes (PTG) status. More than nine hours of work taken under PTG status will be considered part of a degree program.

**Music**
Advisers:
- Mel Ivey, Room 2146, Dalton Center
- Brian Wilson, Room 2117, Dalton Center

The Master of Music is designed to enhance the student's teaching, performing, research, and creative abilities in music. The School of Music offers coursework 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. Students are admitted to graduate study in music on the basis of transcripts. Exceptions to admission requirements may be granted if competency can be demonstrated through Preliminary Examinations. Admission to the graduate program does not imply that the student will be permitted to pursue a specific area of concentration (performance, composition, etc.). Program of study will not be determined until Preliminary Examinations are taken and the student has completed 6-10 semester hours of course work. At that time a recommendation for degree candidacy will be approved if the student has demonstrated a sufficient level of scholarship and musicianship.

Preliminary Examinations are administered upon entry to the graduate music program. Areas of examination include performance, music history, music theory, music therapy, functional piano, and conducting (including aural skills and instrument techniques).
MAS TER'S DEGREE PROGRAMS AND REQUIREMENTS

areas in which the student will be tested are determined by the choice of area of concentration.

Program requirements
The graduate student adviser 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 adviser provides information to the student regarding probable success in the degree program and any time limitation that may apply to the student's completion of degree requirements. Program of study in each of the five areas of concentration are as follows:

PERFORMANCE (Minimum of 30 hrs.;

Entrance Requirements
Preliminary Examinations in theory, history/literature, and performance. Sight-reading may be requested. The performance preliminary examination will determine if the student will be permitted to pursue this major area of concentration. Vocal majors must demonstrate piano skills and a proficiency in French, German, and Italian diction. Deficiency course work will not apply toward the degree.

1. Required courses: MUS 610, Introduction to Research in Music (3); MUS 600, Applied Music (6); MUS 690, Graduate Recital (2), including oral exam
2. Cognate music studies: composition, music education, history/literature, theory, jazz studies (9-12)
3. Electives to make a total of at least 30 semester hours.

COMPOSITION (Minimum of 30 hrs.;

Entrance Requirements
Preliminary Examinations in theory, history/literature, and piano. The student must have taken a minimum of 12 semester hours in composition and counterpoint, 18 semester hours in theory (which may include counterpoint), and 6 semester hours in music history/literature. Before the student will be admitted to this area of concentration, the faculty must review and approve the student’s original compositions in one of the major forms.

1. Required courses: MUS 610, Introduction to Research in Music (3); Music Composition 562, 563, 662 (6), MUS 700, Master’s Thesis in Composition (6), including oral exam
2. Cognate music studies: applied music, music education, history/literature, theory, jazz studies (9-12)
3. Electives to make a total of at least 30 semester hours.

CONDUCTING (Minimum of 30 hrs.;

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

1. Required courses: MUS 610, Introduction to Research in Music (3); Conducting 530, 531, 600 (6); MUS 694, Form in Music (2); MUS 690, Graduate Recital (2), including oral exam
2. Cognate music studies: applied music, composition, history/literature, jazz studies, music education, and performance (9-12)
3. Electives (not necessarily limited to music) to make a total of at least 30 semester hours.
4. Special information: Regular and frequent experiences in conducting are a requirement in this program. These experiences will include conducting an approved public school ensemble (at the student's own school) or an apprenticeship with a major University ensemble. Students who are selected as apprentices to the University ensemble must be full-time graduate students and participate in a major ensemble while in residence. Off-campus, Conducting 600 students must schedule frequent meetings on campus with the supervising teacher in addition to the site visitations by the instructor. The Graduate Recital (600) results from an examination of a complete public program, either with an approved school ensemble or with an ensemble of University students. At the direction of the student’s committee, piano study may be required in the program of study.

MUSIC EDUCATION (Minimum of 30 hrs.;

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

Entrance Requirements
Preliminary Examinations in theory and history/literature.

1. Required courses: MUS 610, Introduction to Research in Music (3); MUS 642, Philosophy of Music Education (2); MUS 650, Seminar in Music Education (2); MUS 691, Special Project in Music Education (3) or MUS 681, Research in Musical Behavior (2), or MUS 700, Master’s Thesis (6)*
2. Electives in music education (5-8)
3. Cognate music studies: applied music, composition, theory, history/literature, jazz studies (9-12)
4. Electives to make at least 30 semester hours.
5. (Every student is required to register for one of these culminating projects, each of which includes an oral exam.)

MUSIC THERAPY (Minimum of 30 hrs.;

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

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

1. Required courses: MUS 610, Introduction to Research in Music (3); MUS 680, Seminar in Music Therapy (2); MUS 681, Research in Musicial 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, 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 teaching certificate, is 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 and music theory.

Program requirements
The graduate student adviser 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 through 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 adviser provides information to the student regarding probable success in the degree program and any time limitation that may apply to the student’s completion of degree requirements. Program requirements include:
1. Nine hours from the Education core courses: ED 602, School Curriculum (3); ED 603; Social and Philosophical Foundations (3); ED 604; Psychological Foundations of Education (3)
2. 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); Electives in Music Education (2); MUS 691, Special Project in Music Education (2), including oral exam or MUS 681, Research in Musical Behavior (2), including oral exam
3. Four hours in applied music, music theory, or music history/literature
4. Six hours of electives, selected in consultation with the graduate adviser.

**Occupational Therapy**

Adviser:
David L. Nelson, Room 169, Wood Hall

The Occupational Therapy Department provides two graduate programs which lead to the Master of Science. The graduate-professional program for nontherapists and the graduate program for certified therapists.

**The Graduate-Professional Program**

This program is designed to prepare the student for the profession of occupational therapy while also earning the Master of Science. This twenty-eight month program of combined academic and field education (seventy-three semester hours) is intended for the student who has a baccalaureate degree in a major other than occupational therapy. The program is accredited by the American Occupational Therapy Association and the American Medical Association.

Graduates are qualified to take the American Occupational Therapy Certification Exam and are eligible for licensure/registration in those states regulating occupational therapy.

**Admission requirements**

To be eligible for the program, each applicant must present evidence of the following admissions criteria:
1. An earned bachelor’s degree from an accredited college or university.
2. A grade point average of 2.8 or better (3.0 effective fall 1989) in the last two years of undergraduate work.
3. Scores on the Graduate Record Examination - General (Apptitude) Test.
4. Be a registered occupational therapist.

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

To apply, the applicant must complete both The Graduate College application and the departmental application. For full-time study, initial enrollment should be scheduled for summer session. Part-time study may begin in any semester or session.

**Program requirements**

Completion of thirty-semester hours of graduate courses which include the following:
1. Occupational Therapy (21 hours)
   - OT 610, Professional Issues
   - OT 633, Administration in Occupational Therapy
   - OT 640, Theory in Occupational Therapy
   - OT 660, Research in Occupational Therapy
   - OT 686, Graduate Seminar
   - OT 700 or OT 710 (6 hours)
2. Electives in occupational therapy, related fields, or areas of specific interest selected with advice and consent of the Graduate Coordinator (6 hours)
3. Electives (3 hours)

**Paper Science and Engineering**

Adviser:
Raja G. Aravamuthan, Room 2016, McCracken Hall

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

**Admission requirements**

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

Applicants are encouraged to submit results of the Graduate Record Examination as a 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 need one or two background courses in Process Engineering, Mathematics, or Chemistry.

2. Chemical Engineering graduates will generally satisfy the Science, Engineering, and Mathematics requirements but will be required to take three Pulp and Paper systems graduate level courses (PAPR 690, 691, and 696) within the normal graduate program.

3. Chemistry graduates will generally satisfy the Science, Engineering, and Mathematics requirements but will be required to take three Pulp and Paper systems graduate level courses (PAPR 690, 691, and 696) within the normal graduate program.

4. Graduates of other science, engineering, or technology programs may be required to take background undergraduate courses in Process Engineering, Mathematics, Chemistry, or Physics, depending on the particular credentials of the applicant. Also, three graduate courses in Pulp and Paper systems (PAPR 690, 691, and 696) will be required within the normal graduate program.

If the graduates mentioned in paragraphs 2-4 (above) don’t have any pulp and paper experience, they are to take two basic undergraduate courses in pulp and paper processes (PAPR 203 and 204). In some instances, it may be recommended that the applicant register for one or more semesters of undergraduate course work in order to satisfy particular academic areas prior to applying for graduate admission. Many students have found it desirable to obtain a second bachelor’s degree in Paper Science or in Engineering. This approach is useful to
Program requirements

1. A minimum of fifteen hours of Paper Science selected from these twenty-four or more hours of offerings subject to the stipulations set above: Surface and Colloid Chemistry 600; Paper, Printing, and Inks 620; Coating Rheology 640; Mechanics and Optics of Paper and Fibers 600; High Polymer Topics 680; Pulp and Paper Operations I 690; Pulp and Paper Operations II 691; Grad Topics in Paper/Printing 695; and Paper Industry Control Systems 696.

2. A minimum of nine additional hours of graduate courses from Chemistry, Computer Science, Physics, Mathematics, Electrical Engineering, Industrial Engineering, or Mechanical Engineering, or Business Information Systems, selected with the consent of the graduate adviser. Approved courses include: Chemistry 520, 530, 550, 560, 570, 624, 626, 653, 661, 663; Computer Science 506, 625, 631; Physics 520, 563; Mathematics 506, 507, 510, 561, 562, 565, 660; Electrical Engineering 501, 605; Industrial Engineering 508, 604, 606, 608, 610, 611; Mechanical Engineering 531, 560, 573; Business Information Systems 690.

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.

Physics

Adviser: D. W. Halderson, Room 1135, Everett Tower

The Department of Physics offers a graduate program leading to the Master of Arts in Physics. Thirty semester hours of graduate credit are required. The objective of the program is to enable students to acquire the knowledge and technical skills needed in physics-related occupations and in graduate study at the doctoral level. Participation in research is an important part of the program and occurs in any of the three major fields:

1. Theoretical physics—for example, classical fields, nuclear structure, nuclear reactions, classical fields, and solid state.
2. Experimental physics—for example, atomic physics, optics, optical spectroscopy, nuclear physics, and materials analysis with accelerated ions. Equipment available for experimental research includes a vacuum ultraviolet spectrometer, and a 12 MeV tandem Van de Graaff accelerator.
3. Computer and instrumentation physics, including the use of minicomputers and VAX computers and assorted microprocessor-based microcomputers.

Admission requirements

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

Program requirements

The thirty semester hours of graduate credit must include the following:

1. Thirteen hours of required courses in physics, namely: Research Seminar 610; Quantum Mechanics I 622; Statistical Mechanics 624; Classical Mechanics 630; and Electricity and Magnetism 662. Substitutions for these courses may be made only with the approval of the graduate adviser.

2. Eleven additional hours from Physics, Mathematics, or other departments chosen with the consent of the graduate adviser.

3. Satisfactory completion of a Master's Thesis (6 hrs. of PHYS 700).

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

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

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

Admission requirements

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

Program requirements

In order to qualify for the Master of Arts in Political Science, the student, in addition to satisfying the general requirements of The Graduate College, must have a 3.0 GPA in the two options and must complete a minimum of forty-two semester hours of graduate credit.

Requirements in the two options may not be interchanged.

Requirements for the thesis option

1. Thirty hours of graduate credit in Political Science. With the written approval of the graduate adviser, the student may substitute up to two courses with a maximum of eight hours of cognate work.
Vicki Cox, student with a bachelor’s degree in experimental psychology is also offered for a development of a personal program to accommodate the academic and professional experience. Applicants without any experience may be required to complete an additional three hours of practicum following matriculation.

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

Applicants for the master's degree program in experimental or applied behavior analysis must have completed a minimum of eight hours of basic experimental laboratory courses including experimental analysis and experimental design. Equivalent courses at Western Michigan University are PSY 252/258 and PSY 330.

Applicants for the master's degree program in applied behavior analysis are expected to show evidence of some professional experience. Applicants without any experience may be required to complete an additional three hours of practicum following matriculation.

The application procedure includes submission of:
1. A transcript showing the completion of a major or minor in psychology
2. Graduate Record Examination (verbal and quantitative aptitude test) or Miller Analogies test scores
3. Three letters of recommendation
4. An autobiography describing academic interests and professional goals

Individuals applying for Fall admission and requesting test-taking assistance should apply by February 15. Applicants applying for winter admission (January) should apply by October 15. Applicants should apply directly to The Graduate College and the Department of Psychology.

Advisers:
M. K. Malott—Experimental
Wayne Fuqua—Clinical
Richard Tsegaye-Spates—Applied Behavior Analysis
Dale Brehmower—Industrial/Organizational

Howard Farris—School Psychology

Program requirements

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

Applied Behavior Analysis:
The applied behavior analysis program requires from psychology 36 hours of credit including PSY 700, Masters Thesis (6 hrs.), practicum activity (3 hrs.), and twenty-seven credit hours of Psychology. These twenty-seven hours include three hours of PSY 634, Advanced Statistics; three hours of PSY 608, Current Research in Applied Behavior Analysis, three hours of PSY 572, Behavioral Systems Analysis; three hours in learning, and twelve hours of credit in Applied Behavior Analysis from selected courses in behavior theory, technology, and applications. This program is designed to prepare the student for doctoral study or a professional position in one or more areas of psychological service. This thirty-six hour program is not designed to meet the requirements for licensure in the State of Michigan.

Clinical Psychology:
The clinical program requires a minimum of forty-eight hours, including three hours of clinical practicum, nine hours of statistics and research methods, and three hours of electives from psychology or a related discipline, and thirty-three hours of course work in psychology. These thirty-three hours consist of selected areas of study which include a general core curriculum (12 hrs.), behavior assessment and diagnosis (6 hrs.), methods of behavior change (9 hrs.), and behavior theory and applications (6 hrs.). These areas of specialization encompass a broad spectrum of clinical theory and application, or the theory and techniques of behavior analysis or behavior modification. An application for the thesis included in the research methods may be arranged with the adviser. The clinical program is designed to prepare the student to pursue doctoral study to obtain a professional position in mental health services and is intended to meet the requirements of the Michigan Licensure Law for Psychologists.

Industrial/Organizational Psychology:
This program requires a minimum of thirty-six credit hours, including nine hours in personnel selection, training, and development; learning and motivation (3 hrs.), statistical analysis (6 hrs.), and industrial/organizational research applications (6 hrs.). Six elective hours may be selected from within psychology or from a discipline related to the student’s program emphasis. A master’s thesis is required of persons planning to pursue a Ph.D. degree, while those with a professional orientation select a research project and a professional practicum (3 hrs.), in an industrial setting. The selection of elective courses outside the core, including the thesis option, is approved by the adviser for...
School Psychology: Applicants are admitted to the School Psychology Specialist degree program and receive the Master of Arts degree within that sequence. The master’s degree program requires a minimum of thirty-five credit hours, including six hours of electives from one or more fields related to School Psychology, as well as written validation of the required School Psychology competencies, or coursework including PSY 517, 519, 601, 602, 603, 608, 634, 655, 683, 686, and 668, Behavioral Assessment and Consultation. Multiple practicum and other school setting experiences are required within the apprenticeship training model of the program. Apprenticeships at this degree level have a basic educational behavior analysis and research skills, and the methods for applying them directly with clients within educational settings. Students are focused on learning characteristics of mainstream and exceptional children, as well as careful analyses of the educational environments in which the children perform. Educational and behavioral techniques focus on constructing educational environments to maximize each child’s potential according to learning characteristics. The master’s program is considered an integral part of the Specialist in School Psychology, and basic preparation for doctoral training in School Psychology.

Public Administration
Adviser: F.J. Mortimore, Center for Public Administration Programs B-1, Hillside Building-East

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

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

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

Program requirements
The Master of Public Administration degree requires between thirty-nine (39) and forty-five (45) semester hours of study for completion; this credit hour requirement can be reduced in certain cases by the Graduate Adviser when, through previous graduate study, the degree candidate has acquired skills deemed essential to the professional administrator. Full-time graduate students should find it possible to complete MPA requirements in four semesters (12 months) while part-time and mid-career degree candidates should find it possible to complete requirements for the MPA in approximately 24-48 months. Ordinarily, pre-career candidates (recent college graduates) will be required to complete all of the following program components, while in-career candidates (those with some previous administrative/supervisory experience) will be required to complete only the first three components listed below:

1. A professional core consisting of five courses: PSCI 631 (3), The Foundations of Public Administration, PSCI 633 (3), The Political Environment of Public Administration, PSCI 634 (3), Seminar: Professional Issues in Public Administration, PSCI 635 (3), Pro-Seminar in Agency Administration, and a course in organization theory.

2. A technical core consisting of five or six courses, providing training in budgeting, finance, communication skills, statistics, administrative law, personnel administration, program evaluation, and computer usage.

3. An area of specialization or concentration which provides each candidate an opportunity to develop an in-depth understanding of some particular application of administrative activity, such as health care administration, social agency administration, personnel administration, budgeting and financial administration, or local government administration.

4. Professional field experience consisting of a three to four month internship for pre-career students with some agency of city, county, regional, state, or federal government, or with another appropriate agency.

Science Education
Adviser: Robert H. Poel, B-329 Ellsworth Hall

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

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

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

1. Nine hours from the following education core courses:

   b. ED 602, School Curriculum

   c. ED 603, Social and Philosophical Foundations

   d. ED 604, Psychological Foundations of Education

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

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

Social Work
Director of Admissions and Student Services
Room 402, Moore Hall

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

In addition to the core curriculum, students elect a concentration in either of the areas of Social Treatment or Social Policy, Planning, and Administration. There are five major content areas in the curriculum: Social Policy, Social and Behavioral Theory, Social Welfare Research and Technology, Social Work Practice (Social Treatment Concentration, and Social Welfare Policy, Planning, and Administration Concentration); and Field Education, in conjunction with the basic M.S.W. program. Students may pursue areas of individual special interest such as Community Organization, Criminal Justice Corrections, Family and Child Welfare, Industrial Social Work, Minority Issues, Rural Mental Health, Social Justice, School Social Work, Social Work in Health Care, Social Work Licensing and Regulation.
and Women's Issues. Advisers will assist students with selection of appropriate courses within the School and University which relate to the area of interest being pursued. In addition, the school offers opportunity for participation in an interdisciplinary Graduate Specialty Program in Alcohol and Drug Abuse (SPADA), a multidisciplinary Graduate Specialty Program in Gerontology, and a Graduate Specialty Program in Holistic Health Care.

**Admission Requirements**

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

1. Evidence of adequate academic preparation for graduate study in social work. This includes consideration of both undergraduate performance and area of study. (Undergraduate preparation in the social and behavioral sciences and social work/social welfare is given particular attention.)

2. Evidence of personal qualifications considered desirable for successful social work practice. These include motivation for a human service profession, personal maturity, and leadership ability.

**Program Requirements**

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

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

3. Waiver of up to twelve semester hours of required courses, except field work courses, may be arranged upon verification of successful completion of course work covering the same content. Credit hours for all courses thus waived must be substituted for with an equal number of graduate credit hours from transfer credit and/or enrollment in courses. (While undergraduate course work may be a basis for waiver, approved graduate courses must be completed to achieve the M.S.W. degree requirement of 60 hours.) Waivers are arranged on a course-by-course basis through advisement. Students who have successfully completed the first year of an M.S.W. program from an accredited school of social work may enter the second year of MU’s M.S.W. program.

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

In addition to the regular two-year, full-time program, the School offers a planned part-time program on campus and a part-time, off-campus degree program located in Grand Rapids in cooperation with the Division of Continuing Education. Persons interested in part-time programming should contact the Director of Admissions and Student Services.

Financial aid is available to a limited number of qualified, full-time students. Information regarding the various types of available assistance may be obtained by writing to Director of Admissions and Student Services, School of Social Work, Room 402 Moore Hall.

**Sociology**

**Director:**

**Graduate Studies:**

Stanley S. Robin, 2413, Sangren Hall

Ronald C. Kramer, 2402 Sangren Hall

**Disciplinary Master’s Option I**

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

**Admission Requirements**

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

**Program Requirements**

1. Complete at least thirty graduate credit hours, selected in consultation with the departmental master’s adviser. At least twenty hours, including thesis, must be in sociology; up to ten hours may be in an approved cognate area. SOC 581, 683, 693, and 700 are required of all master’s students.
2. Maintain a grade-point average of 3.0 or better in all course work.
4. Pass an oral examination on the thesis or the essay.

**Applied Master’s Option II**

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

**Admission Requirements**

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

**Program Requirements**

1. Complete 40-42 graduate credit hours: fifteen hours in 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 (intership essay) at the conclusion of the program. A thesis option is possible with the addition of two credits, under special circumstances. Consult the departmental master’s adviser for the exercise of this option.

**Financial Support**

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

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

**Special Education**

Advisers:

Alonzo Hannahford, Barbara Harris, Dona Icabeone, Abraham Nicolaou, Elizabeth Patterson, Donald Sellin.

Department office is located in Room 3506, Sangren Hall.

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

**Prerequisites**

1. Michigan Teaching Certificate or equivalent.
2. A minimum of one year of successful teaching experience for the Master
A comprehensive written examination
2. A minimum of nine hours of credit in
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1. Initial Endorsement Program
Certified regular classroom teachers
in the field of Special Education must
Program requirements
1. A point-hour ratio of at least 2.6 (30
effective fall 1989) during the last sixty
semester hours of undergraduate study.

3. A comprehensive written examination
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Statistics
Advisers:
Joseph McKeen, Michael Stoline
Room 3319, Everett Tower

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

Option I (Theoretical)
This option combines a regular Master of Arts in Mathematics with substantial work in statistics. A graduate from this option is well prepared to proceed into a doctoral program in statistics. Students receive excellent training for professional employment in the field of statistics with concentration in Statistics.

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

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

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

Admission requirements
For admission to this option, candidates must have completed an undergraduate program containing a substantial amount of mathematics, including a 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, 522, 660, 682, 664, and 680
2. Three of the following: MATH 563, 566, 661, 663, 665, 666, 667, 669
3. Two hours of MATH 691 and/or 696
4. Three credit hours of MATH 688 or 712
5. Pass the Department Graduate Exams in Statistics covering material in MATH 562, 660, and 662

Vocational Education
Adviser:
Jack T. Humbert,
Room 1009, Distributive Education Building

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

Admission requirements
An undergraduate minor of twenty hours in distributive education, home economics, industrial arts, industrial education, or vocational-industrial education, plus professional preparation in teacher education, including directed or supervised student teaching.

Program requirements
Complete at least thirty graduate credit hours, selected in consultation with the program adviser. The program of study will consist of 3-9 hrs. of Professional Education courses, 15-18 hrs. of Professional Vocational courses and Technical Content courses, and 3-9 hrs. of electives.

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 Specialty

Alcohol And Drug Abuse
Adviser:
Janice Dekker,
Room B-305, Ellsworth Hall

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

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

Admission requirements
Students must be accepted by The Graduate College and admitted to a master’s, specialist, or doctoral degree program. Persons who have previously completed a graduate degree or are eligible for the Graduate Directory may apply for admission to the SPADA Program only.

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

- **Biol 507**—The Biology of Addictive Drugs (3 hrs.)
- **SOC 617**—The Etiologies of Substance Abuse (3 hrs.)
- **Biol 603, CECP 631, SOC 618, or SWRK 663**—Seminar in Substance Abuse (3 hrs.)*
- *These courses are cross-listed in the departments and school indicated and graded on a Credit/No Credit basis.

SPADA participants must elect one of the following courses outside their department or discipline:

- **PSY 596** Human Drug Use and Abuse (3 hrs.)
- **PSY 663** Marital Therapy (3 hrs.)
- **SOC 647** Social Epidemiology (3 hrs.)
- **SOC 667** Evaluation Research (1 hr.)
- **SWRK 636** Theory and Practice of Group Treatment (3 hrs.)
- **SWRK 667** Seminar in Social Policy, Planning, and Administration (3 hrs.)
- **HHS 530** Clinical Theory for Health and Human Services (variable topics course) (3 hrs.)
- **Women and Substance Abuse Treatment**
  - Legal and Illegal Drugs
  - The Family and Addiction
  - Drugs and the Paraphylly
- **HHS 589** Applied Alcoholism Recovery Techniques (3 hrs.)

### 3. Chemistry background through two courses in biochemistry.

#### General Course requirements

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

- **BMED 632** Advanced Techniques in Electron Microscopy, 4 hrs.
- **BMED 710** Independent Research—Varied Topics in Applied Electron Microscopy, 3 hrs.
- **BMED 712** Professional Field Experience—Working experience in a professional electron microscope laboratory, 6 hrs. (Fall or Winter)
- **BMED 537** Embryology, 3 hrs. (Winter)
- **BMED 554** Histological Techniques, 3 hrs. (Spring)
- **BMED 574** Histology, 3 hrs. (Winter)

*To be arranged as projects between W.M.U. and a commercial Electron Microscope Laboratory.

**To be arranged between W.M.U. and the Argonne National Laboratory.**

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

### Electron Microscopy

**Adviser:** Leonard Beuving, Room 5060, McCracken Hall

The Graduate Specialty Program certificate will be awarded to those candidates who have completed a minimum of 16 credit hours of prescribed course and laboratory work beyond a Master of Science degree. The candidate must demonstrate to the satisfaction of a committee composed of three members (2 of which must be Biomedical Sciences Faculty) competence in preparation of specimens, operation and maintenance (reasonable and required) of equipment, and photographic processing and printing. The evaluation of competence will be by an oral or written examination and practical demonstration of skills. The purpose of the program is to allow students 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 microscope 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).

### Gerontology

**Adviser:** Ellen K. Page-Robin, B108 Henry Hall

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

#### Admission requirements

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

#### Program requirements

In addition to completing the requirements of the degree program, persons seeking the Graduate Specialty Program in Gerontology must complete a course of study totaling 20 semester hours. Some required courses for the specialization may be satisfied with regular degree requirements. Three courses are required: Blind Rehabilitation 599.

Gerontology, 3 credit hours. Health and Human Services 660, Multidisciplinary Seminar in Gerontology, 3 credit hours; and Health and Human Services 662, Program Planning and Development in Gerontology, 3 credit hours. Up to six hours of thesis/dissertation or field experience from the student’s graduate department may also be counted, provided the thesis/dissertation topic or the field placement is certified as relevant to gerontology by the Gerontology Adviser.

The remainder of the 20-hour requirement will be acquired through elective courses chosen from a list of approved courses available through the Gerontology Program Office.

### Holistic Health Care

**Adviser:** Molly Vass, B112 Henry Hall

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

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

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

#### Admission requirements

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

#### Program requirements

The academic core and clinical program consists of fifteen semester hours, distributed in the following manner:
Policy, Planning, And Administration

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

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

Admission requirements
Students must be admitted by The Graduate College and the School of Social Work, present evidence of a master's degree in social work with a major in social treatment, have completed a research and statistics course, be or have been employed in a health or human service organization, and complete an interview as conditions of acceptance.

Program requirements
Completion of a minimum of eighteen hours of graduate courses. A minimum of twelve hours must be completed within the policy, planning, and administration concentration in the School of Social Work, and six hours of electives must be completed from the list approved by the policy, planning, and administration faculty.
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. Reservations indicated on the Certificate of Candidacy must be submitted during the first semester or session of enrollment.
3. A point-hour ratio of at least 3.25 must be secured in all graduate work undertaken beyond the bachelor’s degree.
4. Attainment of satisfactory scores on standardized tests approved for each program by the Graduate Studies Council. A satisfactory score usually is considered to be one that is at the fiftieth percentile or better.
5. Acceptance by The Graduate College and an academic unit for a definite program of study.

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

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

Educational Leadership
The Department office is located in Room 3312, Sangren Hall.
The Specialist in Education is offered to prepare persons for leadership roles in educational administration. The Ed.S. is a terminal academic degree appropriate for those students who wish to earn a post-master’s academic degree but who do not plan to continue formal academic studies beyond the Ed.S. Thus, persons seeking admission to the Ed.S. program should be fairly definite about academic and professional goals and aspirations.

Admission Procedures
The procedures for admission to an Ed.S. program are identical to those required for admission to a doctoral program. Additionally, a person admitted to the Ed.S. degree program will possess, at time of admission, or will fulfill, prior to graduation, the requirements of the State of Michigan for certification as a school administrator. Consult the program adviser for the types of certification available and the basic requirements for certification.

Program Requirements
1. All requirements for candidacy and graduation specified by The Graduate College.
2. Possession of, or completion of State-approved department requirements for a specific type of administrator certification valid in the State of Michigan.
3. Completion of degree requirements, including department core requirements and requirements for a specific type of administrator certification. Department core requirements for the Ed.S. degree include accepted credit in the approved program of study for the following degree requirements:
a. EDLD 602: Educational Leadership
b. EDLD 640: Introduction to Research
c. Six hours in EDLD 712, Professional Field Experience.
d. Six hours in EDLD 720, Specialist Project.

Students who plan to seek admission to the Ed.S. program are advised to consult with the Department Chair or the Program Coordinator for Educational Administration prior to (a) submission of application materials and (b) enrollment in courses. Students should note that completion of courses prior to admission is not a
guarantee of admission. Students are further advised that admission to U.S. programs occurs on an infrequent basis, i.e. during Fall and Winter semesters and at such other times as the Department deems appropriate.

School Psychology
Howard Farris,
Program Coordinator
Vicki Cox, Program Secretary
Room 255, Wood Hall
The Specialist in Education in School Psychology is a competency based program designed to prepare persons for careers in School Psychology. Applicants are admitted to the specialist program and receive the master’s degree in the process of completing the specialist sequence. The program has adopted an apprenticeship training model in which the applicant receives a personal appointment to one faculty adviser and two faculty sponsors. These faculty 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 a careful analysis of the various educational environments in which these children are required to perform. The student masters educational and behavioral techniques which focus on constructing educational environments to maximize each child's personal set of learning characteristics.

Completion of the specialist degree is required for recommendation for temporary approval. After one year of successful practice as a school psychologist, the graduate is eligible to be recommended for full approval as a Michigan School Psychologist. Applicants must apply directly to both The Graduate College and the Department of Psychology. Those applying for Fall admission should submit all materials by February 15, while those applying for Winter admission (January) should submit materials by October 15.

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

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

Program requirements
Upon successful completion of a program of 65 graduate credit hours, both a Master of Arts in Psychology and a Specialist in Education in School Psychology are awarded. This is a competency based program approved by the Michigan State Board of Education. Degree requirements may be satisfied by written validation of a specified set of skill competencies or by completion of designated courses, or both. Responsibility to ensure proper experiences for competency validation or course work completion is placed on the student and the faculty training committee. The training sequence will include:

1. Up to nine credit hours of prerequisite course work may be required of an entering student who does not have sufficient undergraduate training in behavior analysis or who fails to pass an exam in basic applied behavior analysis concepts. The need for such prerequisites and the specific courses will be decided by the major advisor, and these hours will not be included in the 65 credit hours required in the program.

2. Competency validation and/or course work in Psychology 517, 519, 601, 602, 603, 608, 634, 655, 658, 683, and 686. PSY 570 is recommended but not required.

3. Practical experiences in at least two settings.

4. Six hours of course work outside of Psychology.

5. Completion of a 600 clock hour (12 credit hour) internship experience, half of which must be in a school setting under supervision of a fully approved school psychologist or consultant and a WMU faculty member.

6. Specialization in one or more topical areas, which may include: (a) educational assessment and planning; (b) educational technology; (c) behavior analysis and modification; (d) curriculum design, programming, and coordination; (e) teacher consultation techniques; (f) parent and child counseling; (g) work with deaf, blind, speech, or orthopedically impaired; (h) American sign language and braille; (i) work with general and/or specific social and academic behavior adjustment problems; (j) mainstreaming procedure and models; (k) research methods; (l) administration and program management; (m) interdisciplinary teaming approaches; (n) criterion referenced behavioral assessment techniques; (o) professional ethics and legal issues; and (p) educational system analysis, synthesis, and evaluation.

7. Completion of a six-credit-hour Specialist Project.

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

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

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

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

A student will be expected to 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 expected must be approved by the Graduate Studies Council. Appropriate competency in language, statistics, and computer programming has been established for each program and approved by the Graduate Studies Council.

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

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

General Requirements For A Doctoral Degree

Admission

See Calendar of Events for application deadline.
1. See specific program description to determine the minimal entrance requirements.
2. Official transcripts of all courses taken beyond high school showing the degrees earned.
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. Names and addresses of three references who may be consulted.
5. Evidence of appropriate background, objectives, and communication skills demonstrated in an autobiographical statement.
6. Attainment of satisfactory scores on standardized tests approved for each program by the Graduate Studies Council. Graduate Record Examination scores on the Aptitude Test are required for each doctoral program except the program in Special Education which requires the Miller Analogies Test. The Miller Analogies Test is also required for the doctoral program in Psychology. A satisfactory score usually is considered to be one that is at the fiftieth percentile or better.
7. Admission by both The Graduate College and the unit offering the doctoral program.

Applicancy
1. A student admitted with less than twenty hours of graduate study must request status as an applicant after completing at least a semester hour of graduate work, whichever comes first. A student should present this request to the adviser who will submit a recommendation to The Graduate College.
2. A student admitted with more than twenty hours of graduate study must request status as an applicant after completing one full semester of graduate work at Western Michigan University or forty semester hours of graduate work, whichever comes first.
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. Completion 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 student who is an official applicant for a doctoral degree must seek candidacy no later than the end of the second calendar year or its equivalent and meet the following requirements:
1. An overall point-hour ratio of 3.25 in all graduate work completed.
2. Completion of all basic course requirements.
3. Completion of the research tool and/or language requirements.
4. Successful completion of the comprehensive examinations established for the program.
5. Endorsement by the Doctoral Dissertation Committee of the plan for the student’s dissertation.

Graduation

See Calendar of Events for Application deadline.
1. Completion of a minimum of ninety hours of courses, seminars, research, and other requirements including fifteen hours of dissertation with an overall point-hour ratio of at least 3.25. Honor point deficiencies acquired in credits earned at Western Michigan University cannot be made up by credits earned at another university.
2. Three years of study of which at least an academic year of two consecutive semesters must be spent in full-time study.
3. 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 College.
4. Consultation with the Dissertation Assistant in The Graduate College before registering for Doctoral Dissertation (15 hrs.) in order to be informed about the regulations pertaining to the preparation of the manuscript.
5. Students conducting research that involves human or animal subjects must have prior approval of the research proposal by the appropriate University board, thus ensuring compliance with the regulations for the protection of such subjects. For more information, call Research and Sponsored Programs, 387-3670.
6. Approval of the dissertation by the Doctoral Dissertation Committee, composed of a minimum of three members of the Graduate Faculty, at least one of whom shall be from outside the student’s major department or unit. The dissertation must be in a form acceptable to the unit and The Graduate College.
7. Satisfactory performance on the doctoral examination.
Programs Leading To A Doctoral Degree

Counselor Education and Counseling Psychology

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

Five doctoral program options are offered through the Counselor Education and Counseling Psychology Department. These programs, leading to a Doctor of Education degree, are governed by training committees comprised of Department faculty. The Counseling Psychology Training Committee is responsible for the Counseling Psychology doctoral program. The Counseling and Related Educational Program Training Committee is responsible for all other departmental doctoral programs: Community Agency Counseling; Counselor Education and Supervision; Pupil Personnel Services in Schools; and Student Personnel Services in Higher Education.

Admission
Admission to a doctoral program is a two-step process. Applications first must be submitted to The Graduate College. Persons admitted by The Graduate College then may be considered for admission to a specific program by the appropriate departmental training committee. Applicants should request current admission information from The Graduate College and the Department.

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

Counseling Psychology

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

1. Basic course requirements Psychology core (53 hrs.)
   a. Methodology (9 hrs.)
   b. Cognitive-affective basis of behavior (3 hrs.)
   c. Biological basis of behavior (3 hrs.)
   d. Social basis of behavior (6 hrs.)
   e. Individual differences (9 hrs.)
   f. Other scientific foundation courses (3 hrs.)
   g. Knowledge and use of ethics (3 hrs.)
   h. Supervised practica (17 hrs.)

2. Advanced preparation and specialization (14-15 hrs.)
   a. Psychodiagnostics (6 hrs.)
   b. Counseling psychology theory and practice (8-9 hrs.)

3. Electives (9 hrs.)
4. Internship (4 hrs.): 2,000 clock hours in an American Psychological Association approved setting or the equivalent setting.
5. Doctoral Dissertation (18 hrs.)
   a. Dissertation Seminar (3 hrs.)
   b. Doctoral Dissertation (15 hrs.)

Total Hours 98
All Counseling Psychology students are expected to demonstrate competencies in psychological theory, practice, and research by passing a series of doctoral comprehensive examinations in the following areas: 1) general knowledge of psychology; 2) counseling psychology information and knowledge; 3) scholarly inquiry and communications; and 4) practitioner skills.

Community Agency Counseling

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

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

Counselor Education and Supervision

The Department recognizes its responsibilities to educate persons who will become the counselor educators of the future and in this way contribute to the further development and enhancement of the counseling profession. Doctoral students pursuing this specialization are expected to demonstrate 1) a wide range of individual and group counseling skills; 2) a sound theoretical foundation in counseling; 3) teaching and supervision competencies; 4) an understanding of academic program development, curriculum and administration; 5) research skills; and 6) competencies associated with being an educational leader.

Students are expected to involve themselves in appropriate activities of the Department, College, University, and of relevant professional associations. Graduates of the program are prepared to function productively and effectively as counselor educators and supervisors in colleges, universities, and in governmental and regulatory agencies.

Pupil Personnel Services

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

Student Personnel Services in Higher Education

The student personnel option in higher education has been developed to prepare individuals to administer college and university student personnel programs.
DOCTORAL DEGREE PROGRAMS AND REQUIREMENTS

Admission requirements

Students completing the graduate program should be prepared to administer programs related to or incorporating the services of 1) admissions, 2) housing and residential life, 3) academic and special advisement, 4) career development, planning, and placement, 5) financial aids, 6) records and registration, 7) international student advisement, 8) student activities and organizations, and 9) other student support systems. Students desirous of emphasizing course work related to counseling center positions should consider the Counseling Psychology program, Department of Counselor Education and Counseling Psychology.

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 evidences in constitutional provisions, legislative enactments, administrative decisions, and 6) an understanding of the development of influencing strategies relevant to institutional decision-making processes and political realities.

Educational Leadership


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

Doctoral programs of study are offered in 1) educational leadership, 2) K-12 school administration, 3) human resource development, and 4) measurement, research, and evaluation.

Students who plan to seek admission to a doctoral program in the Department of Educational Leadership are advised to consult with the Department Chair or a Program Coordinator prior to (a) submission of application materials and (b) enrollment in any courses prior to admission. Students should check that completion of courses prior to admission is not a guarantee of admission or a guarantee that credit earned will be included in a doctoral program of study. Students are advised that admission to doctoral programs occurs on an infrequent basis, i.e., during Fall and Winter semesters and at such other times as the Department deems appropriate.

Students who plan to seek admission should note that the Department typically receives more applications for admission than the number of students who can be admitted. Thus, no guarantee of admission can be given or should be inferred prior to formal action by the Department.

Admission requirements

1. Regular admission in The Graduate College. Application materials which must be submitted to The Graduate College include:

   a. Official transcripts of all courses taken beyond high school showing the degree earned.
   b. A grade point average of at least 3.25 for all graduate work undertaken beyond the bachelor’s degree.
   c. A completed application form, including the six references who may be consulted.
   d. Evidence of appropriate background, objectives, and communication skills demonstrated in an autobiographical statement.
   e. Attainment of satisfactory scores on the Verbal and Quantitative sections of the Graduate Record Examination.
   f. Attainment of a satisfactory score on the English Qualifying Examination.

2. Successful completion of a core examination if required within an area of specialization.

Program requirements

1. All requirements for Applicancy, Candidacy, and Graduation as specified by the Graduate College.
2. Completion of doctoral degree core requirements within the time limit for completion of degree requirements (unless waived).
3. Completion of requirements for an area of concentration if any area of concentration has been selected.
4. Successful completion of a core comprehensive examination administered by the department.
5. Successful completion of a specialty comprehensive examination administered by the doctoral supervisory committee.
6. Successful completion of a cognate examination if required within an area of concentration.

Mathematics

Gary Chartrand, Chairperson of Advisers Room 3319, Everett Tower

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

Admission requirements

A student may enter this program with a master’s degree or directly upon completion of a bachelor’s program. In addition to satisfying the general admission requirements of The Graduate College, the student must have acquired a sufficient level of mathematical training with satisfactory grades as determined by the Department Doctoral Committee. Upon entrance to the program the student is assigned an adviser who assists him/her in planning his/her program until he/she reaches the point of having a Dissertation Adviser 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 Preliminary Examinations. Graduate courses are offered (usually analysis, graph theory or topology), and a semester course in Complex Analysis. 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) five additional approved courses including at least one graduate course in each of 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 Department Preliminary Examination. For a student concentrating in applied mathematics, Probability, or Statistics, for students specializing in college mathematics teaching these requirements are (1) two-semester graduate sequences in Algebra and in one other approved area in which preliminary examinations are offered (usually analysis, graph theory or topology), and a semester course in Complex Analysis; (2) five additional approved courses including at least one graduate course in each of Applied Mathematics, Probability/Statistics, and Computer Science. The balance of 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.

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Mathematics

Gary Chartrand, Chairperson of Advisers Room 3319, Everett Tower

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

Admission requirements

A student may enter this program with a master’s degree or directly upon completion of a bachelor’s program. In addition to satisfying the general admission requirements of The Graduate College, the student must have acquired a sufficient level of mathematical training with satisfactory grades as determined by the Department Doctoral Committee. Upon entrance to the program the student is assigned an adviser who assists him/her in planning his/her program until he/she reaches the point of having a Dissertation Adviser 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 Preliminary Examinations. Graduate courses are offered (usually analysis, graph theory or topology), and a semester course in Complex Analysis. 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) five additional approved courses including at least one graduate course in each of 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 Department Preliminary Examination. For a student concentrating in applied mathematics, Probability, or Statistics, for students specializing in college mathematics teaching these requirements are (1) two-semester graduate sequences in Algebra and in one other approved area in which preliminary examinations are offered (usually analysis, graph theory or topology), and a semester course in Complex Analysis; (2) five additional approved courses including at least one graduate course in each of 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.
Statistics offers opportunities for financial Graduate Assistantships, University following the defense and examination, the consists of a colloquium talk presented to chaired by the Dissertation Adviser, normally creative research, and, in general, further dissertation, which will be read and judged the Department of Mathematics and Adviser, the candidate is required to do the Committee is to receive copies of all these this individual is designated as the Outside Member. At least seven days prior to the final dissertation defense, the Doctoral Committee is to receive written reports (including recommendation) on the candidate’s dissertation from each of the Dissertation Adviser, the Second Reader, and the Outside Member. Each member of the Dissertation Committee is to receive copies of all these reports prior to the dissertation from. Under the direction of the Dissertation Adviser, the candidate is required to do creative research, and, in general, further higher knowledge in some area of mathematics. The findings of the candidate must be compiled in scholarly form in a dissertation, which will be read and judged by the Dissertation Committee. The candidate’s final dissertation oral defense, chaired by the Dissertation Adviser, normally consists of a colloquium talk presented to the Department of Mathematics and Statistics, after which an oral examination on the candidate’s dissertation is conducted by the Dissertation Committee. Immediately following the defense and examination, the Dissertation Committee meets to consider whether the dissertation should be approved and whether the candidate has passed the examination. These two recommendations are made to the Doctoral Committee.

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

Concentration In Graph Theory and Computer Science
Advisers:
Gary Chartrand, Room 3319,
Everett Tower, Dionysiou Kouantonis, Dalia Motzkin, Kenneth L. Williams,
Room 4045, Friedmann Hall

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

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

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

Program requirements
1. Departmental Graduate Examinations: As early as possible, a student must pass Departmental Graduate Examinations in:
   a. Linear Algebra (530),
   b. Topology (622), and
   c. Real Analysis (673).
2. Coursework and Dissertation (minimum of 90 hours):
   a. Approved two-semester graduate sequences in each of: graph theory, algebra, and probability or statistics,
   b. An approved graduate course in each of: combinatorics, measure and integration, scientific programming, advanced data structures, analysis of computer algorithms, and mathematical theory of formal languages,
   c. An approved seminar discussing relationships between graph theory and computer science,
   d. Approved additional graduate courses, reading courses, and seminars;
   e. Research and dissertation (normally 15 hours) which may be in graph theory and/or computer science.
3. Departmental Preliminary Examinations: Each student in the doctoral program, Graph Theory and Computer Science option, must pass the Departmental Preliminary Examinations in three areas: Graph Theory, Computer Science, and Algebra.

4. Research tools. For students in the doctoral program, Graph Theory and Computer Science Option, these will consist of competence in applied mathematics (two approved graduate courses) and an approved foreign language, or two approved foreign languages.

Administration
The doctoral program, Graph Theory and Computer Science Option, is jointly administered by the Departmental Doctoral Committee and the Graph Theory and Computer Science Program Committee.

Financial assistance
The Department of Mathematics and Statistics offers opportunities for financial support of graduate students through Graduate Assistantships, University Fellowships, 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
Adviser:
Gerald Sievers, Room 3319,
Everett Tower

Admission requirements
Students in the doctoral program, Statistics Option, will be those who have been admitted to the doctoral program of the Department and who have been designated as “Statistics Option” at the time of admission. A student in the regular doctoral program can request a change of status to the Statistics Option. Admission and change of status requests for the doctoral program, Statistics Option, will be considered by the Statistics Doctoral Subcommittee and final decisions will be made by the Departmental Doctoral Committee.

The usual admission requirements of The Graduate College and the Department must be met. In addition, a student 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 advisement of students in the doctoral program, Statistics Option. Upon entrance to the doctoral program, Statistics Option, the student will be assigned an adviser by the Statistics Doctoral Subcommittee and the Departmental 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 and the Statistics Doctoral Subcommittee, (s)he will be assigned a dissertation adviser. The candidate and the dissertation adviser 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 Subcommittee and approved by
DOCTORAL DEGREE PROGRAMS AND REQUIREMENTS

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),
   b. Real Analysis (673), 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, 660, 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 of variance;
   b. An approved graduate course in measure theory;
   c. An approved cognate of 15 credit hours in computer science and/or numerical analysis;
   d. An approved professional and/or statistical laboratory experiences (not to exceed 10 credit hours);
   e. Additional approved graduate courses and seminars; and
   f. Research and dissertation (normally 15 hours).

3. Departmental Preliminary Examination: Each student in the statistics concentration must pass Departmental Preliminary Examinations in the areas: Linear models and design, and two of the following—analysis, algebra, 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 selected from foreign languages, American sign language, computer usage, or advanced statistics. The doctoral candidate will also show evidence of an ability to interpret, integrate, and discuss research data by the satisfactory completion of comprehensive examinations in two areas of concentration and the preparation of a review paper of publishable quality.

   The program is arranged to provide formal evaluations of the student as he/she progresses from baccalaureate apprentice to doctoral applicant with the completion of the Master's Thesis, the completion of required course work, and completion of a fifteen credit hour dissertation. In addition to the required hours of formal course work, research activity, and professional experience, the student is required to demonstrate competence in two research tools selected from foreign languages, American sign language, computer usage, or advanced statistics. The doctoral candidate will also show evidence of an ability to interpret, integrate, and discuss research data by the satisfactory completion of comprehensive examinations in two areas of concentration and the preparation of a review paper of publishable quality.

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ADOPTAL DEGREE PROGRAMS AND REQUIREMENTS

Public Administration

Adviser: Peter Kobrak, Center for Public Administration Programs B-1, Hillside Building-East

The Doctoral program in 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 sector.

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.

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 cores which contain the following courses:

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

- **ADMINISTRATIVE LEADERSHIP CORE (9 hours)**
  - PADM 677 The Public Administrator (3 hrs.)
  - PADM 685 Bureaucracy and Society (3 hrs.)
  - PADM 680 Intellectual Foundations of Public Administration (3 hrs.)

- **POLICY RESEARCH CORE (15 hours)**
  - PADM 691 Statistics for Public Administrators (3 hrs.)
  - PADM 693 Action Research Project (3 hrs.)
  - PADM 673 Quantitative Public Policy Analysis (3 hrs.)
  - PADM 694 Qualitative Research Methods (3 hrs.)

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

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

The third option, the biology/biomedical sciences option, requires a concentration of 40 graduate hours in biology, biomedical sciences, biochemistry and related fields such as biostatistics and health related issues in addition to graduate work in biology and biomedical sciences. This option is designed for students who want background depth in the biological/biomedical sciences and who are likely to teach science and science education methods courses for both preservice and in-service teachers, as well as teachers of college science courses, or researchers in the area of science education.

Science Education

Adviser: Robert H. Poel, Room B-329 Ellsworth Hall

The Doctor of Philosophy Degree in Science Education involves a minimum of ninety semester hours of graduate work in a broad based science program with course electives in more than one science. Three options of specialization or concentration are possible.

In the first option, 20 hours of graduate work in one science, selected from Biology, Biomedical Sciences, Chemistry, Geology, or Physics are required. Ten hours of graduate work in each of two other sciences must also be elected. The elections are designed to provide depth in one science area and a breadth in other sciences in order to prepare graduates of the program to be (1) directors of science instruction or department heads in large school systems or in state agencies, (2) college instructors who are likely to teach science and science education methods courses for both preservice and in-service teachers, (3) teachers of college science courses, or (4) researchers in the area of science education.

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

The third option, the biology/biomedical sciences option, requires a concentration of 40 graduate hours in biology, biomedical sciences, biochemistry and related fields such as biostatistics and health related issues in addition to graduate work in biology and biomedical sciences. This option is designed for students who want background depth in the biological/biomedical sciences and who are likely to teach science and science education methods courses for both preservice and in-service teachers, as well as teachers of college science courses, or researchers in the area of science education.

Admission requirements

The minimum admission requirements to this degree program are an undergraduate major in one science (Biology, Biomedical Sciences, Chemistry, Earth Science, Geology, Physics) and an undergraduate minor in a second science. Students electing Option I should have a minor in a third area and a minimum of one year of undergraduate work in a fourth science, the other. It is designed for students who want background depth in the biological/biomedical sciences and who are involved in training and educating technicians, practitioners, and professionals in health related fields and who need to communicate these concepts, administer programs, or develop, implement, and/or evaluate curricula and programs in these areas.

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Admission requirements

The minimum admission requirements to this degree program are an undergraduate major in one science (Biology, Biomedical Sciences, Chemistry, Earth Science, Geology, Physics) and an undergraduate minor in a second science. Students electing Option I should have a minor in a third area and a minimum of one year of undergraduate work in a fourth science, the other. It is designed for students who want background depth in the biological/biomedical sciences and who are involved in training and educating technicians, practitioners, and professionals in health related fields and who need to communicate these concepts, administer programs, or develop, implement, and/or evaluate curricula and programs in these areas.

Science Education

Adviser: Robert H. Poel, Room B-329 Ellsworth Hall
DOCTORAL DEGREE PROGRAMS AND REQUIREMENTS

Program requirements

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

1. Science and related areas:
   - Option I: Twenty hours of graduate credit in one of the following sciences: Biology, Biomedical Sciences, Chemistry, Geology (Earth Science), or Physics and ten semester hours of graduate credit in each of two other sciences.
   - Option II: Twenty hours of graduate work in Biology, Biomedical Sciences, Chemistry, Geology (Earth Science), or Physics and ten hours of graduate work in a second science. Ten hours of courses dealing with environmental issues offered in such departments as Geography, Geology, the Social Sciences, and related areas.
   - Option III: A minimum of 30 semester hours of graduate credit in the biological and biomedical sciences, with at least 20 semester hours in one of these two sciences and 10 in the other, and at least 10 hours of graduate credit in another approved science area such as biochemistry, biostatistics, or health related techniques or issues.

2. Professional Education: Twenty hours of research related courses at the graduate level.

3. Research tools: Six to twelve hours. Students are required to demonstrate competency in two research tools, and this is usually done by satisfactorily completing one or two courses in each research tool area. The two research tools generally elected are statistics and computer programming.

4. Doctoral Seminar: Four to eight hours.

5. Dissertation: Fifteen hours.

6. Electives. Zero to five hours to make a total of ninety hours and to include additional courses from science, education, research, or other appropriate areas.

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

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

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

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

Sociology

Director, Graduate Studies: Stanley S. Robin,
2413 Sangren Hall. Phone: 507-474-6075.

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

A basic feature is the core training in general sociology, theory, research methods, and social psychology. Concentration is required in two areas of sociology. The two are selected by the student from the departmental areas of concentration: Applied sociology, criminology, medical sociology, social psychology, sociology of science, sociology of knowledge, comparative sociology, race relations and theory, as well as others approved by the student's doctoral committee. Course work in a cognate area, approved by the student's doctoral committee, is also required. The areas of concentration are important and active ones in the field, and thus provide students with valuable specialties to augment the doctoral training in the discipline as a whole.

Admission requirements

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

Program requirements

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

Financial support

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

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

Special Education

Advisers: Alonzo Hannaford, Barbara Harris, Dona Iacobone, Abraham Nicolaou, Elizabeth Patterson, Donald Sellin.
Office: 3506 Sangren Hall.

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

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

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

All students in the program will be required to complete successfully a scholarly dissertation. Following the guidelines established by The Graduate College, the student will select a dissertation adviser and a dissertation committee who will guide the student in the development of a dissertation. Following the completion of the dissertation, the student will be required to complete successfully an oral defense of the dissertation which will be conducted by the dissertation adviser, the dissertation committee, and an additional reader selected by the student with the approval of the adviser from the graduate faculty outside the Department of Special Education.
The College of Arts and Sciences offers a variety of subjects that familiarize the graduate student with the world of ideas and deepen his/her understanding of our Sciences, Biostatistics, Chemistry, offered in Anthropology, Biology, Biomedical Science, Communication, Computer Science, Development Administration, Earth Science, Economics, English, Geography, Geology, History, Mathematics, Medieval Studies, Physics, Political Science, Psychology, Public Administration, School Psychology, Science Education, Sociology, and Statistics.

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

Anthropology (ANTH)
Professors E. Garland, W. Garland, Greenberg, Jacobs, Maher, Sundick; Associate Professors Cremin, E. Loeffler; Assistant Professor Zagarell.

Open to Upperclass and Graduate Students

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

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

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

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

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

520 History of Ethnological Theory
3 hrs.
A systematic examination of the evolution of the significant theoretical problems and contributions in anthropology over the last two centuries. Developments are examined in relation to the prominent figures in the discipline and their times. Prerequisites: ANTH 220, 240, or consent of instructor.

522 Methodology in Ethnographic Research
3 hrs.

523 Ethnographic Field Session
3-6 hrs.
Supervised field examination of human communities in respect to specific ethnographic questions, analysis of field data, and report writing. May be repeated for credit up to a total of six hours. Prerequisite: Consent of instructor.

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

534 Culture and Personality
3 hrs.
An investigation of the interaction of culture and personality with particular attention to the role of culture as a force in the development of the individual. Prerequisites: ANTH 220, 240, or consent of instructor.
536 Cultural Evolution
3 hrs.
An inquiry into the dynamics of culture through a study of selected theories of cultural change and their application to concrete situations such as the role of complex civilizations and the reactions of non-Western societies to contact with the West. Prerequisites: ANTH 220, 240, or consent of instructor.

538 Law and Culture
3 Hrs.
A study of law through the theory and method of comparative legal dynamics. The relation of law to the whole of culture, the function of law as revealed in the comparative study of societies ranging from simple to complex. Prerequisites: ANTH 220, 240, or consent of instructor.

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

542 Development Anthropology
3 hrs.
An examination of the role of social science when applied to the solution of specific development problems, particularly in the Non-Western World. Explores a wide range of applied or adaptive research techniques designed to insure that directed social change actually benefits those for whom it is intended. Also surveys numerous research strategies, methods and constraints involved in conducting research for national or international development agencies. Prerequisites: ANTH 220, 240, or consent of instructor.

545 Topics in Ethnology
3 hrs.
An intensive study of the cultures of an area of the world (e.g., Japan, Philippines, Caribbean, East Africa) or selected problems (e.g., kinship systems, millenarian movements). Topic will be announced each semester. May be repeated for credit. Prerequisites: ANTH 220, 240, or consent of instructor.

551 Human Osteology
3 hrs.
A study of the human skeleton. Emphasis will be on morphological and metrical variation, odontology, paleoanthropology, and reconstruction of the individual and the population. Prerequisite: ANTH 250, or consent of instructor.

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

596 Readings in Anthropology
1-4 hrs.
Independent study arranged in consultation with an instructor. Intended for advanced students with good academic records. One to two hours credit per semester, cumulative to four hours. Prerequisite: Consent of instructor.

Open to Graduate Students Only

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

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

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

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

700 Master's Thesis
6 hrs.

710 Independent Research
2-6 hrs.

Arts and Sciences (A-S)

Open to Upperclass and Graduate Students

American Studies

A-S 501 Studies in American Culture
1-4 hrs.
An interdisciplinary study of perennial issues in American life. The topics of this course are drawn from literature, the arts, the social sciences, philosophy, and religion. This course must be approved by the American Studies Program Adviser.

Environmental Studies

EVS 550 Contemporary Environmental Projects
1-4 hrs.
Contemporary Environmental Projects is designed for students who wish to carry on advanced interdisciplinary work in Environmental Studies under the direction of a faculty member. Work will be geared to a single project in which there is outside investigation, research, field experiences, and/or workshop experiences. Students selecting this course will work on projects especially designed for their programs. The goal of this course is to identify a problem, outline the approach to study, and to consider paths to solving the problem. The course is repeatable for up to eight hours of academic credit. Prerequisite: Consent of instructor and approval of the Director of the Environmental Studies Program.

Foreign Studies Seminars

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

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

Arts and Sciences (A-S)

Open to Upperclass and Graduate Students

Biology and Biomedical Sciences

Pippen, Chairperson; Professors Beuving, Brewer, Buchala, Ehrie, Eisenberg, Engemann, Fiscor, Fowler, Friedman, VanderBeek, Wood; Associate Professors Cowan, Ginsberg, Inselberg, McIntire; Assistant Professor Walker.

Biology (BIOL)

Open to Upperclass and Graduate Students

501 Ecological Adaptations of Organisms
3 hrs.
An investigation of the many environmental factors (light, temperature, time, magnetism, and others) that influence the life and behavior of organisms. A study will be made of the strategies used by organisms to adapt to these factors. Adaptation will be considered as adjustments in both behavior and physiology. Ecological interactions between the environment and the organisms at the molecular, cellular, and organism levels will be studied. Plants, animals, and micro-organisms will be used as examples. Prerequisites: BIOL 101, 102.

502 Human Ecology
3 hrs.
A study of the various aspects of the ecology of humans, including pollution, population, land use, and nutrition. One student project and required field trips. Prerequisite: Eight hours of Biology or consent of instructor.

505 Quantitative Biology
3 hrs.
The use of the computer and statistics to perform analyses of biological concern. Emphasis will be placed on ecological and physiological analyses. Lectures and regularly assigned homework exercises. Previous computer programming experience is desirable. Prerequisites: BIOL 201 and a basic statistics course or consent of instructor.
507 The Biology of Addictive Drugs  
3 hrs.  
The principles of pharmacology (mode of action and effects of drugs) are related to abuse drugs, such as marijuana, alcohol, heroin, methadone, LSD, amphetamines (Speed), and cocaine. The course is designed primarily for nonscience majors to give them an understanding of the objective and subjective effects of drug use. Legal and social implications of illegal drug use are discussed. No prerequisites.

509 Evolution  
3 hrs.  
A consideration of the theory of evolution by natural selection, including discussions of the mechanisms of evolution and predictions generated by the theory. Prerequisites: BIOL 250 and BIOL 301 or consent of instructor.

512 Environment and Health Problems  
3 hrs.  
The impact of the environment on the health of the individual and of populations, the resulting physiological and anatomical difficulties, and the various means employed in meeting these challenges. Prerequisites: Eight hours of Biology.

515 Plants for Food and Industry  
3 hrs.  
Representative cereal, fiber, and industrial plants and products of primary economic importance will be examined, such as wheat, rice, wood and its uses, soybeans, and grapes. Following a discussion of plant composition, the course will investigate the botanical characteristics of each plant, the areas where it is grown, and the special aspects of its composition and growth habits that account for its economic promotion and 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: BIOL 102, CHEM 101, or equivalent courses.

517 Cell Physiology  
3 hrs.  
Concerned with the details of structure and functioning of cells, both animal and plant. The current status of major problems in the field is considered. Prerequisite: A course in physiology.

520 Systematic Botany  
3 hrs.  
Principles and techniques of plant classification, nomenclature, and biosystematics are presented in lectures and 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: BIOL 102 or equivalent.

523 Heredity and Plant Breeding  
3 hrs.  
Principles of plant breeding. Quantitative genetics, population genetics, systems of mating, heterosis, and the genetics of pathogenic organisms are discussed. The basic unity of methods used in breeding self-pollinated and cross-pollinated species is considered. Prerequisite: Eight hours of Biology.

525 Biological Constituents  
3 hrs.  
The chemical elements in plants and animals, as well as the synthesis, characterization, and degradation products of the more important compounds. Prerequisites: Twelve hours of Biology and one year of Chemistry or consent of instructor.

526 Plant Disease  
3 hrs.  
Considers plant disease as one complex of phenomena within the much larger complex of the biological sciences. Rather than being a catalog of diseases, their causes, characteristics and control, it portrays plant pathology in terms of general biological concepts. Prerequisite: Eight hours of Biology.

528 Biology of Non-Vascular Plants  
3 hrs.  
A detailed comparative study of the structure, reproductive cycles, and ecology of the various groups of algae, fungi, and bryophytes. Laboratory study will be complemented by field investigations. An independent project may be required. Prerequisite: BIOL 102.

529 Biology of Vascular Plants  
3 hrs.  
A detailed comparative study of the structure, reproductive cycles, and phytology of vascular plants. Laboratory study will be complemented by field trips. An independent project may be required. Prerequisite: BIOL 102.

533 Neuroendocrinology  
3 hrs.  
Neuroendocrinology is designed to acquaint the student with the interrelationships of the environment and the organism, as mediated by the neuroendocrine system. The physiology and morphology of the neuroendocrine system will be studied, as well as the chemical structure of the neurohormones. Regulation of cellular chemistry by the neuroendocrine products will be emphasized. Prerequisites: A course in physiology, organic chemistry, or consent of instructor.

535 Plant Nutrition  
3 hrs.  
The elements essential for plant growth and development, their uptake, and their main functions in the plant are examined. Some important relationships of plant nutrition to human nutrition will be pointed out. The cycling of elements in nature provides insights into ecological aspects of plant nutrition. Throughout the course, a balance between theory and application will be maintained. Several demonstrations and lab experiences serve to enrich the course: for example, students cooperate in making up nutrient solutions, growing various plants in them, and observing the effects of nutrient deficiencies. Prerequisites: BIOL 102, CHEM 101, and a course in physiology.

538 Field Natural History  
3 hrs.  
A study of ecological communities, with particular emphasis on those accessible for use by public schools (e.g., school grounds, vacant lots, roadside, parks, and undeveloped areas). Primarily for teachers. Prerequisite: At least twelve hours of Biology or consent of instructor.

539 Animal Behavior  
3 hrs.  
Animal behavior with emphasis on evolution and ecology. Includes an introduction to the ethological point of view. One student project. Prerequisite: Eight hours of Biology or consent of instructor.

541 Invertebrate Zoology  
3 hrs.  
A study of the anatomy, physiology, embryology, and life history of representatives of the major groups of invertebrate animals. Prerequisites: Twelve hours of Biology, including BIOL 101.

542 Entomology  
3 hrs.  
A general study of insects, their structure, classification, life histories, ecological relationships, and economic importance. Collection and identification of local species is included. Prerequisite: Eight hours of Biology, including BIOL 101.

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

548 Animal Ecology  
3 hrs.  
Principles of animal populations and communities, inter-relations of life history features (such as habitat selection and reproductive patterns) and population traits; competition and predation and their role in the evolution of community structure, and the roles of animals in the functioning of ecosystems. Methods of detecting abundance are studied. Prerequisite: BIOL 301, or equivalent.

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 workings of ecosystems are integrated. Field ecological methods are emphasized. Prerequisite: A course in ecology.

550 Plant Anatomy  
3 hrs.  
An embryological and histological approach to the study of morphogenesis in seed bearing plants. Primary emphasis will be placed on monocots and dicots. Prerequisite: BIOL 102.

551 Parasitology  
3 hrs.  
A study of parasites and host-parasite relationships illustrated by representatives of the major parasite groups. Special attention is given to the parasites of man. Prerequisite: Twelve hours of Biology, including BIOL 101.

552 Plant Ecology  
3 hrs.  
A detailed study of the growth, distribution, survival, and environmental interactions of plants. Ecological plant analysis methods will be given strong emphasis. There will be laboratory and field investigations. An independent project may be required. Prerequisites: BIOL 102 and BIOL 201.

553 Limnology  
3 hrs.  
Biological, chemical, and physical aspects of lakes, ponds, and streams. Ecological relationships of invertebrate animals and lower plants are emphasized. Prerequisites: BIOL 101 and 102, CHEM 101 recommended.

554 Water Pollution Biology  
3 hrs.  
A comparison of organisms which live in clean waters as contrasted to those in
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polluted waters. Streams, lakes, and ponds will be studied. Water conditions will be analyzed, and the use of biological indicators will be studied. The course will include field trips, laboratory work, and lecture presentations. Prerequisites: BIOL 101 and 102.

555 Marine Biology
3 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.

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

559 Radiation Biology
3 hrs.
Study of the nature of radiation and radioactive decay, the uses of radioisotopes in biological investigation and the effects of radiation on living systems. Prerequisites: Twenty hours of mathematics or science or consent of instructor.

560 Ichthyology
3 hrs.
A general survey of fishes that considers their anatomy, physiology, ecology, behavior, and phylogeny. Field and laboratory work emphasizes the methods of collection, preservation and identification of Michigan fishes. A paper may be required. Prerequisite: Eight hours of Biology, including Biology 101.

577 Comparative Animal Physiology
3 hrs.
An examination of how different groups of animals have adapted to various aspects of a dynamic environment. Prerequisites: Physiology and Organic Chemistry.

598 Readings in Biology
1-3 hrs.
599 Independent Studies in Biology
1-4 hrs.
For advanced students who wish to carry on advanced work in special fields. Prerequisite: Consent of instructor.

Open to Graduate Students Only
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.

603 Seminar in Substance Abuse I
3 hrs.
An interdisciplinary seminar designed to reflect broadly conceived intervention strategies ranging from primary prevention to rehabilitation. The training in the principles of intervention and clinical practice will continue to be taught within the student's basic professional discipline. In part, the seminar will be used to elaborate upon the applications of these principles to the problems of substance abuse. This course is cross-listed with Counseling-Personnel, Social Work, and Sociology. Prerequisite: Admission to Specialty Program in Alcohol and Drug Abuse, or consent of instructor. Graded on a Credit/No Credit basis.

604 Seminar in Substance Abuse II
3 hrs.
Continuation of BIOL 603. This course is cross-listed with Counseling-Personnel, Social Work, and Sociology. Prerequisite: Admission to Specialty Program in Alcohol and Drug Abuse, or consent of instructor. Graded on a Credit/No Credit basis.

Seminars in Biology
2-3 hrs.
Seminars in which a selected area of biology is studied in depth. Oral presentations and discussion will be required. Possible topics will reflect the areas of expertise of the biology 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.

611 Seminar in Animal Biology
612 Seminar in Plant Biology
613 Seminar in Ecology
614 Seminar in Genetics/Evolution
615 Seminar in Physiology

Topics in Biology
3-4 hrs.
Courses in which a selected area of biology is studied in depth. Possible topics will reflect the areas of expertise of the biology 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.

621 Topics in Animal Biology
622 Topics in Plant Biology
623 Topics in Ecology
624 Topics in Genetics/Evolution
625 Topics in Physiology

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

700 Master's Thesis
6 hrs.
710 Independent Research 2-6 hrs.
712 Professional Field Experience 2-12 hrs.

Biomedical Sciences (BMED)
Open to Upperclass and Graduate Students

518 Endocrinology
Fall (alternate years), 3 hrs.
A survey of the hormonal integration of organ-system function, including the chemical nature of these secretions, the cellular and biochemical mechanisms of hormone actions, and the endocrine feedback control mechanisms. The regulatory nature of hormones in developmental processes, in adaptation, and in disease processes will be discussed. Prerequisite: BMED 350, biochemistry recommended.

519 Endocrinology Laboratory
Winter (alternate years), 3 hours. Laboratory experience in endocrinological concepts involved in endocrine research and clinical testing. Prerequisite: Permission of instructor.

520 Human Genetics
3 hrs.
The principles of human heredity with particular emphasis on the clinical significance of biochemical and chromosomal variation. Abnormalities of development and methods of risk analysis in genetic counseling are discussed. Prerequisites: BMED 250 or BMED 495, or consent of instructor; biochemistry recommended.

524 Microbial Genetics
Fall, 3 hrs.
A molecular approach to microbial genetics, dealing primarily with bacterial and viral systems. Emphasis is placed on current literature and on the applications of concepts of microbial research. Prerequisites: BMED 250 and BMED 312 or consent of instructor; biochemistry recommended.

525 Genetics Laboratory
Winter '88, 3 hrs.
Students will acquire techniques currently used in the field of genetics. Although all areas of genetic interest will be presented, emphasis will be placed on the areas of Cytogenetic, biochemical genetic, genetic toxicology and genetic counseling techniques which are currently used in medical, industrial biomedical research areas. In addition time will be provided for in depth experimentation. Prerequisites: BMED 250 or equivalent.

531 Biology of Aging
3 hrs.
This course is designed to provide non-majors 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.

532 Bacterial Physiology
Winter 3 hrs.
Bacterial structure-function relationships are examined in a biochemical context. Current concepts of cell biochemistry are organized around the bacterial cell as a traditional model system for understanding energetics, synthesis of cell structures, transport, metabolism and regulatory mechanisms. The course is designed for advanced undergraduates and beginning graduate students. No textbook required; reading assignments are from the scientific literature. Prerequisites: A microbiology course and a biochemistry course.

534 Virology
3 hrs.
A study of the classification, structure, and chemistry of viruses. Emphasis will be placed on the cell-virus interaction leading to the disease process or cellular alterations in mammalian systems. Prerequisite: BMED 312; biochemistry recommended.
536 Immunology
3 hrs.
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 humoral and hypersensitivity reactions. Prerequisites: BMED 350, biochemistry recommended.

537 Histology
Fall, 3 hrs.
A study of the function and microscopic anatomy of mammalian tissues. Prerequisite: BMED 211 or consent of instructor.

540 Cell and Organ Culture
3 hrs.
The purpose is to introduce the student to the fundamental procedures of cell and organ cultures of mammalian tissue. The application of cell and organ culture to routine clinical, research, or drug screening procedures will be emphasized, as well as specialized procedures employed to solve specific biomedical research problems. Prerequisite: Consent of instructor.

554 Histological Techniques
Winter of alternate years, 3 hrs.
A variety of techniques, including cellodin, paraffin, decalcification, and special stains, will be used to prepare mammalian tissues for histological examination. Prerequisite: BMED 537 or consent of instructor.

570 General Pathology
Fall of alternate years, 4 hrs.
An introduction to pathology which describes the structural and biochemical changes occurring in cells and tissues following injury or disease. Prerequisites: BMED core curriculum and organic chemistry.

574 Embryology
4 hrs.
Embryology is the study of the development of an organism from a single fertilized cell to a complex multicellular fetus. The course will present this material from both a classical descriptive and experimental cellular point of view. In addition to the lecture, laboratory exercises will provide experience in the recognition of the various stages of development and in the culturing and manipulations of embryos in vitro and in vivo. Prerequisites: BMED 213, 250, or equivalent.

598 Readings in Biomedical Sciences
1-3 hrs.

599 Independent Studies in Biomedical Sciences
1-3 hrs.
For advanced students who wish to carry on advanced work in special fields. Prerequisite: Consent of instructor.

Open to Graduate Students Only

601 Special Topics
2-6 hrs.
Critical examination of developments in the various specialties represented by members of the department. The field in which work is offered will be indicated in the student's record. May be repeated for credit. Prerequisite: Consent of instructor.

602 Seminar: Variable Topics
2-6 hrs.
Several seminars in various areas of Biomedical Sciences will be offered. The student's record will indicate the seminars in which he/she has participated. May be repeated for credit. Prerequisite: Consent of instructor.

610 Biomedical Science for Secondary Education
3 hrs.
Instructional laboratory techniques suitable for secondary education programs in health and human biology. This course is directed toward graduates with science degrees who teach secondary education units in health and human biology. Course content is variable to take advantage of new techniques, available instruction, and the interests of the students. Prerequisite: Consent of instructor.

621 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.

630 Electron Microscopic Techniques
3 hrs.
A technique oriented laboratory stressing the various preparatory procedures employed for viewing biological materials. Prerequisite: Consent of instructor.

631 Experimental Microbial Physiology
3 hrs.
An experimental approach to microbial physiology, biochemistry, and molecular biology with major emphasis on laboratory techniques. Prerequisite: Consent of instructor.

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 techniques of autoradiography; protein tracer, such as peroxidase, ferritin, lanthanum, etc.; special tissue preparations, such as in vivo perfusion, various fixation, varied embedding material, etc.; and particulate materials preparation. The student will conduct detailed examinations of his/her preparations and prepare critical critiques.

633 Topics in Biomedical Sciences
3 hrs.
Courses in which a selected area of biomedical sciences is studied in depth. Possible topics will reflect the areas of expertise of the biomedical sciences faculty. The specific topic dealt with in a given semester will be indicated in the Schedule of Classes and on the student's record. Students may take one or all topics offered for credit. Prerequisite: Consent of instructor.

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

700 Master's Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

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

500 Black Humanism
3 hrs.
An examination of the creative dimension of the Black Experience, isolated and set apart in an enemy environment, Black Americans of African descent have been very creative in a wide range of human undertakings. This fact has been acknowledged and accepted, but this creativity has not had free range. One of the outcomes of the Black Revolution has been the emergence of "soul" as a concept to label the artistry and the artfulness of Black American life. The creative dimension has also included contributions to science and technology. Black humanism is a way of getting at the life-styles of Black communities and individuals and the viability of the Black presence and experience. What universal elements can be identified in "soul"? What would American life and culture be like without this elusive quality?

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

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

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

Chemistry (CHEM)

Professors Anderson, Berndt, Brown, Cooke, Foode, Harmon, Houser, Howell, Kanamueller, Lowry, McCarville, Steinhous, Stenesh, Associate Professor Warren, Assistant Professor Kelly.

Open to Upperclass and Graduate Students

501 Chemical Communications
1 hr.
Principles and techniques involved in writing and/or presenting technical information is discussed and practiced through a series of lectures and assignments. Prerequisite: Twenty-four hours of chemistry.
550 Chemical Literature 2 hrs.

An introduction to the use of the various types of chemical literature such as journals, abstracts, monographs, government, and institutional publications, and patents. Both manual and computer search techniques are employed in the course of completing assigned problems involving literature searches in analytical, biological, inorganic, organic, and physical chemistry fields. Prerequisite: Twenty-three hours of chemistry.

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.

509 Topics in Chemistry 3 hrs.

A topic is presented in greater depth or from a perspective different from that of a typical undergraduate course. Representative topics, such as pesticides and drugs, industrial chemistry, chemical pollution, etc., according to student interests and requests. Prerequisite: Sixteen hours of chemistry or consent of instructor.

510 Inorganic Chemistry 4 hrs.

The course includes descriptive and theoretical inorganic chemistry as well as preparation of different types of inorganic compounds. Prerequisite or concurrent enrollment: CHEM 431.

520 Instrumental Methods in Chemistry 3 hrs.

An introduction to the theory and applications of modern chemical instrumentation is presented. General topics covered are elementary electronics, electrochemistry, spectrometry, and other instrumental techniques. Four hours of laboratory per week. Prerequisites or concurrent enrollment: CHEM 431, 436.

530 Introduction to Spectroscopy and Molecular Structure 3 hrs.

Introduction to the basic principles of atomic and molecular spectroscopy with emphasis on quantum concepts, interpretation of spectra in relation to changes in atomic and molecular energies, elucidation of molecular structure from interactions with electromagnetic radiation in the ultraviolet, visible, infrared, and microwave regions and with magnetic fields as applied to nuclear resonance and electron spin resonance. Prerequisite: CHEM 431.

535 Introduction to Physical Chemistry 3 hrs.

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

550 Biochemistry I 3 hrs.

The chemistry, properties, and molecular biology of proteins and nucleic acids includes discussions of amino acids, enzymes, and biochemical energetics. Prerequisites: CHEM 361 and 430 or 535.

552 Biochemistry I with Laboratory 4 hrs.

This course consists of 550 plus lab. Experiments involve more advanced techniques and instrumentation than in 456 laboratory. Emphasis will be on purification and properties of proteins and nucleic acids. Prerequisites: CHEM 361 and 430 or 535.

554 Biochemistry II 3 hrs.

Continuation of 550. Chemistry and metabolism of carbohydrates and lipids. Metabolism of amino acids and photosynthesis. Prerequisite: CHEM 550 or 552.

556 Biochemistry II with Laboratory 4 hrs.

This course consists of 554 plus laboratory. Experiments involve more advanced techniques than in 456 laboratory. Emphasis will be on metabolism of carbohydrates, lipids, proteins, and nucleic acids. Prerequisite: CHEM 550 or 552.

560 Qualitative and Spectroscopic Analysis of Organic Compounds 4 hrs.

A course in the spectroscopic and chemical methods of identification of organic compounds in the pure state and in mixtures which has as a secondary goal the development of deductive reasoning in the field of organic chemistry. Prerequisites: CHEM 361 and twenty-four hours of chemistry.

564 Drugs and Pesticides 3 hrs.

This course introduces students to the chemical nature and use 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.

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. Prerequisites: CHEM 361 or 365, and CHEM 431 or 535.

580 History of Chemistry 3 hrs.

This course is taught from the point of view of the history of chemical theory in which the evidences are critically presented. Prerequisite: Sixteen hours of chemistry, including at least one semester of organic.

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

501 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.) Prerequisite: CHEM 501 or equivalent.

605 Advanced Chemistry Laboratory Technique 1 hr.

Content of course will vary depending on needs and interest of the students. Topics may include glassblowing, laboratory electronics, vacuum-line manipulations under controlled atmosphere, separation and purification, and radio-chemical techniques. May be repeated for credit. Prerequisite: Approval of instructor.

610 Advanced Inorganic Chemistry 3 hrs.

Covers the principles in inorganic chemistry and the chemical elements. Such topics as electronic structure of the atoms, periodic classification of the elements, valency and the chemical bond, coordination compounds, and nonaqueous solvents are included in the study of chemical principles. The remainder of the course concerns the chemical elements and their compounds. Prerequisite: CHEM 510.

611 Advanced Inorganic Chemistry 3 hrs.

The chemistry of the transition elements. Consideration of the electronic and magnetic states of the transition metals and their compounds, the symmetry, stability, and reaction mechanisms of coordination compounds, application of bonding theories, systematic chemistry of the transition and inner transition elements. Prerequisite: CHEM 510.

622 Theory of Analytical Chemistry 3 hrs.

A course in the fundamental principles underlying chemical methods of analysis. Special emphasis is placed on equilibria, kinetics, and mechanisms of the important types of chemical reactions (acid-base, precipitation, complex formation, and redox) involved in chemical analysis; on methods of separation (precipitation, electrodemotion, and distillation techniques); and on the application of statistical methods to sampling, experiment design, and interpretation of results. Prerequisite: CHEM 431.

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; fluorimetry, and other selected topics. Prerequisite: CHEM 520.

625 Electroanalytical Chemistry 3 hrs.

The theory and application of electrochemical measurements are discussed with particular emphasis on the theoretical aspects of polarography, potentiometry, conductometry, titrations, and other selected topics. Prerequisite: CHEM 520.

626 Chemical Instrumentation 3 hrs.

Principles and characteristics of construction and design for chemical and optical instruments. Prerequisite: CHEM 520.
Communication (COM)

630 Advanced Physical Chemistry
3 hrs.
A study of the fundamentals of quantum mechanics and some of its applications to chemistry. Included are the exactly solvable systems, some approximation methods used for chemical bonds and in more complicated molecules, and introduction to group theory representations and character tables. Some programmed computer programs will be used. Prerequisite: CHEM 431.

633 Chemical Thermodynamics
3 hrs.
Includes a review of the three laws of thermodynamics, state functions, activities, partial molar qualities, thermodynamics of solutions, equilibrium, and statistical thermodynamics. Prerequisite: CHEM 431.

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.

650 Proteins and Nucleic Acids
3 hrs.
A study of enzyme catalysis, kinetics, structure and mechanism, and a survey of aspects of enzyme function. Prerequisite: CHEM 550.

652 Lипиды
3 hrs.
The chemistry, metabolism, and methods of isolation and analysis of the major classes of lipids are discussed. Specific topics include fatty acids, fats, phospholipids, glycolipids, and chromotography. Prerequisite: CHEM 554 or consent of instructor.

653 Enzymes
3 hrs.
A study of enzyme catalysis, kinetics, structure and mechanism, and a survey of various enzyme systems and other aspects of enzyme function. Prerequisite: CHEM 550.

661 Organic Reactions
3 hrs.
An intensive study of organic reactions with emphasis on preparative scope and utility. The following types are considered: Aliphatic substitution, oxidation, reduction, condensation, etc. Prerequisite: CHEM 361.

662 Stereochemistry
3 hrs.
A consideration of shapes of molecules and their isomeric consequences. Atomic and molecular orbital interpretation of molecular shape. The stereochemical relationships in substitution and alkene addition reactions will be considered. Prerequisite: CHEM 361.

663 Mechanisms in Organic Chemistry
3 hrs.
Free radical, ionic, and multimeter reaction types are considered. The influence of structure and media on reactivity is included. Prerequisites: CHEM 361 and 431.

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

700 Master's Thesis
6 hrs.

730 Doctoral Dissertation
15 hrs.

735 Doctoral Research
2-10 hrs.

750 Special Topics in Communication
1-3 hrs.
Advanced graduate 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 office. 300 Sprau Tower. Six hours of 555 and 655 may be accumulated as credit toward a Master of Arts in COM.

530 Studies in Altitude Change: Variable Topics
3 hrs.
Selected areas of detailed study within the total range of rhetoric. Each of the courses listed below carries separate credit, and a student may take any or all of the offerings listed under COM 530. Additional topics may be found in the Schedule of Classes.

540 Studies in Mass Communication: Variable Topics
3 hrs.
Analysis in depth of continuing issues in mass communication. Topics vary from semester to semester, and students may take one or all topics for credit.

541 Mass Communication Law
3 hrs.
The laws, principles, and issues of mass communication regulation. Includes media ownership and licensing, programming, political broadcasting, controversy, defamation, obscenity, advertising, and the role of the FCC, FTC, and other regulatory agencies.

542 Mass Media and the Child
3 hrs.
The effects of mass media fare on individuals, groups, and institutions. The fields of politics, advertising, and other regulatory agencies.

543 Mass Media and the Child
3 hrs.
Assesses the impact that mass media fare has on the minds and behaviors of children.

544 Mass Communication and Social Change
3 hrs.
The course examines the role of the mass media in diffusing information and persuasive messages, and the effects of these messages on individuals, groups, and institutions. The fields of politics, advertising, and public relations are studied from the communication/change viewpoint of the practitioner and the consumer.

545 Television and Social Change
3 hrs.
The course examines the role of the mass media in diffusing information and disseminating it to the public. Questions related to media access, fairness, media regulation, and message production are discussed in light of current events.

546 Mass Entertainment
3 hrs.
This course examines the role and function of mass entertainment fare in modern society. Major topics include mass entertainment as part of leisure, the social and psychological functions of mass entertainment, measuring mass taste and in depth study of popular mass media formats such as soap operas, detective, western, popular music, etc.

547 Organizational Uses of Radio and Television
3 hrs.
Applications of radio and TV technology for the business professional, educator, media specialist, and the clinician. Utilization of electronic media for training, research, observation, and instruction. In addition to required text materials, students must provide supplies averaging about $10.00 per student.

548 Broadcast Management
3 hrs.
Studies the functions and responsibilities of broadcast station management. Students examine theories of management, audience research, budgeting and accounting principles, sales and regulatory problems.

549 Public Relations and Organizations
3 hrs.
The course will examine the role of public relations and public information in a variety of organizations with a communication theory perspective. The course is designed to prepare students for public relations and public information, or for other positions in organizations concerned with the flow of information across organization boundaries.

550 Public Relations Program Development
3 hrs.
This is an advanced course in public relations emphasizing research methodology, developing planning objectives, and program evaluation for corporate, governmental, educational, and social service organizations. Prerequisite: COM 549.

551 Methods of Film Analysis
3 hrs.
An introduction to the approaches to film analysis (auteurist, intentionalist, sociological, structural, historical, ideological, psychological) by intensive "reading" and shot sequence examination and evaluation of widely divergent works. Prerequisite: COM 549 or 556.

560 Studies in Communication Education: Variable Topics
3 hrs.
Selected studies in background, methods, materials, and procedures in any one of the several speech areas. Possible topics include directing speech activities, communication behaviors of change agents, as well as others. Topics will vary from...
58 COLLEGE OF ARTS AND SCIENCES

561 Teaching Communication in the Elementary School
4 hrs.
Examination of the linguistic development of pre-school and elementary school children, the functions of language, study of the nature of the emotional and physical development of children as related to symbol-using behaviors, study of materials and methods for affecting desired behaviors in children's thinking, communicating, and enjoyment. The undergraduate student must have completed at least twelve hours of work in COM or obtain consent of instructor. Prerequisites: ED 300 and COM 365 or 366. Offered Fall semesters only.

562 Teaching Communication in the Secondary School
4 hrs.
This is a course in becoming a professional teacher of communication. The focus of the course is self-examination, openness, and individual initiative. Some of the major topics are an examination of self in relation to teaching, the evolving and changing philosophies of speech communication education, the world of high school teaching as it now exists, innovative procedures in teaching communication, and how to get and hold a job in speech communication. The class is, for the most part, a laboratory-workshop, using a mixture of group work, guests, visitations, and special projects. The student must have completed at least fifteen hours of work in COM and, ideally, take the course immediately prior to student teaching. Prerequisite: ED 301. Offered Winter semesters only.

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.

570 Studies in Communication: Variable Topics
3 hrs.
Selected areas of study within the total range of communication. Each course carries separate credit, and a student may take any or all of the offerings listed under COM 570. The topics will be listed in the Schedule of Classes.

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

572 Nonverbal Communication
3 hrs.
The course examines theory and research in the nature and function of nonverbal message systems. Topics include: the role of nonverbal communication in the developmental stages of humans; individual differences in ability to interpret messages; the relationship of nonverbal communication to the concept of culture; extensions of a person such as space, clothing, possessions, and specific messages related to the face and body.

573 Personality and Communication
3 hrs.
The course examines the major personality theories as they contribute to an understanding of the role of communication in self-development. Particular emphasis is given to humanistic theories.

574 Intercultural Communication
3 hrs.
An examination of the factors contributing to effective communication in an intercultural context. The course focuses on such topics as ethnocentrism, cultural perceptions, values and beliefs, language and meaning, and nonverbal factors. Communication systems of selected countries are described and analyzed.

575 Family Communication
3 hrs.
Examines the current literature pertaining to holistic systems, power influences, and satisfactory patterns of family communications. Students analyze family interactions and identify satisfactory patterns of marital family communication.

577 Communication Ethics
3 hrs.
Principles and perspective of ethical speech communication are studied and applied to a variety of private and public communication situations. The impact of honest versus deceptive communication on the individual and society is evaluated.

579 Female/Male Interaction
3 hrs.
Examines the variable of gender as it influences communication between women and men. Topics include female-male stereotypes, interpersonal attraction, differences in female-male verbal and nonverbal codes, relational dialogues and patterns, and female-male interaction on the job. Cross-listed with SOC 599.

581 Introduction to Communication Research
3 hrs.
In this introductory course, students will acquire skills and knowledge of basic research design, data collection, data analysis, computer usage, and report writing needed for the completion of a research project.

583 Interviewing
3 hrs.
Theories and principles of planning, conducting, and evaluating interviews are studied and applied to specific interview types, including selection, performance appraisal, survey, and journalistic interviews. Emphasis is placed on the perspective of the interviewer rather than the interviewed.

584 Health Communication
3 hrs.
Studies concepts and theories relevant to the maintenance and enhancement of effective communication in health care settings. Emphasis is given to the study and application of communication theories to the transactions which occur among health professionals and between professionals and clients/patients.

585 Family Communication
3 hrs.
The course examines the major personality theories as they contribute to an understanding of the role of communication in self-development. Particular emphasis is given to humanistic theories.

587 Communication Ethics
3 hrs.
Principles and perspective of ethical speech communication are studied and applied to a variety of private and public communication situations. The impact of honest versus deceptive communication on the individual and society is evaluated.

589 Female/Male Interaction
3 hrs.
Examines the variable of gender as it influences communication between women and men. Topics include female-male stereotypes, interpersonal attraction, differences in female-male verbal and nonverbal codes, relational dialogues and patterns, and female-male interaction on the job. Cross-listed with SOC 599.

591 Introduction to Communication Research
3 hrs.
In this introductory course, students will acquire skills and knowledge of basic research design, data collection, data analysis, computer usage, and report writing needed for the completion of a research project.

598 Independent Study
1-4 hrs.
A program for advanced students with an interest in pursuing independently a program of readings, research, or projects in areas of special interest. To be arranged in consultation with a member of the staff and the Chairperson of the Department.

Open to Graduate Students Only

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.

601 Introduction to Graduate Study in Communication
3 hrs.
Introduces COM graduate students to the research literature, methodology and theoretical domains of the communication discipline. Students will learn the standards of scholarly writing and be introduced to the criteria for choosing and evaluating research methodologies.

605 Special Topics in Communication
1-3 hrs.
Intensive group study of special topics in communication education, interpersonal and organizational communication, mass communication, oral interpretation, and film. Many of these special courses are organized in response to special needs or interests of students on campus, in the community, and in the region. Some topics are announced in the Schedule of Classes; some are added during the semester. Further information and a full listing of topics may be obtained from the COM Department. Third Floor, Sprague Tower. Six hours of COM 505 and 605 may be accumulated as credit toward a master's degree in COM.

670 Seminar in Communication: Variable Topics
3 hrs.
Exploration of selected topics in communication. Possible topics, each of which may be taken for credit, include:
- Current Issues in Communication
- Conference Leadership
- Communication and the Future
- Organizational Communication Theory
- Power/Leadership in Organizational Communication

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

572 Seminar in General Semantics
3 hrs.
A seminar which explores the differences between language and behavior. In depth
study of differences between symbol and signal behavior, intensional and extensional languages, role of language in developing brain systems, a consideration of the Koraybskian analogy of “map and territory,” among other subjects.

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.

681 Group Communication Processes
3 hrs.
A study of group communication as it affects problem solving and decision making procedures. Emphases 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.

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

700 Master’s Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience 2-6 hrs.

Computers Science (CS)

Nelson, Chairperson; Professor Williams, Associate Professors Boals, de Doncker-Kapenga, Hamilton, Kerstetter, Kountians, Motzkin, Assistant Professors Kaminski, J. Kapenga, I. Natour, Pinkowski, Trency.

Open to Upperclass and Graduate Students

501 Computer Concepts for Public Administrators
3 hrs.
A fundamentals course for students in academic programs in Public Administration. An introduction to how computers work, how they are programmed and their use in information systems. Students learn to work with computer input and output on the WMU DEC System-10 and write at least one elementary computer program. Course requirements include several reports and a term project. This course may not be used toward a major or minor in Computer Science.

502 Introductory Microcomputer Concepts for Teachers
3 hrs.
This course is designed to provide teachers with a minimum foundation in computer concepts and programming. Emphasis is on the use of the BASIC language to perform a variety of educational applications on microcomputers. Computer terminology and capabilities are explored as well as the significance of computers in contemporary society. Students will write a number of programs and will receive an introduction to the use of standard system software. Flowcharting is introduced. Examples of Computer Assisted Instruction will be given. Not for Computer Science majors or minors. Prerequisite: MATH 150 or equivalent.

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

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 503.

506 Scientific Programming
3 hrs.
An introduction to solving scientific and engineering problems on computers. The topics include root-finding, matrix calculations, numerical integration and the numerical solution of differential equations. The FORTRAN language and various library software packages will be used. Prerequisite: MATH 230 or MATH 374, and CS 201 or CS 306. Jointly listed with Mathematics and Statistics.

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 variable 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. Prerequisite: CS 331 and a course in probability or statistics.

527 Theory of Computer Graphics
3 hrs.
A first course in the design of interactive computer graphics systems. Currently available hardware and software systems are described. Emphasis is on theoretical considerations in the new Science of interactive computer graphics software systems. Prerequisites: MATH 230 and CS 331.

543 Principles of Database Management Systems
3 hrs.
The fundamental concepts of database design and efficient usage are presented. Topics include: an overview of database the three data models—relational, hierarchical, and network; conceptual, logical, and physical database design and evaluation. The design theory of relational data models will be emphasized. Query languages, query optimization, security, integrity, and concurrency protocols will also be covered. A student may not receive credit for both CS 433 and CS 543. Prerequisite: CS 342.

544 Software Systems Development
3 hrs.
Advanced computer programming techniques used in the specification, design, and implementation of large software systems. Testing and maintenance of software systems. Modular programming, top-down structured design, composite design, HIP, project management. Emphasis is placed on the solution of large software system problems using a team approach. Prerequisite: CS 331.

554 Operating Systems
3 hrs.
Fundamentals are stressed. A historical survey of the development and growth of operating systems is given to lend perspective to the ideas that follow. Basic concepts and terminology will be emphasized. Programming assignments leading to the construction of a simple operating system are used. Structured Processes, communication and synchronization, shared resources, memory management, resource allocation, scheduling, deadlocks, file management, and protection are discussed. Applications to a real system are investigated to motivate the ideas presented in the text and lectures. Prerequisite: CS 331.

555 Computer Networks and Distributed Systems
3 hrs.
The design and evaluation of computer networks using current hardware and software are explained. Various types of computer buses, local area networks, and long haul networks are defined. Case studies of popular networks are presented. Layered network models are studied. There is lab work with local area and long haul networks. Prerequisites: CS 224 and CS 331.

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 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 310 and CS 331.

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.

582 Introduction to Artificial Intelligence Techniques
3 hrs.
Provides an overview of artificial intelligence and its major issues and application areas. Covers basic techniques and concepts used in A.I. applications, e.g., searching techniques, pruning, heuristics, production systems, predicate calculus, resolution, and plan generating systems. Prerequisite: CS 331.
595 Advanced Topics in Computer and Information Science 3 hrs.
This course examines collective bargaining. 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.

599 Independent Study in Computer Science
1-3 hrs.
Advanced students with good scholastic records may elect to pursue independently the study of some topic of special interest. Topics are chosen and arrangements are made to suit the needs of each particular student. Prerequisite: Written approval of instructor.

Open to Graduate Students Only
563 Studies in Computer Science 3 hrs.
Advanced work organized around topics related to the field of study indicated in the above title. Students may take this course more than once.

625 Computer Structures 3 hrs.
Provides the principles of design of modern digital computers. Circuit implementations of switching networks and of sequential machines are investigated. Recent computer developments such as microprocessors, disk memories, integrated circuits and microprogramming are included. Designs of various CPU circuits and memory organizations are considered. Prerequisite: CS 331 and EE 250.

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 use of data structures in a variety of application areas are covered. Introduces complex data structures. Prerequisite: CS 331.

652 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 331 and 631.

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, transaction files, phantom files and hybrid structures are also studied. Distributed data bases, data base machines and current query languages will be covered. Prerequisites: CS 331 and 543.

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.

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.

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.

682 Artificial Intelligence 3 hrs.
Computer intelligence, computer learning, information representation, heuristics, problem solving, pattern recognition, natural language processing, computer vision and searching techniques. Applications in chemistry, medicine, game-playing, and psychology. The LISP language will be used for programming. Prerequisite: CS 582.

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

700 Master’s Thesis 6 hrs.

710 Independent Research 2-6 hrs.

712 Professional Field Experience 2-6 hrs.

Economics (ECON)
Professors Gardner, Ho, Kripalani, Ross, Sichel, Zelder; Associate Professors Asela, Caruso, B. Harik, S. Harik, Hoffman, Neill, Payne, Pozzo, Assistant Professors Huang, Kern.

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

625 Computer Structures 3 hrs.
Provides the principles of design of modern digital computers. Circuit implementations of switching networks and of sequential machines are investigated. Recent computer developments such as microprocessors, disk memories, integrated circuits and microprogramming are included. Designs of various CPU circuits and memory organizations are considered. Prerequisite: CS 331 and EE 250.

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 use of data structures in a variety of application areas are covered. Introduces complex data structures. Prerequisite: CS 331.

652 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 331 and 631.

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, transaction files, phantom files and hybrid structures are also studied. Distributed data bases, data base machines and current query languages will be covered. Prerequisites: CS 331 and 543.
developments in local, state, and federal governments regarding bargaining units, negotiations, grievance procedures, strikes, and dispute settlements. Prerequisites: ECON 201 and 202 or consent of instructor.

517 Economics of Health and Human Services 3 hrs.
Economic problems of health and human services will be considered. Alternative policy solutions are viewed from the economist's point of view. Not open to Economics graduate students.

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.

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. Special attention will be paid to evaluating the effectiveness of the United States foreign-aid program and examining the issues arising as a result of the conflict with the U.S.S.R. Prerequisites: ECON 201 and 202.

591, 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.

598 Readings in Economics 1-3 hrs.
An independent program of study for qualified students to be arranged in consultation with the instructor. Prerequisite: Consent of Department Chairperson.

Open to Graduate Students Only

600 Applied Economics for Management 3 hrs.
The course examines the relationship between the theory of the firm and recent developments in the area of operations research. Among the concepts and tools discussed are game theory, linear programming, capital budgeting, inventory theory, input-output analysis, price policy, and cost analysis. This course may not be taken for credit if a student has received credit for ECON 400.

601 Economic Analysis for Administration 3 hrs.
This course will focus on the basic principles of economic theory and policy analysis to give the Public Administration student the essential tools needed for understanding policy analysis and resource allocation. Students will be expected to demonstrate the ability to analyze a policy or resource allocation problem using the tools presented in the course. Closed to Economics Graduate Students. Prerequisite: ECON 201 or consent of instructor.

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.

603 Advanced Price Theory 3 hrs.
An advanced study in the logic of the pure theory of production; joint production and joint costs, and introduction to the multiperiodic production theory. Advanced theory of consumer behavior; aggregation problems in product supply, factor demand and consumer demand analysis; review of selected empirical studies on consumer demand analysis; consumer surplus; problems involving optimization over time and under conditions of uncertainty; role of savings in consumer demand theory; utility maximization over time. Prerequisites: ECON 303 and 504.

609 Seminar in Economics 1-3 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 staff. Topics will vary, and course may be repeated.

623 Public Budgeting 3 hrs.
This course focuses on budget processes and techniques at the local, state, and federal levels. Primary emphasis is on the preparation phase of the budget process and the alternative budgeting techniques currently in use. Sources of revenues will also be examined. Closed to Economics Graduate Students. Prerequisite: ECON 601 or consent of instructor.

624 Issues in Public Finance 3 hrs.
An exploration of issues in taxation, government spending, fiscal policy, and intergovernmental relations with emphasis on recent literature in those areas. Prerequisites: ECON 201 and 202.

650 Industrial Organization and Public Policy 3 hrs.
The interest of this course centers on the areas where markets are characteristically oligopolistic. After a brief review of the different market types, the more important market structure, behavior, and performance variables and their accompanying public policy implications are dealt with.

662 National Income Analysis 3 hrs.
A basic course in economic theory with emphasis on modern theories of output of the economy as a whole and on the uses of these theories as guides to policy. Prerequisites: ECON 201 and 202.

680 Problems in International Trade and Finance 3 hrs.
An analytical understanding of contemporary issues in international trade and finance will be emphasized. Prerequisite: ECON 480 or consent.

688 Issues in Economic Development 3 hrs.
An intensive examination of a number of selected key topics in development economics, centering on issues of crucial importance to developing nations. Examples of such issues are primary products, capital formation, technological change, inflation, debt servicing, population, etc. Prerequisites: ECON 201 and 202.

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

700 Master's Thesis 6 hrs.

710 Independent Research 2-6 hrs.

712 Professional Field Experience 2-12 hrs.

English (ENGL)
E. Galligan, Chairperson; Professors Combs, Cooley, Cooney, Davidson, Demetarakopoulos, Ginanakis, Gingerich, C. Goldmark, H. Goldmark, Johnston, La Rue, H. Scott, S. Scott, Small, Stoupe, Weaver, Woods; Associate Professors Bailey, N. Carlson, Cutbirth, Davis, Douma, Drzick, Dybek, Gordon, Hains, Hayden, Hinkel, Jayne, Jorgens, Pugh, Seler, Shafer, Stone, Syndergaard, Szalkowski, Assistant Professors Egan, Eter-Lewis, Joslin, Matthews, Morton, Murphy.

Except as noted below, graduate students in non-English curricula may elect 500-level English courses for graduate credit only if they have had two prior literature courses.

When they are scheduled as off-campus, interinstitutional courses by the Division of Continuing Education to meet for thirty-six contact hours during the semester, 500-level English courses will carry three credits.

Open to Undergraduate and Graduate Students

510 Special Topics in Literature 4 hrs.
Study of a literary movement, theme, or genre such as classicism, the Arthurian tradition, the lyric. May be repeated for credit as long as the topics are different.

530 Medieval Literature 4 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.

532 English Renaissance Literature 4 hrs.
Readings in representative writers of the period 1500-1660.

534 Restoration and Eighteenth Century Literature (British Literature 1660-1800) 4 hrs.
Readings in representative writers of the period 1660-1800, focusing on the diversity of literary forms in the period.

536 Nineteenth Century British Literature 4 hrs.
Readings in representative writers, focusing on one or more principal movements of the century.

538 Modern Literature 4 hrs.
Readings in representative writers in the period 1890-1945, not exclusively in British and American literature.

540 Contemporary Literature 4 hrs.
Readings in representative writers who have come to prominence chiefly since 1945.

544 The British Novel 4 hrs.
A study of the novel as a literary form reflecting in its development and diversity.
changes in human consciousness. Emphasis will be on development of the British novel from the eighteenth to the early twentieth century. Prerequisite: ENGL 110.

555 Studies in Major Writers 4 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.

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.

572 American Dialects 4 hrs.
A study of regional, social, and stylistic variation among American dialects with emphasis on the dialects of minority ethnic groups as structured systems.

574 Linguistics for Teachers 4 hrs.
An application of the concepts of linguistics to the teaching of language, literature, composition, and reading in the English curriculum. Prerequisite: ENGL 270, 271, 373, or equivalent.

582 Studies in Children's Literature 4 hrs.
A study in depth of significant themes, movements, and types of children's literature. Prerequisite: ENGL 282 or permission of the department.

597 Studies in English: Variable Topics 1-3 hrs.
Group study of special topics in literature, film, English language, and writing. Many of these special courses are organized around special events or speakers on campus or in the community, or in response to special needs or interests in students. Some topics are announced in the Schedule of Classes; some are added during the semester.
Further information and full listing of topics may be obtained from the English Department, sixth floor Sprau Tower.

588 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.

610 Seminar 3 hrs.
Study of a problem in literary history or criticism. May be repeated once with the permission of the graduate adviser.

615 Literary Criticism 3 hrs.
Readings in several significant theorists on the nature of literature, the characteristics of audience response to literature, and principles underlying the analysis and evaluation of literature. Works in at least two genres will be examined in light of these theoretical writings.

621 Studies in British Literature 3 hrs.
The advanced study of selected aspects of British literature. May be repeated once with the permission of the graduate adviser.

622 Studies in American Literature 3 hrs.
The advanced study of a topic in American literary history, such as The American "Renaissance," The 1920's, The Transcendental Tradition in American Literature, Fiction (or Poetry, or Drama) in America, or The Development of Modern American Prose Style. May be repeated once with the permission of the graduate adviser.

630 Research and Writing 3 hrs.
A survey of aids in research leading to completion of a writing project.

631 Essay Writing 3 hrs.
A course in the writing of informal expository prose in the forms used for addressing general audiences. There will be a generous amount of reading in exemplary works and a concern for understanding the rhetorical principles underlying good modern prose. Prerequisite: A bachelor's degree.

632 Article Writing 3 hrs.
A course in the writing of informative prose directed toward a non-specialist audience. There will be study and practice in the methods of gathering and analyzing information and in the effective organization and presentation of factual material.

633 Professional Writing: Form and Technique 3 hrs.
A course in writing in the various formats needed by large institutions, whether academic, corporate, or public. Particular emphasis will be placed on the use of the interview to gather information, on preparing speeches, brochures, newsletters, and other publications, and on the techniques of nonpersonal prose.

640 The Nature of Poetry 3 hrs.
A study of styles, techniques, forms, and conceptions of poetry, including practice in explication, both oral and written, of individual poems.

641 Studies in Modern Poetry 3 hrs.
An intensive study of the work of several modern poets.

642 Studies in Drama 3 hrs.
Selected areas of drama from classical times to the present.

644 Studies in the Novel 3 hrs.
An examination of significant forms and techniques employed in the novel from its beginnings to the modern age.

645 Studies in the Modern Novel 3 hrs.
An intensive study of the works of some important novelists of the twentieth century.

Selected tragedies of Shakespeare.

653 Studies in Shakespeare: Comedy 3 hrs.
Selected comedies of Shakespeare.

666 Graduate Writing Workshop 3 hrs.
Any given section of this course will focus on either poetry, fiction, or drama. Course organization will emphasize roundtable discussion of student writing. Course may be taken more than once; a student may elect up to 12 credit hours in one genre and up to 18 hours in all. M.F.A. candidates must take at least 6 hours in their area of specialization. Open to graduate students accepted into the M.F.A. program and, with the permission of the instructor, to other graduate students.

673 Psycholinguistics in Reading 3 hrs.
An examination of psycholinguistic insights into the nature of the reading process, with emphasis on practical implications and applications for the classroom. No prerequisite.

680 Advanced Methods in Teaching Literature 3 hrs.
A study of theories and methods of teaching language and composition.

681 Advanced Methods in Teaching Language and Composition 3 hrs.
A study of theories and methods of teaching language and composition.

697 Studies in English: Variable Topics 1-3 hrs.
Group study of special topics in language, literature, and composition. These special courses and workshops may be offered on campus, in off-campus centers, or as in-service work in schools. Students may repeat this course, providing topics vary. For further information, consult the graduate adviser.

699 M.F.A. Project 3-6 hrs.
A collection of short fiction, a collection of poetry, a collection of one-act plays, a full-length play, or a novel. The work presented in fulfillment of this requirement must be judged by a committee of the graduate faculty to be worthy of publication or production; a public reading or performance is required.

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

700 Master's Thesis 6 hrs.

710 Independent Research 2-6 hrs.

712 Professional Field Experience 2-12 hrs.

Geography (GEOG)
Quandt, Chairperson; Professors Dickason, Ettenlaub, Heller, Kirchherr, Micklin, Raup, Stoltman, Vluch; Associate Professors Erhart, Assistant Professor Strole.

Systematic Geography
Open to Upperclass and Graduate Students

521 Studies in Climatology and Meteorology 3 hrs.
Studies at an advanced level in climatology and meteorology. Topics of current interest to atmospheric scientists are examined in depth. Regional climatic phenomena and their relation to atmospheric circulation patterns are also investigated. Prerequisites: GEOG 225 or consent.
Studies in Economic Geography

2-3 hrs.

Studies in Economic Geography presents world patterns of agriculture, manufacture, or transportation which link global production and consumption. In any term, the course focuses upon one of these three economic sectors. Prerequisites: GEOG 205 or 244 or consent of instructor.

a. Agriculture. Describes and analyzes agricultural systems throughout the world; focuses on selected crop-livestock systems and the changing character of agricultural land use in the United States.

b. Manufacture. Examination of theories and strategies of industrial plant location, the relationship of industrialization to regional economic growth and development, and selected industry case studies evaluating the interrelations of locational, economic, technological, and political factors in the respective industry’s historic evolution.

c. 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.

Studies in Human Geography

2-3 hrs.

Each course listed under this general title is a concentration study of one of the principal subdivisions of human geography. The scope and principal themes of each specialized field are reviewed, with consideration given to current research on selected problems. Prerequisites: GEOG 203 or GEOG 205 or GEOG 244, or by consent of instructor. Course may be repeated for credit.

a. Cultural Geography. Techniques of spatial analysis applicable to the study of humans and their environment. The place of origin, diffusion and present distribution of selected cultural patterns will be traced with emphasis given to cultural traits which strongly influence human occupancy of the earth’s surface.

b. Historical Geography. Studies of geographic and related features which have combined to influence the course of historical development. This course will concentrate on a particular region and/or period of time during each semester in which it is offered. Each specialization will be designated in the Schedule of Classes.

c. 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.

Water Resources Management

3 hrs.

Examination of water resources management with emphasis upon rational development and utilization of available supplies. Topics include supply and demand, methods of technological and geographical augmentation (desalination, inter-basin transfers, etc.), water administration and policies, and various water problems together with possible approaches to their solutions.

Outdoor Recreation: Resources and Planning

3 hrs.

Examination of extensive, resource-based outdoor recreation (such as parks, wilderness, wild rivers, hunting and fishing, hiking, etc.) with emphasis upon recreational planning. Topics include supply and demand for outdoor recreation, identification of present and future recreational needs, policy considerations, administration of recreational land uses, and various problems associated with outdoor recreation. Readings, discussion, and student-designed and executed individual studies provide professional orientation.

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 environmental problems. Prerequisite: GEOG 350 or consent.

Studies in Urban and Regional Planning

3 hrs.

Each of the courses listed under this number focuses on a major aspect of planning, including a review of the objectives of the planning process, legislation pertaining to planning operations, and methods of field and library investigation required for analysis and policy formulation in matters related to planning.

a. 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.

b. 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 unique regional and environmental tradeoffs, and on problems of implementing regionally-oriented planning programs.

c. Public Lands and Parks. Specific programs and policies relating to the preservation and/or development of government-controlled lands.

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

Seminar in Physical Geography

2-3 hrs.

A review of current literature and recent developments in several disciplines which form the basis of physical geography. Since each seminar emphasizes different subject areas, such as landforms, soils, and vegetation, this seminar may be repeated. A final research project is required. Prerequisites: One of several advanced courses in physical geography, geology or biology, or consent of instructor.

Seminar in Urban and Regional 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

Anglo American

3 hrs.

Review of the physical, cultural, and economic geography of the United States and Canada. Focus on regional problems and outlooks. Lectures, assigned readings, and periodic seminars. May not be taken for credit if student has received credit for GEOG 380.

South America

3 hrs.

Regional study of the nations of South America with attention to the interrelationships of the physical and cultural environments. Historical background necessary for the interpretation of the present political, social, and economic conditions is included. May not be taken for credit if student has received credit for GEOG 381.

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.

Western and Southern Europe

3 hrs.

Examination from western Europe from a regional perspective. The environmental and historical backgrounds serve as a foundation for more intensive study of contemporary conditions, problems, and issues. May not be taken for credit if student has received credit for GEOG 383.

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.

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.
The student will acquire proficiency in the fundamental techniques and skills of photogrammetry and photointerpretation during the first part of the course. The remainder of the semester will be spent in interpreting photos dealing with such topics as geomorphology, archaeology, vegetation and soils, water resources, rural and urban land use, as well as topics adapted to the interest and anticipated future work of the student.

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 advisor and instructor.

Open to Graduate Students Only

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

665 Seminar in Geography 1 hr.
Designed for the advanced student interested in analyzing problems related to various topics in geography. Prerequisite: Consent of instructor. May be repeated for credit. This course is graded on a Credit/No Credit basis.

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.

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.

512 Hydrogeology 3 hrs.
The study of surface and groundwater with special emphasis on its chemistry, movement, and relation to the geologic environment. Prerequisite: Senior standing.

513 Wetlands Hydrology 3 hrs.
Introduction to hydrologic function of wetlands, wetlands classification, and the relationship between hydrology and soil and plants. Emphasis will be placed on the use of these parameters in wetlands delineation. Prerequisite: Senior standing.

520 Economic Geology 3 hrs.
Origin, occurrence, and utilization of metallic and non-metallic mineral deposits, and mineral fuels. Three lectures a week. Prerequisite: GEOL 335 or consent of instructor.

530 Plate Tectonics and Earth Structure 3 hrs.
Major tectonic features and internal structure of the earth in relation to plate tectonics, critical examination of the tenets of plate tectonics. Prerequisites: GEOL 131, 301, or 335.

532 Geomorphology 3 hrs.
Detailed consideration of the earth’s surficial processes including transformation of fluvial, glacial, mass-wasting, eolian, and coastal landforms. Laboratory exercises involve interpretation of topographic maps, geologic maps, and air photographs. Prerequisite: GEOL 130.

535 Sedimentation and Stratigraphy 4 hrs.
Processes, characteristics, and relationships among fluvial, deltaic, strand plain, lagoon, shelf, and slope, and the distribution of glacial, mass-wasting, and coastal deposits. Laboratory includes textural analysis, sedimentary structures, paleocurrent analysis, electric logs, subsurface maps, and application of statistical and computer methods to solution of sedimentologic problems, and basin analysis. Course includes a 3-day field trip. Three lectures and one three-hour laboratory per week. Prerequisite: GEOL 131 and 335.

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 131 and consent of instructor.

539 Field Studies in Geology 1-6 hrs.
Field study of specific subjects in geology. Subjects offered will be announced in advance and selected from the following: Regional Geomorphology, Field Mapping, Structural Geology, Petrology, Stratigraphy and Sedimentation, Environmental Geology, and other selected topics. It is recommended that the student should have Geology 100 or
130 and/or have the permission of the instructor before enrolling in this course. The course is normally taught two weeks of summer prior to the fall term but may be offered at other times. Students planning to take this course should first check with the Earth Science adviser.

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. Prerequisite: GEOL 130, 131, or consent.

545 Carbonate and Evaporite Depositional Environments 3 hrs.
Processes, characteristics, and relationships of modern and ancient and basinal carbonate and evaporite facies. Course includes an 11-day field trip (Spring Vacation) to investigate Holocene Pleistocene, and Tertiary carbonate environments and facies in Florida, and a 3-day trip to northern Indiana and Ohio to examine Silurian Platform carbonates. Student projects include logging, description, and interpretation of core and slabs at the mesoscopic level. Two lectures and one 3-hour laboratory per week. Prerequisites: GEOL 535, and consent.

555 Clastic Depositional Systems 3 hrs.
Description and analysis of clastic depositional systems and the discussion of sediment that they produce, with stratigraphic and seismic analysis. Prerequisite: GEOL 535 or consent of instructor.

560 Introduction to Geophysics 3 hrs.
Introduction to geophysical exploration methods including seismic reflection and refraction, gravity, electric, and electro magnetic properties of earth materials. Prerequisites: PHYS 110-111 or 210-211, MATH 122, and GEOL 130.

561 Seismic Methods 3 hrs.
Reflection and refraction seismology as applied to the search for petroleum, site studies in civil engineering, and other geologic problems. Two lectures and a three-hour practical laboratory with field exercises and problems. Prerequisites: GEOL 560, MATH or CS 306, and MATH 123.

562 Gravity and Magnetic Methods 3 hrs.
Potential field methods as used in mining and petroleum exploration, for geologic mapping, and groundwater problems. Analytical solutions, numerical modeling, and other interpretation techniques. Prerequisites: GEOL 560, MATH or CS 506, and MATH 123.

563 Electrical Methods 3 hrs.
Resistivity sounding and profiling, induced polarization, spontaneous potential, electromagnetic methods using natural and artificial fields. Two lectures and three-hour laboratory with field studies and laboratory modeling. Prerequisites: GEOL 560, MATH or CS 506, MATH 123, and PHYS 540.

564 Field Geophysics 3 hrs.
Field studies demonstrating the use of seismic refraction, gravity, and electrical resistivity methods for glacial geology and groundwater problems in the Kalamazoo area. Course also includes a week trip to Michigan’s Upper Peninsula to apply magnetic, self potential, electromagnetic, and gravity methods in Precambrian terrain. Prerequisite: GEOL 560.

Open to Graduate Students Only

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

605 Groundwater Modeling 3 hrs.
Study of groundwater flow and contaminant transport rates using analytical and numerical models. Prerequisites: GEOL 512, 600, Fortran or Basic, MATH 274, or consent of instructor.

610 Geochemistry 3 hrs.
An introduction to the basic principles and theories of geochemistry. Prerequisites: GEOL 440 or permission.

611 Mineral Analysis 3 hrs.
X-Ray diffraction and fluorescence techniques applied to mineralogical and petrological problems. Prerequisites: GEOL 335 or permission.

615 Contaminant Hydrology 3 hrs.
Theory and field methods related to the transport of contaminants in groundwater. Includes theoretical considerations, case histories, law, analysis of problems, and preparation of hydrogeological reports.

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

634 Research in Geology and Earth Science 1-4 hrs.
Advanced readings or research in an area to be selected after consultation with a supervising staff member. May be repeated for credit (for no more than a total of six hours).

640 Igneous and Metamorphic Petrology 4 hrs.
Advanced discussion of origins and positions of igneous and metamorphic rocks in light of recent experimental evidence and concepts of global tectonics. Prerequisite: GEOL 440 or equivalent.

645 Carbonate Petrology and Paleoeocology 3 hrs.
Identification, recognition, and analysis of carbonate rocks in hand specimen and thin section and environmental conditions under which they were formed; also, ecological relationships of organisms living in carbonate environments. GEOL 433 and 535, or consent of instructor.

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 offered during a semester or term will be announced in advance.

565 Clastic Petrology and Basin Analysis 3 hrs.
Examination, analysis, and interpretation of clastic rocks in hand specimen and thin section and how sediments are distributed in basinial settings. GEOL 535 or consent of instructor.

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.

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

700 Master’s Thesis 6 hrs.

710 Independent Research 2-6 hrs.

712 Professional Field Experience 2-12 hrs.

History (HIST)

Breisach, Chairperson. Professors Beech, Brown, Castel, Cordier, Davis, Dennison, Gregory, Hamner, Maier, Nahm, Nodel, Schmitt; Associate Professors Burke, Hahn, Hawks, Houdek, Patterson; Assistant Professor Stone.

United States History

Open to Underclass and Graduate Students

520 Colonial America 3 hrs.
The American colonies as part of the British empire, their founding, their political, social, and economic growth to the eve of the American Revolution.

521 The Era of the American Revolution, 1763-1789 3 hrs.
Causes, characteristics, and consequences of the American Revolution. Emphasis on factors which induced the British to alter existing relationships with the American colonies, and the nature of American responses. Efforts by both British and American leaders to preserve the imperial connection are studied along with the American movement to independence. The course also covers military and diplomatic aspects of the Revolution, and societal changes brought by American independence.

522 The Age of Democracy and Expansion, 1789-1848 3 hrs.
Deals with the establishment of the Federal Government, the origin and development of political parties, the causes and consequences of the War of 1812, territorial expansion and the increasing sectional conflict between North and South.

523 The American West 3 hrs.
A study of the exploration and settlement of the North American continent. Topics include Indian relations, utilization of land and resources in the fur trade, mining, and cattle ranching, and the establishment of law and order on the frontier.
524 The Civil War and Reconstruction
3 hrs.
Examines the origins of the Civil War, the reasons for Northern victory and Southern defeat, and the conflicts over Reconstruction policy and the status of Black Americans.

525 The Emergence of Modern America, 1877-1914
3 hrs.
This course will focus on the causes and consequences of industrialization, urbanization, Progressivism, and the concurrent revolutions in agriculture, transportation, and communications. Attention will also be given to changing attitudes and values; the problems of generalization, and the anonymous American.

526 United States, 1914-1945
3 hrs.
This course deals with four periods of recent American history: the Great War and Peace Conference of 1914-1919, the 1920s, the Depression, and American participation in World War II. Focus is on the major social, political and economic trends, problems and personalities of the era, and the vastly changed position of the United States in world affairs.

527 United States Since 1945
3 hrs.
This course deals with the efforts of the nation, and groups within the nation, to cope with the enormous social, political, and economic problems of the decades after World War II. It traces the growth of American involvement in foreign affairs as a world power.

Europe

549 Topics in Ancient History
3 hrs.
Selected topics in ancient history such as recent archaeological discoveries, the Roman republic, Imperial Rome, primitive Christianity, and the like. The specific topic is announced in the Schedule of Classes. Course may be repeated under different topics.

550 Topics in Medieval History
3 hrs.
Selected topics in medieval history such as the History of the Medieval Church, Daily Life in the Middle Ages, etc. Topic to be announced in the Schedule of Classes. Course may be repeated under different topics.

554 Renaissance and Reformation
3 hrs.
Major developments in the period; activities of merchant venturers; rise of the modern state; cultural achievements of the Italian Renaissance; religious thought of Luther, Calvin, and Zwingli; renewal of the Roman Catholic Church; Anglicanism; the Radical reformation; religious wars and cultural activities in the Reformation.

556 Studies in Modern European History
3 hrs.
Selected topics in European history since the 16th century. Topics announced in the Schedule of Classes. Course may be repeated under different topics.

559 The French Revolution and Napoleon
3 hrs.
The nature of revolution and revolutionary psychology; 18th century background to the French Revolution; major events and phases; Napoleon and the French empire; impact of the revolution on Europe and the rest of the world.

560 Nineteenth Century Europe
3 hrs.
Major developments in European history from the fall of Napoleon to the beginning of World War I. Confrontation between the forces of reform, conservatism, and nationalism; unification of Germany and Italy; the changing diplomatic balance; arts and culture of the era.

561 Victorian England: The Era of the Middle Class
3 hrs.
A look at the years of Victoria’s long reign as Great Britain attempted to solve the problems caused by the French and Economic Revolutions through parliamentary reform and additional democracy, resulting in the transition from a rural to an urban society, the rise of the middle class to a position of dominance, and the emergence of Britain as the greatest industrial nation and the wealthiest empire in the world.

562 Hitler’s Europe, 1914-1945
3 hrs.
Major developments in European history since the beginning of World War I to the conclusion of World War II. The new structure of postwar Europe in the 1920s; the assault on ethnic and religious minorities and on democratic government; the collapse of international order and World War II; arts and culture of the era.

563 Europe Since 1945
3 hrs.
Major developments in European history since the end of World War II. Recovery and reconstruction, the movement toward European unity; the East-West conflict; roles and objectives of major European states and blocs in international affairs.

Theory and Practice

565 Local and Regional History
3 hrs.
Studies of small areas in great detail such as archives and manuscript collections, ethnographic data. This course is an introduction to the sources and techniques of local historians and their applications to a variety of research objectives.

511 Introduction to Archives
3 hrs.
Theory, techniques, and practice in the development and administration of archives and archival materials.

512 Introduction to Museum Studies
3 hrs.
A survey course dealing with the history, philosophy, organization, and practice of museums. The course will examine the organization and structure of various types of museums, and will cover such topics as collecting the museums, conservations and security, care of collections, display techniques, historic preservation, registration and cataloging, and museum ethics.

513 Historic Preservation
3 hrs.
Examination of problems in developing historic sites and districts. Topics include documenting historic sites, registration procedures, preservation law, funding sources, history of the preservation movement, social issues in urban rehabilitation, public, private and citizen interaction.

591 Topics in Theory and Practice
2-3 hrs.
Selected theoretical, technical, and interpretive issues in the field of history. Topics include philosophy of history, computers in historical research, interaction between history and such disciplines as archaeology, psychology, and climatology, new forms and techniques of historical documentation, and major historical interpretations currently before the academic world and the public. Topics announced in the Schedule of Classes. Course may be repeated under different topics.

Open to Graduate Students Only

690 Historical Method
3 hrs.
This course is intended as a general introduction to the field of history and its recent development. Emphasis is upon the structures of historical reasoning and explanation, and the use of expository oral and writing skills in communicating historical knowledge to various audiences. The course also surveys library research methods, including major journals and bibliographical tools for general historical research. It includes examination of the interaction between history and other disciplines which provide epistemological frameworks for historical explanation, such as philosophy, biography, and psychology.

691 Historical Sources
3 hrs.
This course is an introduction to the sources and methods used in the study of traditional societies, particularly ancient and medieval Europe. Students are acquainted with the techniques of locating, studying and interpreting a diversity of written sources, such as narratives, chronicles, annals, charters, early government records, etc., with an emphasis on authenticating, dating and localizing such materials. The course also covers techniques for dealing with the variety of material remains which can generate historical data, such as archaeological, numismatics, epigraphy, and so on. The major objective of the course is to create an awareness for students in all facets of historical studies of the great variety of sources available for historical reconstruction, as well as the need for painstaking research at the local level as the first step in synthesizing broader studies of various chronological periods and geographical areas.

692 Historiography
3 hrs.
A course in general historiography. Readings from a departmental list in addition to assignments in student's major field. Prerequisite: HIST 690.

695 Readings in Selected Fields
3 hrs.
An individual study course designed to broaden a student's knowledge in a selected field beyond the scope offered by regularly scheduled courses.
This course will be offered regularly. The comparable methods course for Latin is LAT 557, Teaching of Latin.

Translation Courses (TRNS)

Open to Upperclass and Graduate Students

510 Translation Seminar

4 hrs.

Intensive practice in translation, primarily of non-literary documents, into English. The course will also include some practical work in lexicography, error analysis, translation quality assessment and general problem solving. Prerequisites: LING 105; ENGL 305; TRNS 310, FREN 316, 317, 328, 551, or GER 316, 317, 325, 552; or LATV 316, 322, 325, 551, or SPAN 316, 317, 325, 552.

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

550 Independent Study in French

1-3 hrs.

Directed, individual study of a specific topic in a French literary or linguistic area. Departmental approval required for admission. Repeatable for credit. Prerequisite: One 500-level course in the major; a minimum grade point average of 3.0 in the major.

552 Advanced German Composition

3 hrs.

Intensive practice in composition and stylistics directed toward appreciation of literary and other written expression in German with work in free composition at an advanced level. Prerequisites: GER 316 and 317 or equivalent.

553 Advanced German Conversation

3 hrs.

Intensive training in conversational German with emphasis on colloquial language and idiom. Prerequisites: GER 316 and 317 or equivalent.

559 History of the German Language

3 hrs.

Survey of the development. Prerequisite: Six hours of 300-level German or above.

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, 322 or 325 or equivalent. Representative topics which may be treated in this area include:

The Novelle—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.

LANGUAGES AND LINGUISTICS

Other Courses

Open to Upperclass and Graduate Students

500 Studies in History

1-3 hrs.

Selected topics in historical studies. Topics announced in the Schedule of Classes. Courses may be repeated under different topics.

598 Independent Reading in History

2-4 hrs.

Students will acquaint prospective language teachers as the culture component. Preferably, majors and minors (but the hours may not be counted toward the minor). This course may be taken in two consecutive semesters (32 contact hours per week, 6 credit hours). Prerequisite: TRNS 510.

599 Internship

Variable hours

Professional internship experiences in museums, historical administration, historic preservation, editing, etc. Registration requires prior approval of the department chairman and the graduate adviser. Graded on a Credit/No Credit basis.

Open to Graduate Students Only

683 Seminar in History

3 hrs.

694 Colloquium

1 hr.

Course taught by the assigned instructor and by invited guest lecturers. Topics announced in the Schedule of Classes. Course may be repeated under different topics. Offered infrequently.

699 Historical Essay

4 hrs.

An analytical and interpretive study to be written under the supervision of a member of the history faculty and selected in consultation with the graduate adviser.

700 Master's Thesis

6 hrs.

710 Independent Research

2-6 hrs.

712 Professional Field Experience

2-12 hrs.

Languages and Linguistics

Krawutschke, Chairperson; Professors Cole, Ebling, Griffin, Haenicke, Palmatter, Resch, Associate Professors Benson, Bigelow, Febles, Feikel, Gardiner, Hendriksen, Kissell, Miller, Munroe, Teichert, Assistant Professors Harris, Lehman-Srinivasan, Running Johnson.

Language Teaching Courses

Open to Upperclass and Graduate Students

558 Modern Language Instruction (in French, German, Spanish, or other language)

3 hrs.

Required for modern language teaching majors and minors (but the hours may not be counted toward the minor). This course will acquaint prospective language teachers with various approaches and strategies involved in modern language teaching. Specifically, in a performance-oriented program, students will learn theory and practice related to teaching the listening, speaking, reading, and writing skills, as well as the culture component. Preferably, students should complete this course before beginning directed teaching.

559 History of the German Language

3 hrs.

Survey of the development. Prerequisite: Six hours of 300-level German or above.

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, 322 or 325 or equivalent. Representative topics which may be treated in this area include:

The Novelle—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.
Spanish (SPAN)
Open to Upperclass and Graduate Students

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.

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.

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.

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

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

550 Independent Study in Latin
1-3 hrs.
Directed individual study of a specific topic or genre in a Latin literary or linguistic area (e.g., biography, bucolic poetry, comedy, history, or satire). Departmental approval required for admission. Repeatable for credit. Prerequisite: A minimum grade point average of 3.0 in the major.

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.

560 Medieval Latin
3 hrs.
A study of the period 500-1500 A.D., when Classical Latin was evolving into new vernacular forms which would eventually become the modern Romance Languages. Prose and poetry readings include a variety of themes reflecting the intellectual, cultural and religious thinking of the times. Prerequisite: LAT 200, 201, 324 or equivalent or permission of the instructor.

550 Independent Study in Latvian
1-3 hrs.
Directed individual study of a specific topic in a Latvian language, literature, or culture area. Departmental approval required for admission. Repeatable for credit. Prerequisite: Permission of instructor.

551 Advanced Latvian Grammar and Composition
3 hrs.
An advanced study of the intricacies and problems of Spanish grammar, syntax, and style with attention to improving written expression in Spanish at an advanced level. Prerequisites: Spanish 316, 317, and one additional 300-level course. At least three hours of 526, 527, 528, or 529 are recommended.

553 Advanced Spanish Conversation
3 hrs.
Intensive practice to reinforce and expand the basic oral communication skills and to develop flexible and idiomatic oral expression. Prerequisites: Spanish 316, 317, and one additional 300-level course. At least three hours of 526, 527, 528, or 529 are recommended.

560 Studies in Latvian Literature
3 hrs.
Topic varies according to genre, author, or period and will be announced. May be repeated for credit under a different topic. Prerequisite: Permission of instructor.

579 Seminar in Latvian Linguistics
2-4 hrs.
Each seminar will deal with a selected topic relating to Latvian linguistics, e.g., the development of the Latvian literary language—from folk literature to the present-day idiom. May be repeated for credit with a different topic. Prerequisite: Permission of instructor.

597 Seminar in Latin Linguistics
2-4 hrs.
Each seminar will deal with a selected topic relating to Latin linguistics, e.g., the development of the Latin literary language—from folk literature to the present-day idiom. May be repeated for credit with a different topic. Prerequisite: Permission of instructor.
552 Sociolinguistics
4 hrs.
A systematic study of the linguistic correlates of social behavior and the influence of society on the nature of language.

597 Seminar in Linguistics—Variable Topics
2-4 hrs.
Each seminar will deal with a selected topic relating to language and/or linguistics. Since content will vary from semester to semester, students are advised to check course descriptions in the Department Office. The Department will welcome suggestions for seminar topics from students. Prerequisite: Major or minor status or permission of instructor.

598 Readings in Linguistics
1-4 hrs.
An opportunity for advanced students with good scholastic records to pursue the independent study of a linguistic subject not specifically covered by any of the courses in the Linguistics program. Prerequisite: Permission of the instructor and chairperson.

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

Languages (LANG)

710 Independent Research
2-6 hrs.

Linguistics (LING)

710 Independent Research
2-6 hrs.

Mathematics and Statistics (MATH)

Buckley, Chairperson; Professors Alavi, Charrand, Clarke, Fienenburg, Gioia, Goldsmith, Hirsch, Hsieh, Kapoor, Laing, Meyer, Petro, Riley, Schreiner, Schwenk, Sievers, Stoline, White, Yang, Associate Professors Blefko, Channell, McKean, Mihakko, Pence, Stoddart, Turner, Assistant Professors Alemayehu, Oeltermann, Treiman.

Open to Upperclass and Graduate Students

506 Scientific Programming
3 hrs.
An introduction to solving scientific and engineering problems on computers. The topics include root-finding, matrix calculations, numerical integration and the numerical solution of differential equations. The FORTRAN language and various library software packages will be used. Prerequisite: MATH 230 or 374, and CS 201 or 306.

507 Numerical Analysis I
3 hrs.
The analysis and use of numerical algorithms will welcome solutions of nonlinear equations, systems of linear equations, interpolation, numerical differentiation and integration. Prerequisite: MATH (230, 272, and 274) or 374 and CS/MATH 506.

510 Applied Matrix Algebra
3 hrs.
An introduction to the study of methods to solve linear systems of equations, least squares approximation problems, and eigenvalue problems. Topics covered include the algebra of real and complex matrices with particular emphasis on LU decompositions, QR decompositions, singular value decompositions, generalized inverses, Hermitian symmetric matrices, position definite matrices and the Spectral Theorem. Applications from multivariate calculus will be discussed. Prerequisites: Either MATH 230 and MATH 272 or MATH 374.

530 Linear Algebra
3 hrs.
Properties of finite dimensional abstract vector spaces, linear transformations, and matrix algebra are studied. Prerequisite: MATH 330.

540 Advanced Geometry
3 hrs.
Topics to be selected from projective geometry, algebraic geometry, differential geometry, or noneuclidean geometry. Prerequisite: Consent of instructor.

550 Teaching of Secondary Mathematics
3 hrs.
This course is designed to give candidates an overview of teaching mathematics in the secondary schools. Emphasis will be on teaching strategies to help students understand mathematical concepts. Prerequisite: MATH 272.

552 Teaching of Elementary Mathematics
3 hrs.
Consideration is given to teaching problems and trends in the elementary mathematics classroom. The student will learn to work cooperatively with elementary school teachers and to observe them teaching mathematics. Prerequisite: MATH 272 or consent of instructor.

553 Participation in Elementary Mathematics Teaching
2 hrs.
Students will participate in an elementary classroom in various aspects of helping children learn mathematics. Prerequisite: Consent of instructor.

557 Statistical Design and Analysis of Experiments
3 hrs.
The analysis of variance, the discussion of hypothesis testing, and the interpretation of results of both theory and applications. Topics 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.

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 analyses and output. Each student will be required to complete and submit two projects. Prerequisites: MATH 265 or MATH 330.

566 Nonparametric Statistical Methods
3 hrs.
This course presents a broad overview of nonparametric 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 ranks or ranks, order statistics, rank correlation, efficiency. Emphasis will be on applications of nonparametric statistical methods to data from many different applied fields. Prerequisite: An introductory statistics course.

567 Statistical Design and Analysis of Experiments
4 hrs.
A course in experimental design and the analysis of variance, with particular emphasis of data obtained from 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. The course is designed to help the student understand the complete analysis of good applied problems. Prerequisite: An introductory statistics course.

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.

570 Advanced Calculus
3 hrs.

572 Vector Calculus and Complex Variables
4 hrs.
Functions of several variables, implicit and inverse functions, Jacobians, multiple integrals, Green's theorem, divergence, curl, the Laplacian, Stokes Theorem, analytic functions, Laurent expansions, residues, argument principle, and conformal mapping. Prerequisites: (MATH 230, 272 and 274) or 374.

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.

580 Number Theory
3 hrs.
Diophantine equations, congruences, quadratic residues, and properties of number-theoretic functions. Prerequisite: MATH 330.

595 Seminar in Elementary Mathematics Education
1-3 hrs.
Current curriculum problems in the area of elementary mathematics education are identified and discussed. Students are required to identify a problem and give both an oral and written report on research in that area. Prerequisite: MATH 552.

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

600 Statistics for Public Administrators
3 hrs.
This course is designed to assist public administrators in understanding various statistical procedures which could be used to comprehend and interpret data sets related to public policy analysis. Topics covered in the course include: a review of basic statistics in the context of policy analysis, and case studies used in analyzing policy data. Throughout the course, examples will be used from policy analysis and evaluation literature to illustrate the utility of the statistical procedures presented. Prerequisite: Elementary statistics or equivalent. (Cross-listed with PADM 591.)

602 Mathematical Modeling I
3 hrs.
This course considers the methodology of modeling a series of practical problems. The mathematical tools used may include dimensional analysis, optimization, differential and difference equations, graph theory and network flow theory. The practical problems may include population dynamics, economic theory of prices and production, scale models, scheduling problems, pollution, social group interaction, epidemics, and facility location. Prerequisite: MATH 574 or consent of instructor.

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 408 or 608 or IEEM 610.

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.

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

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.

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.

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.

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

619 Computer Methods in Secondary Mathematics
3 hrs.
This course will emphasize applications of computer techniques to the teaching and learning of mathematics in grades 7-12. The BASIC programming language will be reviewed in the context of solving mathematical problems using microcomputers and the WMU DEC system-10. Computer-oriented mathematics curriculum materials will be examined and developed. Prerequisite: Consent of adviser.

622 General Topology I
3 hrs.
Topics include: Separation axioms, continuity, compactness, connectedness, product and quotient spaces, metric spaces. Prerequisite: MATH 570 or permission of instructor.

623 General Topology II
3 hrs.
Topics include: Continuous functions, uniform spaces, function spaces, paracompactness. Prerequisite: MATH 622.

624 Algebraic Topology
3 hrs.
Topics will include simplicial complexes, homology and cohomology theories, including singular homology theory. Prerequisite: MATH 622.

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.

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.

631 Abstract Algebra II
3 hrs.
A continuation of 630. Modules, structure theory of modules over principal ideal domains, applications to finitely generated abelian groups, rational and Jordan canonical forms of a linear transformation, Bilinear and quadratic forms. Prerequisite: MATH 630.

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

637 Numerical Linear Algebra
3 hrs.
The analysis and use of numerical algorithms for solving problems from linear algebra, including matrix norms, singular value decompositions, Gaussian elimination, least square methods, eigenvalues and iterative methods. Prerequisites: MATH 510 or 530, and 506 or 507.

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.

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.

641 Graph Theory II
3 hrs.
Continuation of MATH 640. Prerequisite: MATH 640.

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.

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. Prerequisite: Approval of instructor.

649 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.

651 Mathematics for Elementary School Teachers
3 hrs.
Emphasizes the concepts and foundations of the mathematics commonly taught in elementary school and of associated problems of learning and teaching. Each student will be expected to study and report on some special problem or aspect of the teaching of mathematics. Prerequisite: Consent of advisor.

652 Mathematics for Junior High School Teachers
3 hrs.
This course is designed to acquaint the student with contemporary trends in junior high school Mathematics. Several current programs will be studied to determine what topical content should be included and the treatment to be given to this content in a modern mathematical program for junior high school students. Prerequisite: Consent of advisor.

653 Studies in Teaching of Secondary Mathematics
3 hrs.
An advanced methods course devoted to the identification and evaluation of strategies for teaching mathematics. Strategies for teaching skills, concepts, generalizations, problem-solving, and proof-making will be explicated. Prerequisite: Consent of advisor.

654 Curriculum Studies in Algebra and Geometry
3 hrs.
Current curriculum recommendations, problems, and trends in algebra and geometry are identified and discussed and the most recent experimental and commercial curriculum materials analyzed. Prerequisite: Consent of advisor.

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 advisor.

660 Statistical Inference I
4 hrs.
A first course in mathematical statistics. Topics include: distributions of statistics, asymptotic distribution theory, theories of estimation, functions of sufficient statistics, confidence intervals; theories of testing, uniformly most powerful tests; likelihood ratio tests; selected topics in statistics. Prerequisite: MATH 562.

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-squared; Wishart distribution; applications to tests of the mean vector and covariance matrix; principal components; factor analysis; cluster analysis; discriminant analysis. Prerequisite: MATH 663.

662 Applied Linear Models
3 hrs.
An advanced course in applied statistics. Linear models will be used to treat a wide range of regression and analysis of variance methods. Topics include: matrix review; multiple, curvilinear, nonlinear, and stepwise regression; correlation, residual analysis; model building; computer programs for multiple regression, computer programs for analysis of variance and covariance models. Prerequisite: MATH 562.

663 Linear Models
3 hrs.
A theoretical study of the general linear model including random vectors, quadratic forms, multivariate normal distributions, least squares estimation, hypothesis testing for full and reduced models, generalized inverses. Prerequisites: MATH 660 and 662 and 510.

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; computer programs; random effects, fractional replication. Prerequisite: MATH 562.

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.

666 Nonparametric Statistical Theory
3 hrs.
A theoretical study of nonparametric statistics and robust statistical procedures. Topics may include: order statistics, empirical cdfs, M-estimates, rank statistics, optimality considerations, asymptotic distribution theory. Prerequisites: MATH 673 and 660.

667 Introduction to Random Processes
3 hrs.
This course is a treatment of random processes. Additional topics may include: order statistics, empirical cdfs, M-estimates, rank statistics, optimality considerations, asymptotic distribution theory. Prerequisites: MATH 673 and 660.

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, log-linear models, incomplete tables, symmetry, marginal homogeneity, and conditional independence models. Prerequisite: MATH 662.

669 Studies in Probability and Statistics
3 hrs.
The subject matter for this course is variable. Advanced work is considered and organized around topics not usually considered in the other courses.

673 Real Analysis
4 hrs.
Topology of n-dimensional space, continuity and differentiability of functions of one variable; Riemann-Stietjes integral; convergence of sequences and series of functions; Fourier series; analysis of functions of several variables. Prerequisite: MATH 570 or approval of adviser.

676 Complex Analysis
3 hrs.
Topics include: Cauchy Theory, series expansion, power series, types of singularities, calculus of residues. Prerequisite: MATH 673.

677 Measure and Integration
3 hrs.
The basic theory of measure and integration, including such topics as Lebesgue measure, abstract measures, measurable functions, product measures, Lp spaces, Radon-Nikodym theorem. Prerequisite: MATH 673.

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.

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.

680 Topics in Statistical Computing
3 hrs.
Study of the computational algorithms used in solving statistical problems. Students will write their own FORTRAN routines as well as drivers and subroutines to implement mathematical and statistical packages. Problems covered include approximating probabilities and quantiles for selected distributions; Monte Carlo studies; least squares computational procedures for linear and nonlinear models such as QR decompomositions and iteratively reweighted least squares, and robust estimating procedures. Additional topics may include generalized linear models, nonlinear models, and multivariate problems. Prerequisites: CS 306 or CS 201; MATH 662 or MATH 568 and MATH 230.

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.
690 Seminar in Applied Mathematics
1-3 hrs.

691 Practicum in Statistical Consulting
1 hr.
Provides graduate students with the opportunity to participate as statistical consultants on real projects. The student consultants are involved with all aspects of the statistical consulting experience from data manipulation and analysis to the design of the statistical aspects of the project and from interaction and effective communication with a client to the production of a final written report on the statistical aspects of the project. May be taken for credit at most three times.
Prerequisites: MATH 662 or concurrent enrollment and at least one of MATH 563, 566, 567, or 568.

692 Seminar in Topology
1-3 hrs.

693 Seminar in Algebra
1-3 hrs.

694 Seminar in Graph Theory
1-4 hrs.

695 Seminar in Mathematics Education
1-4 hrs.

696 Seminar in Probability and Statistics
1-3 hrs.

697 Seminar in Analysis
1-3 hrs.

698 Statistical Consulting Internship
2-6 hrs.
The statistical consulting internship program provides a graduate student with the opportunity to work as a member of the staff in the Center for Statistical Services. The student gains considerable experience in all aspects of the consulting experience and the operation of a consulting center.
Prerequisite: Consent of Adviser.

699 Reading and Research
1-6 hrs.
Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

712 Professional Field Experience
2-12 hrs.

730 Doctoral Dissertation
2-12 hrs.

735 Graduate Research
2-10 hrs.

Medieval Studies (MDVL)
Otto Grundler, Director

The Medieval Institute of Western Michigan University offers an interdisciplinary program leading to the Master of Arts in Medieval Studies. Either as preparation for further doctoral work or for a terminal degree, the program provides students with a broad background in medieval and Renaissance history, languages, literatures, philosophy, religion, the arts, and in research methodology.

Western Michigan University offers an academic environment appropriate for the study of the Middle Ages. The University library houses extensive holdings of books and periodicals in all areas of medieval studies, and the Institute of Osterician Studies library contains unique collections of early manuscripts and rare books in the field of monastic and Renaissance history and thought. Western Michigan University is the host institution for the annual International Congress on Medieval Studies, and Medieval Institute Publications publishes various series of monographs and periodicals in the field of medieval studies.

The Teaching Faculty of the Medieval Institute are the following:
George T. Beech (History), Guntram G. Bischof (Religion), Gary Bigelow (Spanish), Ernst A. Breisach (History), Norman E. Carlson (English), Nancy Gutirth (English), Audrey Davidson (Humanities), Clifford Davidson (English), Stephane Demetrakopoulos (English), David Ede (Religion), E. Rozanne Elder (History), Judith Engle (Latin), Robert W. Felkel (Spanish), Billie Fisher (Art, Kalamazoo College), Jeffrey B. Gardiner (German), C. J. Gianakaris (English), Otto Grundler (Religion), L. John Link (Art), Else Jorgens (English), Johannes A. Kissel (German), Peter Krawutschke (German), Emmanuel Nodel (History), Robert A. Palmer (Languages and Linguistics), Kathleen Smith (French, Kalamazoo College), Thomas Seiler (English), Matthew Steel (Music), John H. Stroupe (English), Larry E. Syndergaard (English), John Wickstrom (History, Kalamazoo College).

Medieval Institute
Open to Upperclass and Graduate Students

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.

597 Directed Study
1-3 hrs.
Research on a selected topic in the field of medieval studies directed and supervised by a faculty member. Registration requires at least junior standing and approval by the Director of the Medieval Institute.

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

700 Master's Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

Required Core Courses

ENGLISH
530 Medieval Literature
4 hrs.

HISTORY
691 Historical Sources and Methods
3 hrs.

LATIN
598 Latin Literature before 1000
2 hrs.

560 Medieval Latin
3 hrs.

RELIGION
500 Christian Theology to 1500
4 hrs.

Cognate Electives

ART
583 History of Medieval Art
3 hrs.

585 History of Renaissance Art
3 hrs.

HISTORY
550 Topics in Medieval History
3 hrs.

554 Renaissance and Reformation
3 hrs.

692 Histonography
3 hrs.

ENGLISH
510 Millennium, Utopia, and Revolution
4 hrs.

555 Major Winters: Chaucer, Dante, Milton, Spenser
4 hrs.

642 Studies in Drama
4 hrs.

652 Studies in Shakespeare: Tragedy
3 hrs.

653 Studies in Shakespeare: Comedy
3 hrs.

RELIGION
510 Medieval Music
2 hrs.

585 Medieval Music
2 hrs.

566 Renaissance Music
2 hrs.

Philosophy (PHIL)

A. Falk, Chairperson; Professors Ellin, Pritchard; Associate Professors Sheridan, Dilworth.

There is no graduate program in philosophy at WMU. Graduate students in other areas seeking to add analytical depth and perspective to their major studies through the study of philosophy should consult with the department chairperson, 5018 Friedmann Hall.

Open to Upperclass and Graduate Students

510 Professional Ethics
4 hrs.

A philosophical examination of the foundations of ethics in the professions.
Topics to be considered include the professions and professionalism, relationships between professional and ordinary ethics, social responsibilities of the professions, professional/client relationships, regulation of the professions, and codes of ethics.

520 Mathematical Logic 3 hrs. Basic ideas in modern mathematical logic; fundamentals of propositional and quantificational calculus; basic features of formal languages and axiomatic theories; topics in mathematical logic, e.g., the deduction theorem, consistency and completeness, and incompleteness. Prerequisites: MATH 310 or MATH 314 or permission of instructor.

534 Moral and Philosophical Foundations of Health Care 4 hrs. In this course philosophical reflection and biological science are combined in a critical examination of the nature and purpose of the health sciences. Topics to be considered include: the aims of the health sciences; the interplay of fact and value in health care, contrasting views of humankind embedded in health science, patient autonomy, dignity, and medical paternalism. This is a cross-college interdisciplinary course which is taught with faculty from the General Studies Science area.

570 Philosophical Topics 1-4 hrs. An examination of special philosophical topics. Topics to be listed in the Schedule of Classes.

598 Readings in Philosophy 1-4 hrs. Research on some selected period or topic under supervision of a member of the Philosophy faculty. Approval of instructor and chairperson of the department's individualized courses must be secured in advance of registration.

Physics (PHYS) Bernstein, Chairperson. Professors Carley, Hardie, Oppliger, Shamu, Soga, Tanis. Associate Professors Halderson, Kaul, McGinn, Assistant Professors Chung, Rosenthal.

Open to Upperclass and Graduate Students

520 Analytical Mechanics 3 hrs. The topics studied include the dynamics of a single particle and the motion of a system of interacting particles. Techniques of vector analysis are used frequently, and conservation laws are developed and applied. The Lagrangian formulation of mechanics is introduced. Prerequisite: Physics 211 and either MATH 274 or 374. The mathematics course may be taken concurrently.

540 Electricity and Magnetism I 3 hrs. Winter This is a theoretical course providing a thorough investigation of electric and magnetic fields. The applications of the theorems of Stokes and Gauss are emphasized, and Maxwell's equations are developed. Prerequisites: Physics 211 and either MATH 274 or 374, or consent of the instructor.

541 Electricity and Magnetism II 3 hrs. This course is a continuation of 540 and is an elective for majors wishing advanced work in field theory. Maxwell's equations and their applications to topics such as time-dependent fields, wave guides, and radiation will form the principal topics of the course. Prerequisite: Physics 540.

550 Quantum Mechanics 3 hrs. Winter In this course the development of quantum mechanics is traced, and simple applications of the theory are discussed. Topics include the uncertainty principle, the Schroedinger equation with solutions, the coupling of angular momenta, and perturbation theory. Prerequisite: Physics 211 and 520 or consent of the instructor.

562 Atomic and Molecular Physics 3 hrs. Fall This course continues the study of the applications of quantum mechanics. Topics include the helium atom, multielectron atoms, the Raman, Zeeman, and Stark effects, stimulated emission, transition rates, selection rules, the diatomic molecule, and molecular physics. Prerequisite: Physics 550 or consent of the instructor.

563 Solid State Physics 3 hrs. After an initial study of symmetry and crystal structure, quantum mechanics is used to describe the cohesion of solids, x-ray and neutron diffraction, the elasticity of solids, lattice vibrations, and the thermal and electrical properties of solids, with particular emphasis on metals. Prerequisite: Physics 550 or consent of the instructor.

564 Nuclear and Particle Physics 3 hrs. Winter This course covers such topics as properties of nuclei, collision theory, nuclear reactions, nuclear models, fundamental interactions, and classification techniques used in particle physics. Discussions of experimental methods as well as theoretical treatments using quantum mechanics are included. Prerequisite: Physics 560 or consent of the instructor.

566 Advanced Laboratory 3 hrs. Winter The objectives of this course are to provide the student with experience in the use of modern laboratory equipment and with a better understanding of several important physical phenomena. The student will perform experiments from a list covering three areas: atomic, solid-state, and nuclear physics. A portion of the semester may be devoted to studying a problem in depth. The course consists of three, three-hour laboratory periods each week. Prerequisites: Physics 340 and Physics 560 (560 may be elected concurrently with 566).

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, conservation of momentum, and conservation laws. An introduction to the general theory of relativity will also be given. Prerequisite: Physics 520 (may be taken concurrently).

598 Selected Topics 1-4 hrs. This course affords an opportunity for advanced students with good scholastic records in Physics to pursue independently the study of some subject of interest to them. Prerequisite: Consent of the instructor.

Open to Graduate Students Only

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. All courses will be graded on a Credit/No Credit basis.

622 Quantum Mechanics I 3 hrs. This course is designed to provide a foundation of fundamental techniques of calculation for more advanced work in the physics and chemistry of atoms, molecules, nuclei, and solids. An attempt will be made to provide an understanding of the principles of the subject through the Schroedinger-Heisenberg equations as well as through the formal operator theory of Dirac. The simple and representative systems of the simple harmonic oscillator and the one-electron atom will be discussed. The course will be confined almost solely to the non-relativistic approximation. This course and 623 are offered in alternate years.

623 Quantum Mechanics II 3 hrs. This course is a continuation of 622. It employs state-vector formulation to study several problems of general interest, such as time-dependent perturbation theory, systems of identical particles, and introductory relativistic quantum mechanics. Prerequisite: PHYS 622.

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. This course and 630 are offered in alternate years.

630 Classical Mechanics 3 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. This course and 624 are offered in alternate years.

662 Electricity and Magnetism 3 hrs. This course deals with the static electromagnetic field and its interaction with matter. The applications of boundary value problems are emphasized. This course and 622 are offered in alternate years.
Political Science (PSCI)

Open to Upperclass and Graduate Students

504 Making of Public Policy in the U.S.
3 hrs.
A study of the formation of public policy at the local, state, and national levels with emphasis on the impact of decision processes upon policy outcomes.

505 National Public Policy
4 hrs.
This seminar places primary attention on emerging trends and issues that will affect the political, economic and social character of American public life a decade or more ahead, and analyzes potential changes in existing public policies. Significant analysis and writing are required.

506 Problems of American Government
3-4 hrs.
A critical examination of major problems facing national, state, or local government with emphasis upon contemporary efforts and studies designed to understand or solve such problems. Topics will vary from semester to semester and students may repeat the course.

516 Political Campaigning
4 hrs.
The course is designed to provide students with a practical guide on how to organize and conduct a political campaign. For the potential candidate or campaign worker, it tells how to do it. For others, it describes how campaigns are used to try to influence voters.

520 Constitutional Law
3 hrs.
Study of leading American constitutional principles as they have evolved through major decisions of the U.S. Supreme Court. Emphasis on judicial review, federalism, separation of powers, commerce, and taxation.

522 Civil Liberties and Civil Rights
3 hrs.
An examination of Supreme Court responses to First Amendment, criminal procedure, and equal protection questions with particular emphasis on political, social, and policy-making aspects.

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.

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.

531 Administration in Local and Regional Governments
3 hrs.
The administrative organization, structure, procedures, and forms of local units of government are analyzed.

532 The Bureaucracy
3 hrs.
The analysis of the role of public bureaucracies in the decision processes of government.

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.

534 Administrative Theory
3 hrs.
A study of descriptive theories of organizational and administrative behavior relevant to government administrative agencies. Theories of complex formal organizations, decisional theories, and systems theories will be analyzed.

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.

536 Comparative Public Administration
3 hrs.
This course introduces students to a variety of public administration systems found in the contemporary world and includes a brief evolutionary history of these systems. Various theoretical models of administration and bureaucracy are compared with current practice in Western Europe, North America, the Soviet Union, and in contemporary Asian and African systems.

541 Comparative Political Systems
3 hrs.
A study of the principal types of political systems. The course examines comparatively and theoretically governmental institutions, political processes, political behavior, and political development.

542 Administration in Developing Countries
3 hrs.
A consideration of the relation of administrative structure and technique to the political, economic, and social problems of the developing countries. Special attention is given to the role of the bureaucracy in the political system and to the nature of, and obstacles to, administrative modernization.

549 Problems of Foreign Political Systems
3-4 hrs.
Course will consider selected problems of the governments and political systems of Western and Eastern Europe, Asia, Africa, and Latin America. The specific problems, topics, and countries to be studied will be announced each semester. May be repeated.

552 Studies in International Relations
3-4 hrs.
Examines selected topics within the field of international relations. Topics will vary and will be announced each semester. Course may be repeated.

553 United Nations
3 hrs.
A study of the United Nations in action. Attention is focused on significant political problems confronting world organization, i.e., functional and dysfunctional aspects of the UN, nationalism vs. internationalism, conflict resolution and UN peace-keeping efforts, specific UN accomplishments in maintaining a dynamic international equilibrium, UN weaknesses and the future of world organization.

555 International Law
3 hrs.
The theory, sources, development, and general principles of international law, and the relationship of law to the dynamics of international politics. Decisions of international and municipal tribunals and the practices of states will be used to demonstrate the basic rights and obligations of states in time of peace and war. Such topics as recognition of states, diplomatic practice, treaties, and neutrality will also be discussed.

557 Studies in Foreign Policy
3-4 hrs.
Examines selected topics within the field of foreign policy. Topics will vary and will be announced each semester. Course may be repeated.

562 Modern Democratic Theory
3 hrs.
The course consists of two parts. First, a consideration of traditional democratic theories, and the criticism of these theories emanating from modern elitists such as Mosca, Michels, Pareto, and Ostrogorski. Second, an analysis of the attempts of contemporary economists, political scientists, and sociologists to meet these criticisms by revising democratic theory.

563 Theories of Revolution
4 hrs.
Examines significant classical and contemporary theories of revolution with reference to both their analytical and normative implications.

564 Introduction to Political Analysis
3 hrs.
A consideration of the approaches and methods used by contemporary political scientists with an emphasis on the application of scientific method to the study of politics. Included are applications of leading models of politics and the formulation of concepts, generalizations, and theories.

572 Computer Applications for Political Scientists
3 hrs.
This course is designed to provide students with a foundation in computer concepts and applications in political science and public administration. They will learn to use application packages such as SPSS and DPL. The course includes computer exercises and a term project. Prerequisite: CS 105 or equivalent or consent of instructor.
590 Research Methods
3 hrs.
Study of the formulation of research questions, the design of research, the methods of data collection, and the procedures for analyzing data concerning political institutions and behavior.

591 Statistics for Political Scientists
3 hrs.
An introduction to statistical reasoning with particular reference to research on political institutions and behavior. This course will emphasize bivariate statistics, but will include a brief introduction to multivariate analysis. No mathematical prerequisite is required.

598 Studies in Political Science
1-4 hrs.
An opportunity for advanced students with good scholastic records to pursue independently the study of some subject of interest to them. Subjects are chosen and arrangements made to suit the needs of individual students. Prerequisite: Approval of Department Chairperson and instructor.

Open to Graduate Students Only

600 Seminar: National Politics
3 hrs.
Research and study in selected topics in national politics. Topics will vary from semester to semester, and students may repeat the course.

601 Seminar: State Politics
3 hrs.
Research and study of selected topics in state politics. Topics will vary from semester to semester, and students may repeat the course.

602 Seminar: Urban Politics
3 hrs.
Examination of the literature on American urban politics and application of this literature to the development or refinement of some theories of community political behavior. The city will be used as a laboratory for the advancement of theoretical and empirical knowledge of politics. May be repeated.

610 American Political Institutions
3 hrs.
A systematic treatment of the characteristics of the coordinate branches of American government, interest group and media influences, and the processes by which public policy is formulated and carried out.

622 Seminar: The Judiciary
3 hrs.
Study and research of major topics of interest in the judicial process, judicial decision-making, judicial behavior, the judiciary as policy-maker, judicial systems, and public law. Topics will vary from semester to semester, and students may repeat the course.

628 Administrative Law and Governmental Rules
3 hrs.
Examines the process by which local, state, and national laws are administered and enforced by public agencies. Special attention is focused on the development, adoption, and enforcement of administrative rules. Prerequisite: PSCI 200 or consent.

630 Seminar: Public Administration
1-3 hrs.
Study of selected topics in public administration. Subject matter will vary, and the course may be repeated. The number of hours for which the course is offered in any given semester will be listed in the Schedule of Classes.

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.

633 The Environmental Politics 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.

634 Seminar: Professional Issues in Public Administration
1 hr.
This seminar examines topics of interest to professionals in the field of public administration. May be repeated. Total not to exceed three hours. Graded on a Credit/No Credit basis.

635 Professional Seminar in Agency Administration
3 hrs.
This professional seminar concludes the MPA candidate’s program of study and provides an opportunity to focus all previous professional experience and academic preparation on the analysis and solution of a major problem confronting an agency of government. The candidate’s report culminating this study should be of educational value to the student, of practical benefit to the agency studied, and of academic quality acceptable to the faculty.

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.

640 Seminar: Foreign Political Systems
3 hrs.
Study and research on major topics dealing with the political systems of selected countries. Independent research and seminar presentations for each student are stressed. The country to be studied may be located in Europe, Asia, Africa, or Latin America, and will be announced each semester. May be repeated.

644 Seminar: Political Modernization
3 hrs.
Focusing on the developing areas and using an interdisciplinary approach, the process of political modernization is examined in selected countries or typically on a cross-national basis. The topic to be studied will be announced each semester. Each student will conduct independent research. May be repeated.

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 variations 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.

646 Seminar in Development Administration
3 hrs.
The seminar is devoted to research related to administration in developing areas. Topics may range from general subjects dealing with various aspects of bureaucracy in one or more countries to narrow problems at the level of a ministry of sub-ministry. The research experience and final papers will be shared with the other students in the seminar.

650 Seminar: International Relations
3 hrs.
Study and research on a common topic of current international political, organizational, or legal significance. Individual papers and reports will be presented. May be repeated.

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 in certain periods in history, or regions of the world may be considered. Subject will vary, and the course may be repeated.

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.

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

700 Master’s Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

Psychology (PSY)

Lyon, Chairperson; Research Professor Ulrich, Professors Asher, Farris, Gault, Huitema, Kent, Koronakos, R. W. Malott, Michael, Robertson, Tsegaye-Spates, Associate Professors Alesi, Brethower, Fujiu, Nangle, Poling, Assistant Professors Burnett, Dickinson, M. K. Malott, Redmon.

Open to Underclass and Graduate Students

510 Advanced General Psychology
3 hrs.
Readings, lecture, and discussion designed to introduce students to modern behavior theory. Emphasis will be upon human behavior, both normal and abnormal, with a significant portion of the course devoted to
the higher cognitive processes. Recommended as a cognate course in Psychology. Recommended prerequisite: One prior course in psychology.

512 Behavioral Pharmacology and Toxicology
3 hrs.
Topics range from the use of drugs to clarify behavioral principles to the use of behavioral preparations to discern pharmacological effects. Readings include summaries of pharmacological evidences and selected experimental reports concerning both the behavioral techniques and pharmacological problems in basic research. Prerequisite: 12 hours of Psychology, permission of instructor, or enrollment in SPADA program.

513 Research in Animal Behavior
3 hrs.
A review of the research literature in several areas of animal behavior. Particular emphasis will be placed on species-typical behaviors and their ecological significance, and forms of learning which are not easily explained by operant and respondent models.

516 Conditioning and Learning
3 hrs.
A study of the various approaches to response measurement, experimental methodology, and theoretical interpretations of data in the area of conditioning and learning.

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.

518 Research in Stimulus Control
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.

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.

524 Human Sexuality
3 hrs.
Discussion of those human behaviors concerned with sex, sexuality, and reproduction. Consideration is given to the anatomical, physiological and psychological properties of sexual functioning in male and female. Emphasis is placed upon the sexual response cycle as described by Masters and Johnson. The course is not intended to provide therapy training.

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 thought to contribute to responsible and irresponsible drug intake. Although human drug use and abuse are the primary focus of the course, nonhuman research findings are emphasized where appropriate.

529 Generalization, Discrimination, and Concept Formation in Humans
3 hrs.
Basic theoretical interpretations, methodological issues and data analysis in the stimulus selector will be reviewed and analyzed with an emphasis on the potential and actual applications to human behavior.

530 Statistics for the Behavioral and Health Sciences
3 hrs.
An introduction to basic statistical procedures and concepts. Topics include: measures of central tendency and variability, frequency distributions and graphic presentations, the normal curve, probability theory and the binomial, hypothesis testing, the t-test, chi square, correlation, regression and an introduction to analysis of variance.

535 Instrumentation in Psychology
3 hrs.
A survey of problems in response measurement in experimentation. Lecture and laboratory. May be repeated for credit.

540 Industrial Psychology
3 hrs.
Application of psychological principles to industry and other organizations. An examination of employee selection, job satisfaction, training, evaluation of performance, supervision, and working conditions.

542 Human Factors in Engineering
3 hrs.
A survey of research on the adaptation of equipment, products, and environment to human capacities. (Cross-listed with IEGM 542.)

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.

562 Management of Health Related Behaviors
3 hrs.
A behavior analysis approach to the management of behaviors directly and indirectly impacting health. Emphasis will be placed on outpatient, public health applications and preventive approaches to health maintenance.

570 A Behavior Analysis Approach to the Area of Retardation
3 hrs. Fall
Topics will include: historical background, assessment, treatment, and legal implications of treatment.

572 Applied Behavior Analysis: A Systems Approach
3 hrs.
The application of systems analysis concepts to the design of systems which yield behavioral measures of complex social situations.

574 Experimental Social Psychology
3 hrs.
Methodology of research with groups, with emphasis upon design and application. Prerequisite: Permission of the instructor.

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.

597 Topical Studies in Psychology
1-4 hrs.
A survey and discussion of selected research topics of current interest. Topics may include both basic science and applied aspects of the discipline. Permission of Instructor. Courses may be repeated for credit, although the total number of credits may be limited by the degree program. Students should consult the program adviser.

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.

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

601 An Introduction to Issues in Behavioral Assessment
1 hr.
This course is designed to provide information on the legal and ethical issues in assessment which serve as a framework for the evaluation of testing procedures. An overview of norm-referenced assessment instruments, traditional personality tests, and criterion-references tests, as well as supervised practice in direct observational assessment are included. This course is scheduled for the first five weeks of the semester in which it is offered.

602 An Introduction to the Theoretical Analysis of Behavior
1 hr.
This course considers the extension of basic behavioral concepts and relations to thinking, private stimulus control, self-awareness, perception, and other related topics often considered least amenable to a behavioral analysis. It presents a radical behavioral position on these and other theoretical issues, and considers the various objections to this point of view. This course is scheduled for the second five weeks of the semester in which it is offered.
603 An Introduction to Professional Issues in Applied Behavior Analysis
1 hr.
This course considers an examination of recent literature with respect to the areas of legal regulation of behavior modification, professional standards of practice, the conduct of human research, and an analysis of ethical behavior. This course is scheduled for the final five weeks of the semester in which it is offered.

608 Current Research in Applied Behavior Analysis
3 hrs.
A detailed examination of research methodologies and strategies, emphasizing the areas of measurement, reliability, and single organism research design. In addition, several areas of current research interest, as exemplified by the journal of Applied Behavior Analysis, will be studied.
Prerequisites: Previous course work in applied behavior analysis and previous or concurrent enrollment in PSY 530, 634, or equivalent.

609 Advanced Seminar in Applied Behavior Analysis Research
3 hrs.
An advanced course emphasizing: a) the continued examination of current research topics, and b) the development of professional research skills (planning and preparation, grantmanship, dissemination, skill maintenance). Prerequisites: Previous enrollment in PSY 608 and permission of instructor.

610 Experimental Analysis of Behavior
3 hrs.
A survey of the major facts, concepts, principles, and methodology of respondent and operant research. The emphasis will be on nonhuman research especially as described in the Journal of the Experimental Analysis of Behavior.

611 Current Research in Experimental Analysis
3 hrs.
A detailed study of the immediately preceeding year's principal research in the analysis of behavior. The emphasis will be on lower animal research, especially as described in Journal of the Experimental Analysis of Behavior.

612 Advanced Physiological Psychology
3 hrs.
A survey of the interrelationships of physiological and behavioral processes. Lecture and laboratory. Prerequisite: Permission of the instructor.

620 Analysis of Abnormal Behavior
3 hrs.
An advanced study of behavioral disorders as characterized by the standard classification systems, the DMS III and ICD-9-M, with respect to their etiology, prognosis and treatment.

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.

634 Advanced Statistics
3 hrs.
Topics include statistical decision theory, one factor analysis of variance, multiple correlation, factorial designs, randomized block designs, fixed, random and mixed models, and basic issues in experimental design. Prerequisite: PSY 530 or equivalent.

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.

636 Experimental Design
3 hrs.
A study of true and quasi experimental designs, comparisons of single organism and group designs, consideration of artifacts and interpretation, and comparisons of statistical and non-statistical designs. Prerequisite: PSY 634 and 635.

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.

643 Personnel Selection and Placement
3 hrs.
A critical study of assessment techniques such as testing, weighted application blanks, and interviewing. Included is consideration of administrative procedures and the methods of measuring the functional adequacy of assessment methods. Prerequisite: A course in Statistics.

644 Personnel Training and Development
3 hrs.
The course emphasizes the principles of learning as well as the techniques and administrative procedures used in the development of human resources at all levels.

645 Psychology of Work
3 hrs.
Emphasis is placed upon an investigation of worker attitudes, morale, motivation, supervisory styles, and social interaction as determiners of employees' productivity and job satisfaction with particular attention paid to the "problem employee."

650 Professional Ethics and Legal Issues
3 hrs.
A seminar devoted to topics of current as well as historical professional concern regarding professional application and research ethics. Topics include the American Psychological Association publications on professional ethics and the use of human subjects in research as well as APA Standards for Providers of Psychological Services, and the Michigan laws relating to the practice of psychology, the rules of the Board of Psychology, the concept of licensure, advertising to the public and psychology in the media.

652 Systems Analysis
3 hrs.
An advanced course stressing integration of behavior analysis and systems analysis applied to the design, creation, and management of human performance systems. The course operates much of the time as a simulated organization with each student taking on a variety of organizational roles. Students do analyses of systems in which they are involved and implement their systems designs within the course and in external settings. Prerequisite: PSY 572.

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.

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.

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.

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.

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. Permission of Instructor.

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. Permission of the instructor.

665 Behavior Analysis and Behavior Modification
3 hrs.
This is a treatment course designed to familiarize the student with the methods, applications, theory and clinical literature of behavior analysis and behavior modification. Training in community applications and token economies, skills acquisition, self-management, and behavior programming are also included. Permission of instructor.

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. Permission of Instructor.

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. Permission of Instructor.
The course is intended to develop proficiencies in the assessment of behavior problems, using self-report measures, behavioral interviewing, direct observation techniques, and physical recording. Reliability and validity issues with respect to each assessment tool are covered. Behavioral consultation, an efficient alternative to one-to-one counseling in which therapist contact is primarily with the manager rather than the client, is introduced. Students complete a lab project, using assessment and consultation techniques learned in the course. Prerequisite: PSY 601, nine hours graduate credit in psychology, or permission of instructor.

674 Verbal Behavior

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. Prerequisites: PSY 601, nine hours graduate credit in Psychology or permission of instructor.

678 Behavior Analysis and Cognitive Psychology

The first third of the course will consider behavioral approaches to the kinds of issues that are the major focus of cognitive psychology: complex human learning, memory, thinking, problem solving, imagery, language, and the self. The remainder will survey and analyze the approach to these issues taken by various types of cognitive psychologists: developments from the field of verbal learning, information theory, psycholinguistics, ethology, Piaget, and the cognitive behaviorists. Prerequisite: Nine hours of graduate credit in Psychology or permission of instructor.

679 Radical Behaviorism and Behavior Modification

This course is intended to provide training in the theoretical analysis of various psychological events which include both behavioral and mental references. The course includes an in-depth analysis of the theoretical basis of the philosophic position identified as "radical behaviorism" as contrasted with other theoretical positions in Psychology. Prerequisite: Nine graduate hours in Psychology.

681 Personality Assessment

Survey of the theory of personality assessment and the basic concepts of nonprojective measurement, with emphasis on the administration, scoring and interpretation of various instruments for personality evaluation. The course includes, but is not limited to, the supervised practice in the administration of the MMPI, clinical analysis questionnaire, and observational rating scales. Prerequisites: PSY 601 or equivalent and graduate program status.

682 Norm Reference Testing: Interpretation

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 formal and informal 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 (1972), 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.

683 Norm Reference Testing: Interpretation and Administration

A combined lecture and laboratory individual assessment course. Lecture focuses on basic psychometric concepts directly related to test administration and interpretation, as well as behavioral concepts and operational analyses of performance on specific test items, development of written personalized educational programs from collected assessment data, and writing of clear and useable reports. Recent issues in the intelligence controversy are also covered. Laboratory focuses on supervised experience in administering, scoring, interpreting, and developing short term educational plans using selected batteries of standardized individual assessment techniques, including but not limited to: Stanford-Binet Intelligence Scale (1972), McCarthy Scales of Children's Abilities (1972), Peabody Picture Vocabulary Test, Bayley Scales of Infant Development (1972), 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.

684 Personality Assessment: Projectives

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 evaluation. Prerequisites: PSY 601, 681, and degree program status.

686 Criterion Referenced Assessment

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 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:
Public Administration (PADM)

670 Public Policy and Strategic Planning 3 hrs.
Public policy is examined as a process extending from policy formulation through implementation. Attention is directed both to strategic planning and to the political environment within which such planning occurs. The course reviews alternative models seeking to describe and explain planning and public policy making, and explores the role of agency leadership in making critical decisions.

671 The Public Good 3 hrs.
This course will introduce students to the problems associated with defining the public good and the public interest, the historical and philosophical contexts of moral reasoning, the ambiguities of the value side of the policymaker's life, and how to think constructively about moral dilemmas; how the administrator uses discretionary power; how personal moral codes relate to assumptions about professional ethics and standards.

672 Historical and Comparative Analysis of Public Policy 3 hrs.
This course will deal historically and comparatively with the substance of administrative practices and policy assumptions and applications.

673 Quantitative Public Policy Analysis 3 hrs.
This course will examine the principal quantitative methods of public policy analysis. The focus of the course will be on the use of quantitative analytic techniques or tools employed to study policy issues. A majority of the analytic tools and techniques considered will be data- and problem-oriented.

674 Human Behavior in Public Organizations 3 hrs.
This course deals with the bases of organizational behavior, including conceptual material, empirical research, and applications. It examines such individual dimensions of organizational behavior as attitudes, values, perceptions, learning, personality, stress, and motivation. The course examines interpersonal influence and considers such dimensions of group dynamics as intragroup and intergroup behavior, group norms, cohesiveness, conformity, and groupthink. It concludes with consideration of such organizational processes as power, authority, politics, leadership, conflict, decision making, performance evaluation and behavioral elements of organizational communication.

675 Advanced Administrative Theory 3 hrs.
Students will assess current normative and descriptive theories of Public Administration, the variety of conceptual systems, operationalism and levels of organizational analysis, including the history of organization theory, the theory of bureaucracy, taxonomies, non-bureaucratic organizations, organization as a social issue, and tomorrow's organizations.

676 Cases in Public Policy Implementation 3 hrs.
This course will utilize a case study approach to public management problems. Students will be asked to weigh such factors as the following on a case-by-case basis.

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.

680 Intellectual Foundations of Public Administration 3 hrs.
This course is designed to acquaint participants with the fundamental ideas of modern public administration. The material is presented both historically and topically, with special attention to the classic studies and seminal discussions which have shaped the discipline. Participants are also introduced to the problems associated with defining the public good and the public interest, the ambiguities of the value side of the policymaker's life, and to how personal moral codes relate to assumptions about professional ethics and standards.

681 Designing Policy and Policy Systems 3 hrs.
The focus of this course is three-fold. First, it provides the administrator a conceptual understanding of the policy analysis process and illustrates how alternative models fit into that process. Building upon this base, the second part of this course focuses on the bureaucratic and political impediments to implementing policy analysis. Finally, it considers how administrators manage research and analysis at various stages of the policy-making process.

682 Administrative Decision Making 3 hrs.
This course will examine the organization as a system of linked sub-systems and analyze the elements of decision making as influenced by this environment. The impact of bureaucratizations on communication and control patterns will be related to managerial processes. Attention will be devoted to the effort of a systemic decision framework for the individual decisions.

683 Seminar in Administrative Theory and Practice 3 hrs.
The historical evolution of management thought is reviewed with particular reference to classical, neoclassical, and contemporary approaches to organizational structure and managerial functions. This course also pays particular attention to management strategy as reflected in public and private sector case studies, and examines how managerial decisions are made within 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 these 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.

685 Bureaucracy and Society 3 hrs.
Bureaucracy has become the predominant organizational form within the public sector in all advanced industrial societies today. This course explores the growth of bureaucracy, the expansion of its political role, goals, and objectives, and several alternative bureaucratic models, including the Weberian and Marxist approaches.

691 Seminar in Quantitative Policy Analysis 3 hrs.
This research seminar is designed to enable a group of candidates to tackle a current, unsolved policy problem in state or local government. Such a problem will be identified prior to the course, and the collective task will be to complete a working paper utilizing quantitative analysis.

692 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 services. May be repeated for credit with a different topic.

693 Action Research Project 3 hrs.
This course will be taken twice. Each time it will follow a methodological sequence of other courses that discussed various research techniques used in the analysis and evaluation of public policy. Various projects will be undertaken by students on a team basis. These projects will allow for the specific application of the tools of analysis previously examined in the quantitative survey courses. Repeatable for credit.

694 Qualitative Research Methods 3 hrs.
In this seminar, participants will conduct and be instructed in research using qualitative designs such as comparative historical, case study, content analysis, observation and intensive interviewing. The course will emphasize the operationalization of...
qualitative concepts and the research potential of data sources such as census, archives, documents and any natural setting.

695 Research Design
3 hrs.
This course will include conceptual and model analysis, hypothesis testing, research literature, theory construction, and individual research papers. Those papers may become the research design chapters for the students’ dissertations.

698 Studies in Selected Public Policy Areas
3 hrs.
This 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.

730 Doctoral Dissertation
15 hrs.
The dissertation will be policy-oriented and done with methodological care. It will be the student’s bridge back to the agency for which he or she works or to the agency for which he or she would like to work. A practitioner’s labor, the dissertation will provide analyses at a sophisticated level of a management or policy problem confronting the people of Michigan and how an administrative agency could recommend and implement alternative solutions. Graded on a Credit/No Credit basis.

Religion (REL)

Lawson, Chairperson; Professors Bischoff, Earhart, N. Falk, Grundler, Siebert, Associate Professor Ede

Open to Upperclass and Graduate Students

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: Zoroastrianism, Buddhism, Taoism, Shinto; New Religions of Japan, Religion in Japanese Literature; Islam in the Modern World; Christian Theology to 1500; Renaissance and Reformation Theology.

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 Yogas; the Occult Tradition.

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.

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.

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.

598 Readings in Religion
1-4 hrs.
Research on some selected period or topic under supervision of a member of the Religion faculty. Approval of instructor involved and Chairperson of the Department must be secured in advance of registration.

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

710 Independent Research
2-6 hrs.

Science Division (SCI)

Professor R. Poel

Open to Upperclass and Graduate Students

588 Readings in Science
1-4 hrs.
To be used by students seeking work in topics not otherwise available. The student is limited to not more than four hours in all reading courses and work must be completed under a member of the graduate faculty.

Open to Graduate Students Only

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.

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.

620 Topics in Science Education
2-6 hrs.
This course will present, analyze, and evaluate methods and techniques of teaching science. Topics may include new approaches for teaching science, new science curriculum, laboratory practices, science education research, motivational techniques, and other methodological problems confronting science teachers. Course content may vary, and the course may be repeated for up to 6 hours of credit provided different topics are involved.

621 Topics in Science
2-4 hrs.
This course is designed to examine various science concepts and new developments of science of interest to science teachers. Each course will be subtitled, and the content will vary to reflect the various sciences, new developments and emphases, and the needs of the science teaching community. The course may be repeated for credit provided different topics are involved.

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.

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.

710 Independent Research
2-6 hrs.

730 Doctoral Dissertation
15 hrs.

735 Graduate Research
2-6 hrs.

Social Science Division (SSCI)

Open to Upperclass and Graduate Students

500 Historical Studies in Social Science
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: Marxism, Capitalism, Socialism, Democracy, Fascism, Totalitarianism, Totalitarianism, Totalitarianism, Totalitarianism.

501 Problems in Social Science
1-4 hrs.
This independent study course allows students to study various problems in Social Science 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 Social Science. 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.

598 Readings in Social Science
1-4 hrs.
To be used by students seeking work in topics not otherwise available. The student is limited to not more than four hours in all reading courses and work must be completed under a member of the graduate faculty.

Open to Graduate Students Only

610 Problems in Social Science Education
1-4 hrs.
This independent study course allows students to study various problems in Social 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 Social 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.

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.

620 Topics in Social Science Education
2-6 hrs.
This course will present, analyze, and evaluate methods and techniques of teaching science. Topics may include new approaches for teaching science, new science curriculum, laboratory practices, science education research, motivational techniques, and other methodological problems confronting science teachers. Course content may vary, and the course may be repeated for up to 6 hours of credit provided different topics are involved.

621 Topics in Social Science
2-4 hrs.
This course is designed to examine various science concepts and new developments of science of interest to science teachers. Each course will be subtitled, and the content will vary to reflect the various sciences, new developments and emphases, and the needs of the science teaching community. The course may be repeated for credit provided different topics are involved.

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.

690 Social 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.

710 Independent Research
2-6 hrs.

730 Doctoral Dissertation
15 hrs.

735 Graduate Research
2-10 hrs.
Sociology (SOC)

Chaplin, Chairperson, Professors Braithwaite, Friday, Marble, Page-Robin, Petersen, Robin, VanValey, Wagenauf, Walker, Associate Professors Kramer, Ross, Sonnad, Wainer; Assistant Professors Carinella-MacDonald, MacDonald.

Open to Upperclass and Graduate Students

501 Social Systems Theory and Analysis

3 hrs.

An investigation and critique of social systems theory, general systems analysis, and specific systems analysis techniques which have been used in social organizations. Each student will be required to conduct a systems analysis during the course. Prerequisite: SOC 200 or consent of instructor.

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.

512 Child Abuse

3 hrs.

This course is an examination of child abuse in American society. Medical, psychological, educational, psychiatric, legal, and treatment perspectives are combined in a social analysis. The origins, family context, nature, extent, and social consequences of child abuse are discussed. Current applied social and legal solutions are presented, as well as possible social change required to respond to this phenomenon.

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.

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.

521 Childhood Socialization

3 hrs.

An investigation of social development of the child from birth to adolescence. Course will focus on child's interactions with parents and peers and these influence processes of learning, language acquisition, role-playing, the organization of knowledge, and development of self. Prerequisite: SOC 320 or Consent of Instructor.

522 Adolescent Socialization

3 hrs.

An investigation of social learning and personality development in adolescence. This course examines the effects of interaction patterns and group allegiances, social class membership, biological maturation, sex roles and self-awareness on adolescent behavior, personality development and orientations toward the adult world and adulthood. Prerequisite: SOC 320 or Consent of Instructor.

523 Contemporary Social Movements

3 hrs.

A study of the origins, growth, and effects in contemporary society of social movements. Selected social movements including communism, fascism, the radical left, the radical right, women's liberation, etc., will be analyzed. Prerequisite: SOC 200 or equivalent.

524 Adult Socialization

3 hrs.

Examination of processes of social learning and personality development from late adolescence through middle age. The course will focus on selection and performance of adult roles, issues of stability and change in adult identity, and the effects of role transitions and personal crises on adult development. Prerequisite: SOC 320 or Consent of Instructor.

528 Research Methods in Social Psychology

3 hrs.

An examination and comparison of major research strategies in social psychology as applied to several selected major topics within the field. Students will be expected to review, critique, and research within a selected area. Prerequisite: SOC 380 or equivalent.

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.

540 Sociology of Medicine

3 hrs.

A comprehensive survey of concepts and research findings in the field of the sociology of medicine. Topics to be covered include: the distribution of illness in society, relationships between social stress and disease, illness as a social process, health care delivery, and the sociology of health care professionals. Prerequisite: SOC 373 or graduate standing.

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 social science, including SOC 200 or consent of instructor.

556 Social Stratification

3 hrs.

An analysis of the nature, causes, and consequences of class and status differences within societies. Stress is placed upon such concepts as mobility, class, status, and differential power. Conflict and functional theories of stratification are treated. Prerequisite: SOC 200 or consent of instructor.

560 Corporate and White-Collar Crime

3 hrs.

An intensive analysis of corporate and white-collar crime from a sociological perspective. Topics covered include the problems involved in defining corporate and white-collar crime, an assessment of the costs of these crimes, a description of the nature, extent and distribution of these forms of criminal behavior, the etiology of corporate and white-collar crimes, and societal and legal reactions to these types of crime. Prerequisite: SOC 202.

561 Violence and the Violent Offender

3 hrs.

This course analyzes the nature and pattern of violence. It looks at the social, cultural and individual factors that increase the probabilities of violent behavior. Assault, murder, rape, robbery, mass murder, domestic violence, and war will be analyzed from cross-cultural perspectives. Causes, processes, and prevention will be discussed.

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. An analysis of coping strategies is discussed and the role of the victim in the criminal justice system is analyzed.

563 Organized Crime

3 hrs.

Review of the history and development of organized crime, the role of organized crime in the larger system, the basis for its persistence in American society, its impact and pervasiveness, and the implications for the criminal justice system and society.

564 Juvenile Delinquency and the Community

3 hrs.

A study of juvenile delinquency as a social problem. Extent, causative factors, methods of treatment, and control are covered. When feasible, community resource people are invited to participate. Prerequisite: SOC 200.

565 Community Corrections

3 hrs.

This course reviews the role of corrections in communities and the impact community based programs (e.g., half-way houses, work release, etc.) have on society and offenders. Organizational and management structures are reviewed and policy perspectives are discussed. Prerequisite: SOC 465.

566 Advanced Criminology

3 hrs.

Advanced Criminology is a theoretically oriented course. Looking historically at the philosophical belief systems, classical and modern theories of crime are reviewed. Specific types of crimes such as property crime, violent personal crime and corporate crime are discussed and interpreted within the theoretical paradigms reviewed. Prerequisite: SOC 360.

570 Studies in Social Institutions: Variable Topics

1-4 hrs.

An examination of a selected topic in the area of social organization and institutions. The focus of the course will be substantive.
but theoretical and methodological concerns will also be covered. Possible topics could include work and leisure, occupations and professions, sociology of science, mass society, macro-sociology, arts, and others. May be repeated for credit with a different topic. Prerequisite: SOC 200 or consent of instructor.

573 The Sociology of Political Behavior
3 hrs.
Systematic sociological theory and research applied to the study of political organization and behavior in the United States and in selected countries abroad. Such topics as political parties, voting, bureaucracy, and political ideology will be considered. Prerequisite: SOC 200 or consent of instructor.

574 Sociology of Religious Institutions
3 hrs.
A study of the social role of religious institutions and beliefs with particular reference to the United States. The course considers social factors affecting development of different types of religious institutions and the influence of religion on American society. Prerequisite: SOC 200 or equivalent.

575 Industrial Sociology
3 hrs.
The sociological study of industrial organizations and of the process of industrialization. The impact of technology and related factors on work organizations, the structure and operation of labor unions, and the changes occurring in industrial society are discussed. Prerequisite: SOC 200 or equivalent.

576 Sociology of School Organization
3 hrs.
Advanced studies of education as an institution, emphasizing interaction with other social institutions and analysis of internal organization. Attention is focused on the school and social change, schooling and the control of society, and schooling and stratification, as well as impediments to change, power and authority structures and the schools, the teaching profession, and student social structures. Prerequisite: Six hours of sociology or consent of instructor.

578 Sociology of Law
3 hrs.
An examination of legal organization, the legal profession, and legal norms in the United States and other western societies. Emphasis will be placed upon the relationship between the legal system and the society in which it functions. Prerequisite: SOC 200 or equivalent.

579 Female/Male Interaction
3 hrs.
Examines the variable of gender as it influences interaction between women and men. Topics include female-male stereotypes, interpersonal attraction, differences in female-male verbal and non-verbal codes, relational dialogues and patterns, and female-male interaction on the job. Cross-listed with COM 579.

581 Logic and Analysis of Social Research
3 hrs.
The course is designed to provide grounding in basic univariate and bivariate descriptive and inferential statistics for social scientists. Prerequisite: SOC 382 or graduate standing.

585 Research Methodology: Variable Topics
1-4 hrs.
This course concentrates on specialized research techniques and topics such as sampling and survey design, interviewing, the use of sociological computer software, etc. May be repeated for credit with different topic. Prerequisite: Consent of Instructor.

590 The Family as a Social Institution
3 hrs.
The family viewed in historical and cross-cultural perspectives. A structural-functional analysis of the family system. Emphasis is placed on change and comparative analysis. Prerequisite: SOC 200 or equivalent.

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.

593 Marriage and Family in Middle and Later Years
3 hrs.
A systematic analysis of the marital and family system and interpersonal relationships of husbands and wives, and parents and children during middle age and the later years of married life. Prerequisite: SOC 390 or equivalent, or consent of instructor.

596 Directed Individual Study
2-6 hrs.
A program of independent study (reading or research) to provide the unusually qualified sociology student with the opportunity to explore a topic or problem of interest, under the guidance of one of the faculty of the department. The initiative for planning the topic for investigation must come from the student. Approval is contingent upon the merit of the proposal. Maximum of four hours may be applied toward master's degree. Enrollment beyond the first semester may be either for the same topic or for a new topic. Prerequisite: Consent of instructor and the department chairperson.

Open to Graduate Students Only
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.

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.

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.

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; ethnomethodology, philosophy of science, experimental design, Marx, Weber, or other selected theorists. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

610 Deviance and Social Problems Theory
3 hrs.
An intensive and critical examination of the historical development and current status of the major theoretical orientations in the study of deviance and social problems theory.

611 Proseminar on Social Problems
3 hrs.
A critical overview of the current state of knowledge in the major subfields of social problems. Emphasis will be placed on conceptual and methodological problems in the areas and the relationship of each of these areas to one another.

612 Applied Sociology
3 hrs.
Provides an overview of the development of applied sociology and an introduction to essential skills. Among the topics covered are proposal writing, budget preparation, systems analysis, presentation of data to clients, and the writing of research reports. Case study material will be used to introduce students to applied sociology in public, private, and non-profit settings.

614 Seminar in Ethnic Relations
3 hrs.
Advanced study of race and ethnic relations, problems, and trends. Prerequisites: SOC 314 or consent of instructor.

615 Patterns of Intercultural Adjustment
3 hrs.
A study of processes of intercultural adjustment involving different racial, national, and religious groups. The factors giving rise to present-day conflicts are examined and special emphasis is given to techniques of adjustment through individual and community action. Prerequisite: SOC 200 or equivalent.

616 Studies in Social Problems
Variable Topics
3 hrs.
A detailed study of a social problem area through student reports and seminar discussion. Instructor will select specific topic. Course is intended to provide intensive joint exploration of significant sociological issues. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

617 Etologies of Substance Abuse
3 hrs.
A study of various social and behavioral theories regarding the causation of alcohol and drug addiction. The findings of research will be examined as they tend to support or disconfirm these social and behavioral theories.

618 Seminar in Substance Abuse
3 hrs.
An interdisciplinary seminar designed to reflect broadly conceived intervention
strategies ranging from primary prevention to rehabilitation of the addict. The basic training in the principles of intervention and clinical practice will continue to be taught within the student’s basic professional discipline. In part, the seminar will be used to elaborate upon the applications of these principles to the problems of substance abuse. This course is cross-listed with Biology, Counseling-Personnel, and Social Work. Graded on a Credit/No Credit basis.

634 Seminar in Substance Abuse II 3 hrs.
Continuation of SOC 618. This course is cross-listed with Biology, Counseling-Personnel, and Social Work. Graded on a Credit/No Credit basis.

625 Social Psychological Theory 3 hrs.
A study of major theoretical approaches in social psychology and their methodological and substantive implications. Prerequisite: SOC 320 or equivalent.

626 Advanced Social Psychology 3 hrs.
Advanced exploration of contemporary social psychology, with selected examples of theory and research to represent current work in social psychology, and cognitive social psychology. Prerequisite: SOC 625.

628 Seminar in Social Psychology: Variable Topics 3 hrs.
An advanced seminar in some specialized aspect of social psychology. May be repeated for credit with a different topic. Prerequisite: SOC 625.

632 Studies in Comparative Sociology: Variable Topics 3 hrs.
Intensive analysis of selected topics using a comparative frame of reference. The seminar will focus on such topics as major theoretical perspectives, methodological issues, and interpretation of studies of such institutions as: educational systems, industrial systems, and family systems. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

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.

641 Social Psychology of Health and Illness 3 hrs.
An examination of the impact of disease or disability on the individual. Individual responses to disease and disability are examined in relation to cultural, social psychological, and personality variables. Environmental stress and personality factors are considered as they relate to the onset of disease. Consideration is given to the relevance of social factors for health services planning and communication of health care professionals with patients and clients. Prerequisite: SOC 540, or SOC 540 may be taken concurrently.

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.

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.

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. Only to Health Care Administration students, except by permission of instructor.

660 Seminar on Theories of Crime 3 hrs.
This course will deal with the most current theoretical developments in criminology, evaluating research related to the verification of theories and analysis of the objectives of theory, the requirements of theory, and the testing of theory. Prerequisite: SOC 566.

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.

662 Comparative Corrections 3 hrs.
Review and analysis of the philosophies of corrections in different societies, the implementation of penal measures and innovative and alternative strategies of social control in eastern and western Europe, Asia, and the United States.

663 Comparative Criminology 3 hrs.
An analysis in depth of crime as this phenomenon is viewed in Sweden, Germany, Poland, and other eastern and western European countries. Emphasis is placed on theoretical and etiological approaches in different societies, and the applicability and tests of theories in these societies. Prerequisite: SOC 566.

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.

676 The School and the Community 3 hrs.
Analysis of the school as a social institution in the American community, including consideration of interaction between the school and other basic social institutions, and the sociological significance of community structures, processes and problems for school community relationships. Prerequisite: SOC 200 or equivalent.

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.

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.

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.

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 various data collection techniques will be assessed. Prerequisite: SOC 581 or consent of instructor.

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.

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.
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.

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.

689 Evaluation Research II
3 hrs.
The purpose of this course is to provide an opportunity to conduct an actual evaluation study based on the techniques and procedures covered in SOC 687. The course will include discussion of each student's evaluation findings. Prerequisite: SOC 687.

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.

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.

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.

699 Master's Essay
2 hrs.
An analytical and interpretative study under the supervision of the candidate's master's adviser and a second faculty member.

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

700 Master's Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

725 Doctoral Research Seminar
2-6 hrs.

730 Doctoral Dissertation
15 hrs.

735 Graduate Research
2-10 hrs.
Accountancy (ACTY)
Welke, Chairperson; Professors Burke, Neubig, Newell, Associate Professors Dykxhoorn, Hines, Hodges, Kreuze, Morris, Schaeberle, Sheppard, Sinning; Assistant Professor Forrest.

Open to Upperclass and Graduate Students

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.

514 Institutional Accounting
3 hrs.
A comprehensive study of the recording of transactions by government units and the preparation of financial statements by fund entities. City government is the basic unit of study, however, school districts, universities, and hospitals are given brief coverage to illustrate the similarity in accounting for all not-for-profit entities. Prerequisite: ACTY 211 or consent of instructor.

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.

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.

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

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.

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)

606 Advanced Financial Accounting
3 hrs.
An intensive study of asset valuation, liabilities, corporate capital, and the determination of income. Prerequisite: ACTY 211 or equivalent.

607 Accounting Control and Analysis
3 hrs.
A study of management systems and techniques used for profit planning and control of a business firm. Organizational relationships and implications are examined in the development of operations controls, management controls, and strategic planning. This course is in the graduate business core, and is closed to students with credit in Cost Accounting 322 or its equivalent. Prerequisite: ACTY 211 or equivalent.

608 Advanced Accounting
3 hrs.
A study of advanced accounting problems distinctive to corporate and partnership types of business organizations. Prerequisite: ACTY 606 or equivalent.

610 Seminar in Financial Accounting Theory
3 hrs.
Intensive examination and study of the underlying postulates, concepts, and principles of accounting. Course may be repeated under different topics. Prerequisite: ACTY 608 or consent of instructor.

617 Seminar in Advanced Auditing and Systems Concepts
3 hrs.
An advanced course which integrates auditing and systems concepts. Intensive examination of audit tools, audit theory and practice, management of the accounting information systems and EDP applications. Prerequisites: ACTY 313, ACTY 516, ACTY 607 or consent of instructor.

622 Seminar in Management Accounting Concepts
3 hrs.
A study of advanced methods of cost measurement and control. Includes standard cost, budgetary control, profit-volume
systems and the techniques of systems development including fact gathering and recording, work analysis, and office work simplification and measurement. Prerequisite: BIS 102.

564 Information Resource Management
3 hrs.
This seminar course provides an overview of the management of information systems resources. The student will gain an insight and understanding of the subject through study of the fundamentals of organizing, planning, controlling, and other significant management tasks that relate to the management of information resources. Prerequisite: BIS 462.

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.

598 Readings
1-4 hrs.
A series of direct readings in the area of administrative systems, business communication, or computer information systems. Prerequisite: Consent of department chair.

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

700 Master's Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

Business Information Systems (BIS)
Sanders, Chairperson; Professors Bowman, Branchaw, Jones, Moskovis, Targowski, Associate Professors Athappilly, Mascolini, Rooney, Supnick, Swenson; Assistant Professor Yeager.

Open to Upperclass and Graduate Students

554 Topics in Business Communication
3 hrs.
An intensive study of a topic in business communication such as a communication system, business media, business publicity, and others. The topic will be announced in advance. May be repeated for credit.

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.

556 Office Management
3 hrs.
Procedures of office administration with attention to supervisory patterns in development, appraisal, and management of human resources.

557 Topics in Administrative Systems
3 hrs.
Includes an intensive study of a selected topic in administrative systems such as communication audits, consumer relations, office systems, work measurement and simplification, forms control and design, and others. The topic will be announced in advance. May be repeated for credit.

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.

Finance and Commercial Law (FCL)

Finance Area
Professors Edwards, Issa, Associate Professors Kennedy, Metwalli; Assistant Professors Balik, Burnie, D'Mello, Jones, Krishna-Swamy, Mangla, Scheu.

Open to Upperclass and Graduate Students

519 Security Analysis
3 hrs.
An analysis of stocks and bonds. Prerequisite: FCL 326.

521 International Finance
3 hrs.
A study of contemporary problems in international finance. The course examines the international money markets, working capital considerations, and capital budgeting problems as faced by the multinational corporation. Prerequisite: FCL 320 or equivalent or consent of instructor.

526 Group Insurance and Pensions
3 hrs.
By means of problems and cases this course analyzes in detail the following areas: group life and health insurance, business life and health insurance, insured pension plans, and estate and tax planning. Prerequisite: FCL 322.

527 Risk Management and Insurance
3 hrs.
Insurance and self insurance. The management of risk for a company. Prerequisite: FCL 321 or consent of instructor.

528 Insurance Company Management
3 hrs.
The topics studied by means of cases and problems in this course include multiple-line insurance operations, special problems in functional areas of industry operations, and personal and commercial risk surveys and analysis. Prerequisite: FCL 323.

598 Readings in Finance
1-4 hrs.
Directed individual study of bodies of knowledge not otherwise treated in departmental courses. Prerequisite: Written consent of instructor.

Open to Graduate Students Only

608 Financial Management
3 hrs.
Study of the principles and problems underlying the management of capital in the business firm. Stresses the financial officer's responsibilities. Skills are developed in the marshalling and interpreting of data for use in making and implementing capital expenditure policies, solving short-term and long-term financing problems, establishing dividend policies, effecting mergers and consolidations, and adapting to trends in financial markets. Techniques used include case analysis and problem solving. Demonstrates financial management's role in the total management effort. Prerequisite: FCL 320 or equivalent.

610 Financial Aspects of Higher Education
2-4 hrs.
A survey of the financial considerations in the administration of institutions of higher education. The topics covered include the management of short-term investments, the management of endowment funds, budgeting for operations and for capital projects, and the development and implementation of group insurance and pension programs. Prerequisite: Adviser's consent.

612 Health Care Financial Management
3 hrs.
This course deals with advanced financial management concepts affecting health care institutions. Working capital management, capital budgeting and medicare.
reimbursement programs are examined. Prerequisite: FCL 320 or equivalent.

620 The Capital Market
3 hrs.
Study of the sources and flow of demand and supply of credit. The business application of monetary theory to financial institutions and their operational problems. Prerequisite: FCL 608 or consent of instructor.

621 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 326 or its equivalent. Prerequisite: FCL 608 or consent of instructor.

622 Mergers and Acquisitions
3 hrs.
A detailed investigation and analysis of the financial aspects of corporate business combinations. The course analyzes valuation considerations in large and closely-held companies and examines the structuring of the financial package to be offered. Prerequisite: FCL 608 or consent of instructor.

624 Applied Financial Management
3 hrs.
An analytical approach to problems facing the financial executive. Cases selected cover short- and long-term financial decision-making processes with particular emphasis on statement analysis and working capital management. Other problems will emphasize capital investment decision, valuation and cost of capital, risk analysis, capital structure, and dividend policies. Prerequisite: FCL 608.

626 Insurance and Government
3 hrs.
This course covers the historical development, legal background, and methods of governmental supervision of the insurance industry. Principal emphasis will be placed upon state supervision of insurance, but the role of the federal government in present and future regulation is also considered. Prerequisite: Consent of instructor.

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
McCarty, Chairperson; Associate Professors Batch, Grossman, Stevenson, Assistant Professors Pretty, Schanz, Van Auken-Haight.

Open to Upperclass and Graduate Students

532 Real Estate Law
3 hrs.
The study of land ownership, sales agreements, including the legal duties of the real estate broker, mortgages, land contracts, leases, zoning, condemnation and urban land development problems. Prerequisite: FCL 340.

550 Law of Business Organizations
3 hrs.
A study of the laws affecting the organization and operation of business enterprises. The course examines the different forms of business organization, principally corporations and partnerships and analyzes how their structure affects the operation of various activities. Prerequisite: FCL 340.

552 International Business Law
3 hrs.
A study of national, regional and international laws which affect the conduct of international business. An examination of the legal regulations which promote or restrain trade or investment by international business firms. Prerequisite: FCL 340.

554 Government Regulation of Business
3 hrs.
This course examines the laws, rules and regulations on the federal, state and local level which affect most business enterprises. Substantive laws affecting the firm's obligation to employees, stockholders and the general public are examined as are procedural laws affecting the regulation of the firm by public institutions. Prerequisite: FCL 340.

556 Marketing and Sales Law
3 hrs.
The course examines the law as it applies to the sale of goods, warrants affecting such sales and methods of financing those sales. Legal obligations imposed upon and risks assumed by the public are emphasized. Prerequisite: FCL 340.

598 Readings in Commercial Law
1-4 hrs.
Directed individual study of bodies of knowledge in commercial law which will enhance the student's areas of interest and competence. Prerequisite: Written permission of instructor.

Open to Graduate Students Only

607 Legal Controls of the Business Enterprise
3 hrs.
Reviews the legal problems encountered by executives in various business enterprises. Legal controls affecting the marketing, management, finance, and accounting functions are studied. Various facets of antitrust law, labor law, corporation law, and securities law are examined. Prerequisite: FCL 340.

650 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 340.

660 Health Law Administration
3 hrs.
The course provides a study of the law as it relates to the delivery of health care services. The cases, regulations and statutes in state and federal legal systems that affect the health care professional and institutions are examined. Legal concepts such as respondent superior, good samaritan laws, informed consent, and confidentiality will be explored. Prerequisite: FCL 340.

661 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 660.

General Area
Open to Upperclass and Graduate Students

504 International Business Seminar
1-4 hrs.
A foreign study seminar designed for qualified and capable undergraduate students, graduate students, teachers, and business executives. The seminar introduces participants to a first-hand knowledge of business operations abroad through on-site inspection of foreign manufacturing, marketing, financial, and governmental organization, supplemented by coordinated faculty lectures and assigned readings. Undergraduate or graduate credit of six hours, in one 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

600 Seminar in Business
3 hrs.
Intensive problem-solving in the primary business fields. Consent of instructor required. May be repeated for credit.

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

700 Master’s Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

Management (MGMT)
Stamm, Chairperson; Professors Beam, Boeker, Hill, Keenan, Rizzo, Smith; Associate Professors Alie, Carey, Farrell, Assistant Professors Golhar, Verser, Wilhelm.

Open to Upperclass and Graduate Students

510 Multinational Management
3 hrs.
An examination of management strategy, controls, environmental influences of the multinational corporation with consideration of geographic factors. The management function abroad will be examined in light of the cultural assumptions underlying U.S. management and will deal with the necessary modification for effective operations in a cross-cultural environment.

512 Women in Management: Male, Female and Organizational Perspectives
3 hrs.
A seminar dealing with the changing roles of women in business. Emphasis is given to the unique needs of women aspiring to managerial and professional ranks.
Changes in attitudes and behaviors of women, men and organizations and the implication of change for traditional male-female relationships and organizational operations are explored.

514 Entrepreneurship
3 hrs.
A senior or graduate elective for students interested in entrepreneurial careers. Primary attention given to managing a new or rapidly growing business. Alternative sources of capital are examined. Various growth strategies are considered along with personal requirements for entrepreneurial success.
Prerequisite: Senior standing or permission of instructor.

540 Advanced Statistics
3 hrs.
A second course in statistics complete enough to be used with limited background. Includes probability theory, 1, 2, F, and binomial probability distributions, hypothesis testing with sampling theory, and Type I, Type II errors, point and interval estimates, statistical inference, comparison tests (two-sample and K-sample), association tests (correlations and regression), and non-parametric tests. Prerequisite: MGMT 200.

Open to Graduate Students Only

600 Seminar in Management (Topic)
3 hrs.
Intensive problem-solving in advanced management topics, including the preparation of a major staff report. Repeatable for different topics.

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.

651 Analysis of Administrative Behavior
3 hrs.
Analysis of the contributions of management theory and of the behavioral sciences to modern administrative practices; group and individual behavior as related to and affected by the administrative process, lectures, cases, conferences. Not open to students having received credit for MGMT 451.

653 Behavioral Science Applications for Managerial Effectiveness
3 hrs.
Models, methods, and applied technology relevant to the control of human performance in complex organizations. Emphasis on achieving human outputs such as productivity, satisfaction, learning, retention, decisions, problem solutions. Applied technologies could include selection, placement, job, and organizational analyses and evaluation.

655 Organization Theory
3 hrs.
Theories, models, and applications relevant to the structure of complex organizations and their subprocesses. Emphasis on alternative designs, their causes and consequences.

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.

681 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.

664 Simulation
3 hrs.
A systematic study and application of the methodology of system simulation including system identification and description, model development, computer implementation, experimental design and validation. Special attention is given to model classification, especially deterministic vs. probabilistic and discrete vs. continuous, and how it relates to computer implementation and fields of application. Prerequisites: MGMT 360 or equivalent and BIS 602 or equivalent.

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.

666 Inventory Management
3 hrs.
The theory of scheduling and inventory management, including both deterministic and probabilistic models beyond the introductory level. An intermediate course in management science. Prerequisite: MGMT 463 or equivalent.

695 Advanced Management Practices
3 hrs.
Independent study of current trends and advanced problems in the organization and management of complex organizations. Prerequisite: Consent of department chairman. May be repeated for credit.

699 Policy Formulation and Administration
3 hrs.
The 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 strategies 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, companywide general management decisions. Prerequisites: Completion of MBA core courses.

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

700 Master’s Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

Marketing (MKTG)
Crow, Chairperson; Professors Dannenberg, Delene, Lindquist; Otteson; Associate Professors Belonax, Brogowicz, Luoman, Mayo, Quarash, Assistant Professors Lane, Lee, Reck.

Open to Upperclass and Graduate Students

570 Problems in Retailing
3 hrs.
Designed to analyze current retailing problems, market segmentation, inventory planning and control, vendor evaluation, stores services, traffic patterns, and warehousing. Report required. Prerequisites: Permission of instructor and senior level.

571 Healthcare Marketing
3 hrs.
An analysis of the field of marketing and its application in the healthcare industry. Emphasis will be on the role of marketing as a management function in providing professional product and services. Prerequisites: MGMT 374 and 474.

574 Marketing Logistics
3 hrs.
An analysis of problems relating to the movement, handling and storage of industrial products. Attention will also be given to changing market conditions and industrial structure as they affect the physical distribution of industrial goods. Prerequisites: MGMT 370.

575 International Marketing
3 hrs.
An examination of the theories and principles of international marketing. Attention directed to related commercial policies, trade practices and procedures, and marketing research tools and techniques needed to locate and evaluate foreign markets. Prerequisite: MGMT 370.

576 Marketing Strategy
3 hrs.
Identification of marketing problem situations and cause diagnoses with development of appropriate marketing strategies. Emphasis placed on application of marketing fundamentals to factual case situations and on decisions in a simulated dynamic environment. Communication of findings and strategies emphasized. Cases and computer games used. Senior level. Prerequisites: MGMT 371, plus six additional MGMT hours.

577 Advertising Theory and Ethics
3 hrs.
Critical examination of social, cultural, and ethical implications of “public and business” responsibilities involved in the advertising function. Special student interests developed through research and term projects. Prerequisites: MGMT 370, 374, permission of instructor.
578 Marketing Decisions in Publicity and Public Relations
3 hrs.
Analysis of principles and practices of publicity and public relations as these areas relate to the firm's overall promotional strategies; stress on application through case studies and term project. Prerequisite: MKTG 370.

598 Readings in Marketing
1-3 hrs.
Directed individual study of bodies of knowledge not otherwise treated in departmental offerings. Prerequisite: Consent of instructor.

Open to Graduate Students Only

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.

671 Quantitative Analysis of Marketing Decisions
3 hrs.
Applications of quantitative methods of marketing management utilizing analytical tools in the areas of product, price, distribution, promotion decisions, and other marketing-related problems. Required for all MBA marketing concentrations, may be waived for those having MKTG 471 or its equivalent.

673 Product and Pricing Strategies
3 hrs.
In depth consideration of product life cycle including addition, modification, deletion analysis, special attention to demand analysis, cost considerations, competitive actions, and governmental regulations. Prerequisite: MKTG 607.

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.

675 Analysis of Distribution Systems
3 hrs.
Organization, structure, and behavior of channels of distribution; focus on various distribution systems through which goods are marketed; cases and problems utilized. Prerequisite: MKTG 607.

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.

700 Master's Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

678 Seminar in Marketing
3 hrs.
Intensive problem solving in the primary business fields. Prerequisite: Consent of instructor.

679 Market Programming
3 hrs.
Designed for special emphasis toward developing a total marketing strategy within an organization. Practical application of the marketing tools and techniques to a current problem originating in a business organization. Strongly recommended for all MBA marketing concentrations. Prerequisite: Consent of instructor.

Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.
Counselor Education and Counseling Psychology (CECP)
Hovestadt, Chairperson; Professors Belson, Betz, Carlson, Geisler, Mazer, Oswald, Trembly, Urbick; Associate Professors Bullmer, Morris; Assistant Professors Newman, See.

Open to Upperclass and Graduate Students

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.

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.)

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.

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.

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.

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.

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.

606 Basic Personality Processes
3 hrs.
Focuses on personality issues of particular importance to the student of counseling. Basic personality constructs and experimental investigations of personality dynamics will be surveyed, including stress and anxiety, coping and defense mechanisms, emotion, conflict and cognitive styles. Various conceptualizations will be studied, including psycho-dynamic, interpersonal, phenomenological, cognitive and behavioral approaches.

610 Career Development: Theory and Practice
3 hrs.
Course content includes: (1) a study of the world of work as it impacts the psychological and sociological life of the individual; (2) an examination of career development theory, decision-making, and the application to counseling and psychotherapy; (3) the identification of informational resources related to career choice; and (4) an exploration of the needs and concerns of clients from a variety of cultural backgrounds.

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 and the phenomenological, and the existential are studied and compared.

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...
625 Legal Issues in Student Personnel Services

The law, as evidenced in constitutional provisions, legislative enactments, and court decisions, related to the administration of student personnel services will be the major focus of the course. Institutional-governmental relations and issues of consumerism will be reviewed.

623 College Student Development

Explores the nature and development of the post-secondary student pertaining to student personnel program administration. Emphasis will be given to the consultant's role in psycho-affective education and primary prevention.

624 Program Evaluation in Student Affairs

Methods and techniques appropriate for the program evaluator will be considered as they relate to: (1) assessment of student needs and (2) program evaluation.

625 Legal Issues in Student Personnel Services

The law, as evidenced in constitutional provisions, legislative enactments, and court decisions, related to the administration of student personnel services will be the major focus of the course. Institutional-governmental relations and issues of consumerism will be reviewed.

626 Administration of Student Personnel Services

Emphasis will be upon: (1) organizational models; (2) professional organizations; (3) psychological components and role of each; and (4) administrative tools and techniques.

627 Community Agency Counseling and Administration

This course is designed to acquaint participants with a broad range of policies and procedures of administration and selected principles in program evaluation drawn from various organizational settings. The history, role and function of counselors and counseling psychologists will be analyzed. Evolving directions in the field of counselor education/counseling psychology will be considered.

629 Organization and Principles of Elementary School Guidance

A thorough investigation of philosophical concepts and principles underlying counseling and pupil personnel programs in elementary schools. The history, organization, and administration of the program services are surveyed and practical application of concepts is required.

630 Organization and Principles of Secondary School Guidance

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.

631 Seminar in Substance Abuse I

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 crosslisted with Biology, Social Work, and Sociology. Graded on a Credit/No Credit basis.

632 Seminar in Substance Abuse II

Continuation of CECP 631. This course is cross-listed with Biology, Social Work, and Sociology. Graded on a Credit/No Credit basis.

633 Student Affairs Services in Post-Secondary Education

The introductory section of this course will include the history of postsecondary education in America. The second phase of the course content will focus on the student personnel service area: (1) historical perspectives; (2) philosophical foundation; (3) professional organizations; and (4) service delivery systems.

672 Use of Clinical Judgment in Assessment

Clinical judgment in diagnosis and assessment is studied with the focus on sources of error that enter into the process of judging, diagnosing, and assessing. Opportunities for practicing the systematic use of behavioral observations and interviews are provided. Prerequisite: CECP 692 or permission of the instructor.

673 Marital and Sex Therapy

The subject of human sexuality is examined from a variety of social, psychological, and cultural viewpoints. Various forms of sexual dysfunction are studied and examined for understanding both physiological and psychological components and role of each in the dysfunction. Finally, there is in depth study of current approaches to therapy as well as attention to other issues such as conjoint treatment of couples, resistance, sexual dysfunction in both partners, and sexual dysfunction and its relationship to marital discord. Prerequisite: CECP 692 or permission of instructor.

674 Psychological Development Theory

The course examines psychological development from a number of perspectives including psychodynamic object-relations and social learning. The course is designed for counselors and counseling psychologists who wish to view their work in a developmental framework. Implications of developmental theory for counseling and psychotherapy are emphasized.

675 Counseling Theories and Practices

This is an advanced course in counseling theory and practice. The course is concerned with theoretical aspects of the counseling relationship as well as the general practices of counseling. Prerequisites for the class include one formal exposure to counseling theory, supervised laboratory work, and experience in the field of counseling. The course is not designed to include practicum type experiences, but it is helpful if the participant is concurrently seeing clients on a paid or volunteer basis. Prerequisite: CECP 611 or 612 or equivalent.

686 Topical Seminars

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.

691 Supervision in Counseling and Psychotherapy

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. Prerequisite: CECP 692, 693 or permission of the instructor.

692 Advanced Practicum in Counseling and Psychotherapy I

An advanced practicum designed to increase the competency of experienced counselors and therapists. Staffing experience to engage in seminar-structured learning. Topics will be designated by professors offering the seminars. May be repeated for credit.

693 Advanced Practicum in Counseling and Psychotherapy II

A continuation of CECP 692. Graded on a Credit/No Credit basis. Prerequisite: CECP 692.

694 Vocational Development Theory

An advanced course that involves the critical examination of existing theories of vocational development, the motivation to work and their application to the counseling therapeutic process. Research pertaining to vocational development and the world of work will be analyzed.
92 COLLEGE OF EDUCATION

696 Practicum in Group Counseling
3 hrs.
Supervised practice in counseling with groups of varying types and ages. Staffing conferences of on-going groups will use audio and video tapes, content analysis, and other evaluative techniques. Prerequisite: Permission of instructor. Graded on a Credit/No Credit basis.

698 Readings in Counselor Education and Counseling Psychology
1-4 hrs.
Advanced students with good academic records may elect to pursue independently the study of a special topic. The topic chosen must be approved by the instructor involved and arrangements made with instructor's consent. May be selected more than once; total may not exceed four hours.

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.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

725 Doctoral Research Seminar
2-6 hrs.

730 Doctoral Dissertation
15 hrs.

732 Doctoral Clinical Internship
1-4 hrs.

Education and Professional Development (ED)


Open to Upperclass and Graduate Students

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.

504 Adult Development
3 hrs.
This course will provide an in depth look at each age and stage in the life cycle. It will explore such problems as the changing role of parents and singles, the changing societal pressures on teachers, new adult life-styles, middle 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.

505 The Adult Learner
3 hrs.
This course will provide an in depth look at the learning adult from approximately age 22 to death with special emphasis on human abilities, unique learning styles, and characteristics of the adult learner. Theories of adult learning, studies of intelligence and memory, learning capabilities, abilities, approach, and speed of learning will be considered. Motivation as prerequisite for high-level wellbeing and problem-solving will be studied.

506 Teaching in Adult Education
3 hrs.
This course is designed to provide teachers with a knowledge of special situations incurred in the teaching of adults. Included also are techniques of interpersonal communication with adults, as well as a practical exercise in the designing of learning experiences for adults. Extensive use will be made of audiovisual media, experts in the field, and field observation in adult learning activities. The course should be helpful to administrators in planning inservice programs for their own staff.

508 Seminar in Parent Education
2 hrs.
Emphasis will be placed on cooperative problem-solving between parents and teachers of school-age children and youth. Problems considered will include such topics as grief and loss through death, divorce, or separation; special needs and contributions of multiracial parents; parents as resources 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, to work toward potential solutions of problems.

509 Parent Education for Teachers of Young Children
3 hrs.
This course will help teachers to 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.

511 Developmental Reading Theory and Application
3 hrs.
Focuses on the application of reading theory in the teaching of reading skills to special-needs students. Intensive study of the theory and practice of individualized reading, language-experience approaches, and basic reading materials will be made. Will focus on the actual use of materials with pupils to provide practical experiences in teaching on an individual and small-group basis. Efficacy of reading procedures will be studied through actual use with pupils. Prerequisite: ED 312 or 322 and permission of instructor.

516 Professional Symposium in Reading
3 hrs.
This course is designed to be the initial course in the graduate program in reading. It is designed to present the basic concepts concerning the nature of the reading process and the teaching of reading. Emphasis will be placed on reading as a thinking process and on factors affecting reading performance. Special emphasis will be placed on child development; language development; concept development; physical, psychological, and environmental factors affecting the child's learning to read. In addition, the course will provide a brief overview of the delivery systems and procedures used in the U.S. to teach reading. This will involve an historical overview as well as current and potential future practices.

517 Reading in the Content Areas
3 hrs.
Designed to acquaint junior and senior high school teachers with the reading skills which should be taught and refined in their specific curricular areas. An effort will be made to help teachers, through demonstration and practice, achieve optimal benefit from secondary textbooks and related reading materials.

521 Piaget and Young Children
3 hrs.
A continuation of ED 517, in which teachers think will be applied to early childhood curriculum. Teachers will apply Piagetic tasks and will be able to improve curriculum for young children with growing understanding of children's minds.

548 Audiovisual Media I
3 hrs.
An introduction to audiovisual media as effective means for achieving educational objectives in presentational, interactive, and individualized modes of instruction. Emphasizes evaluation, selection, production, and classroom use of commercially available and locally produced instructional materials. Students are expected to participate in laboratory experiences in which they produce materials such as mounted and laminated pictures and displays, overhead projection transparencies, audio tapes and photographic slides, and to demonstrate proficiency in the operation of audiovisual equipment. In addition to texts, each student should plan to spend $15 or more for supplies and have the use of a simple camera.

549 Audiovisual Media II
3 hrs.
A continuation of ED 548, in which teachers and media specialists consolidate basic audiovisual skills and deal in depth with more advanced processes and techniques. Laboratory experiences may include production of complex transparencies, photographic slides, filmstrips and prints, super 8 film, audio and video tapes, duplicated materials, and more sophisticated charts, posters, and displays. A systematic production-planning process is emphasized, with consideration given to evaluating effectiveness of media and to requirements for operating a school building level media center. In addition to texts, each student should expect to spend
604 Psychological Foundations of Education
3 hrs.
An overview of the psychological forces that influence the learner in his/her educational setting with special emphasis on the nature and significance of human variability, development of self, measurement and evaluation, and a consideration and application of principles of learning in classroom situations.

605 Teaching of Social Studies in the Elementary Schools
3 hrs.
This course is designed to help teachers understand the role of the social studies in the elementary school, gain insight into important considerations in the selection of content, and discover how to guide and assess the learning of children in this field. Planning social studies experiences and ways of working with children in a classroom setting will be emphasized.

606 Early Childhood Workshop: Learning and Curriculum
6 hrs.
This workshop promotes an understanding of how the young child learns; students will use these learning principles as bases for curriculum development. Students will construct materials and equipment and develop curriculum plans. Portions of the course can be designed to meet the individual needs of students. These will be taught by experts from appropriate fields within and outside of the University. Prerequisite: Admission to the master's program in Early Childhood Education.

607 Research Methods in Early Childhood Education
3 hrs.
The purpose of this course is to acquaint students 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.

608 Seminar in Early Childhood Development
3 hrs.
The content of this seminar may vary each semester depending on the interests and needs of the students, but is invariably designed to provide an in depth exploration of some facet of development in young children. Each student is expected to conduct a search of the literature on a specific topic. Topics may include child-rearing practices, sex-role identification, cognitive development, language acquisition, psychomotor development, and parent education.

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.

611 Informal Approaches to Studying Young Children's Development
3 hrs.
The course helps teachers observe, evaluate, and guide young children's growth while developing their skill in informal observation techniques. Teachers will learn about their children from new perspectives, recognizing and meeting children's needs. Evaluation procedures will help account for children's psychological and social growth while creating classroom conditions to maximize this growth.

612 Reading Techniques for the Elementary Classroom Teacher
3 hrs.
This course is designed to provide an in-depth study of the nature of the methods and procedures used in teaching children to read. This course will provide opportunity for the production of original materials to be used in the classroom at the elementary level. Participation in classrooms will be required. Prerequisite: ED 516.

613 Early Childhood Problems and the Teacher
3 hrs.
Deals with concept 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.

619 Clinical Studies in Reading
3 hrs.
This course is intended to provide the basic information needed in the examination of persons with reading disorders. Interviewing techniques and examination procedures will be the basic content. 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 should 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.

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 which make effective therapy possible. Prerequisites: ED 312 or 322 and 619.

622 Middle-Junior High School Curriculum
3 hrs.
This course is designed to provide students with opportunities to examine and evaluate middle-junior high school curricula in a variety of content areas. A primary charge for these students will be the construction of a curriculum program that focuses on the development of the early adolescent/adolescent youth. The constructed curriculum's foundation is based on current research and sound psychological principles with regard to the teaching/learning process. A second major emphasis in this course will be on the organization and management in the middle-junior high school. The constructed curriculum unit will reflect an integration of effective research-supported organization and management skills with the content in each particular discipline.

623 The Early Adolescent Learner
3 hrs.
Theoretical background and research related to the intellectual, emotional, and physical growth of the adolescent. Prerequisite: ED 548 or equivalent experience.
perceptual, social, and personality development are presented and explored. Emphasis is placed upon problems teachers face with early adolescent learners and appropriate strategies for helping these students realize their potential. 641 Instructional Development 3 hrs. Intended for media specialists and experienced teachers, this course employs an accountability model for application of media research and technology to actual courses and units of instruction. Students follow a systematic instructional development procedure from task analysis to evaluation, working together with their own students or as assistants and consultants to other professionals. Prerequisite: ED 548 or equivalent.

642 Photographic Communication 3 hrs. Explores uses of photography in the communication of ideas, considering techniques of composition, lighting, equipment operation, and basic photographic processes as means toward achieving an effective visual statement. Following assignments, each student plans and produces a picture story or photo essay suitable for publication and a synchronized sound/slide presentation for a specified audience. Considerable laboratory time is required outside of class. In addition to text materials, each student must have the use of a high quality, versatile camera and should expect to spend $25 or more for supplies. Prerequisite: ED 549 or 550 or equivalent experience.

643 Practicum in Clinical Studies in Reading 3 hrs. This course is intended to give students experience in employing both informal and formal standardized instruments and techniques necessary for the diagnosis and treatment of the disabled reader. The course emphasizes the use of various measurement points outlining their capabilities and limitations. Skills in interviewing, observing, diagnosing, planning treatment, and working with parents and school personnel are taught. Prerequisites: ED 619 and ED 643.

645 Studies in Educational Technology 1-3 hrs. Explores theory and innovative developments in educational technology and suggests practical, instructional applications. Such topics as the following may be considered: Design and Analysis of Individualized Instruction, Instructional Simulation and Gaming, Computer Applications in Instruction, and Diffusion and Adoption of Innovative Practices in Education. This course may be repeated for credit as different topics are offered. Prerequisite: ED 548 or equivalent experience.

650 Characteristics of the College Student 2 hrs. The course is primarily intended for students who are preparing to teach at the college (community, four-year, or graduate) level. As much as practicable, the course will be conducted on an “action-research” basis. Every opportunity to interact with college students on a firsthand, face-to-face basis will be utilized by the individual members of the class. Opportunities will be provided to investigate such topics as the academic adjustment, capabilities, motivations, behaviors, attitudes, and factors affecting the academic achievement of college students; the effects of separation from home and family, effects of interpersonal relations, and effects of campus social life on college students; and economic stability as it affects college students. Prerequisite: ED 601

652 Language, Reading, and the Young Child 3 hrs. The course focuses on language and the nature of the reading process and its development in a child from birth through the primary grades. Teachers will explore contemporary reading and language programs from this point of view. Deeper understanding of language-reading processes will enable teachers to arrive at ideal language-learning programs for the children they teach.

653 Practicum in Reading Therapy 3 hrs. This course affords students the opportunity to build competencies attained in ED 643. Reading therapy is offered on a one student to client basis under the direction of a trained clinical therapist. The course serves as an instructional internship for working with pupils who have problems in reading and related areas. This course will provide graduate students practice in setting up and executing prescriptive instructional objectives, selecting materials in terms of needs, and carefully designing instructional procedures for disabled readers. Prerequisites: ED 619, 620, 643.

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. Prerequisites: ED 597, 619, 687.

670 School Climate and Discipline 3 hrs. This course is designed for teachers and administrators who wish to develop a school or classroom climate which maximizes learning and minimizes discipline problems. Emphasizes new approaches to working successfully with problem students and classes.

687 Improvement of Reading in Secondary Schools 3 hrs. Designed to aid teachers in developing the reading abilities and skills of their students at the secondary level. Emphasis is placed on aims, materials, and procedures. Graduate students will become knowledgeable about the readability of textbooks and how to adjust work to range of ability. Opportunities for understanding and using standardized and informal instruments as measures of student progress will be afforded. Emphasis will be placed on the organization of course work for improving reading skills. Prerequisite: Ed 312 or 322.

690 The Community College 2 hrs. Studies the historical development of the junior and community college movement, the function of the community college in the total educational program, the divergent aims and curricular requirements of preprofessional, academic, and vocational programs, the guidance and counseling function, community services programs, and methods and materials of instruction at the college level.

695 Reading Seminar 3 hrs. This course is designed to be the culminating course in each of the three streams in the master’s program in reading. Designed to acquaint teachers, reading specialists, and administrators with the current research and literature pertinent to their areas of specialization. They should further 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.

697 Special Topics in Reading 1-3 hrs. A variable credit course designed to provide a vehicle for the development and implementation of special topics in the field of reading. The purpose is to provide students with the opportunity to study topical current issues.

698 Resolving Educational Problems in the Schools 1-6 hrs. With variable topics and variable credit, this course is offered for inservice 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.

699 Seminar in College Teaching 2 or 4 hrs. Designed for students who are interested in preparation for college teaching. The student is expected to enroll for four credit hours, work with a faculty member in his/her major department or unit in a classroom situation for a semester, and attend eight scheduled discussion sessions arranged for all students in the seminar. These discussions will emphasize important topics related to college teaching. Exceptions may be made for the student who already has college teaching experience. In such cases, the student should enroll for two credit hours and attend the seminar discussion sessions only. Prerequisite: Permission of instructor.

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

700 Master’s Thesis 6 hrs.

710 Independent Research 2-6 hrs.

712 Professional Field Experience 2-12 hrs.
623 Education and Training Project Management
3 hrs.
Examination of techniques for management of the costs, performance, and scheduling of education and training projects. Development of skills in planning and communicating project information.

629 Field Studies Seminar in Human Resource Development
3 hrs.
Application of principles and concepts acquired in other HRD courses to field settings. Participants are expected to demonstrate skills in consultation, project management, instructional design, and presentation. Regularly scheduled supervision/semester sessions for feedback and analysis of performance. Prerequisite: Permission of adviser. Graded on a Credit/No Credit basis.

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 to critically evaluate instrumentation as well as develop a plan for the creation of an instrument.

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.

643 Personnel Evaluation
3 hrs.
Concepts and standards for design of personnel evaluation systems. Course requires design of a personnel evaluation system and an evaluation of the personnel evaluation system. Prerequisite: Permission of adviser.

645 Research Design and Data Analysis I
3 hrs.
The study of the principles of research design and data analysis is pursued at both the conceptual and applied levels. Emphasis is on the development of the conceptual skills of design analysis and interpretation. Techniques of statistical analysis include the use of computer programs for data analysis. Prerequisite: EDLD 640.

646 Research Design and Data Analysis II
3 hrs.
A continuation of the study of the principles of research design and data analysis techniques. Advanced skills in design and analysis are developed in addition to an examination of design issues in educational settings. Skills in the use of computer programs for data analysis are required. Prerequisite: EDLD 645.

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.

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. Students will be expected to judge naturalistic inquiry will be studied and applied to selected naturalistic study reports. Prerequisite: EDLD 640.

651 Advanced Applications of Measurement Methods
3 hrs.
Intensive study of applications of educational measurement theory and methodology to specific needs for instrumentation and assessment. Students will engage in development, validation, and application of new instruments for collecting educationally important data. Prerequisites: EDLD 640 and 641.

652 Evaluation Practicum
1-6 hrs.
Fielded planned 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.

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 640 and 646.

656 Theories of Measurement Seminar
3 hrs.
A seminar for students seeking advanced theoretical understanding of the principles of measurement. Theories of measurement construction beyond classical test theory (e.g., item response theory and generalizability theory) are applied to instruments relevant to education. Prerequisites: EDLD 641 and 646.

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.

660 The Principalship
3 hrs.
Survey of tasks and functions of school building administration with applications in planning and decision-making through use of simulations, case studies, and analytical exercises. Development of knowledge and skill related to tasks and functions of school building administration. Prerequisite: EDLD 660.

661 School Law
3 hrs.
Study of federal and state constitutions, legislative, regulatory guidelines, and court decisions as related to operation of educational institutions and organizations. Development of awareness and knowledge of legal parameters related to education. Completion of EDLD 602 before enrollment in EDLD 661 is recommended.
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.

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.

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.

672 School Finance 3 hrs.
Intensive instruction and discussion of schools. Critical examination of alternative patterns for design of public funding formula and practices for funding public schools. Consideration of patterns of fiscal resource development other than public funds as a means of financing public or private education. Completion of EDLD 662 before enrollment in EDLD 672 is recommended. Prerequisites: EDLD 602 and 640.

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.

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.

680 The Superintendency 3 hrs.
Examination of the line and staff roles involved in the "superintendency" with emphasis on the role of the superintendent of schools as the chief executive officer in school and school-related organizations. Prerequisites: Master of Arts in Educational Leadership or equivalent and permission of adviser.

681 Policy Development 3 hrs.
The content of this course includes examination of policy issues, purposes, functions, methods, and approaches for policy development. Critical review of development of policies for educational institutions. Prerequisites: Master of Arts in Educational Leadership or equivalent and permission of adviser.

682 Computer Applications in Administration 3 hrs.
Study, design, and application of computer technologies in performance of administrative functions and tasks in educational organizations. Prerequisite: Permission of adviser.

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. Prerequisite: EDLD 602 or permission of instructor.

698 Readings in Educational Leadership 1-4 hrs.
Directed individual study of topics or bodies of knowledge not otherwise treated in department courses. A maximum of four hours earned in EDLD 698 is applicable on degree programs. Prerequisite: Permission of adviser.

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

700 Master’s Thesis 6 hrs.

710 Independent Research 2-6 hrs.

712 Professional Field Experience 2-15 hrs.

720 Specialist Project 6 hrs.

725 Doctoral Research Seminar 2-6 hrs.

730 Doctoral Dissertation 15 hrs.

735 Graduate Research 2-10 hrs.

Health, Physical Education, and Recreation (PEGR)

Zaituk, Chairperson; Professors Cheatham, Heinig, Ray; Associate Professors Dawson, Jevert, Meyer; Assistant Professors Berkey, Gross, Hubalk, Moss, Powell, Schreiber.

500 Studies in Health, Physical Education, and Recreation (PEGR) 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.

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.

514 Methods and Materials in Health Education 2 hrs.
Lectures and demonstrations with emphasis on effective health supervision of school children, principles and practices of health teaching in the various grades, and interrelation of this teaching with that of other subjects in the curriculum. Prerequisites: PEGR 314 and 315, or consent of instructor.

516 Issues in Health Education 1-4 hrs.
Issues vary or occasionally repeat depending on the timeliness of the issue. Following are currently recommended themes. Students may register for 516 more than once but may not repeat the same issue. Issues include: Improving Health Behavior; Alcohol and Drug Education; Sexually Transmitted Diseases; Consumer Health; Cardiovascular Health; Stress Management; Bio Feedback; Patient Education; Health Careers, Parent Education; Wellness and Lifestyle; Safety and Health in the Industrial Setting.

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.

521 Therapeutic Trends for Exceptional Children 3 hrs.
A study of past, present, and future trends in habilitation and rehabilitation programs for handicapped people.
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

535 Principles and Problems of Coaching
2 hrs.
Various dimensions and forces affecting coaching are identified and explored, including educational implications of sport and coaching, characteristics of coaches and athletes, vital relationships, motivation, emotions, behavior, discipline, selecting and evaluating personnel, scientific principles and systems of training, the organization and planning of practices and total programs

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.

560 Administration of Physical Education
2 hrs.
For administrative officers, as well as for teachers and directors of physical education. Includes a study of representative programs of physical education and a discussion of standards for evaluating such programs. Case studies examined.

562 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

572 Recreation for the Aging
2 hrs.
An overview of aging, especially as it relates to leisure pursuits and organized recreation.

580 Studies in Athletic Training
1-2 hrs.
Listed with various topics. A lecture/demonstration course concerned with the prevention, diagnosis, and treatment of sport type injuries. Prerequisites: BMED 211, 240, PEP 392

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.

591 Evaluation in Health, Physical Education, and Recreation
2 hrs.
Acquaints students with the theory, selection, construction, administration, interpretation of appropriate tests in the field. Class activity will include study and discussion of selected tests, application, scoring, interpretation, and construction of tests.

595 Analysis of Movement in Sport
2 hrs.
The study of movement of muscles and the application of kinesiology to physical activity.

598 Reading in Health, Physical Education, and Recreation
1-2 hrs.
Advanced students with good academic records may elect to pursue independently a program of readings in areas of special interest. Prerequisite: Approval of graduate director in Physical Education.

Open to Graduate Students Only
630 Advanced Coaching
1-2 hrs.
Advanced theories of conditioning, training, practice organization, scouting, game and tournament planning, skill analysis and correction, defensive and offensive strategies, safety procedures, purchases and care of equipment, public relations, and promotion specific to each sport. A graduate student may apply a maximum of eight hours credit from PEGR 530 and 630 combined toward the master's degree program.

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.

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.

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.

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.

648 Advanced Studies in Motor Development
1-3 hrs.
A series of advanced seminars dealing with specific topics in motor development and special physical education. Emphasis will be placed on in depth study of theories, problems, practices, and issues with appropriate lectures and experiences leading toward the development of a research project or a master's thesis. Topics include:
- Play Theory
- Psychology of Sport
- Mainstreaming
- Developmental Programs in Special P.E.
- Aquatic Programs in Special P.E.

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.

661 Problems and Trends in Health, Physical Education, and Recreation
2 hrs.
Deals with modern trends, and with instructional and supervisory problems involved in conducting an effective program in physical education including a critical appraisal of present practices.

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
- Public Relations and Promotion
- Administration of Athletic Programs
- Legal Liability

680 Advanced Studies in Athletic Training
1-3 hrs.
A series of advanced seminars dealing with specific topics in sports medicine. Emphasis will be placed on in depth study of theories, problems, practices, and issues with appropriate lectures by physicians and specialists in the field. Professional sports medicine seminars will complement conventional on-campus study. Prerequisite: Completion of 580 series or consent of instructor. Topics include:
- Sports Medicine: Applied Anatomy and Physiology
- Sports Trauma Assessment and Management
- Sports Trauma Physical Therapy
- Administration of an Athletic Training Program
- Emergency Procedures and Orientation

690 Research Procedures in Health, Physical Education, and Recreation
3 hrs.
Research procedures in health, physical education, and recreation and sports. Introductory principles of scientific inquiry, research methods applicable to these fields, evaluation of published research, and procedures for developing a research design.

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.

699 Advanced Studies in Exercise Science
2 hrs.
A series of advanced seminars dealing with specific topics in exercise science. Emphasis will be placed on in depth study of theories, problems, and issues with appropriate lectures and experiences leading toward the development of a research project or a master's thesis.

Open For Graduate Students Only—Please refer to The Graduate College section for course descriptions. (Prerequisite: Approval of graduate director in Physical Education.)

700 Master's Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.
512 In-Service Professional Development 1-4 hrs.
This course is designed for teachers, counselors, psychologists, social workers, and other interested in studying selected aspects of special education at appropriate locations, such as state hospitals and special schools. A variety of instructional experiences is provided, including conferences. Prerequisite: Consent of department and concurrent enrollment in SPED 530.

514 Introduction to Learning Disabilities 2 hrs.
This course focuses on basic knowledge in the area of learning disabilities. Historical perspectives, definitions, and major issues will be explored. Service delivery systems and evaluation procedures will be examined and evaluated. Prerequisite: Consent of department.

527 Exceptional Learners in Regular Elementary Programs 3 hrs.
This course is designed for prospective elementary teachers. Emphasis is placed on the types of exceptional learners found in elementary programs. Required adaptations and modifications, and available resources and services for these learners are stressed. Prerequisites: Consent of the department. Not acceptable for Special Education majors.

529 Exceptional Learners in Regular Secondary Programs 3 hrs.
This course is designed for prospective secondary teachers. Emphasis is placed on the types of exceptional learners found in secondary programs. Required adaptations and modifications, and available resources and services for these learners are stressed. Prerequisites: Consent of the department. Not acceptable for Special Education majors.

530 Education of Exceptional Persons 3 hrs.
This course deals primarily with the problems of individuals who are atypical in terms of their sensory, physical, mental, emotional, and learning characteristics. Emphasis is placed on developing an understanding of the psychological, sociological, multi-cultural, philosophical, legal, and educational aspects of each type of exceptionality, including education in the Least Restrictive Environment. Prerequisite: Consent of department.

531 Classroom Practicum in Special Education 1 hr.
This course will provide the student with an opportunity to work within a classroom setting with a particular disability group—MR, POHI, EI, VI—at the elementary or secondary level. It is intended to provide the student with an awareness of the nature and needs of these handicapped students and the role of the teacher in working with such students. Prerequisites: Consent of the department and concurrent enrollment in SPED 530.

533 Assessment and Prescription in Special Education 3 hrs.
The major focus of this course is the understanding of the Clinical Teaching Model. Emphasis is placed on the relevance of assessment and prescription to the teaching of handicapped learners. Prerequisite: Consent of department.

534 Curriculum and Instruction in Special Education: Elementary 3 hrs.
The major focus of this course is the application of the Clinical Teaching Model to the education of mildly and moderately handicapped elementary and preadolescent students. Additional topics include: service delivery systems, roles of teachers and ancillary personnel, legal requirements, and major issues confronting the field of elementary special education. The course is a continuation of SPED 533 with focus on the elementary level. Prerequisite: Consent of department.

535 Adapting Teaching Strategies for Exceptional Persons 3 hrs.
This course consists of a combination of classroom and field-based experiences designed to integrate the philosophy and techniques of inquiry teaching into the Clinical Teaching Model. Students will be provided content and resources in science and mathematics for use with handicapped learners. Prerequisite: Consent of department.

536 Curriculum and Instruction in Special Education: Secondary 3 hrs.
The major focus of this course is the application of the Clinical Teaching Model to the education of mildly and moderately handicapped adolescents and young adults. Topics include understanding of handicapped adolescents and young adults, educational, curricular and instructional approaches, and transition programming. Prerequisite: Consent of department.

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 technology may be used to improve the education and lives of handicapped learners. Prerequisite: Consent of department.

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.

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.

540 Introduction to Mental Retardation 2 hrs.
This course provides an introduction to the field of mental retardation. Emphasis is placed on the interpretation of mental retardation in home, school, and community settings. Although primarily intended for those preparing to become teachers of the mentally retarded, it is also recommended for counselors, psychologists, social workers, and other allied professionals. Prerequisite: Consent of department.

541 Program Practicum in Special Education: MR 1 hr.
This course will provide the student with guided observations of school and community agencies serving the retarded. This course is intended to provide the student with an awareness of a continuum of special education placements and the role of non-school agencies serving retarded persons and their families. Prerequisite: Consent of department and concurrent enrollment in SPED 540.

542 Introduction to the Severely Impaired 3 hrs.
This course is designed to provide basic knowledge about severely impaired persons. The problems of severe impairments are examined in light of biomedical, legal, sociological, and educational perspectives. Special emphasis within the perspective of education includes information regarding management, assessment, instruction, and organization. Prerequisite: Consent of department.

544 Educating the Severely Impaired 3 hrs.
This course develops specific skills in the assessment, prescription, implementation, and evaluation of educational programs for the severely impaired. Course content focuses upon the areas of mobility, communication, sensorimotor development, self-help skills, cognition, and adaptive behavior. Prerequisite: Consent of department.

545 Education of Moderately and Severely Retarded Persons 2 hrs.
This course follows SPED 540 and focuses on understanding the ways in which teachers can organize curriculum and implement assessment and instruction to ensure maximum learning for students with mental retardation. Prerequisite: Consent of department.

546 Teaching Practicum in Special Education: MR 1 hr.
This course will provide the student with a structured assignment working with a retarded pupil. It is intended to enable the student to demonstrate skills in assessment and prescription, and in the implementation and evaluation of a tutorial plan of instruction for a specific mentally retarded pupil. Prerequisite: Consent of department and concurrent enrollment in SPED 545.

550 Introduction to the Orthopedically and Otherwise Health Impaired 2 hrs.
This course provides an introduction to the field of the orthopedically and otherwise health impaired. Topics include the medical conditions leading to orthopedic impairment, and the educational, therapeutic, psycho-social, and vocational implications of such impairments. Prerequisite: Consent of department.
551 Program Practicum in Special Education: POHI
1 hr.
This course will provide the student with guided observations of school and community agencies serving the POHI population. This course is intended to provide the student with an awareness of a continuum of special education placements and the role of non-school agencies serving POHI individuals and their families. Prerequisite: Consent of department and concurrent enrollment in SPED 550.

555 Education of Physically and Multiply Handicapped
2 hrs.
This course focuses on the educational needs of physically and multiply disabled students and the implementation of educational programs through curriculum development and instructional adaptations. Special attention will be given to communication needs, self-care needs, and the life management needs of these students. In addition, recreational and vocational programs will be explored. Prerequisite: Consent of department.

556 Teaching Practicum in Special Education: POHI
1 hr.
This course will provide the student with a structured assignment working with a physically or multiply impaired pupil. It is intended to enable the student to demonstrate skills in assessment and prescription and in the implementation and evaluation of a tutorial plan of instruction for a specific physically or multiply impaired pupil. Prerequisite: Consent of department and concurrent enrollment in SPED 555.

570 Introduction to the Emotionally Disturbed
2 hrs.
This course is intended to provide a basic foundation for understanding the condition of emotional impairment and appropriate educational and management provisions. Prerequisite: Consent of department.

571 Program Practicum in Special Education: EI
1 hr.
This course will provide the student with guided observations of school and community agencies serving the emotionally disturbed population. The course is intended to provide the student with an awareness of a continuum of special education placements and the role of non-school agencies serving emotionally disturbed persons and their families. Prerequisite: Consent of department and concurrent enrollment in SPED 570.

575 Education of Emotionally Disturbed Persons
2 hrs.
This course is to be taken following SPED 570 and focuses on understanding curriculum organization and the application of the Clinical Teaching model to instruction in order to assure maximal learning by students with emotional impairment. Prerequisite: Consent of department.

576 Teaching Practicum in Special Education: EI
1 hr.
This course will provide the student with a structured assignment working with an emotionally disturbed pupil. It is intended to enable the student to demonstrate skills in assessment and prescription, and in the implementation and evaluation of a tutorial plan of instruction for a specifically emotionally impaired pupil. Prerequisite: Consent of department and concurrent enrollment in SPED 575.

598 Readings in Special Education
1.4 hrs.
This course is designed for students interested in independent study. Topics chosen must be approved by the instructor and chair of the department. The course may be repeated for credit. Prerequisite: Consent of department.

Open to Graduate Students Only

620 Advanced Assessment of the Exceptional Learner
2 hrs.
This course is designed to provide graduate students in special education with advanced assessment techniques appropriate for mildly and moderately handicapped learners. Major emphases are the interpretation of norm-referenced and criterion-referenced test results. Topics such as non-discriminatory testing, multi-cultural considerations and selection of instruments will be discussed. Prerequisite: Consent of department.

621 Curriculum Development for Exceptional Learners
2 hrs.
This course is designed to provide experienced special education personnel with knowledge and skills in the conceptualization, construction, adaptation, and evaluation of curricula for handicapped learners in both self-contained and resource-type programs. Legal, social, cultural, financial, and theoretical forces that impact on curricula will be discussed. Prerequisite: Consent of department.

622 Development and Assessment of Preprimary Exceptional Children
4 hrs.
This course is designed to provide teachers with an in-depth understanding of normal and abnormal developmental patterns of preprimary children (birth to 5 years of age) as related to mental subnormality, neurologic dysfunction, communication disorders, physical and sensory impairments, and emotional disturbance. Emphasis will be placed on developmental assessment and the collecting and reporting of diagnostic information. Prerequisite: Consent of department.

623 Curriculum and Methods for Preprimary Exceptional Children
4 hrs.
This course is designed to provide teachers with skills in translating diagnostic information into a meaningful educational plan for children (birth to 5 years of age). Emphasis will be placed on situation-specific teaching roles as well as curricular and methodologic strategies in preprimary special education. Prerequisite: Consent of department.

630 Clinical Practice in Special Education
3 hrs.
This course serves as a culminating, practical experience within the Master Clinical Teacher program. Students will apply the Clinical Teaching Model in practical situations with exceptional learners. In addition, students will demonstrate supervisory and interdisciplinary communication skills associated with a consultant role. This course is offered on a Credit/No Credit basis. Prerequisite: Consent of department.

633 Education of Gifted and Talented Children and Youth
2 hrs.
This course is designed for regular classroom teachers, administrators, and other personnel. The characteristics of gifted and talented learners will be discussed. Personal, social, and multi-cultural factors which directly or indirectly influence the growth and development of these individuals will be considered. Attention will be given to methods and criteria used in identifying and programming for gifted, talented, and creative individuals. Prerequisite: Consent of department.

634 Advanced Theory and Practice in Learning Disabilities
2 hrs.
This course will examine several theoretical perspectives which attempt to explain why learning disabled children fail to learn. Under each perspective, selected theorists will be studied in terms of their specific theory and its application to the Clinical Teaching Model. Emphasis will be placed upon the treatment validity of the remediation methodology derived from each theory. Prerequisite: Consent of department.

635 Counseling Parents of Exceptional Children and Youth
3 hrs.
This course explores the dynamics of parents’ reactions to their exceptional children and youth. Techniques for helping parents deal with stressful situations in the home, school, and community will be developed. Prerequisite: Consent of department.

636 Topical Seminar in Special Education
2 hrs.
This course is designed to provide a survey or in-depth coverage of topics directly related to the education of exceptional children and youth. The course may be repeated for credit. Prerequisite: Consent of department.

637 Research and Evaluation Techniques in Special Education
4 hrs.
This course is designed to provide students with skills and knowledge of research and evaluation in the following areas: the role of research and evaluation in special education, the use of the scientific approach, research and evaluation designs, observation and measurement, statistical analysis, interpretation of research and evaluation reports, and report writing. Prerequisite: Consent of department.

638 The Application of Behavior Theory to Classroom Teaching
3 hrs.
This course examines the principles of behavior theory as related to academic and non-academic behaviors of exceptional children. General and specific methods for generating, strengthening, and maintaining desirable behavior, and methods for weakening undesirable behavior are presented. Prerequisite: Consent of department.

640 Organization and Administration of Special Classes and Services for the Handicapped Persons
2 hrs.
This course examines the principles and practices of organization and administration of special education programs at the state, intermediate and local levels. Prerequisite: Consent of department.
641 Supervision of Special Education Programs and Services
3 hrs.
This course is designed to provide the experienced special educator with specific knowledges and skills necessary for supervising personnel who are providing direct services to exceptional learners. Emphasis will be given to those procedures utilized in selecting personnel, identifying resources for program development and support, facilitating change in teacher behavior, and evaluating the effectiveness of program operations and personnel. Prerequisite: Consent of the department.

642 Developing Techniques for In-Service Training in Special Education
2 hrs.
This course is designed to inform students of the issues and problems involved in developing in-service education and to provide students an opportunity to design and present in-service programs for critique. Determining the needs of a given target population and an examination of delivery systems currently in use will be emphasized. Prerequisite: Consent of department.

643 Legal and Financial Aspects of Special Education
3 hrs.
The current legislative and financial bases for special education (national, state, and local levels) will be examined in relation to the development and modification of special education programs. The basic concept of budgeting of resources and expenditures will be discussed. Prerequisite: Consent of department.

650 Seminar on Special Education in Higher Education
3 hrs.
This course examines the structure of higher education and the roles a faculty member plays within a department, a college, and a university (e.g., teaching competence, professional recognition, and service). In addition, current issues in higher education and teacher education will be examined. Prerequisite: Consent of department.

656 Advanced Educational Foundations of Special Education
3 hrs.
This course is provided for students who have acquired extensive professional preparation and broad experience in the education of exceptional persons. An in depth knowledge of etiologies and characteristics of exceptionalities will be developed. Attention will be given to historical, social, cultural, economic, and psychological factors which have influenced or may influence the roles, functions, and structure of public schools, institutions, and agencies, and the programs and services provided for exceptional learners. Prerequisite: Consent of department.

659 Application of Learning Theories to Educational Programming for Exceptional Learners
2 hrs.
This course will offer an overview of theories of learning as they apply to exceptional learners. An in depth analysis of selected theories will be conducted in order to compare and contrast the relationships of each to the development of long-term goals for handicapped learners. Prerequisite: Consent of department.

661 Consultation Skills for Special Education Personnel
2 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: Consent of department.

674 Directed Teaching in Special Education
3-6 hrs.
This course is a requisite for graduate students who are preparing to teach in special education and is preferably taken after directed teaching has been completed in a regular classroom. This course is graded on a Credit/No Credit basis and is cross-listed with ED 674.

675 Internship in College Teaching
3 hrs.
This course is designed specifically for students officially admitted to the doctoral program in Special Education. The student will be expected to evidence ability to plan and execute instructional tasks, develop and apply appropriate evaluative techniques, and interpret students' performances. Prerequisite: Consent of department.

688 Classroom Management
2 hrs.
This course deals with techniques for the physical, instructional, logistic, and behavioral management of classrooms. Various management strategies will be discussed and several will be focused upon in detail. Prerequisite: Consent of department.

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

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

730 Doctoral Dissertation
15 hrs.

Course descriptions: Numbers following course title indicate hours of lecture and laboratory per week during a semester (lecture hours-laboratory hours).

Graduate Offerings:

The College of Engineering and Applied Sciences includes the following departments:
- Aircraft and Automotive Engineering
- Consumer Resources and Technology
- Electrical Engineering
- Engineering Technology
- Industrial Engineering
- Mechanical Engineering
- Military Science

Consumer Resources and Technology (CRT)

Coates, Chairperson; Professor Humbert; Associate Professors Petersens, Steinhuis, Woloszyk, Assistant Professors Dannison, Little.

Open To Upperclass and Graduate Students

500 Seminar in Distribution (3-0)
3 hrs. Fall, Winter
An intensive study of problems related to distribution. This seminar is especially recommended for graduates in food and petroleum distribution.

522 Textile Clinic (2-0)
2 hrs.
Investigation of textile problems, resources, and research. Prerequisite: CRT 220 or permission of instructor.

524 The Socio-Psychological Aspects of Clothing (3-0)
3 hrs. Fall—Even Years
Study of dress and adornment as related to human behaviors. An interdisciplinary approach to clothing-related research and non-verbal communication, person perception, and group conformity.

555 Problems in Nutrition (3-0)
3 hrs.
A discussion of current problems in nutrition. Not open to dietetics majors. Prerequisite: CRT 260 or equivalent.

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.

598 Independent Study in Consumer Resources and Technology
1-6 hrs. Fall, Winter, Spring, Summer
Directed independent advanced study in subject matter area not otherwise treated in departmental courses. Department approval required prior to enrollment.

Open to Graduate Students Only

600 Clothing Techniques (1-3)
2 hrs.
Meets the needs of the advanced student in clothing construction techniques.

602 Tailoring Techniques (1-3)
2 hrs.
Specialized tailoring techniques in coats and suits. Problems in the use and performance of new textiles in clothing.

604 Studies in Textiles and Clothing (2-0)
2 hrs.
Concentrated study of specifics within these fields relating to the interests of the students. Can be repeated if topic is different to maximum of six hours.

610 Nutrition in the Life Cycle (2-0)
2 hrs.
Concentrated study of nutritional needs throughout the life cycle. Emphasis on (1) maternal and child nutrition, (2) adolescent and young adult nutrition, and (3) aging and nutrition on a three-year rotation basis. Student can enroll for any stage or for each stage in subsequent semesters. Prerequisite: CRT 460 or 565.

614 Nutrient Metabolism I (2-0)
2 hrs.
Study of the functions, requirements, and interrelationships in metabolism of energy, protein, carbohydrate, and lipids.

615 Nutrient Metabolism II (2-0)
2 hrs.
Study of the functions, requirements, and interrelationships in metabolism of vitamins and minerals.

616 Consumer Education (2-0)
2 hrs.
Marketing problems and consumer credit. Students work on individual problems which concern the buying consumer goods.

618 Teaching of Specific Subjects in Consumer Resources and Technology (2-0)
2-3 hrs.
Intensive study of teaching techniques unique to specialized subject matter offered in variety of curricula in consumer resources and technology.

622 Occupational Laboratory Experience (2-0)
A supervised experience program in a specific occupational area. Prerequisite: VE 542 or permission of instructor.

636 Teaching for Independent Living (3-3)
4 hrs.
Provides a practical background and a basic understanding of skills and problems of the homebound and visually impaired.

648 Adult Education in Homemaking (2-0)
2 hrs.
Influence of developmental needs of adults and changes in society affecting families in developing adult programs in homemaking education.

652 Family Life Education (3-0)
3 hrs.
Current issues, trends, and methods in teaching family life education.
654 Housing (2-0) 2 hrs.
Economic and social aspects of housing. Single, duplex, and multiple housing problems considered.

660 Studies in Family Relationships (3-0) 3 hrs.
Concentrated study of specifics in family relationships.

664 Seminar in Home Economics (2-0) 2 hrs.
Investigation and discussion of current research and literature in specified home economics topics.

666 Studies in Home Economics Education (2-0) 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.

700 Master’s Thesis (3-0) 6 hrs.

710 Independent Research (2-0) 2-6 hrs.

Vocational Education Courses (VE)
The following courses are designed for professional preparation in Vocational Education programs.

Open to Upperclass and Graduate Students

512 Principles of Vocational Education (3-0) 3 hrs.
The place and function of the practical arts and vocational education in the modern school; fundamental principles upon which this work is based. For teachers of agriculture, business, distributive education, home economics, industrial subjects, office subjects, and for vocational administrators.

513 Technical Education Methods (3-0) 3 hrs.

514 Workshop in Vocational-Technical Education (1-3 hrs.)
Designed to assist vocational education personnel meet vocational education program standards of quality mandated by the vocational-technical education service. Workshop topics will vary to meet vocational education personnel needs. 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.

542 Occupational Education (2-0) 2 hrs.
Planning for wage earning programs at the secondary and adult levels.

543 Coordination Techniques in Cooperative Education (3-0) 3 hrs.
This is a study of duties and responsibilities of the teacher-coordinator. The organization and establishment of training programs, supervision of trainees on the job, development of individual training programs, establishing working relationships between the school, business, and home; and participation in activities in the community, especially adapted to current and prospective coordinators.

Open to Graduate Students Only

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 industry under the supervision of a member of the graduate faculty. Prerequisite: Consent of instructor and department chair prior to registration.

613 Vocational Laboratory Experience 2-3 hrs.
Supervised industrial experience, requiring full-time employment for at least one semester. Students will study and participate in experiences in a specific occupational area. Prerequisite: Consent of instructor and department chair prior to registration.

614 Administration and Supervision of Practical Arts and Vocational Education (2-0) 2 hrs.
Emphasizes functions of administration and supervision, and problems involved in organizing and operating vocational-technical education programs. For teachers, administrators, and supervisors of vocational education programs and those preparing for such positions.

615 Trends in Technology and Employment (2-0) 2 hrs.
Major occupational shifts resulting from recent advances in science and technology. The changing nature of the labor force, economic and sociological implications of automation and atomic power.

616 Occupational Selection and Training 3 hrs.
Primarily designed for vocational-technical teachers and administrators. Special emphasis on adapting instruction to individual needs.

617 Seminar in Vocational Education (2-0) 2-6 hrs.
An intensive study of problems related to vocational education. Topics vary from semester to semester, and a student may take more than one topic up to a maximum of six hours. See schedule for specific topical offerings and credit hours in any one semester or session.

619 Measurement and Evaluation in Vocational Education (2-0) 2 hrs.
Preparation and using written and performance tests. Includes interpretation of test results, and evaluation of achievement.

620 Laboratory Planning and Organization (2-0) 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.

646 Teaching Problems in Vocational Education (2-0) 2 hrs.
Advanced individual or small group study of teaching methods, techniques, and technical problems. Emphasis placed on problem solving, pupil planning, and demonstration techniques. A teaching program unique to a particular school required.

Electrical Engineering (EE)

Hesselberth, Chairperson; Professors Alag, Davis, VanderKooi; Associate Professors Gesink, Mason, Mousavinezhad; Assistant Professors Geji, Johnson.

Open to Upperclass and Graduate Students

501 Introductory Power Systems (3-0) 3 hrs.
An introduction to electrical power systems for non-electrical engineering students. Prerequisites: EE 211, MATH 374.

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: EE 361, EE 221.

530 Power System Analysis (3-0) 3 hrs.
Modern systems, control, optimization, network theories, matrix language, computer methods, steady state. Prerequisite: EE 430.

560 Time-Varying Fields (3-0) 3 hrs.
Electrodynamics, Maxwell’s Equations, Boundary value problems and solutions of Helmholtz Equation in different coordinate systems. Green’s functions, transmissions lines and waveguides. Introduction to perturbational and variational methods. Engineering EM Background needed for more advanced topics. Prerequisite: EE 361.

561 Data Communications (3-0) 3 hrs.
Overview of digital communication systems and network; analysis of current standards, design techniques, routing procedures and protocols. Prerequisites: EE 335, EE 380.

570 Digital Control System (3-0) 3 hrs.
State variable technique, controllability and observability, digital control system design with state or output feedback, maximum principle, optimal linear regulator—deterministic and stochastic state observers. Prerequisite: EE 371.

595 Introduction to Advanced Topics (3-0) 3 hrs.
To introduce students to advanced topics in electrical engineering not included in other course offerings. May be taken more than once up to six hours.

Open to Graduate Students Only

605 Microcomputer Systems (2-3) 3 hrs.
Analysis and design of microcomputer-based systems with emphasis on applications. Prerequisite: A computer programming course.
610 Network Synthesis (3-0)  
3 hrs.  
Synthesis of active and passive networks. Prerequisite: EE 310.

630 Power Systems Analysis II (3-0)  
3 hrs.  
Continuation of EE 530, with emphasis on transient analysis of power systems. Prerequisite: EE 530.

640 Electronic Instruments (3-0)  
3 hrs.  
Analysis of instrumentation systems including basic instrumentation concepts, dynamic analysis of instruments, transducers, operational analog methods, digital methods and applications. Prerequisites: EE 320, EE 371, EE 251.

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: EE 355, EE 357.

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, magnetic equations of plasmas, transport phenomena, and plasma stability. Prerequisite: EE 560.

662 Numerical Methods in Electromagnetics (3-0)  
3 hrs.  
Solution of electromagnetic field problems by finite difference, finite element, moment and interactive methods. Applications include topics in Electrostatics, Waves, Scattering, Machines and Transformers. Prerequisite: EE 560.

663 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: EE 560.

670 Modern Control Theory (3-0)  
3 hrs.  
Modern control theory using "state variable" formulations provides a unified approach to a wide variety of problems. Depends on matrix theory and linear algebra. Prerequisite: EE 371 or permission of instructor.

671 Optimal Control Systems (3-0)  
3 hrs.  
Optimal control dynamic programming. Portraying's principle, linear optimal regulator, system identification, stochastic and adaptive control. Prerequisite: EE 670.

680 Control Systems Analysis (3-0)  
3 hrs.  
Analysis of control systems using modern methods. Prerequisite: EE 539, EE 670.

685 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.

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.

700 Master's Thesis  
6 hrs.

Industrial Engineering  
(IE)  
Bafna, Chairperson; Professors Munsterman, Wolf, Associate Professors Boughner, White, Wygant; Assistant Professors Akers, Genaidy, Lyth.

Open to Upperclass and Graduate Students  
500 Advanced Industrial Relations (3-0)  
3 hrs.  
Interplay among government agencies, labor organizations, and management. Particular emphasis is placed on collective bargaining procedures, issues, and applications through case studies. Prerequisite: IE 403 or permission of instructor.

505 Advanced Work Analysis (3-0)  
3 hrs.  
Synthesis of effective work methods using a predetermined basic motion time system. Methods-Time Measurement, standard data system development, and administration. Prerequisite: IE 205, 305, or permission of instructor.

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. Not open to students with credit in IE 307. Prerequisite: Course in computer programming, EE 100 or equivalent.

508 Advanced Quality Management (3-0)  
3 hrs.  
Analysis and application of new concepts in the fields of quality control. Tests of significance, probability studies, and other uses of statistics as applied to quality control. Prerequisite: IE 318 or 326 or permission of instructor.

515 Design of Experiments and Regression Analysis (3-0)  
3 hrs.  
Topics related to experimental design and regression analysis. Topics include randomized blocks,拉丁 squares, factorials, multiple correlation and regression, and its application to response surfaces. Prerequisite: IE 261 or equivalent.

542 Human Factors Engineering (2-3)  
3 hrs.  
A survey of research on the adaptation of equipment, products, and environment to human use. (Cross-listed with PSY 542.)

557 Topics in Industrial Engineering (3-0)  
3 hrs.  
Group study of special topics in industrial engineering and technology. The specific topic will be shown in the course title when scheduled. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

Open to Graduate Students Only  
600 Concepts and Principles for Manufacturing Administration (3-0)  
3 hrs.  
To study the concepts of supervision with particular design for those who have had little or no previous academic orientation to the principles, concepts, and philosophy of industrial supervision.

604 Facilities Planning and Design (3-0)  
3 hrs.  
An analytical approach to the planning and design of manufacturing facilities and material handling systems. Prerequisite: IE 404, 414, or permission of instructor.

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 decision models, effect of taxation and depreciation on economic decision, and capital allocation. Not open to those with credit in IE 310.

608 Reliability Engineering (3-0)  
3 hrs.  
The formulation of mathematical models for reliability allocation and redundancy. Topics include time dependent and time independent prediction measures for both maintained and non-maintained systems. Prerequisite: MATH 360 or 362.

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.

611 Operations Research for Engineers (3-0)  
3 hrs.  
Concepts and techniques of operations research with emphasis on industrial applications. Topics include queueing theory, inventory models, Monte Carlo simulation, game theory, and dynamic programming. Linear programming is not included; see IE 610. Prerequisite: MATH 362.

612 Productivity and Operations Management (3-0)  
3 hrs.  
Topics relating to the planning and control functions of manufacturing systems are presented. These topics include management of the production system, strategies of product design and process selection, design of production systems, plant location, shop floor control, purchasing, quality management, and productivity improvement. Prerequisite IE 326 or equivalent.
demands made on the project manager 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.

622 Industrial Supervision Seminar (3-0) 3 hrs. An analysis of the writings, literature, and philosophy concerning line supervision and employee direction in manufacturing industries. Prerequisite: IE 630 or permission of instructor.

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: Systems. Prerequisite: IE 319 or equivalent.

640 Introduction to Manufacturing Administration (3-0) 3 hrs. An introduction to manufacturing administration, including a discussion of computer applications, preparation of short reports and personal and societal concerns of technically educated professional employees.

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.

657 Studies in Industrial Engineering (3-0) 3 hrs. Advanced work organized around topics of current interest in engineering and technology. The specific topic will be shown in the course title when scheduled. May be repeated for credit with a different topic. Prerequisite: Consent of instructor.

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 for credit at the graduate level. 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 descriptions.

700 Master’s Thesis 6 hrs.

Mechanical Engineering (ME)

Kenig, Chairperson; Professors Groper, Hamelsink, Hemmye, Matthews, Associate Professor Easwaran, Guichelaar, House, Sharma, Williams, Assistant Professors Ar-Gur, Cho, Sahin, VandenBrink.

Open to Upperclass and Graduate Students

531 Energy Management (3-0) 3 hrs. Winter. Theory and application of industrial energy audits. Energy conservation and waste heat recovery. Prerequisite: ME 332 or consent.

533 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.

558 Mechanical Vibrations (3-0) 3 hrs. Winter. A study of the oscillatory motion of physical systems with emphasis on the effects of vibrations on the performance and safety of mechanical systems. Prerequisites: ME 258, MATH 374.

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.

560 Engineering Analysis (3-0) 3 hrs. Fall. Application of vector analysis and differential equations to the solution of complex engineering problems. Prerequisite: ME 360 or equivalent.

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, nonlinear problems. Prerequisites: MATH 506 or equivalent.

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.

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 nozzle, diffusers, supersonic wind tunnels; and linearized flows and methods of characteristics. Prerequisites: ME 360, 432.

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.

573 Engineering Materials (3-0) 3 hrs. Spring-Odd yrs. Material selection for resistance to both load and environment. Design parameters for material selection and various metal systems, corrosion, service failure and mechanical behavior or engineering alloys at high and low temperatures. Prerequisite: ET 373.
utilizing the computer are studied. Prerequisites: ME 431, 432.

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.

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.

695 Advanced Topics in Mechanical Engineering: Variable Topics 1-4 hrs. A specialized course dealing with some particular advanced area of Mechanical Engineering not included in other course offerings. May be repeated for credit with a different topic up to six credits. Prerequisite: Consent of instructor.

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.

700 Master's Thesis 6 hrs.

Paper and Printing Science and Engineering (PAPR) Valley, Chairperson; Gottesman Professor Janes; Professor Byle, Associate Professors Darling, Kline, Peterson, Assistant Professors Aravamuthan, Bobalek.

Open to Graduate Students Only
660 Mechanics and Optics of Paper and Fibers (2-3) 3 hrs. The mechanics and optics of individual fibers and fiber networks will be considered from both theoretical and measurement standpoints. Stress-strain-analysis, theory of elasticity and flow, statics, reflection, absorption, transmission, and light scattering of these systems will be covered.

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.

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.

691 Pulp and Paper Operations II (2-3) 3 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 instructor.

696 Paper Industry Control Systems (2-3) 3 hrs. A study of the control of pulping and papermaking processes with emphasis on computer control strategies and the instrument systems unique to the paper industry. A unit operations and process modeling approach will be taken to familiarize the student with applications of these techniques to the paper industry.

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

700 Master's Thesis 6 hrs.

710 Independent Research 2-6 hrs.

712 Professional Field Experience 2-12 hrs.
Graduate Offerings:
Art
Dance
Music

**Art (ART)**
Professors Argyropoulos, Carney, Keaveny, King, Link, Strawn, Mergen, Rhodes, Rizzolo, Robbert; Associate Professors Grinwis, Harkness, Methany, Nattel, Neu; Assistant Professor Abramson.

**Open to Upperclass and Graduate Students**

510 Drawing Workshop
1-6 hrs.
Continuation of ART 310. Prerequisite: ART 310. Repeatable for credit.

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 instructor. Repeatable for credit.

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, none for other students. Repeatable for credit under a different title.

530 Ceramics Workshop
1-6 hrs.
Advanced work in ceramics on an independent basis. Prerequisite: ART 330. Repeatable for credit.

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.

534 Textiles Workshop
1-6 hrs.
Continuation of ART 334 with advanced work in textiles design. Prerequisite: ART 334. Repeatable for credit.

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.

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.

540 Painting Workshop
1-6 hrs.
Continuation of ART 340. Prerequisite: ART 340. Repeatable for credit.

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.

542 Watercolor Workshop
1-6 hrs.
Continuation of advanced watercolor techniques with emphasis on experimentation. Prerequisites: ART 342. Repeatable for credit.

544 Hand Papermaking
1-6 hrs.
Continuation of ART 244 and ART 344. Prerequisite: ART 344.

545 Graphic Design
3 hrs.
Advanced work in graphic design. Prerequisite: ART 445 or equivalent experience. Repeatable for credit.

548 Photography Workshop
1-6 hrs.
Professional development through research in advanced projects. Prerequisite: ART 548. Repeatable for credit.

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.
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.

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.

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.

582 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.).

585 History of Renaissance Art 3 hrs.  
The development of art through the early Renaissance to the late Renaissance and Manerism. Some of the major artists discussed are: Giotto, Donatello, da Vinci, Michelangelo, Titian, Van Eyck, Brueghel, and Durer.

586 History of Baroque Art 3 hrs.  
Art of the late sixteenth, seventeenth, and early eighteenth centuries. Major artists and architects discussed are: Caravaggio, the Carracci, Rembrandt, Rubens, Poussin, Velasquez, Bernini, Borromini and Neumann.

588 History of 19th Century 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.

589 History of 20th Century 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. Prerequisites: ART 200 and 221 for Art majors and minors; none for other students.

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, op art, the new realists, and conceptual art. Prerequisites: ART 220 and 221 for Art majors and minors; none for other students.

591 History of Prints 3 hrs.  
Major developments in printmaking, including origins of woodcut and engraving. Renaissance and baroque master etchers and engravers (Durer and Rembrandt). Lithography in the nineteenth century (Delacroix, Daumier, Toulouse-Lautrec). Twentieth century printmaking. Prerequisites: ART 220 and 221 for Art majors and minors; none for other students.

593 History of American Art 3 hrs.  
Art in the United States from the Colonial Period to the present. Topics discussed are: Colonial portraiture and Copley, the evolution of 19th and 20th century painting and sculpture, with emphasis on the work of Stuart, Cole, Cassatt, Homer, Eakins, Ryder, Saint-Gaudens, Marin, Pollock, David Smith, and recent developments.

Open to Graduate Students Only

610 Advanced Drawing 1-6 hrs.  
Graduate level work in drawing. Prerequisite: ART 510. Repeatable for credit.

613 Graduating Presentation 2 hrs.  
Preparation and presentation of graduating exhibition, portfolio, and oral examination or written thesis, with the assistance of the student's major adviser. Evaluated by a departmental review committee. Prerequisite: Last year of graduate study.

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 instructor. Repeatable for credit.

625 Graduate Art Seminar 2 hrs.  
A survey, investigation, discussion, and evaluation of selected topics in contemporary art and associated practive 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.

630 Advanced Ceramics 1-6 hrs.  
Graduate level work in ceramics. Prerequisite: ART 530. Repeatable for credit.

631 Advanced Sculpture 1-6 hrs.  
Graduate level work in sculpture. Prerequisite: ART 531. Repeatable for credit.

634 Advanced Textile Design 1-6 hrs.  
Graduate level work in textile design. Prerequisite: ART 534. Repeatable for credit.

635 Advanced Multi-Media Art 1-6 hrs.  
Graduate level work in Multi-Media Art. Prerequisite: ART 535. Repeatable for credit.

640 Advanced Painting 1-6 hrs.  
Graduate level work in painting. Prerequisite: ART 540. Repeatable for credit.

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.

642 Advanced Watercolor 1-6 hrs.  
Graduate level work in watercolor. Prerequisite: ART 542. Repeatable for credit.

645 Advanced Graphic Design 1-6 hrs.  
Graduate level work in graphic design. Prerequisite: ART 545. Repeatable for credit.

648 Advanced Photography 1-6 hrs.  
Graduate level work in photography. Prerequisite: ART 548 or equivalent experience. Repeatable for credit.

Dance (DANC)

Professors Cornish, Gamble, Stillwell; Associate Professor Mills; Assistant Professors Baas, Nelson, Thomas.

Open to Upperclass and Graduate Students

525 Special Studies in Dance 1-6 hrs.  
A studio of dance styles not included within program. Examples of possible topics include: Afro-American Dance, Ballet repertoire, pre-classic dance forms, and dance for the exceptional student. May be offered with visiting instructor or artist-in-residence. Repeatable for credit up to 6 hrs. Prerequisite: Adviser consent.

560 Performance Variable  
An experience in student or faculty-choreographed dance works, in projects not encompassed in specific dance courses. Application with approval of dance faculty committee must be filed with the dance adviser one month prior to performance. Registration occurs after performance has been completed. Prerequisite: Adviser consent.

565 University Dance Theatre (UDT) 3 hrs.  
UDT is a performing ensemble which provides master classes, residencies, lecture-demonstrations, and concerts in various dance styles in the region. Members must show proficiency in performance, improvisation, teaching, and public speaking. Members must concurrently enroll in at least one studio course at the 200 or 300 level. Repeatable for credit. Prerequisite: Audition or consent of company director.

588 Dance Production 2 hrs.  
The study of the production aspects of dance including sound, lighting, costume, make-up and stage management. Practical applications will include first-hand experience in creating tape collages with special effects, designing lighting, costumes and make-up.

589 Dance Management 2 hrs.  
Course covers front-of-house aspects of management and publicity, budget programming, organization of elements involved in company management, and grantsmanship. Practical application of these principles will be evaluated wherever possible.
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.

Non-reading Independent Study in Dance
1-4 hrs.
Advanced students with good standing may elect to pursue independently the study of some area of dance through the creative process. Topics are chosen and arrangements are made to suit the needs of each particular student. Prerequisite: Approved application required.

Music (MUS)

Professors Appel, Bullock, Curtis-Smith, Humiston, Ivey, Jones, Kynaston, Osborne, Rappeport, Ricci, Sheldon, Suddendorf, Whaley, Wilson, Zastrow, Zupko; Associate Professors Hardie, Heim, McCarthy, Work, Zeegers; Assistant Professors Derry, R. Knific, T. Knific, Little, Moonett, O’Hearn, Pherigo, Pocock, Pratnicki, Seibert, Uchimura, Wolfinbarger, Wong.

Open to Upperclass and Graduate Students

Applied Music
1-2 hrs. ($7)
Private lessons for the graduate student in a non-major area of performance.

Master Class
2 hrs.
The study of literature, performance practices, and techniques for a specified musical medium (instrument or voice). Individual performance assignments will be made appropriate to each student’s level of accomplishment. Class meetings may vary from small groups of students with common performance levels to meetings for the entire class for the purpose of dealing with materials and techniques common to all performers. May be repeated for credit.

New Music Ensemble
1 hr.
A performing organization which is committed to the performance of music and mixed media works in the avant-garde style. The ensemble is open to vocalists and instrumentalists on an audition basis.

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.

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.

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.

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.

Advanced Choral Conducting
2 hrs.
Supervised experience in conducting vocal groups. The student may be called upon to prepare an ensemble for public performance. Prerequisite: MUS 330.

Advanced Instrumental Conducting
2 hrs.
Supervised experience in conducting instrumental groups. The student may be called upon to prepare an ensemble for public performance. Prerequisite: MUS 331.

Elementary School Music
2 hrs.
Emphasizes the place of music in the day-to-day activities in the classroom. The fundamental musical skills are developed in order to assist the teacher to achieve these objectives.

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.

Music Education Materials: Variable Topics
2 hrs.
A study of the theoretical bases for, and practice in, analyzing and evaluating music for use in music education programs. This course may be repeated for a maximum of four credits.

Computer Assisted Instruction in Music
3 hrs.
The primary goal of the course is to teach students, who already program, some of the specific techniques used in developing original software for CAI in music. The main activity in the course will be programming, and one of the products of the course should be, for example, a program of sufficient sophistication as to at least potentially qualify it for publication. Prerequisite: CS 105 or 502 or consent of instructor.

Jazz Improvisation I
2 hrs.
A study and application of the art of arranging for the jazz ensemble—both traditional and contemporary. The course will undertake a detailed study of scoring for winds, brass, strings, voices and percussion in relation to traditional and contemporary trends within the medium. Prerequisite: MUS 264 or MUS 264 concurrently.

Jazz Improvisation II
2 hrs.
A study and directed application of the fundamentals 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 161 with grade of C or better.

Jazz Improvisation III
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 536 and MUS 218, Jazz Ensemble or concurrently.

Counterpoint
2 hrs.
A continuation of MUS 560. Prerequisite: MUS 560.

Advanced Composition
2 hrs.
A study of twentieth century techniques in composition with original work in vocal and instrumental forms. Prerequisite: MUS 362.

Advanced Composition II
2 hrs.
A continuation of MUS 562. Prerequisite: MUS 562.

Musical Acoustics
3 hrs.
A course designed for the music student. Discussion as well as laboratory demonstrations of such principles 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; and psycho-acoustics.

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.

Orchestration II
2 hrs.
A continuation of MUS 567. Prerequisite: MUS 567.
570 Introduction to Musicology 3 hrs.
History, purposes, scope of musicology; leading historians, past and present; modern methods of research, with special emphasis on primary sources and bibliography of the field.

571 Introduction to Musicology 3 hrs.
A continuation of MUS 570.

572 Baroque Music (1600-1750) 3 hrs.
A survey of the choral and instrumental music of the Baroque master such as J. S. Bach and G. F. Handel. Special attention to the development of style from monody through harmonic polyphony. Prerequisites: MUS 270 and 271.

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.

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. Special attention is given to the development of Nationalism. Prerequisites: MUS 270 and 271.

575 Musicology and Research 2 hrs.
Presentation of musicological material in formal writing as well as informal classroom lecture; specific research projects with emphasis on selection and qualitative judgment of materials used.

576 Musicology and Research 2 hrs.
A continuation of MUS 575. Prerequisite: MUS 575.

577 Symphonic Literature 2 hrs.
A survey of music written for symphony orchestra during the Classic and Romantic periods.

578 Chamber Music Literature 2 hrs.
A survey of chamber music literature of the Classic and Romantic periods.

579 Operatic Literature 2 hrs.
A survey of opera from 1600 to the present.

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.

581 Choral Music Literature 3 hrs.
A survey of choral music (mass, motet, anthem, cantata, oratorio) from the Renaissance through the Romantic period.

582 Western Music Before 1600 4 hrs.
A survey of music to 1600. Major developments in style, notation and performance practices will be stressed using works of theorists and primary manuscript sources.

583 Jazz History and Literature 4 hrs.
A survey of the history of jazz including aspects of sociology and history as they relate to the art form of jazz. All periods in jazz history, from its earliest roots in Africa and the slave culture in the United States, up through the blues, Dixieland, swing, bop, mainstream and the more eclectic period of jazz rock and free-form jazz will be explored. Important works will be examined from each period in order to grasp the essentials of a particular style. Prerequisite: MUS 558 or instructor’s consent.

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.

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 genre 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.

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.

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).

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.

598 Readings in Music 1-4 hrs.
Graduate students may enroll in this course after consultation with the graduate adviser.

599 Music Seminar 1-4 hrs.
Open to Graduate Students Only

600 Applied Music 1-4 hrs. ($7)
Private lessons for the graduate student in the major performance area. Includes conducting.

610 Introduction to Research in Music 3 hrs.
A course in the general methods and techniques of research in the field of music. Students will complete a comprehensive bibliography, an annotated bibliography, and a research paper in the area of concentration of their graduate program of study.

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.

640 Band Techniques and Organization 2 hrs.

641 Choral Techniques and Organization 2 hrs.
The study of choral activities in relation to organization, repertoire, style, diction, singing technique, balance, blend, tone quality, phrasing, rehearsal technique, and conducting.

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.

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.

662 Seminar in Composition 2 hrs.
The completion of an original composition of larger scope in any medium, accompanied by analysis of advanced works and reading assignments. May be repeated for credit. Prerequisite: MUS 563.

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.

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.
110 COLLEGE OF FINE ARTS

670 Seminar in Musicology
1 hr.
Research projects from all areas of the history of music. Each student will present his or her findings both as a formally written paper and as a seminar report. Emphasis will be placed on writing style, manner of presentation, scholarship, and validity of conclusions.

671 Seminar in Musicology
1 hr.
A continuation of MUS 670.

677 Contemporary Music
2 hrs.
A survey of trends in European music and music of the Americas from about 1910 to the present day.

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.

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.

681 Research in Musical Behavior
2 hrs.
Development and employment of research methods and techniques to the psychology of music and/or music education. Students enrolled in this course will be responsible for an experimental research project which, in the case of music education students, will satisfy the "terminal project" requirement (MUS 691) or, in the case of music therapy students, will provide the data basis for the required MUS 700, Master's Thesis. When this course is the culminating project for the master's degree, an oral examination on the project and related areas is an integral part of the requirements. Prerequisite: MUS 610 or ED 601.

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.

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.

691 Special Project in Music Education
2 hrs.
A research project in the area of the teaching of music. The nature of the special project is to be determined in consultation with the Graduate Adviser and appropriate members of the graduate faculty. Projects must be approved prior to registration. When this course is the culminating project for the master's degree, an oral examination on the project and related areas is an integral part of the requirements. May be repeated for credit.

Private Music Study—Open to Graduate Students Only

500 Applied Music
1-2 hrs. ($7)
Graduate students who are not majoring in music performance and who do not meet graduate performance level may register for this course. May be repeated for a total of not more than three credit hours.

600 Applied Music
1-4 hrs. ($7)
Qualified graduate students may study in applied music for a total of four semester hours per semester in the major performance area. Three or more credits requires 60 minutes per week of instruction and necessary practice. May be repeated for credit. Includes private conducting study.

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

700 Master's Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.

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

700 Master's Thesis
6 hrs.

710 Independent Research
2-6 hrs.

712 Professional Field Experience
2-12 hrs.
Blind Rehabilitation (BLRH)

Wiener, Chairperson; Associate Professors LaDuke, P., Ponchillia, Weessies; Assistant Professors S. Ponchillia, Leja.

Open to Upperclass and Graduate Students

The purpose of this course is to provide basic information to graduate students and workers in health and human service professions so that they will be able to work more effectively with blind individuals. It is also intended for undergraduate students who may be interested in entering a career in blind rehabilitation and would like to further explore their interest. Tests and assignments will be different for the graduate and undergraduate students. The graduates will have additional readings and will be expected to conceptualize the relationship between their discipline and blindness services. An overview of visual impairment will be provided with both theoretical and practical components.

584 Computer Technology for Visually Impaired Persons 2 hrs.
This course is designed to introduce the student to computer technology, as it relates to visually impaired persons. Students will learn the uses, parts, and operating commands of common adaptive computers, as well as the software used with them. In addition, the major adaptive forms of output including speech, braille and large print, will be investigated. Experimental aspects will be stressed. Students planning to enter this course should have the ability to touch type. Prerequisites: Computer literacy or instructor permission.

587 Low Vision Evaluation and Training 1 hr.
Simulation of common visual impairments are experienced. Evaluation of visual function and training in the use of low vision aids to enhance visual efficiency through environmental manipulation—a hands-on approach. This course is to be part of core program for Orientation and Mobility and Rehabilitation Teaching degree students.

588 The Dynamics of Blindness and Rehabilitation 2 hrs.
This course presents an overview of blindness and the blindness service delivery systems. The social, psychological, educational, recreational, and vocational effects on blind and on visually impaired adults are emphasized.

589 Inter-Professional Seminar Regarding Blind Multi-Handicapped Persons 1 hr.
This course presents an interdisciplinary approach to the study of multihandicapping conditions in which blindness is a common denominator.

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.

591 Braille and Other Communication Methods 2 hrs.
This course is designed to teach the braille literary code as it applies to Rehabilitation Teaching. Braille teaching methods are also presented.

592 Education of the Blind and Partially Sighted 2 hrs.
This course provides an introduction to the ways in which blindness and visual impairment affect blind children, and an overview of the education systems serving them. History of education of visually handicapped children, the effects of a visual impairment on child development, educational assessment and planning and curriculum adaptation are explored.

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.

595 Introduction to Orientation and Mobility 4 hrs.
The content of this course relates to problems of non-visual orientation and mobility. Simulated experiences are provided which emphasize the sensory, conceptual, and performance levels needed for independent travel in a variety of environments.

597 Introduction to Cecuticy 2 hrs.
This course deals with assessment and remediation of functional problems encountered by low vision persons. Emphasis is placed on optical, non-optical, and electronic aids which increase visual functioning. In addition, the nature and needs of low vision persons and the interprofessional nature of low vision services are stressed.
598 Readings in Blind Rehabilitation 1-4 hrs.
This course is arranged on an individual basis to provide students an opportunity to pursue independently the study of special areas of interest in depth.

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

601 Small "N" Research: Design and Analysis 3 hrs.
The purpose of this course is to provide students with a working knowledge of an experimental methodology for demonstrating social 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.

604 Issues in Independent Travel 1 hr.
This course is taken concurrently with Introduction to Orientation and Mobility. It presents theoretical content which facilitates effective teaching of independent travel skills to visually handicapped individuals. The topics of this course include development and use of spatial maps, use of the computer in mobility, conditions of travel, orientation to various environments, and types of guidance devices.

605 Practice Issues in Orientation and Mobility 1 hr.
This course is taken concurrently with Practicum in Orientation and Mobility. It presents content essential for application of practice principles. The topics which are covered include ethical conduct, interviewing, empathic responding, teaching strategies, alternative learning theories, service delivery models, community agency resources, and certification.

664 Principles of Rehabilitation Teaching 3 hrs.
This course is concerned with the development and the current status of rehabilitation teaching as an occupation, with particular emphasis upon the teaching methods and human interrelationships which are essential in instructing visually impaired adults in skills of independent living.

680 Methods and Techniques of Teaching Braille and Other Areas of Communication 2 hrs.
Adaptive communication methods used by visually handicapped persons and the techniques of teaching them are explored in this course. Specifically, braille, handwriting, listening and recording devices, typewriting, and computer technology are presented. This course also includes a supervised practical teaching experience with a visually handicapped person.

691 Practicum in Rehabilitation Teaching 1 hr.
This course provides supervised teaching experiences with blind or visually impaired individuals in a variety of settings.

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.

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.

710 Independent Research 2-6 hrs.
This course requires the completion of a creditable research project related to blind rehabilitation, conducted with faculty guidance.

712 Professional Field Experience 2-12 hrs.
This course requires a supervised internship experience in an organization that serves blind and visually impaired persons, during which the opportunity is provided for practical application of principles and methods in blind rehabilitation.

Health and Human Services (HHS)

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 health service system and the ways in which consumers make use of the system. The analysis focuses on the interplay of forces within the system as well as between the system and its environment.

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.

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, health and mental retardation services, and group medical practice.

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 system as well as the current structure arrangements for carrying out planning in the health arena both at the macro- and micro-levels.

515 Administrative Functions in the Health Care Setting 3 hrs.
This course focuses on the knowledge and skills necessary for the major administrative functions in health organizations. These include goal setting, decision making, personnel management, data processing, service design, and general principles of financial management.

530 Clinical Theory for Health and Human Services 1-4 hrs.
This course covers selected theories which form the foundation for health and human service practice in specialized areas. Students are expected to master the content as a basis for building foundation knowledge for clinical practice. Theory of environmental health, systems theory for the health setting, theories of substance abuse for nursing and medical practice, and community health theory are among the possible areas of study. The specific topics are announced with each semester offering. Prerequisite: Consent of instructor.

531 Introduction to Holistic Health Care 3 hrs.
The primary purpose of this course is to provide an introduction to the philosophies, theories, and concepts involved in holistic health care. It is meant to serve both as a general educational experience for persons wishing to become familiar with holism and as essential basic instruction for persons wishing to apply for admission to the graduate specialty program in Holistic Health Care. Prerequisite: Graduate status.

560 Clinical Practice in Selected Health and Human Service Areas 1-4 hrs.
This course covers variable topics in clinical health and human service practice. It is a skills development course which helps students to become proficient in specific techniques and procedures related to patient care or client service. Clinical applications of biofeedback, clinical practice in genetic counseling, the role of the health team in clinical practice, the patient and medical care, laboratory services, basic clinical skills for the substance abuse setting, and community health education practice are among the possible areas of study. The specific areas are announced with each semester. Prerequisite: Consent of instructor.

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 in the application of social work practice techniques to the health and human service systems. 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.
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.

Open to Graduate Students Only
650 Seminar in Holistic Methods, Part I 3 hrs.
The seminar is team taught and provides students with a broad overview of method which may be utilized in a holistic health care setting. Every one or two sessions a new faculty member representing a different sort of expertise or perspective will guide students through a different holistic method. The seminar provides a principal body of information and some personal experience in the methods which can be used therapeutically by a holistic health care practitioner regardless of the student’s principal disciplinary interest or training. Evaluation is by oral and written examinations. Prerequisite: HHS 531.

651 Seminar in Holistic Methods, Part II 3 hrs.
A continuation of HHS 650, providing an opportunity for exposure to additional holistic methods utilizing the same format and evaluation system as Part I of the seminar. Prerequisite: HHS 531.

662 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. Prerequisite: Permission of Gerontology graduate specialty program advisor.

680 Multidisciplinary Seminar in Gerontology 3 hrs.
A multidisciplinary seminar in gerontology, drawing upon staff from various academic and professional departments on the campus as well as from practitioners in the community. Course work and readings will deal with various theoretical and practical aspects of gerontology including policy formulation and implementation with academic emphasis on the contributions of various academic fields to the understanding of aging. Open to Graduate Students Only—Please refer to The Graduate College section for course descriptions.

712 Professional Field Experience 2-12 hrs.

Occupational Therapy (OT)
Professors Rider, Smith, Tyndall, Associate Professors Bush, Callan, Cooper, Edwards, Ford, Hemphill, Lukens, Nelson, Petersons, Richardson, Assistant Professor Peterson.

Open to Underclass and Graduate Students

530 Sensory Integration and the Child 3 hrs.
Study of theoretical principles and their application to evaluation and treatment of the child with sensory integrative dysfunction. Students will observe and participate in screening and evaluation of children, and they will design treatment plans for selected clients. Prerequisite: OT 335, 351, and 353, or OTR, RPT, or consent.

579 Studies in Occupational Therapy 2-4 hrs.
Examines selected topics within the field of Occupational Therapy. Topics considered will vary from semester to semester. May be repeated for credit. Prerequisites: Advanced O.T. major or departmental permission.

Open to Graduate Students Only
610 Professional Issues 3 hrs.
Current and emerging professional issues will be discussed. Students will take an active part in community, state, or national organizational and/or legislative processes related to the resolution of a specific issue. Students' potential for future professional leadership will be emphasized.

621 Introduction to Neurodevelopmental Treatment for Adults 3 hrs.
Foundations of neurophysiology and motor development are discussed. Opportunity is provided for application of neurodevelopmental theory, treatment principles and techniques to occupational therapy. Special attention is given to management problems of adults with hemiplegia.

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.

633 Administration of Occupational Therapy 3 hrs.
This course utilizes the basic skills of administration (planning, organizing, directing, coordinating, and controlling) in the development of a model of practice for occupational therapy services. These services will be developed for an agency or institution that does not now offer occupational therapy services, or for an agency or institution whose occupational therapy services need to be expanded. In addition to the model of practice, the student will prepare a grant proposal that could be used to initiate funding for the model.

640 Theory in Occupational Therapy 3 hrs.
This course explores core concepts, models, and paradigms of the past, present, and future and their influence on education, research, administration, and practice of occupational therapy. Components of theory, formulation of theory, and the effect of theory development on occupational therapy will also be explored.

660 Research in Occupational Therapy 3 hrs.
The purpose of this course is to explore research in occupational therapy and related fields and develop each student's research and writing skills as applied to occupational therapy. It will include review and critique of occupational therapy research, recognition and application of ethical practices, identification of researchable questions, principles of research design, participation in research and statistical analysis.

686 Graduate Seminar 3 hrs.
This course examines topics relevant to new developments in environmental adaptations, treatment techniques, and innovations in the delivery of occupational therapy services. Prerequisites: OT 610, 640, 660.

697 Investigations in Occupational Therapy 1-3 hrs.
Independent study provided for the qualified occupational therapy student under the guidance of a departmental faculty member. Prerequisite: Consent of graduate coordinator and proposed faculty supervisor. May be repeated for credit.

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

700 Master's Thesis 6 hrs.
Prerequisite: OT 660

710 Independent Research 2-6 hrs.
Prerequisite: OT 660

712 Professional Field Experience 2-4 hrs.
Prerequisite: Consent

Social Work (SWRK)
Professors Burian, Flynn, Kramer, McCasin, Pawlak, Reid, Thompson, Wintberg, Associate Professors Blakely, Cooney, Leightonher, Lish, Mathews, Phillips, Wertkin; Assistant Professors Brown, Halseth, Jones, MacDonald, Morris, Reeser.

Social Policy
Open only to seniors and Graduate Students

512 Social Policy and Service Delivery in Selected Problem Areas 3 hrs.
Intensive study in selected fields of service, specializations, and social problem areas. Attention is focused on learning about the major social policy issues associated with the service or problem area. Specific topics will be announced each semester. Prerequisite: Senior or graduate student standing.

The legal bases of organized social welfare and social work practice are examined through the study of selected examples of social legislation and judicial decisions, the legislative process, development of administrative regulations, and court organization. Illustrative case studies are used to demonstrate how social workers can manage within the restrictions and opportunities presented by legal institutions and practices in social and individual case situations. Prerequisite: Consent of instructor.

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

This first course in social welfare policy in the graduate curriculum explores and identifies the social, political, economic, historical, and philosophical foundations of American social welfare. Emphasis is given to the social conditions of poverty and racism and the structure of social services, particularly as developed through social legislation. The disciplined study of social welfare policy is pursued by the use of a range of explicitly stated analytic frameworks in which alternative choices in social policy and social provisions are made visible. Prerequisite: Consent of instructor.

612 Social Policy and Service Delivery in Selected Problem Areas 3 hrs.
Intensive study of problem solving frameworks for the solution and management of selected social problems. Attention is focused on the roles of policy analysis and formulation, and service delivery in the problem-solving process. Specific topic will be announced each semester. May be repeated for credit. Prerequisite: Consent of instructor.

Social and Behavioral Theory
Open to Graduate Students Only

630 Social Change Theory and Community Analysis 3 hrs.
The community as a field of action for social change and decision making is analyzed. Several conceptions of social change and stability are reviewed. The processes of community decision making are examined. A social systems framework is used as the conceptual base for analysis in both areas. Prerequisite: Consent of instructor.

631 Individual Growth and Development 3 hrs.
This course will focus on an understanding of personality development, change throughout the life cycle. Specific emphasis will be placed on biological substrates, the person's emotional life, and how these factors interrelate with the socialization process and environmental variations. Ethnic and racial variables will be explored as they affect personality development. Theoretical approaches may include psychoanalytic ego psychology, cognitive functioning, and learning theories. Concurrent and interrelated with these theories is a focus on "social role concepts" as they affect a social work case assessment and practice interventions. Prerequisite: Consent of instructor.

632 Organizational Theory for Human Service Management 3 hrs.
An examination of conceptual frameworks useful in the analysis and management of social service organizations, such as the study of structure and process, goals, informal and organizational relations, design, and organizational change. The functional and dysfunctional aspects of bureaucracy for social work practice are examined. Emphasis is placed on skill in the analysis of social service organizations. Prerequisite: SWRK 671 or consent of instructor.

636 Study of structure and process, goals, informal and interorganizational relations, design, and organizational change. The functional and dysfunctional aspects of bureaucracy for social work practice are examined. Emphasis is placed on skill in the analysis of social service organizations. Prerequisite: SWRK 671 or consent of instructor.

638 Psychopathology for Social Work Practice 3 hrs.
This course provides students with knowledge of psychopathology as an aspect of human functioning across cultural labeling. Primary focus is on the interaction between physiological, developmental, emotional, and social aspects of adult and child psychopathology from both descriptive and psychodynamic points of view. General implications for social work intervention, ethical and value issues, and relevant research will receive some consideration. Prerequisite: Consent of instructor.

The purposes of this course are threefold: (1) to increase student knowledge of the methods of empirical research as a tool for social work knowledge building; (2) to improve student capacity for research consumption and utilization in social work practice; (3) to develop elementary skills in the machine processing, analysis, and presentation of data. Classroom instruction includes lecture and discussion plus laboratory sessions designed to familiarize students with data processing, electronic computer, and calculator equipment. Prerequisite: Consent of instructor.

645 Social Welfare Policy, Planning, and Administration Technologies 3 hrs.
The purpose of this course is to provide students with knowledge of a variety of analytical tools and technologies designed to aid in social welfare policy, planning and administrative operations, such as project management, program evaluation, information systems, and computers in social service agencies. Emphasis will be given to skill development in selected technologies. Prerequisite: SWRK 671 or consent of instructor.

Social Welfare Practice
Open to Upperclass and Graduate Students

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.

563 Social Work Concepts in Rehabilitation 3 hrs.
Application of social work problem solving concepts to social-psychological problems in the broad field of physical and mental rehabilitation. Both individualized services and programmatic implications are given consideration. Open to M.S.W. students and students from related professional departments, with consent of instructor.

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 system 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 intervention means are explored. Prerequisite: Consent of instructor.

567 Institutional Correctional Social Work 3 hrs.
Social work treatment within a variety of institutional correctional settings. Prerequisite: Consent of instructor.

568 Social Work in Non-institutional Correctional Settings 3 hrs.
Social work treatment with probationers, parolees, and other non-institutional services. Prerequisite: Consent of instructor.

569 Juvenile Justice 3 hrs.
The course deals with the processing of offenders through the juvenile justice system with concentration on the philosophy and functioning of juvenile courts. Personal and organizational factors that are associated with or that determine offenders' passage through the juvenile court are examined. Prerequisite: Consent of instructor.

636 Theory and Practice of Group Treatment 3 hrs.
Focus of the seminar is on the theory and practice of group work in social treatment settings. Consideration is given to such issues as group dynamics, leadership, composition, direct and indirect intervention and the use of group activities under various conditions. Prerequisite: Consent of instructor.

661 Introduction to Social Work Practice 3 hrs.
Unique features of the profession of social work are introduced in this beginning practice course. A problem-solving framework is provided as the basis of identifying and analyzing various individual and social problems, developing plans for problem alleviation, carrying out and monitoring of the plan and evaluation of effectiveness. In addition, selected theoretical orientations which offer practice alternatives to the problem-solving approach are examined for the purpose of helping each student conceptualize and develop an approach to practice which is theoretically and professionally sound. The focus throughout the course is on the role and responsibilities of the practitioner. Prerequisite: Concurrent enrollment in SWRK 671 or consent of instructor.

663 Seminar in Substance Abuse I 3 hrs.
An interdisciplinary seminar designed to reflect broadly conceived intervention strategies ranging from primary prevention to rehabilitation of the addict. The basic training in the principles of intervention and clinical practice will continue to be taught within the student's basic professional discipline. In part, the seminar will be used to elaborate upon the application of these principles to the problems of substance
664 Social Work Practice in Special Areas 3 hrs.
The 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.

665 Seminar in Substance Abuse II 3 hrs.
Continuation of SWRK 664. This course is cross-listed with Biology, Counselor Education and Counseling Psychology, and Sociology. Graded on a Credit/No Credit basis.

666 Seminar in Individual Treatment 3 hrs.
This course will introduce the student to social work practice with individuals. Social, psychological, economic, and biological stressors are considered as the 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.

667 Seminar in Social Policy, Planning, and Administration 3 hrs.
First part of a two-semester seminar that focuses on the study of social welfare planning, such as models, strategies, problems of planning, needs assessment and program analysis, program design, grant and proposal writing. Emphasis is placed on planning to improve social welfare conditions through program changes and alterations in institutional arrangements. Prerequisite: Concurrent enrollment in SWRK 677 or consent of instructor.

668 Social Treatment with Families 3 hrs.
Introduces students to family therapy emphasizing structural and communications approaches, although other perspectives may also be used by the instructor. Also considered is the impact on family life of developmental and situational variables, including those of race, gender, sexual orientation, and socioeconomic status. Prerequisite: SWRK 666 or consent of instructor.

669 Seminar II in Social Policy, Planning, and Administration 3 hrs.
This is the second part of a two-semester seminar that focuses on the study of financial management and leadership skill development in the management of social welfare agency resources. The seminar focuses on such topics as: social program budget preparation, the relationship between the budget, goals, planning and decision making, staff recruitment, selection, development and training; communication and coping with conflict and performance appraisal. Prerequisite: Concurrent enrollment in SWRK 679 or consent of instructor.

670 Seminar in Social Policy Practice 3 hrs.
This course in social welfare policy develops and integrates content from other courses in the social welfare policy, planning, and administration concentration which introduce 1) the use of specific tools in policy analysis, and 2) interventive skills in community and organizational policy change. Policy intervention skills are developed in such areas as the writing of policy and program evaluations, the giving of expert testimony before decision-making bodies, analyzing and summarizing legislative bills and/or judicial opinions, and the processes of such activities as forming and leading committees and task forces. Prerequisite: SWRK 667 or consent of instructor.

Field Education

Open to Graduate Students Only

671 Field Education in Social Welfare Problem Solving 3 hrs.
This is the beginning field practice course in the master's program, and it is taken concurrently with SWRK 661 in order to maximize the interchange between classroom and field. The field work is designed to provide an opportunity for effective social work social work practice.

The course consists of the units: 1) four weeks of communications lab as an introduction to the field experience; 2) sixteen hours per week in an agency for the remainder of the semester; and 3) seminars with the faculty liaison. The communications lab and seminars will be scheduled with regard to the needs of students. Students will be given some combination of the following responsibilities: work with individuals, families, groups, community problems, and/or policy planning and administrative assignments under the supervision of a field instructor. Graded on a Credit/No Credit basis. Prerequisite: Concurrent enrollment in SWRK 661.

672 Field Education in Social Work Intervention 3 hrs.
This is the second field practice course in the master's program and is a continuation of the field experience of SWRK 671. Continued opportunity to develop and refine skills necessary for effective social work practice is provided. The course consists of two units: 1) sixteen hours per week in an agency and 2) seminars with the faculty liaison. The seminars will be scheduled with regard to the needs of the students. Graded on a Credit/No Credit basis. Prerequisite: SWRK 671.

673 Field Education in Social Planning and Administration 3 hrs.
Placement will be in an agency unit offering direct service experiences with some combination of individuals, families, and groups and additional experiences consistent with the student's learning needs and agency service plans. Campus or field-based seminars may supplement the field experiences. Prerequisites: SWRK 672, SWRK 666, and concurrent enrollment in SWRK 638 and/or SWRK 668 or consent of the instructor. Graded on a Credit/No Credit basis.

674 Field Education in Social Planning and Administration 3 hrs.
Students are provided with direct experience in dealing with problems of community planning for human welfare, and in the administration of service delivery systems. Specialized field placement in social welfare organizations or programs is arranged in accordance with student interests and abilities. Graded on a Credit/No Credit basis. Prerequisite: SWRK 672 or consent of instructor, concurrent with SWRK 667.

675 Advanced Field Education in Social Policy 3 hrs.
Continuation of SWRK 675. 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 675 and concurrent enrollment in SWRK 676, 691, 692, 693, 694, or 695, or consent of the instructor. Graded on a Credit/No Credit basis.

676 Advanced Field Education in Social Policy, Planning, and Administration 3 hrs.
Continuation of Social Work 675. Further emphasis in professional role development for planning and administrative practice. Skill learning assignments will include supervised work in such areas as planning approaches, program development, budgeting, information systems, personnel, management and the organization of groups for involvement in problem-solving activities. Graded on a Credit/No Credit basis. Prerequisite: SWRK 676, concurrent with SWRK 676.

679 Advanced Social Treatment: At-Risk Individuals 3 hrs.
This course is designed to provide students in the Social Treatment concentration with an opportunity to deepen their knowledge of advanced clinical social work practice with an 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 669. Seminar in Individual Treatment; SWRK 668, Social Work Practice. It is designed to meet the requirements for the advanced practice course in Social Treatment. Prerequisites: SWRK 638, 666.

691 Advanced Social Treatment: At-Risk Individuals 3 hrs.
This course is designed to provide students in the Social Treatment concentration with an opportunity to deepen their knowledge of advanced clinical social work practice 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 SWRK 669. Seminar in Individual Treatment; SWRK 668, Social Work Practice. It is designed to meet the requirements for the advanced practice course in Social Treatment. Prerequisites: SWRK 638, 666, 669.

692 Advanced Social Treatment: At-Risk Individuals 3 hrs.
This course is designed to provide students in the Social Treatment concentration with an opportunity to deepen their knowledge of advanced clinical social work practice 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 SWRK 669. Seminar in Individual Treatment; SWRK 668, Social Work Practice. It is designed to meet the requirements for the advanced practice course in Social Treatment. Prerequisites: SWRK 638, 666, 669.

693 Advanced Social Treatment: Groups 3 hrs.
This is an advanced course for Social Work Practice students that prepares them for therapeutic intervention in group treatment. The course will examine interpersonal relations, transference, counter-transference, communication, group processes, problem-solving, and ethical issues in group work and group practice. Prerequisites: SWRK 638, 666, 669.
degree students will complete the project during a Spring Session. Part-time degree students complete the project over a combination of two sessions or semesters. Projects are frequently aimed at performing a community service and vary in focus on professional concerns and issues of local, regional, national, or international importance. These projects are designed to integrate learning which has taken place during the students' work in core courses, provide students with diverse cultural and educational experiences, and further develop of research and practice competence. Graded on a Credit/No Credit basis. Prerequisite: SWRK 640, 672.

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

710 Independent Research 2-6 hrs.

Speech Pathology and Audiology (SPPA)

Erckson, Chairperson; Professors Bate, Lohr; Associate Professors Clark, Hanley, Lawson, Nelson, Oas, Seelig, Sparks, Assistant Professor Boersma.

Open to Upperclass and Graduate Students


Research in normal and disordered communication is studied with reference to the scientific method, principles of measurement, instrumentation, and experimental techniques. The course requires that either a laboratory or a clinical research proposal be formulated by each student.

550 Advanced Speech and Hearing Science 2 hrs.

Theories of speech production, reception, and perception are considered in this course from the point of view of experimental phonetics and experimental audiology. Prerequisites: SPPA 204, 205, 206.

551 Neuropathologies of Speech 2 hrs.

This course is concerned with selected communication disorders associated with neuropathologies. Prerequisites: SPPA 200, 203, 205.

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.

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.

555 Hearing Measurement 2 hrs.

This course acquaints the student with principles, theories, and methods of hearing measurement which provide the basis for clinical audiometric procedures.

556 Rehabilitative Audiology 3 hrs.

Orientation to the clinical management of communication problems associated with auditory impairment.

557 Educational Audiology 3 hrs.

This course deals with the educational, psychological, and vocational needs of the hearing impaired child and the parameters of educational programming.

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.

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.

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

610 Diagnostic Audiology 4 hrs.

An advanced course dealing with batteries of audiological techniques used for assessing rehabilitative needs and for otologic diagnosis.

611 Hearing Aids 3 hrs.

Components, characteristics, evaluation, selection, use, and maintenance of hearing aids are studied in detail.

612 Pediatric Audiology 3 hrs.

This course deals with the identification, measurement, and management of hearing impairment in infants and young children.

613 Industrial and Public Health Audiology 2 hrs.

A study of hearing conservation programs in industry, including noise measurement, damage-risk criteria, hearing measurement, and medico-legal problems; noise in communities; noise as a public health hazard, and hearing screening and deafness prevention programs.

650 Seminar in Speech Pathology 1-4 hrs.

Selected topics in speech pathology are systematically explored through critical analyses of literature and through individual study projects. 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.
651 Seminar in Speech and Hearing Science 2-4 hrs.
Selected topics in speech and hearing science are systematically explored through critical analyses of literature and through individual study projects. Instrumentation, procedures, and techniques employed in perceptual, physical and physiological analyses of normal speech and hearing are among the areas considered. Topics vary from semester to semester and are announced in advance. May be repeated.

652 Seminar in Audiology 2-4 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.

653 Diagnosis and Appraisal I: Principles 3 hrs.
This course provides theoretical bases for the evaluation of speech, hearing, and language disorders.

654 Diagnosis and Appraisal II: Procedures 2 hrs.
In this course the student gains experience with instruments, procedures, and techniques designed for the appraisal and diagnosis of communication disorders. One hour per week of participation in out-patient diagnostic examinations is required.

655 Diagnosis and Appraisal III: Practicum 2 hrs.
In this registration students receive extensive experience in diagnostic examinations.

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.

658 Theoretical Bases for Therapy 3 hrs.
In this course disorders of communication are examined in terms of servosystem, learning theory, and personality theory.

659 Principles of Professional Practice 2 hrs.
Current professional and philosophical questions are studied with reference to the history of the development of the profession of speech pathology and audiology.

660 Voice Disorders 3 hrs.
Organic and functional disorders of laryngeal and resonator origin are studied in depth.

662 Stuttering 3 hrs.
Theories and therapies applicable to the understanding and clinical management of stuttering are studied in depth.

663 Aphasia in Adults 3 hrs.
This course deals comprehensively with the identification and treatment of communication problems in the adult aphasic individual.

670 Clinical Practicum 1-4 hrs.
Supervised clinical experience in the evaluation and/or management of speech, language and/or hearing disorders.

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

700 Master's Thesis 6 hrs.

710 Independent Research 2-6 hrs.

712 Professional Field Experience 2-12 hrs.
Graduate Studies (GRAD)

Open to Graduate Students Only

A graduate student should register for 700-level courses in his or her instructor's department. If the appropriate 700-level course is not offered by that department, the student should seek permission to register for it as a Graduate College (GRAD) course. All 700-level courses are graded on a Credit/No Credit basis.

PLEASE NOTE: Students conducting research (in any 700-level course) that involves human or animal subjects must have prior approval of the research proposal by the appropriate University board, thus assuring compliance with the regulations for the protection of such subjects. For more information, call Research and Sponsored Programs, 387-3670.

700 Master's Thesis
6 hrs.
Candidates for the master's degree may elect to write a thesis in their field of specialization under the supervision of a thesis committee. A student may elect this course in units of from two to six hours; however, the election must be made in no more than two units and within a calendar year. An application form (available in all departments) must be submitted to Registration at enrollment time. Prior to enrollment this form must be signed by: 1) the thesis adviser; 2) the department chairperson; 3) the Dissertation Assistant in The Graduate College. Graded on a Credit/No Credit basis.

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. An application form, signed by the student's graduate adviser and the faculty supervisor, must be submitted to Registration at the time of enrollment. Graded on a Credit/No Credit basis.

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. An application form, signed by the student's graduate adviser and the faculty supervisor, must be submitted to Registration at the time of enrollment. Graded on a Credit/No Credit basis.

720 Specialist Project
6 hrs.
The Specialist Project is designed for the units offering the specialist degree. A student may elect this course in units of from two to six hours; however, the election must be made in no more than two units and within a calendar year. An application form (available in all departments) must be submitted to Registration at enrollment time. Prior to enrollment this form must be signed by: 1) the project adviser; 2) the department chairperson; 3) the Dissertation Assistant in The Graduate College. Graded on a Credit/No Credit basis.

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.

730 Doctoral Dissertation
15 hrs.
The doctoral dissertation is required in all doctoral programs and must reflect an appropriate creative effort on the part of the student. An application form (available in all departments) must be submitted to Registration at enrollment time. Prior to enrollment, this form must be signed by: 1) the committee chairperson; 2) the department chairperson; 3) the Dissertation Assistant in The Graduate College. Registration for 730 will be in increments of 3 hours. Graded on a Credit/No Credit basis.

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. An application form, signed by the student's program adviser and the faculty supervisor, must be submitted to Registration at the time of enrollment. Graded on a Credit/No Credit basis.

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.
Members
Abramson, Jerry, 1965, Assistant Professor of Art
B.A., California (Santa Barbara); M.A., Ph.D., New York
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