

OAKLAND UNIVERSITY

2003-2005
GRADUATE CATALOG



September 2003

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All data in this catalog reflect information as it was available at the publication date. Oakland University reserves the right to revise all announcements contained in this publication at its discretion and to make reasonable changes in requirements to improve or upgrade academic and non-academic programs.

Available at the University Book Center

Oakland University is a legally autonomous state institution of higher learning. Legislation creating Oakland University as an independent institution, separate from Michigan State University, was established under Act No. 35, Public Acts of 1970. The university is governed by an eight-member board of trustees appointed by the governor with the advice and consent of the Michigan Senate.

As an equal opportunity and affirmative action institution, Oakland University is committed to compliance with federal and state laws prohibiting discrimination, including Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. It is the policy of Oakland University that there shall be no unlawful discrimination against any person on the basis of race, sex, sexual orientation, color, religion, creed, national origin or ancestry, age, height, weight, marital status, handicap, familial status, veteran status or other prohibited factors in employment, admissions, educational programs or activities. Inquiries or complaints should be addressed to: Director, Office of University Diversity and Compliance, 203 Wilson Hall, Oakland University, Rochester, Michigan 48309-4401.

Oakland University is accredited by the North Central Association of Colleges and Schools Commission on Institutions of Higher Education (30 N. LaSalle St., Suite 2400, Chicago, Illinois 60602-2504, 800-621-7440).

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- * *ex officio*

Service Offices

Oakland University
Rochester, MI 48309-4401
(248) 370-2100
<http://www.oakland.edu>

Academic units

Dean of the College of Arts and Sciences, 370-2140
Dean of the School of Business Administration, 370-3286
Dean of the School of Engineering and Computer Science, 370-2217
Dean of the School of Education and Human Services, 370-3050
Dean of the School of Health Sciences, 370-3562
Dean of the School of Nursing, 370-4081
Academic Skills Center: 370-4215

Admissions information

Graduate Admissions, 370-3167
Undergraduate Admissions, 370-3360
Alumni Relations: 370-3700
Athletics: 370-3190
Book Center: 370-2404
Campus Recreation: 370-4732
Career services and graduate placement: 370-3250
Cashier's Office: 370-4396
Catalogs (Graduate): 370-3167
(Undergraduate): 370-3360
Cooley Law School: 370-3148
Copy Stop: 370-2851
Counseling (Psychological): 370-3465
Credit Union: 370-3545
Dean of Students: 370-3352
Disability Support Services: 370-3266 (voice) or 370-3268 (TDD)
Golf Course: 370-4150
Grants, Contracts and Sponsored Research: 370-3222
Health Center: 370-2341
ID Card Office: 370-2291
International Students: 370-3358
Library: 370-2471
Loans and on-campus employment: 370-2550
Lowry Early Childhood Center: 370-4100
Meadow Brook Hall: 370-3140
Meadow Brook Theatre: 370-3300
Office of Equity: 370-4404
Public Safety and Police: 370-3331
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SEHS Educational Resource Lab: 370-4230
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Transcripts and academic reports: 370-3452
University Diversity and Compliance: 370-3496

Academic Calendar**2003-2004****Fall 2003**

Registration	Wednesday, Thursday	August 27, 28
Labor Day holiday	Monday	September 1
New Student Convocation	Tuesday	September 2
Classes begin	5:00 p.m., Tuesday	September 2
Thanksgiving recess begins	10:00 p.m., Wednesday	November 26
Classes resume	7:30 a.m., Monday	December 1
Classes end	5:00 p.m., Tuesday	December 9
Study period	5:00 p.m.-10:00 p.m., Tuesday	December 9
Exams begin	7:30 a.m., Wednesday	December 10
Exams end	5:00 p.m., Tuesday	December 16
Fall Commencement	Saturday	December 20

Winter 2004

Registration	Monday	January 5
Classes begin	7:30 a.m., Tuesday	January 6
Martin Luther King, Jr. Day	Monday (Classes suspended)	January 19
Winter recess begins	10:00 p.m., Saturday	February 21
Classes resume	7:30 a.m., Monday	March 1
Classes end	10:00 p.m., Monday	April 19
Study period	Tuesday	April 20
Exams begin	7:30 a.m., Wednesday	April 21
Exams end	10:00 p.m., Tuesday	April 27

Spring 2004

Registration	Thursday	April 29
Spring Commencement	Saturday	May 1
Classes begin	7:30 a.m., Monday	May 3
Memorial Day holiday	Monday	May 31
Classes end	10:00 p.m., Saturday	June 19
Final exams	Monday-Wednesday	June 21-23

Summer 2004

Registration	Thursday	June 24
Classes begin	7:30 a.m., Monday	June 28
Independence Day holiday	Monday	July 5
Classes resume	7:30 a.m., Tuesday	July 6
Classes end	10:00 p.m., Saturday	August 14
Final exams	Monday-Wednesday	August 16-18

Academic Calendar

2004-2005

Fall 2004

Registration	Wednesday, Thursday	August 25, 26
New Student Convocation	Monday	August 30
Classes begin	5:00 p.m., Monday	August 30
Labor Day holiday	Monday	September 6
Thanksgiving Recess begins	10:00 p.m., Wednesday	November 24
Classes resume	7:30 a.m., Monday	November 29
Classes end	10:00 p.m., Monday	December 6
Study period	Tuesday	December 7
Exams begin	7:30 a.m., Wednesday	December 8
Exams end	3:00 p.m., Tuesday	December 14
Fall Commencement	Saturday	December 18

Winter 2005

Registration	Wednesday, Thursday	January 5, 6
Classes begin	7:30 a.m., Monday	January 10
Martin Luther King, Jr. Day	Monday (Classes suspended)	January 17
Winter Recess begins	10:00 p.m., Saturday	March 5
Classes resume	7:30 a.m., Monday	March 14
Classes end	10:00 p.m., Saturday	April 23
Study period	Sunday	April 24
Exams begin	7:30 a.m., Monday	April 25
Exams end	10:00 p.m., Saturday	April 30

Spring 2005

Registration	Thursday	April 28
Classes begin	7:30 a.m., Monday	May 2
Spring Commencement	Saturday	May 7
Memorial Day holiday	Monday	May 30
Classes end	10:00 p.m., Saturday	June 18
Final exams	Monday, Tuesday, Wednesday	June 20, 21, 22

Summer 2005

Registration	Thursday	June 23
Classes begin	7:30 a.m., Monday	June 27
Independence Day holiday	Monday	July 4
Classes resume	7:30 a.m., Tuesday	July 5
Classes end	10:00 p.m., Saturday	August 13
Final exams	Monday, Tuesday, Wednesday	August 15, 16, 17

Admission Schedule

This is a general guide for submission of application material. Some programs have earlier closing dates for admission. Applicants should check the specific admission requirements for the program they wish to enter. If no dates are given, the following schedule will apply.

Term for which admission is requested:

	Regular Applicants	Special Graduate Applicants	International Applicants
Fall 2003	August 1, 2003	August 15, 2003	May 1
Winter 2004	December 1, 2003	December 10, 2003	September 1
Spring 2004	April 1, 2004	April 10, 2004	
Summer 2004	June 1, 2004	June 10, 2004	
Fall 2004	August 1, 2004	August 10, 2004	
Winter 2005	December 1, 2004	December 10, 2004	
Spring 2005	April 1, 2005	April 10, 2005	
Summer 2005	June 1, 2005	June 10, 2005	

Prospective students whose applications for program admission are incomplete on the designated date may be considered for special graduate admission if the program area permits admission in such status. Applications postmarked after the date designated for receipt of special graduate admission requests may be processed in time for late registration if the applicants so desire. However, they should be aware that a \$35 late registration fee will be assessed.

Applicants for special graduate status must submit an application for admission, application fee and transcript that posts evidence of a bachelor's/master's degree.

Admitted applicants to graduate programs who do not enroll for the term in which they were admitted must contact the Graduate Admissions, 160 North Foundation Hall. If done within five terms of the date of original admission term, no readmission fee is charged; thereafter, a new application, documentation and application fee are required. Inactive application files are destroyed after five terms.

■ INTRODUCTION

Oakland University is a comprehensive, state-assisted institution of more than 16,000 students that offers a diverse set of academic programs, from baccalaureate to doctoral levels. In all its activities, Oakland University strives to exemplify educational leadership. Anchored by a strong liberal arts program, the university is organized into the College of Arts and Sciences, schools of Business Administration, Education and Human Services, Engineering and Computer Science, Health Sciences and Nursing, and the Office of Graduate Study. All academic programs of the university are accredited by the North Central Association of Colleges and Schools.

The university's full-time faculty, which now numbers more than 400, has a distinguished record of research and scholarship. Faculty members have won some of the most prestigious awards made by government agencies and private foundations. External funding support for academic, student, and university projects now totals more than \$9 million. Studies in biological and physical sciences and nondestructive testing attract national and international attention to Oakland University, and its highly recognized Eye Research Institute is the only major eye research center in the United States not associated with a medical school. The Institute for Biochemistry and Biotechnology of the College of Arts and Sciences is gaining a national reputation in diverse fields within biomedical sciences. The university takes pride in the many scholarly books and articles written by its faculty and in their contributions to pedagogy and the creative arts. Wherever possible, students are involved in research projects; the results of research and scholarship are integrated into related courses of instruction.

Resources available to support scholarly activities of students and faculty include both library and computing facilities. The central university library is the Kresge Library which has additional specialized collections and services in performing arts and education. Computing resources include a distributed environment on a variety of operating system platforms, connected across campus by a high-speed fiber optic network.

Complementing its academic programs, Oakland University collaborates actively with business and industry to foster economic development in southeastern Michigan and provides major public service offerings with emphasis on the professional performing arts. Meadow Brook Theatre, a professional theatre, is located in Wilson Hall. Meadow Brook Music Festival brings a summer program of world-class entertainment to campus. Meadow Brook Hall, former home of the university's benefactors, now serves as a conference and cultural center; Meadow Brook Art Gallery houses the university's permanent collection of African art and presents a variety of special exhibits annually.

Oakland University was created in 1957 when the late Alfred G. and Matilda R. Wilson donated their 1,500-acre estate and \$2 million to Michigan State University to begin a new college in Oakland County. Named Michigan State University - Oakland, the new campus enrolled its first students in 1959. In 1963, its name was changed to Oakland University and in 1970 the Michigan Legislature recognized the maturity and stature of

the university by granting it autonomy. The governor appointed Oakland University's first board of trustees in 1970.

From its beginning, the university has emphasized academic quality, concentrating on providing a dynamic, student-focused learning environment with integration of liberal and professional studies by a faculty of dedicated scholar-teachers. Located in suburban Oakland County, Michigan, Oakland University is easily accessible to millions of Detroit metropolitan area residents. The natural beauty of the campus, much of it still wooded and undeveloped, is enhanced by comprehensive recreational facilities and modern buildings that house the university's many academic and public service programs as well as some 1,300 residential students. Adjacent to the campus is the Oakland Technology Park, a research park where private-sector companies work hand-in-hand with higher education. Student research and internship opportunities are also enhanced by the proximity of many Fortune 500 companies.

Role and Mission

The following role and mission statement for the university was adopted by the Oakland University Board of Trustees on July 21, 1982. It emphasizes four essential ingredients for the direction of the university: excellent and relevant instruction; high quality basic and applied research and scholarship; responsive and effective public and community service; and a comprehensive schedule of student development activities.

As a state-supported institution of higher education, Oakland University has a three-fold mission. It offers instructional programs of high quality that lead to degrees at the baccalaureate, master's and doctoral levels, as well as programs in continuing education; it advances knowledge and promotes the arts through research, scholarship, and creative activity; and it renders significant public service. In all its activities, the university strives to exemplify educational leadership.

Instruction

Oakland University provides rigorous educational programs. A strong core of liberal arts is the basis on which undergraduates develop the skills, knowledge and attitudes essential for successful living and active, concerned citizenship. A variety of majors and specialized curricula prepare students for post-baccalaureate education, professional schools, or careers directly after graduation. Each program provides a variety of courses and curricular experiences to ensure an enriched life along with superior career preparation or enhancement.

The university offers master's programs that meet demonstrable needs of Michigan residents and that maintain excellence. Doctoral programs are offered which are innovative and serve needs that are not adequately met elsewhere in the state.

Offerings in continuing education provide Michigan residents with high quality course work for professional development and personal enrichment.

Oakland University is selective in its admission standards and seeks both traditional and nontraditional students, ensuring equal opportunity to all who can profit from its offerings. While serving principally Michigan residents, it welcomes qualified applicants from other states and countries. A special effort is made to locate and admit disadvantaged students with strong potential for academic success and to provide the support conducive to the realization of that potential. The faculty and staff cooperate with nearby community colleges to ensure that their students who seek to transfer to Oakland University are well prepared for work at a senior college. In recruiting and admitting students, enrollments are not permitted to exceed numbers consistent with preserving the high quality of instruction.

The university strives to remain current and relevant through an adequate program of continuing faculty development and the exploration of innovative schedules, methods, and curricular design in keeping with the various needs of its diverse students, many of whom commute, work or are older than the traditional college-age student.

Oakland University offers, and will continue to offer, only those programs for which adequate resources and well-prepared faculty are available and for which a demonstrable need is expressed through the attraction of qualified students.

Research and scholarship

Oakland University assumes an obligation to advance knowledge through the research and scholarship of its faculty and students. The university's research and scholarship mission takes expression in a variety of forms ranging from basic studies on the nature of things to applied research directed at particular problems to contributions to literature and the arts. Within its means, the university provides internal financial support for research and scholarship. Simultaneously, it pursues with vigor external sources of support. Research institutes, financed primarily by outside grants, make an important contribution to this mission.

In addition to their intrinsic value, research and scholarship reinforce the instructional mission of the university. Wherever possible, students are involved in research projects, and the results of research and scholarship are integrated into related courses of instruction.

In carrying out its research and scholarship mission the university seeks especially to be responsive to the needs of Michigan, particularly of the populous southeastern sector. Application of research and scholarship to problems and concerns of the state's business and industry and to its scientific, educational, governmental and health and human-service agencies serves also to reinforce the public service role of the university.

Public service

Oakland University serves its constituents through a philosophy and program of public service that are consistent with its instructional and research missions. It cooperates with businesses, governmental units, community groups, and other organizations on research, technical development and problem-solving enterprises in an attempt to apply the expertise of the university to the issues of society in general or the region in particular so as to further enhance the quality of life in the service areas of the university. It attempts to maintain the degree of flexibility necessary to respond with innovative instruction, research and other service to rapidly changing needs. It makes its facilities available for a multitude of activities of agencies and community groups whose purposes are compatible with the mission of the university. It provides access to its programs and campus, insofar as is consistent with the role and scope of the institution, for the recreational and physical enrichment of area citizens. Cultural enrichment is provided for the community through the Meadow Brook enterprises, on- and off-campus presentations by faculty and students, and other campus events. The university aims to provide a model of socially responsible decision-making and ethical institutional behavior, recognizing that institutional strength derives from an effective interaction with the institution's diverse external environs.

Student development

In direct support of its academic mission, Oakland University provides basic services and experiences which integrate cognitive learning with the personal growth of the individual student in the emotional, social, physical, cultural, ethical and interpersonal domains. In so doing, the university seeks to facilitate the development of those personal skills which will contribute to informed decision making and productive citizenship. This objective is accomplished through a variety of student enterprises, including campus organizations, athletics and other sponsored activities and events.

Key to its achievement is the provision of a governance system in which students play a meaningful role in the institutional decision-making processes.

The university takes particular cognizance of its considerable enrollment of older and nontraditional students and provides advising, counseling and other services of special value to such students in effecting career changes and developing additional personal competencies. Through the maintenance of complementary academic and extracurricular environments, Oakland University assists students in the realization that life is a continuum of growth, change and adaptation and provides them with the skills essential to the achievement of their fullest potential.

■ GENERAL INFORMATION

Graduate Programs

Graduate programs, with philosophical foundations in the university's role and mission, are directly linked to the research, scholarship and public service activities of the university. New knowledge is produced, and directed toward the solution of technological, social, economic and political problems and issues. Students, educated in intellectual inquiry and critical analysis, are full partners in graduate programs structured to maximize personal growth and achievement as specific career-related goals are obtained. Dynamic relationships with regional companies provide real advantages in pursuing career options through work-study, internships, project involvement and community action.

Graduate Degree Programs

Doctor of Philosophy:

applied mathematical sciences
biomedical sciences (health and environmental chemistry, medical physics)
education (counseling, early childhood education, educational leadership)
mechanical engineering
reading education
systems engineering

Doctor of Physical Therapy

Doctor of Science in Physical Therapy

Education Specialist: school administration

Master of Accounting

Master of Arts:

biology, counseling, English, history, linguistics, mathematics

Master of Arts in Liberal Studies

Master of Arts in Teaching:

reading and language arts, secondary education

Master of Business Administration

Master of Education:

early childhood education, educational leadership, educational studies, special education

Master of Music

Master of Public Administration

Master of Science:

applied statistics, biology, chemistry, computer science and engineering, electrical and computer engineering, embedded systems, engineering management, exercise science, industrial applied mathematics, information systems engineering, information technology management, mechanical engineering, physical therapy, physics, software engineering, systems engineering

Master of Science in Nursing:

adult gerontological nurse practitioner, family nurse practitioner, nurse anesthesia, nursing education

Master of Training and Development

Graduate Certificate Programs

Advanced Microcomputer Applications
Clinical Exercise Science
Complementary Medicine and Wellness
Corporate and Worksite Wellness
Early Mathematics Education
Exercise Science
Microcomputer Applications
Neurological Rehabilitation
Orthopedic Manual Physical Therapy
Orthopedics
Pediatric Rehabilitation
Statistical Methods
Teaching and Learning for Rehabilitation Professionals
Teaching English as Second Language

Post-Master's Graduate Certificate Programs

Accounting
Advanced Reading, Language Arts and Literature
Business Economics
Educational Administration
Entrepreneurship
Family Nurse Practitioner
Finance
General Management
Human Resources Management
International Business
Management Information Systems
Marketing
Nurse Anesthesia
Nursing Education
Production/Operations Management
Reading, Language Arts and Literature

Development and Review of Graduate Programs

New programs are developed along established guidelines and within the framework of the university's role and mission statement. The approval process is monitored by the Office of Graduate Study. It includes evaluation by and endorsement from several designated internal and external bodies. Once in place, graduate programs are reviewed on a regularly scheduled basis by faculty program review committees and the Office of Graduate Study. At the time of publication of this catalog, several programs are in various stages of review. Program or course changes resulting from these reviews will be announced. Students should maintain contact with their advisers and the Office of Graduate Study to be fully aware of the current status of programs to which they have been admitted.

Accreditation

Oakland University is accredited as a doctoral degree-granting institution by the regional accrediting agency, The North Central Association of Colleges and Schools, 30 N. LaSalle St., Suite 2400, Chicago, Illinois 60602-2504. In addition, specific programs and curricula are accredited individually by specialized or professional accrediting agencies. The principal accreditation agencies are as follows:

Business Administration:

Accreditation Council of the American Assembly of Collegiate Schools of Business

Education

Teacher Education Programs: National Council for Accreditation of Teacher Education
Graduate Counseling: Council for Accreditation of Counseling and Related Educational Programs

Engineering*

Division of Engineering (undergraduate): Accreditation Board for Engineering and Technology – Engineering

Arts and Sciences

Chemistry: American Chemical Society*
Music: National Association of Schools of Music
Political Science (Master of Public Administration): National Association of Schools of Public Affairs and Administration

Nursing

National League for Nursing and Commission on Collegiate Nursing Education
Nurse Anesthesia: American Association of Nurse Anesthetists (Council on Accreditation of Nurse Anesthesia Educational Programs)

Health Sciences

Physical Therapy: American Physical Therapy Association

*Accreditation limited to only one degree per level per institution

■ Student Affairs and Services

The Division of Student Affairs provides an array of out-of-class support services, leisure activities and educational programs that complement and enhance students' educational experiences. The Office of the Vice President for Student Affairs is located in 144 Oakland Center (248-370-4200). Brief descriptions of services for students follow.

Academic Skills Center

The Academic Skills Center, 103 North Foundation Hall, (248) 370-4215, offers free peer tutoring. Tutoring is available by appointment, and walk-in tutoring is available for some mathematics and science courses. In both cases, the sessions may be group sessions.

Campus Recreation

The Department of Campus Recreation provides facilities, programs and services to meet the recreational, fitness, wellness and personal development needs of the Oakland University community. The goal of campus recreation programs is to enhance the quality of student and campus life through knowledge, opportunities, interests and behaviors that promote healthy lifestyles and to encourage making a regular recreational activity an element of daily life.

Campus Recreation programs include intramural sports, club sports, fitness assessment and programs in group fitness sessions and clinics, wellness programs, aquatic and learn-to-swim programs, and informal sports that are self-directed and self-paced. Recreation Center facilities include the recreation gym with three basketball/volleyball courts, a one-tenth mile four-lane running track, three racquetball/walleyball courts, four multi-purpose rooms, a 7,500 square foot fitness center with over 70 pieces of cardio-vascular and strength equipment, wellness center, 50 meter pool, spa and bubble pool in the aquatic center, two class/meeting rooms, locker rooms and snack bar. Campus Recreation also oversees the Upper Pioneer Fields.

Students enrolled in classes that meet on the main campus are assessed an activity fee that permits entry to the center. Further information about eligibility for family members, facility hours or program offerings may be obtained at the facility's Welcome Center or by telephone (248-370-4732).

Career Services

The Career Services Department (275 West Vandenberg Hall, 248-370-3250) assists in identifying professional-level career-related full-time, part-time and seasonal employment opportunities for both students and alumni. Its Professional Employment unit provides assistance to graduating students and alumni in locating career positions. Its Career Experience unit helps students in arranging internships, cooperative education work experiences and part-time or full-time seasonal employment in positions that complement their classroom work. AmeriCorps, a federally funded program, utilizes 40 Oakland University students to meet the educational and human services needs of youths in the Pontiac community. All students are encouraged to explore these programs.

Career Services provides direct access to job opportunities through on-campus interviews, job referral activities and job vacancy postings daily on the Internet. A computerized system, eRecruiting@OU, is used to register students and alumni for referral and on-campus recruiting and to produce a professional-looking resume. Individual placement advising and career information are available to both students and alumni, including open advising during designated hours.

The department offers a variety of job fairs and career information/networking programs throughout the year. Special seminars assist students in developing job search skills. In addition, information is publicized about internship/fellowship opportunities generated outside the university. The department also maintains a home page on the Internet that contains career resources and links to other job/career information. The Web address for Career Services is <http://www.oakland.edu/careerservices>.

The department library contains both printed and videotaped employer information, plus job search information and career publications and periodicals. It also includes the application materials for Graduate Record Examinations (GRE), Law School Admission Test (LSAT), Medical College Admission Test (MCAT), and Graduate Management Admission Test (GMAT), among others.

Counseling Center

The Counseling Center located in the Graham Health Center provides counseling, testing and consultations to university students.

The personal counseling services provide treatment for relationship difficulties, depression and anxiety, stress disorders, underachievement and child, family or marital problems. Evaluations regarding learning problems or disabilities are available through the psychological testing services. For students experiencing drug or alcohol problems, counseling, assessment and referral services are available. Specialized counseling is also available for family members of substance abusers. Career testing and counseling help students to identify potential career majors or educational directions through the clarification of their abilities, interests and personal needs.

Strict rules of confidentiality are observed. No notation is

made in any university record regarding a student's voluntary use of clinic services. The first six counseling sessions for students are free. After that, services are available at a nominal cost. Students may contact the center directly at 248-370-3465.

Dean of Students

The dean of students serves as an advocate for the development of programs and services to meet the developmental needs of students. As such, the dean of students monitors the university environment, assists with student life policy development and serves as an advocate for students facing academic, financial and personal problems while enrolled at Oakland University. The Dean of Students office is located in the Student Affairs Office at 144 Oakland Center (248-370-3352).

Disability Support Services

Advocacy and support services are provided through the Office of Disability Support Services located in 106 North Foundation Hall. Services include, but are not limited to, priority registration, alternative testing arrangements, assistive technology, alternative media formats, assistance in identifying volunteer note-takers and readers, electronic door-openers and sign-language interpreting services. Students are encouraged to schedule an appointment 6 weeks prior to the semester and bring documentation of their disability. To register or for information, contact the DSS Office at 248-370-3266 (voice) or 248-370-3268 (TDD). In cases involving alleged illegal discrimination or harassment, the student should contact the Office of University Diversity and Compliance, 203 Wilson Hall, 248-370-3496.

Health Services

Oakland University students, faculty and staff may receive nurse practitioner medical services at the Graham Health Center (248-370-2341). Services include management of most acute and chronic medical problems, laboratory and pharmaceutical services, and ability to handle minor trauma and to give initial treatment to more serious emergencies. Allergy injections are given while a nurse practitioner is on the premises (the patient must have a doctor's written instructions and vaccine that may be stored at the health center). Information is available on weight control, nutrition, smoking cessation, exercise and many other topics. The center will bill many insurance companies except HMO plans. Student health insurance is available at reasonable rates. For additional information, please visit our website at www2.oakland.edu/ghc.

ID Card Office

The SpiritCard, Oakland's official university identification card, is available to all students. ID cards are required to access residence hall meal plans, the Recreation Center and to check out library materials. There is no charge for the first card, but

replacement cards are \$10. ID cards may be obtained at the ID Card Office, 112 Oakland Center (248-370-2291), during regular business hours. The office is open Monday through Friday 8 a.m. to 5 p.m. and Wednesday evening until 7 p.m. Students must have a valid photo ID (driver's license or passport) and be registered to obtain an OU ID.

International Students and Scholars

Services are provided by the Office of International Students and Scholars located in 157 North Foundation Hall. Orientation, advising, assistance with preparing documents for the U.S. Immigration and Naturalization Service, sponsoring agencies and home country governments are among the available services. International students are required to meet with a staff member prior to registration. Any international student or exchange visitor requiring assistance may contact the office at 248-370-3358.

Lowry Center for Early Childhood Education

The School of Education and Human Services operates the Matthew Lowry Center for Early Childhood Education for young children of students, faculty, staff and the community. The center houses three programs (PreKindergarten, preschool and toddler) and is located in the new SEHS building on the first floor. All programs are accredited by the National Association for the Education of Young Children and are licensed by the Michigan Department of Social Services. The PreKindergarten program is an early childhood program that offers full (9-4) and half day (9-12 or 1-4) programs for children who are 4 years old by September 1 through 5 years.

The Preschool program is an early childhood program that offers full (9-4) and half day (9-12 or 1-4) programs for children who are 3 and 4 years old.

The toddler program is for children 18 months to 3 years old and offers full (9-4) and half day programs (9-12 or 1-4). The curriculum is designed to stimulate and support the developmental growth of young children.

Aside from regular program hours, extended hours are available from 7:30-9 and 4 -5:30 at an additional cost.

The Center operates weekdays from 7:30 a.m. to 5:30 p.m. Space in all programs is limited. Parents are encouraged inquire about the waiting list if interested in registration. Lowry also offers ENVIRO-EXPLORERS, a summer day camp program for children 18 months to 6 years old, focusing on natural explorations of the indoor and outdoor environments. Please call the reception desk for more detailed information (248-370-4100).

Oakland Center

The Oakland Center serves students, faculty, staff, alumni and guests of Oakland University by offering a wide variety of social, recreational, cultural and entertainment programs. Open seven

days a week and located in the heart of the campus, the Oakland Center features a food court including brand name eating establishments, such as Chick-Fil-A and Subway. The University Bookstore is housed in the Oakland Center, as well as vending machines, a campus information center, a games room, Copy Stop Etc., public telephones, newspaper machines, computer labs, e-mail kiosks, a coffee shop, a TV lounge and meeting/multipurpose rooms. Also located in the Oakland Center are the offices of Student Activities and Leadership Development, Student Affairs, Dean of Students, Chartwell's food service, the ID Card Office, student organizations, University Congress, Student Program Board, The Oakland Post student newspaper and WXOU-FM, the student-operated radio station.

■ Oakland University E-Mail

Oakland provides each student with free e-mail service and an address. Instead of sending information through the U.S. Postal Service, Oakland University will e-mail information and direct links to secured Web sites to students via their official OU email address, including grades availability, tuition and fees bills, financial aid, schedule of classes and graduation information.

This information is important to maintaining a student's relationship with the university. The university will hold students accountable for the information sent via e-mail. Therefore, students are encouraged to check their Oakland e-mail account regularly, at least twice each week.

Oakland's University Technology Services Web site offers tips and information about activating, accessing and forwarding OU e-mail at www.oakland.edu/uts/ or selecting the Info Tech button from OU's home page, then clicking E-mail Services.

Oakland University will not sell or give away student e-mail information and will not use e-mail to advertise for third parties.

■ Family Educational Rights and Privacy Act

The federal Family Educational Rights and Privacy Act of 1974 pertains to confidential student educational records. This legislation allows students the right to view upon request their own confidential educational records and defines the use of these records by others. The dean of students is the university compliance officer for the Family Educational Rights and Privacy Act. Students who do not want directory information to appear on the Oakland University web site can restrict release of such data by doing the following:

- Login to Sail
- Click on Login to Secure Area
- Complete the User Login
- Select Personal Information
- Select Directory Profile
- De-select the Display in Directory option for items you wish to not appear in the web directory.

Students who do not want directory information released in any other form must notify the Office of the Registrar in writing. Forms for this purpose are available in 101A O'Dowd Hall. Upon receipt of the completed form or a letter, directory information will be withheld until the student requests in writing that it be released. Requests for privacy may also be faxed to the Registrar at 248-370-3461.

The university considers student theses and dissertations to be public statements of research findings. Therefore, students who submit such work in fulfillment of degree requirements shall be deemed to have consented to disclosure of the work.

A full statement of students' rights is available in the Office of the Dean of Students (144 Oakland Center, 248-370-3352).

Any questions, grievances, complaints or other related problems may be addressed to the Dean of Students, 144 Oakland Center, Oakland University, Rochester, Michigan 48309-4401 (248-370-3352) and/or filed with the U.S. Department of Education.

■ Campus Sex Crimes Prevention Act

Oakland University shall comply with the applicable requirements of the new "Campus Sex Crimes Prevention Act," beginning in 2002, which states that every sex offender registers under "Megan's Law" provide information of his/her enrollment or employment by a college or university. Names of registered sex offenders enrolled or working at Oakland University is provided by the Oakland University Police Department (OUPD) with campus jurisdiction from the State government. To obtain this information, please contact the OUPD, 3 Police & Support Services Building, 248-370-3331 or the police website: <http://mirage.otus.oakland.edu/oupd/oupd.htm>.

Questions or further information regarding the Campus Sex Crimes Prevention Act may be obtained by contacting the Vice President for Student Affairs, 248-370-4200 or the Director of Police, 248-370-3000. In accordance of the "Family Educational Rights and Privacy Act," nothing may be construed to prohibit Oakland University from disclosing information provided to the university concerning registered sex offenders. Finally, it is required that the Secretary of Education take appropriate steps to notify Oakland University that disclosure of this information is permitted.

■ Centralized and Specialized Research Facilities

Office of Grants, Contracts and Sponsored Research

The Office of Grants, Contracts and Sponsored Research supports research and scholarship at Oakland University. In particular, the office acts as the coordinating office between Oakland University and the federal and state agencies, foundations and public and private corporations that provide funds for research, education, training and service programs. In addition to providing information and assistance on sponsored programs, the office is responsible for insuring that ethical and legal guidelines are adhered to in the completion of all research projects. Research involving human subjects must be reviewed and approved by the university's Institutional Review Board. The board insures that research protocols are designed to protect the rights of individuals who participate as subjects in research projects. The university is responsible for the humane care and use of laboratory animals in research and does so through the Institutional Animal Care and Use Committee. This committee monitors research projects involving laboratory animals to ensure that the provisions of all applicable laws and regulations are followed. A Biosafety Committee, which also operates out of the Office of Grants, Contracts and Sponsored Research, is responsible for evaluating all research and teaching that involves recombinant DNA molecules and infectious materials. The Radiation Safety Committee reviews, approves and monitors all use of radiation in research and teaching on the Oakland campus.

The Office of Grants, Contracts and Sponsored Research also oversees the internal awards of research funds to faculty and students. The Research Committee of the University Senate reviews research applications and recommends funding for individual faculty projects and research-related activities, and student research project support. Students and faculty may contact the Office of Grants, Contracts and Sponsored Research for guidelines and application cover sheets. This information is also available on the world wide web; follow the University Research Committee link from <http://www.oakland.edu/research>.

Eye Research Institute

The Eye Research Institute, with laboratories and offices on the third and fourth floors of Dodge Hall, conducts studies on the eye in health and disease. Faculty research is funded by the National Institutes of Health. The research involves a multi-disciplinary approach to the study of the lens and cataract, and the biochemistry, physiology and pharmacology of the retina.

The institute has tissue culture laboratories and transmission and scanning electron microscopes, maintained, in part, by a

CORE grant from the National Eye Institute.

Several members of the Department of Ophthalmology at William Beaumont Hospital, which is affiliated with the institute, are members of the institute's clinical faculty. This affiliation provides enhanced educational experience for ophthalmology residents and fellows. The institute also offers qualified undergraduate and graduate students opportunities for research experience.

The programs of the Eye Research Institute are regularly reviewed by a scientific advisory board, whose members are nationally recognized leaders in eye research.

Further information may be obtained by contacting the Office of the Director.

■ University Approval for Research Activities Involving Human and Animal Subjects, Biosafety, and Radiation Safety

Protection of human subjects

All research projects involving the participation of human subjects or use of materials of human origin must be submitted for review by the Institutional Review Board for the Protection of Human Subjects (IRB) before the research can be conducted. This requirement includes all research, from low-risk investigations such as surveying people on the street about their favorite television shows to high-risk studies like clinical trials of experimental medical treatments. Applications are submitted online (see "Online Application for Conducting Research" section). All students conducting research must have a faculty sponsor. The student and faculty sponsor are jointly responsible for contacting the IRB and for keeping abreast of the approval process as it pertains to the study. For more information about human subjects review and to access the Oakland University Guidelines for Research Involving Human Subjects, visit <http://www2.oakland.edu/research/web/compliance/compliance.cfm?ID=2@1> or contact Dr. Judette Haddad at (248-370-4898) or haddad@oakland.edu. To access the Human Subjects Tutorial, visit <http://www2.oakland.edu/research/web/tutorial/>.

Protection of animal subjects

Research using vertebrate animals must have the approval of the Institutional Animal Care and Use Committee (IACUC) and be conducted according to university guidelines. For more information visit <http://www2.oakland.edu/research/web/compli->

[ance/compliance.cfm?ID=2@2](http://www2.oakland.edu/research/web/compliance/compliance.cfm?ID=2@2) or contact Cliff Snitgen at (248-370-4441) or snitgen@oakland.edu.

Biosafety

All research, teaching and testing at Oakland University involving recombinant DNA, infectious agents and/or cultured cell lines must be approved by the Institutional Biosafety Committee (IBC). Approval is obtained through submission of biosafety research applications. Application can be made in one of two ways: 1) submit online through the Research Application Manager, or 2) e-mail electronic forms to haddad@oakland.edu. For more information and copies of applications, visit <http://www2.oakland.edu/research/web/compliance/compliance.cfm?ID=2@3> or contact Dominic Luongo, Biosafety Officer at (248-370-4314) or luongo@oakland.edu.

Radiation safety

Radioactive material (including machinery producing ionizing radiation) can only be used by authorized Oakland University permit holders or under the supervision of a permit holder. User permits are issued by the Radiation Safety Committee (RSC) only to the fulltime OU faculty members or principal investigators. All others must work under the supervision of a full-time faculty member. To access the Radiation Safety Tutorial, visit <http://www2.oakland.edu/research/web/tutorial/>. For more information, visit <http://www2.oakland.edu/research/web/compliance/compliance.cfm?ID=2@4> or contact Dominic Luongo, Radiation Safety Officer at (248-370-4314) or luongo@oakland.edu.

Online application for conducting research

To access the compliance committee applications referred to above, researchers should visit the Research Application Manager (RAM) at <http://www2.oakland.edu/research/appmanager/>. Researchers who are accessing the site for the first time, should access the Step-by-Step Instructions at <http://www2.oakland.edu/research/appmanager/stepbystep.cfm> to create an account. Depending on the elements involved and the scope of the project, students will gain access to the relevant applications required to conduct the study.

■ Office of Information and Instructional Technology

The Office of Information and Instructional Technology (IIT) provides both centralized information technology services and decentralized computing supports, as well as personnel services to support the instructional, research, administrative and public service activities of Oakland University. Its Information Technology Institute is responsible for the delivery of those services to the academic community's programs.

IIT provides modern, current technology resources involving a distributed computing environment on a variety of operating system platforms. These machines are connected broadly across the campus by a high-speed fiber optic network, providing inter-machine communications between them and a bevy of personal computers and desktop systems.

The distributed resources are offered in a number of attractive public terminal rooms, where adequate user work space, reference materials and consultant help is readily available. Faculty and students are encouraged to avail themselves of these extensive resources and services.

■ Office of Institutional Research and Assessment

The Office of Institutional Research and Assessment (OIRA) provides student-related information such as enrollment, credit hours, degrees, curriculum, etc., to internal and external data-users and decision makers. Internal requests for information are utilized for academic planning, student program development and budgetary purposes. Externally, the Office of Institutional Research and Assessment is charged with the responsibility for compliance with state and federal statistical reporting requirements for public universities, such as the annual state budget request and the Integrated Postsecondary Educational Data System (IPEDS) submission, among others. OIRA is also responsible for coordination and support of activities related to the assessment of student academic achievement, as specified in the Oakland University Assessment Plan submitted to the North Central Association.

OIRA routinely conducts social science research projects related to the university's overall educational mission, such as student retention tracking and the annual survey of new freshmen, which provides data on career goals at time of admission and other descriptive items.

All student information provided by the Office of Institutional Research and Assessment is in the aggregate and is public and available to administrators, faculty, students and the university community at large. Interested persons are encour-

aged to contact OIRA for student-related information. There is no charge for OIRA information.

■ Continuing Education

Continuing education serves individuals at various stages of their careers, from students applying for graduate study to professionals intent on career advancement. Continuing education at Oakland University is delivered through the various academic units. The College of Arts and Sciences offers workshops to prepare students for the Graduate Record Examination (GRE), the Graduate Management Admission Test (GMAT), the Law School Admission Test (LSAT), the Medical College Admission Test (MCAT), and stages additional workshops in speed-reading and reading comprehension. Workshop information may be obtained by calling (248) 370-3125. Information about other programs may be obtained by contacting the College of Arts and Sciences or the schools of Business Administration, Education and Human Services, Engineering and Computer Science, Health Sciences or Nursing.

■ SEHS Educational Resources Lab

The Educational Resources Lab (350 Education Building, 248-370-3060) provides support for the academic, research and development activities of the School of Education and Human Services. Patrons are provided with a functional setting for the examination, study, research, development, production, and evaluation of instructional materials and technologies. Workshops, seminars and consultation services in instructional technology and research strategies are available.

■ POLICIES AND PROCEDURES

Admissions

Requirements for admission to a degree program

The graduate admissions policy of Oakland University is selective. Degree program applicants must have official transcripts and letters of recommendations sent directly by their originators to Graduate Admissions. Detailed instructions are included in the “Application for Admission to Graduate Study.” Additional admission information and requirements may be found in the sections of this catalog describing the programs offered by the various schools and departments. Admission will be granted by Graduate Admissions for a definite term on recommendation by the department or school concerned and is based on the applicant’s undergraduate record, letters of recommendation and other evidence that may be required. All transcripts, recommendations and other documents received by the university become the property of the university and will not be released. Copies will be made only for university use.

An applicant must hold a baccalaureate from a regionally accredited undergraduate institution. Scores from the Graduate Record Examination, including advanced (subject) tests when available, are required from those students who graduated from schools not accredited by one of the regional accrediting agencies. In addition, all international applicants, other visa holders, permanent residents and exchange students who are non-native English speakers must provide proof of English proficiency to be admitted to the university. Proof consists of TOEFL or MELAB test scores, a baccalaureate degree from a regionally accredited U.S. college or university, one year of study at and a diploma from a U.S. high school or 24 transferable credits, excluding ESL coursework, from a U.S. community college or baccalaureate institution.

Conditional admission

Applicants currently completing undergraduate requirements or degree holders whose preparation is judged deficient by the Graduate Admissions may be eligible for conditional admission. Deficiencies of conditionally admitted students must be rectified in a time and manner specified by the Graduate Admissions. Students who do not meet the conditional requirements stipulated on admission are subject to dismissal. While in a conditional status students will not be eligible to receive their degrees, to transfer credit from other institutions, or to hold teaching or research assistantships.

Special graduate status

Special graduate status may be granted by Graduate Admissions to students who wish to pursue a degree, but have not officially been admitted to a degree program. Students must submit a copy of a transcript providing evidence of a bachelor degree awarded and any specific materials required by the department. Students will be allowed to take no more than a total of 12 credits while in this status.

Credit earned at Oakland University under special graduate status — but none that has been earned at another institution — will be officially recorded. This credit may be applied toward degree requirements if a student later is admitted to a degree program and if the credit is appropriate to the degree objective. However, admission as a special graduate student in no way assures subsequent admission to a degree program. Students in this status must apply for admission to a program, through Graduate Admissions and provide official transcripts, recommendations and any additional credentials specified by the program faculty. A recommendation on admission is then made by the academic department or school to Graduate Admissions, which then makes the final decision. Requirements and regulations prevailing for the semester of formal admission to a graduate program will govern the student’s program.

Application for admission by international students

International applicants should submit both a university application and an international student supplemental application at least 6 months before the date they hope to enter the university. Applications will be reviewed for fall and winter admission only. All application materials must be submitted by May 1 for fall admission and by September 1 for winter admission. Application materials include: a university application, the application fee, recommendations, official transcripts, transcript evaluation for students with foreign educational credentials, official test scores, an international student supplemental application and a notarized bank statement in U.S. dollars for the required amount. Fees paid to Oakland University must be made in U.S. funds drawn from U.S. banks. If the application is approved, students will receive a letter of admission to the university. International students are required to submit scores from the Graduate Record Examination General Test (GRE) prior to admission. The Test of English as a Foreign Language (TOEFL) is also required. The Graduate Management Admission Test (GMAT) is required for admission to the MBA program in lieu of the GRE.

International applicants who are presently in the United States on a student status may be required to provide statements from the International Student Advisers at their current institutions. International students who do not enroll during their indicated semester of admission must submit an application to update at least eight weeks prior to the start of the term (fall or winter) in which they wish to enroll.

English Language Proficiency Policy

International applicants, other visa holders, permanent residents, and exchange students whose native language* is not English must provide proof of English proficiency.

Admission

One of the following constitutes proof:

- 1 . TOEFL: 550 minimum on paper-based TOEFL; 213 minimum on computer-based TOEFL
- 2 . MELAB: 77 minimum
- 3 . 24 transferable credits, excluding ESL coursework from a U.S. community college or baccalaureate institution
- 4 . a baccalaureate degree from a regionally accredited U.S. college or university
- 5 . 1 year of study at and a diploma from a U.S. high school

Some programs at Oakland University may require a higher level of proficiency than listed above. Applicants should examine the program description for their field of study for information about additional English proficiency requirements and furnish proof as part of the admission process (admissions: <http://www.oakland.edu>; click on 'Prospective Students').

Admission with ESL Coursework

One of the following constitutes proof:

- 1 . TOEFL: 520-549 on paper-based TOEFL; 192-212 on computer-based TOEFL
- 2 . MELAB: 73-76

Students must register for ESL courses as part of their coursework starting in their first semester of registration. ESL placement is done by the Center for American English (CAE) using the Institutional TOEFL and other assessment tools. Upon completion of the individualized ESL instruction sequence, students' English proficiency will be evaluated using the Institutional TOEFL to determine whether additional ESL coursework is necessary to achieve English proficiency. The individualized ESL instruction sequence designed by the CAE is not negotiable.

Satisfactory completion of the individualized ESL instruction sequence is expected within one year, but ESL coursework is required until minimum proficiency is demonstrated.

Admission to Intensive English Program

Prospective students who do not have adequate English proficiency for admission or admission with ESL coursework to the university can be admitted to the Intensive English Program. ESL placement is done by the Center for American English (CAE) using the Institutional TOEFL and other assessment tools.

Upon completion of the individualized ESL instruction sequence, students' English proficiency will be evaluated using

the Institutional TOEFL to determine whether additional ESL coursework is necessary to achieve English proficiency. The individualized ESL instruction sequence designed by the CAE is not negotiable.

Upon completion of the Intensive English Program, students may (re)apply for admission to Oakland University; applicants are evaluated using the admission criteria described above.

*A native language is a language that is acquired naturally during childhood and is usually spoken at home, as opposed to a language that is learned later in life, for example, as part of a person's formal education. Students whose native language is not English are encouraged to visit the Center for American English to discuss any language difficulties they may have while attending Oakland University.

Inactive status and readmission

Oakland University classifies inactive students into three categories that require reapplication or readmission. The categories are as follows:

- 1 . Admitted applicants who do not enroll for the term in which they were admitted must apply to update their admission to graduate study. If done within five terms of the original admission term, no additional fee is charged; thereafter, a new application, documentation, transcripts and application fee are required. Inactive files are destroyed after five terms.
- 2 . Students who have been admitted to a graduate program and have completed course work but subsequently have not enrolled at Oakland University for a period of two years must apply for readmission and pay the readmission fee. Readmission is not automatic. The readmission request is reviewed by the appropriate admissions committee and Graduate Admissions. Each request is evaluated in terms of the six-year time limit for completing degree requirements, performance in course work and progress toward the degree. Students will not be readmitted to programs that have been suspended or discontinued. The catalog current at the time a student is readmitted will govern program requirements, policies and procedures.
- 3 . Students who have not registered for an Oakland University graduate course for seven years are considered inactive and their graduate files are destroyed. Students who wish to take classes subsequently must follow the regular admission procedure. The student's Oakland University transcripts remain available in the Academic Records Office.

Program Transfers or Endorsement Additions

This process is to be used only by students who have been admitted to one master's degree program and wish to transfer to another master's degree program or who wish to add into an endorsement program. Please note that additional application

materials may be required. Program admission requirements are detailed in this catalog. Regulations governing graduate programs require that all credit applied toward a degree must be earned within six calendar years of the awarding of the degree.

Graduate Non-Matriculating Admissions

Applicants who wish to enroll in graduate courses, but do NOT wish to be admitted to a graduate program may request non-matriculating status. Applicants admitted to a non-matriculating status are subject to the following stipulations:

Guest Status

Graduate students from other accredited colleges or universities must submit a graduate application with verification of academic standing from the applicant's home institution BEFORE the applicant will be considered for enrollment.

Professional Development

Applicants who have a bachelor's degree from an accredited college or university must submit a graduate application with a copy of a transcript providing evidence of a terminal degree (bachelor's, master's or doctoral).

1. Admission is granted to a particular school or college, but NOT to a specific graduate program.
2. There is no limitation on the number of graduate credits that may be earned in this status.
3. Departmental permission must be obtained, prior to enrolling for graduate courses, to assure proper academic preparation.
4. There is no assurance that credits earned in this status will be approved and applied toward a graduate program.
5. Not more than 12 credits would be eligible for review, approval and application toward a graduate program at a later date. These credits must comply with requirements published in the Time Limit section of the Graduate Catalog.
6. Non-matriculating graduate students who later decide to seek admission to a graduate program must adhere to all admission requirements specified by the program.

Michigan Intercollegiate Graduate Studies (MIGS)

The MIGS program is a cooperative inter-institutional arrangement which permits graduate students to take advantage of educational offerings available at other participating institutions but not available at their own. It is open to any student in good standing in a graduate program at a member institution. Courses must be numerically graded courses (not graded P/F, S/U or CR/NC) approved in advance by the student's graduate adviser and the MIGS liaison officer at both the home institution and the host institution. Admission by the host university

is contingent on the availability of space and resources. The member institutions are Andrews University, Central Michigan University, Eastern Michigan University, Grand Valley State University, Michigan State University, Michigan Technological University, Northern Michigan University, Oakland University, Siena Heights College, University of Detroit-Mercy, University of Michigan, Wayne State University and Western Michigan University. Additional information is available in the Office of Graduate Study.

Post-baccalaureate status

Post-baccalaureate status may be granted applicants who have a bachelor's degree from an accredited college or university and who wish to enroll in undergraduate courses, either to develop an additional major or to prepare for admission to a degree program. Please contact the Undergraduate Admissions for a post-baccalaureate application.

Academic Procedures

Transcripts

Academic records are maintained in the Academic Records Office, 102 O'Dowd Hall. Transcripts of academic records may be obtained by completing a transcript request form at the Academic Records Office or by writing to: Transcript Request, Office of the Registrar, Oakland University, Rochester, Michigan 48309-4401. Requests should include the name under which the student attended, the student's Oakland University student number, the date the student last attended and date of degree (if applicable), and the address to which the transcript is to be sent.

A check or money order for \$5 per transcript must accompany the request. Transcripts will not be issued for students who have delinquent indebtedness to the university or who are delinquent in repaying a National Direct Student Loan (NDSL), Perkins Loan or Nursing Student Loan (NSL).

Grades

The Office of the Registrar has discontinued mailing grades to students starting with the winter 2003 semester. Grades can be accessed in two ways:

1. By calling the SAIL system at (248) 370-4646 and following the voice prompts to listen to grades.
2. From a computer with Internet access:

Go to the Oakland University home page at www.oakland.edu. Click on the SAIL (Student and Administrative Information Link) in the lower right corner of OU's home page Click on "Login to Secure Area". Enter your nine-digit student ID number as the User ID and six-digit per-

sonal identification number as the PIN then click on "Login". Click on "Student Services & Financial Aid". Click on "Student Records". Click on "Final Grades" and then "Select a Term". Grades then can be printed from the Web.

In the event that a paper copy of grades is needed for employee tuition reimbursement, forward a request to registra@oakland.edu with your name and address.

Starting fall 2003, Oakland University also will begin sending official university business information to students through their free OU e-mail account, providing a more efficient and cost-effective notification of items like bills, schedule of classes, news, campus events and more.

In some cases, students will receive the information directly in their e-mail. In others, they will receive an e-mail notification that data is available to access through a secure Web site.

All OU students will be held accountable for the information the university sends through e-mail. Through the Oakland system, students can forward their Oakland e-mail to a preferred e-mail account. However, if the preferred e-mail address changes, the student will be responsible for updating the forwarding address.

Students can learn more about Oakland e-mail and find answers to their questions on OU's E-mail Account Document Library Web page by clicking on the Information Technology button from anywhere on Oakland's home page, then selecting e-mail services.

Petition of exception

Students may request waivers or modifications of specific academic requirements by filing a Petition of Exception form with their advisers or advising committees. The advisers or committees will make recommendations to the Office of Graduate Study, who will review the petition and notify students of any action taken. Petition of Exception forms may be obtained in the Office of Graduate Study.

Restriction of student records and holds

Students may not register for classes if their records have been restricted and holds placed on their records because they failed to pay fees, to submit complete application forms or to satisfy admission or retention conditions.

Transfer credit

Students who are in good standing (not probationary or conditional) in a master's degree program and wish to transfer courses from other accredited U.S. colleges or universities must have such credit approved by their academic advisers and the Office of Graduate Study. The credit must be earned at the graduate level (500 level and above) with a grade of at least 3.0 (or B) and not be graded pass/fail, satisfactory/unsatisfactory or credit/non-credit; it must be applicable to the student's program and may not have been previously used to satisfy degree requirements at

this or another institution. In accordance with policies set by the Michigan Council of Graduate Deans, no more than one credit will be awarded, per week of instruction. Applications should be filed after the first semester is completed at Oakland and, in any event not later than the first week of the semester in which the student expects to graduate. It will be necessary to have official transcripts of the work on file in the Office of Graduate Study. Transfer of credit applications are available in the Office of Graduate Study.

A maximum of 9 semester hours of transfer credit is acceptable toward a graduate degree. Approved transfer credit will appear on the student's official transcript in the Office of the Registrar. Transfer credit earned more than six years before the degree is awarded will not be applied toward degree requirements.

Courses taken as an undergraduate

Up to 12 credits (400 level and above) taken as an Oakland University undergraduate may be applied to a graduate program if the courses have not been used to fulfill the bachelor's degree requirements. They must be applicable to the student's graduate program, approved by the student's adviser or program committee and the Office of Graduate Study. Graduate fees are assessed at the time of transfer to the graduate record. Transfer request forms are available in the Office of Graduate Study.

Courses applied to an earlier graduate degree

Except in some cases of the doctor of philosophy degree, where up to 32 credits from a previous master's degree may be applied, credit earned in one master's degree program cannot be used again in a second master's program.

However, course requirements in a second master's program may be satisfied by courses taken in an earlier master's program, provided that the credit was earned within the specified time limit. In this case, the student, in consultation with his/her adviser, must elect a substitute course as a replacement for the required course and file a Petition of Exception with the Office of Graduate Study.

Course competency credit

Competency examinations are offered by some departments and with the approval of the Office of Graduate Study can be used to update Oakland University credit which is beyond the six-year time limit. Students should consult their advisers for specific information and must register and pay fees during the normal registration period. University legislation stipulates that the examination must be taken not more than six weeks after the close of registration.

Changes in enrollments (add/drop)

Graduate students wishing to add or drop a course may secure the appropriate form from the Registration Office or from the academic office of the area in which they are enrolled. A student adding a course beginning the first day of classes will need the signature of the instructor of the new course. The add/drop form is then presented to the Registration Office for processing. If a refund is involved it will be mailed to the student. The first two weeks of a semester (one week in spring or summer sessions) are a no-grade period for dropping courses. See the Schedule of Classes for dropping and withdrawal options.

Withdrawal

A graduate student wishing to withdraw from the university may do so by filing an official withdrawal notice with the Registration Office. This may be done in person, by SAIL (Student Access Information Line), fax, or certified mail. Information about each option is provided in greater detail in each term's Schedule of Classes. The withdrawal is recorded by the Registration Office and the amount of refund, excluding the non-refundable enrollment fee, is determined based on the date of receipt. If a refund is due, it will be mailed to the student.

Academic probation

Students who are not making satisfactory progress in their programs, as determined by their advisers and program chairperson, may be placed in probationary status with conditions imposed for retention in the program.

Academic conduct of graduate students

All members of the academic community at Oakland University are expected to practice and uphold standards of academic integrity and honesty. Academic integrity means representing oneself and one's work honestly. Misrepresentation is cheating since it means students are claiming credit for ideas or work not actually theirs and are thereby seeking a grade that is not actually earned. Following are some examples of academic dishonesty:

- 1 . Cheating on examinations. This includes using materials such as books and/or notes when not authorized by the instructor, copying from someone else's paper, helping someone else copy work, substituting another's work as one's own, theft of exam copies, or other forms of misconduct on exams.
- 2 . Plagiarizing the work of others. Plagiarism is using someone else's work or ideas without giving that person credit; by doing this students are, in effect, claiming credit for someone else's thinking. Whether students have read or heard the information used, they must document the source of information. When dealing with written sources, a clear distinction should be made between quotations (which reproduce information from the source word-for-word within quotation marks) and paraphrases (which digest the source of information and produce it in the student's own words). Both direct quotations and paraphrases must be documented. Even if students rephrase, condense or select from another person's work, the ideas are still the other person's, and failure to give credit constitutes misrepresentation of the student's actual work and plagiarism of another's ideas. Buying a paper and handing it in as one's own work is plagiarism.
- 3 . Cheating on lab reports by falsifying data or submitting data not based on the student's own work.
- 4 . Falsifying records or providing misinformation regarding one's credentials.
- 5 . Unauthorized collaboration on computer assignments and unauthorized access to and use of computer programs, including modifying computer files created by others and representing that work as one's own.

Unless they specifically indicate otherwise, instructors expect individual, unaided work on homework assignments, exams, lab reports and computer exercises, and documentation of sources when used. If instructors assign a special project other than or in addition to exams, such as a research paper, or original essay or a book review, they intend that work to be completed for that course only. Students must not submit work completed for a course taken in the past or for a concurrent course unless they have explicit permission to do so.

Instructors are expected to maintain the following standards in the context of academic conduct:

- 1 . To inform and instruct students about the procedures and standards of research and documentation required to complete work in a particular course or in the context of a particular discipline.
- 2 . To take practical steps to prevent and detect cheating.
- 3 . To report suspected academic misconduct to the Dean of Students, 144 Oakland Center, for consideration by the Academic Conduct Committee of the University Senate.
- 4 . To present evidence of plagiarism, cheating on exams or lab reports, falsification of records, or other forms of academic conduct before the Academic Conduct Committee.

Students are expected to maintain the following standards in the context of academic conduct:

- 1 . To be aware of and practice the standards of honest scholarship.
- 2 . To follow faculty instructions regarding exams and assignments to avoid inadvertent misrepresentation of work.
- 3 . To be certain that special rules regarding documentation of term papers, examination procedures, use of computer-based information and programs, etc., are clearly understood.

4. To avoid the appearance of cheating.

If students believe that practices by the instructor are conducive to cheating, they may convey this message to the instructor, to the chairperson of the department, or to any member of the student/faculty Academic Conduct Committee (either directly or through the Office of the Dean of Students).

If academic misconduct is determined by the Academic Conduct Committee, the committee assesses penalties ranging from academic disciplinary reprimand, to academic probation, to suspension or expulsion (dismissal) from the university. All conduct records are maintained in the Office of the Dean of Students.

■ Procedures for Appeals

Denial of admission

An applicant seeking an appeal must do so within 15 working days of the date of the denial letter and make such request in writing to the program department (chair, coordinator or admissions committee). The appeal must be based on new information not included in the original application or on extenuating circumstances not known to the department or to the Vice Provost for Research and Graduate Study at the time of the initial decision. Within 15 working days of receipt of the written appeal, the department will submit a recommendation to the Vice Provost for Research and Graduate Study either to admit the applicant or to sustain the original denial. The Vice Provost for Research and Graduate Study shall review the recommendation and notify the student in writing of the final decision within 10 working days of the departmental recommendation. The decision of the Vice Provost for Research and Graduate Study is final.

Dismissal for academic performance

A student must formally request reconsideration from the program department (chair, coordinator or admissions committee) within three months of notice of dismissal, with such request being submitted in writing and including the basis for the appeal, e.g., new supporting information and/or reference to violations of university procedures. Within 15 working days of receipt of the written appeal, the department must submit to the Vice Provost for Research and Graduate Study a recommendation either to reinstate the student to the program (with or without conditions imposed) or to uphold the original dismissal. The Vice Provost for Research and Graduate Study shall review the recommendation and notify the student in writing of the decision within 10 working days.

If the original dismissal is sustained, the student may submit a written request for an appointment with the Vice Provost for

Research and Graduate Study to discuss the decision. After the meeting with the Vice Provost for Research and Graduate Study the student may submit a written request to the Vice Provost for Research and Graduate Study to refer the matter to the chair of the Student Conduct Committee of the Graduate Council for a second review. Such referral shall be forwarded by the Vice Provost for Research and Graduate Study within five working days. The committee will conduct its review within the procedures established by the Graduate Council. A recommendation either to sustain the denial or to reinstate the student (with or without conditions imposed) shall be forwarded to the Vice Provost for Research and Graduate Study. The Vice Provost for Research and Graduate Study may accept or reject the committee recommendation and a letter notifying the student of the Vice Provost's decision shall be forwarded to the student within five working days of receipt of the committee recommendation. The decision of the Vice Provost for Research and Graduate Study shall be final.

Dismissal from the university

Dismissal by the Vice Provost for Research and Graduate Study is based on a recommendation from the program faculty. It is an action taken only after thorough evaluation of the student's progress toward a degree by both the program faculty and the Vice Provost for Research and Graduate Study.

■ Credit system

The unit of credit is the semester hour. No graduate student may register for more than 12 credits in fall or winter semester, or 8 credits in spring or summer, without the written authorization of his/her adviser.

Course numbering system

Courses numbered 100-299 are introductory or intermediate undergraduate courses and cannot be used toward graduate degrees. Courses numbered 300-499 are advanced courses primarily for undergraduates. Graduate students, with the approval of a departmental adviser, may use up to 12 credits of 400-499 courses taken at Oakland University toward a graduate degree. In interdisciplinary programs graduate students, with the approval of a departmental adviser, may use up to 12 credits of 300-499 courses taken at Oakland University toward a graduate degree. Courses numbered 500 and above are primarily for graduate students. Qualified undergraduates may enroll in courses numbered 500-599, provided they have obtained prior written permission to do so from the department chair and the course instructor. Courses numbered 600 and above are restricted to graduate students. Courses 700 and above are primarily for doctoral students, but qualified masters students may enroll provided they have obtained permission from the department or school offering the class.

Grading

To qualify for a graduate degree, a student must have an overall average of at least 3.00 in all courses taken at Oakland University as a graduate student. No grade below 2.0 may be applied toward a graduate degree. Many programs have more stringent grade requirements for credit and retention. Specific information may be found under the appropriate program area of this catalog. The graduate grading system, implemented fall 1984, is described below.

1. The basic graduate grading system at Oakland University is a 32-point system of numerical grades of 0.0 and 1.0 through 4.0 by tenths and nonnumerical grades of W, I, P, U, S, R, and Z.
2. The first two weeks of a semester (one week in the spring and summer sessions) are a "no-grade" period for dropping and adding full semester courses. (For "first-half" or "second-half" courses, this period is the first week of the appropriate "half-term.") Courses dropped during these periods are not indicated on the student's transcript.
3. The meanings of non-numeric grades are as follows:
 - a. The W (Withdraw) grade is assigned by the registrar if a student withdraws officially from a course or all courses between the end of the no-grade period and the last day for withdrawal specified in the Schedule of Classes each term.
 - b. The I (Incomplete) grade is temporary and may be given only after the cut-off date for use of the "W" grade. It is used in the case of severe hardship beyond the control of a student that prevents him or her from completing course requirements. Course work to remove an "I" grade must be completed during the first eight weeks of the next semester (fall or winter) for which the student registers unless a student-initiated extension is approved by the instructor and the Office of Graduate Study. If course requirements are not completed within one year and no semester has been registered for, the "I" grade shall become permanent. A student who wishes to receive an Incomplete grade in a course must present a Student Request for Incomplete (I) Grade form to the instructor by the day of the scheduled final examination. This form, which indicates the instructor's willingness or unwillingness to grant the "I" and the schedule he or she sets for completing the term's work, is available in department offices.
 - c. The P (Progress) grade is a temporary grade that may be given only in a course that cannot be completed in one semester or session. Prior approval must be obtained from the appropriate committee on instruction and the Office of Graduate Study for each course in which "P" grades are to be assigned. The "P" grade is given only for satisfactory work. "P" grades must be removed within two calendar years of the date of assignment; otherwise the "P" converts to a permanent "I" which remains on the transcript. This rule does not apply to doctoral dissertation work.
 - d. The grade of "S" is given in certain selected courses and is

meant to imply 3.0 or better. Courses in which S/U grading is used must be approved by the appropriate committee on instruction and the Vice Provost for Research and Graduate Study, who will notify the registrar.

- e. The grade of "U" is given to graduate students only when a course is graded S/U and implies a non-passing grade of less than 3.00.
- f. The grade of "R" is a temporary grade assigned by the registrar in the absence of a grade from the instructor or in the case of the award of an inappropriate grade.
- g. The final grade of "Z" is assigned upon registration for a course as an auditor. The student's declaration of intention to audit is required at the time of registration, and it is understood that no credit for the course is intended that term. An audit registration for a course is permitted only during the late registration period each term. Permission of the instructor to audit and admission to the university are both required before such a registration will be permitted. Regular tuition and fees apply to all courses.
4. All grades and marks assigned will appear on a student's transcript. However, only numerical grades are used in computing the student's grade point average.

Appeal of Grade

Students desiring to appeal a grade should first contact the instructor who issued the grade. If satisfaction is not received the student may further appeal, in turn, to the program coordinator, the department chair and, finally, to the school dean, whose decision is final.

Repeating courses

With the permission of the program faculty and the Office of Graduate Study, graduate students may repeat a course up to two times. The last numerical grade earned in the course will be used in computing the grade point average. The student must file a Petition of Exception to document permission of program faculty and Office of Graduate Study prior to registration. In addition, the student must file a "Repeat Course Form" at the time of registration for a course previously taken. Filing of this form is the responsibility of the student and will ensure that proper adjustments to grade point average and degree credits are made.

Time limit

Credit earned more than six years before a master's degree is to be granted may not be used to fulfill the degree requirements. This means, for example, that a course taken in Fall 1997 may be used toward a degree only until the end of the Fall 2003 semester. Time limits for doctoral programs will be found within the program descriptions.

Doctoral residency requirement

All doctoral programs have residency requirements. Students are advised to consult the appropriate section of this catalog which pertains to their particular degree program. All doctoral students are required to register for at least one credit of course work every fall and winter semester after their admission to a program. In cases where the student has completed all of the formal course work for the degree, the student may register for doctoral or dissertation research. The student must be registered for the semester in which they defend their dissertation.

Master's thesis and doctoral dissertation

Students must obtain a copy of the publication "A Guide to the Preparation of Graduate Dissertations/Theses" from the Office of Graduate Study and make an appointment prior to beginning work to assure that the manuscript conforms to university standards. Three copies of the approved manuscript must be delivered to the Office of Graduate Study by the date published in the Schedule of Classes for the term in which the student expects to graduate.

The university considers student theses and dissertations to be public statements of research findings. Therefore, students who submit such work in fulfillment of degree requirements shall be deemed to have consented to disclosure of the work.

Graduation Information

Information in this section is intended to guide you in completing your degree requirements. It is not to substitute for departmental advising! See your departmental advisor to confirm that you have met all the following requirements and to determine what additional departmental requirements may exist.

Graduation Checklist For Master's Students

- 1 . A program of study must be filed in Graduation Study (520 ODH).
- 2 . Apply for graduation by the stated deadline in Schedule of Classes for the term in which you expect to graduate.
- 3 . Review your academic record for any unmet requirements:
 - Any incomplete (I) or progress (P) grades must be removed.
 - If you are not finishing the degree within the 6-year time limit, a Petition of Exception must be filed to obtain an extension of time (8 years maximum).
 - All transfer credits must be approved by the beginning of the semester in which you expect to graduate.
- 4 . If completing a thesis, it must be successfully defended 6 weeks prior to the last day of the semester.
- 5 . **All theses must be submitted to the Office of Graduate Study 4 weeks before the last day of the semester.**

- 6 . Must have overall 3.0 GPA to graduate with a Master's degree.
- 7 . If graduation requirements are not completed by the deadlines you must reapply in Academic Records Office for the term in which you expect to complete degree requirements.
- 8 . Master's students, within one term of completing their degree requirements, may participate in commencement. A "Request to Participate in Commencement Ceremony" form must be approved by their academic advisor, department chair and submitted to the Office of Graduate Study for final approval.
- 4 . Participation in graduation ceremony before completion of degree requirements

Graduation Checklist For Doctoral Students

- 1 . A program of study must be filed in Graduation Study (520 ODH).
- 2 . Apply for graduation by the stated deadline in Schedule of Classes for the term in which you expect to graduate.
- 3 . Review your academic record for any unmet requirements:
 - Any incomplete (I) or progress (P) grades must be removed.
 - If you are not finishing the degree within the 6-year time limit, a Petition of Exception must be filed to obtain an extension of time (8 years maximum).
 - All transfer credits must be approved by the beginning of the semester in which you expect to graduate.
- 4 . Verification that all comprehensive exams have been completed must be filed by the department with Graduate Study (520 O'Dowd Hall).
- 5 . Dissertation must be successfully defended 6 weeks prior to the last day of the semester
- 6 . **All dissertations must be submitted to the Office of Graduate Study 4 weeks before the last day of the semester.**
- 7 . Must have overall 3.0 GPA to graduate with a Doctoral degree.
- 8 . If graduation requirements are not completed by the deadlines, you must change your graduation date by contacting Graduate Study (520 O'Dowd Hall).
- 9 . Doctoral students are not eligible to participate in commencement without completing all degree requirements, including dissertation defense and submission of an approved dissertation, signatures of all committee members and/or the head of the academic unit, in the Office of Graduate Study.

Commencement

Commencement ceremonies are held twice each year. A May ceremony recognizes Winter Semester (April) and Spring Session (June) degree candidates. A December ceremony is held for Summer Session (August) and Fall Semester (December) degree candidates. For additional information on upcoming commencement ceremonies, please refer to the Schedule of Classes or www.oakland.edu.

Tuition and Fees

The Oakland University Board of Trustees reserves the right to change any and all tuition and fees when circumstances make such a change necessary. Tuition and fees quoted in this catalog are from the 2003-2004 academic year. The Schedule of Classes for each semester or session carries a listing of current charges.

All fees are assessed at registration and are payable in U.S. dollars. Checks returned by the bank will place students in a non-payment status.

Application fee

A fee of \$30 must accompany an application for admission. This is a non-refundable processing fee.

General service fee

All students who register are assessed a \$145 general service fee each term, of which \$57 is nonrefundable. In addition to funding the cost of registration and student records maintenance, this fee is also used to support such student services as the Oakland Center, Graham Health Center, athletics, and maintenance of the parking lots, roads and walkways on campus.

Tuition

Tuition for each semester is assessed on the basis of the credit value of the course. One credit is the equivalent of one semester hour. On-campus graduate tuition for Michigan residents is \$296.75 per credit while nonresidents are assessed \$533.50 per credit. Some courses have additional special fees, which are published in the class schedule for the term. All fees are subject to change by the Board of Trustees.

Course fee

A course fee of \$13.00 per credit hour (\$52.00 per 4 credit hour course) is charged for some specialized courses. See the current Schedule of Classes for a complete listing of applicable courses.

Student activities fees

Students who register for on-campus credits are charged an activities fee of \$21.00.

Recreation center fee

All students registered for classes are charged a Recreation Center Fee. The fee for each of the fall and winter terms is \$77.00, and the fee for each of the spring and summer terms is \$49.50. Students registered only for classes that meet off site from the main campus will have the fee waived unless they voluntarily pay the fee in order to have access to the Recreation Center. Additional information on Recreation Center services and fees can be obtained from the Department of Campus Recreation.

Late registration fee

Students registering during the late registration period must pay an additional nonrefundable late registration fee of \$35. Students who take courses exclusively within a program scheduled to register after the beginning of classes will not be required to pay this fee if they register during the special registration session scheduled for such groups. Tuition checks returned by the bank will be considered as nonpayment.

Course competency by examination fee

Students who register for degree credit by course competency examination will be assessed \$33 per credit. Consult page 21 for information on the use of competency credit.

Late penalty payment

Late payment of outstanding balances due for tuition, fees and/or housing will result in assessment of a late payment fee of 1.5% of the outstanding balance due at the end of each month. Balances due paid by checks that are returned by the bank are considered nonpayment and will result in assessment of a \$20 fee.

Residential service fees

Residence halls and apartments are financially self-supporting. Housing fees, including room and board, reflect the actual cost of operation and are established by the Oakland University Board of Trustees. The 2003-2004 rate for double room and board is \$5,540, which includes a \$16.00 hall government fee, and is for fall and winter combined. Single room fees, if available, are an additional \$990. Residence halls offers four meal options:

Unlimited Meals plus 100:

Unlimited meals per week in the cafeteria and \$100 to purchase meals at any Chartwells food operation.

14 Meals plus 200:

14 meals per week in the cafeteria and \$200 to purchase meals at any Chartwells food operation.

10 Meals plus 500:

10 meals per week in the cafeteria and \$500 to purchase meals at any Chartwells food operation.

5 Meals plus 700:

15 meals per week in the cafeteria and \$700 to purchase meals at any Chartwells food operation.

University Student Apartments are available for single students who are at least 20 years old. Students can select from 2-bedroom, 3-bedroom (handicapped accessible), or 4-bedroom apartment styles. The 2003-2004 academic year rate for a 4-bedroom apartment is \$4,475. Students living in the apartments are not required to have a meal program. Voluntary meal plans are available for purchase. George T. Matthews Family apartments are available for married students and single parent families. All of the apartments are 2-bedroom, townhouse style. The monthly rental rate is \$650. A \$100 non-refundable down payment is due with all housing contracts. This down payment will be credited against the first housing payment. Students who sign a housing contract are committing to a binding agreement for the contract period. The housing fees may be paid in full at registration or paid in installments as specified in the Schedule of Classes.

If students withdraw from Oakland University, room and board fees are refunded on a prorated basis less penalty fees as described in the terms and conditions of the contract. Formal notice of withdrawal must be given to the Housing Office.

Refund of tuition and fees

Students who withdraw from Oakland University or drop courses that reduce their total credit load may be eligible to receive a partial refund of tuition and fees. Failure to drop or withdraw formally will result in forfeiture of any refund. Official drops and complete withdrawals from all courses must be submitted either in person or by certified mail to the Registration Office (100 O'Dowd Hall), or by fax (248-370-3461). Students may also drop courses up to the last day to drop as published in the Schedule of Classes by using the Student Access Information Line (SAIL) at 248-370-4646 or in person at 100 O'Dowd Hall. See also Adjusting courses (add and drop). The date that notification is received in the Registration Office determines the applicable refund. A specific schedule of refunds, with qualifying dates, is published each semester and session in the Schedule of Classes. Information regarding the method of calculating refunds for financial aid recipients can be found in the current Focus on Financial Aid pamphlet, which is provided to financial aid recipients and available to others upon request. Refund checks will be mailed approximately two weeks after a withdrawal has been filed with the Registration Office (with the exception of September and January when refunds are held until after the date of record for release).

Requirements of the Taxpayer's Relief Act of 1997

The Taxpayer's Relief Act of 1997 was passed by the Congress and signed into federal law by the president in 1997 to offer American taxpayers some tax relief if they made payments during the tax year to a qualified university. Part of this law is a requirement that the university receiving such payments report annually to the taxpayer and the Department of the Treasury the taxpayer's identification number (TIN), also known as the social security number (SSN), the taxpayer's name and amounts paid to the university during the previous tax year. This information is to be reported regardless of the taxpayer's intention to actually take a credit or deduction under this law. Only students not taking for-credit courses or foreign visitors without taxpayer identification numbers are exempt from this requirement. The university must therefore receive your TIN, or SSN before it can conduct billing and receipting transactions with you. You can find more information about this law on the web at <http://www.nacubo.org/tra97/> or by going to the Internal Revenue Service site <http://www.irs.gov/> and refer to the "Tax Regs" section. This public law is in the Internal Revenue Code, Section 6050S.

Residency classification for admission and tuition purposes

For university purposes, "domicile" is defined as the place where an individual intends his/her true, fixed and permanent home and principal establishment to be, and to which the individual intends to return whenever away. Upon admission to the university, a student is classified either as a Michigan resident or a nonresident based upon information relating to the student's domicile. A determination of Michigan domicile is required for in-state rates to apply, except as stated below.

An individual whose activities and circumstances, as documented to and found by the university, demonstrate that the individual has established a Michigan domicile will be classified as a resident. An individual whose presence in the state is based on activities or circumstances that are indeterminate or temporary, such as (but not limited to) educational pursuits, will be presumed not to be domiciled in Michigan and will be classified as a nonresident. To overcome a presumption of nonresident status, a student must file an Application for Reclassification of Residence Status and document with clear and convincing evidence that a Michigan domicile has been established. The burden of proof is on the applicant.

Evidence of domicile:

Certain circumstances, although not controlling, support a claim of domicile. Other circumstances create a presumption against domicile.

Circumstances supporting a claim of domicile include:

- Dependence upon a parent domiciled in Michigan as demonstrated by permanent employment and establishment of a household in the state;
- Employment of the student or the student's spouse in Michigan in a full-time, permanent position, and that employment is the primary purpose for the student's presence in Michigan;
- Residence with Michigan relatives who provide more than half of the student's support including educational costs. This necessarily means that no non-Michigan resident claims the student as a dependent for income tax purposes.

The fact that certain indications of domicile may apply to a student does not mean that the student automatically will be classified as a resident or that the student is relieved of the responsibility for filing an Application. See Residency application process below.

Circumstances that do not in themselves support a claim of domicile include:

- employment that is temporary or short-term military assignment;
- employment in a position normally held by a student;
- ownership or lease of property;
- presence of relatives in the state, except as described above;
- possession of a Michigan driver's license or voter's registration;
- payment of Michigan income or property taxes;
- the applicant's statement of intent to be domiciled in Michigan.

In cases where the university determines that an applicant has not demonstrated establishment of Michigan domicile, unless substantial and new information arises that clearly demonstrates the establishment of domicile, the university will require the applicant to document one year of continuous physical presence in the state as one of the criteria for determining eligibility for resident classification in any subsequent application. The year of continuous presence is never the only criterion used for determining resident eligibility, and, in itself, will not qualify a student for resident status.

In documenting the year of continuous physical presence in Michigan, the applicant will be expected to show actual physical presence by means of enrollment, employment, in-person financial transaction, health care appointments, etc. Having a lease or permanent address in the state does not, in itself, qualify as physical presence. A short-term absence (summer vacation of 21 days or less, spring break and break between fall and winter term), of itself, will not jeopardize compliance with the one year requirement. In determining the effect of a short-term absence, the nature of the absence will be assessed to determine whether

it is contrary to an intent to be domiciled in Michigan.

Presumption of domicile:

Certain circumstances create a presumption of domicile. However, the presence of such a circumstance does not mean that the student will be classified automatically as a Michigan resident or that the student is relieved of the responsibility to file an application. These circumstances include:

Dependent students:

A student is presumed to be a dependent of his or her parents if the student is 24 years of age or younger and has been primarily involved in education pursuits or has not been entirely financially self-supporting through employment.

(a) Residents:

The following apply only if the student has not taken steps to establish a domicile outside of Michigan or any other action inconsistent with maintaining a Michigan domicile.

- A dependent student whose parents are domiciled in Michigan is presumed to be eligible for resident classification.
- A dependent student whose parents are divorced is presumed to be eligible for resident classification purposes if one parent is domiciled in Michigan.
- A student who is living in Michigan and who is permanently domiciled in Michigan does not lose resident status if the parents leave Michigan, provided: (i) that the student has completed at least the junior year of high school prior to the parents' departure, and (ii) that the student remains in Michigan, enrolled as a full-time student in high school or an institution of higher education.

(b) Non-residents: A dependent student whose parents are domiciled outside the state of Michigan is presumed to be a nonresident.

Absences from the state:

Individuals domiciled in Michigan immediately preceding certain types of absences from the state may retain their eligibility for resident classification under the following conditions:

- An individual domiciled in Michigan for five years just prior to leaving the state for less than one year may return to the university as a resident for admission and tuition purposes.
- An individual domiciled in Michigan at the time of entry into active military duty, missionary work, Peace Corps or similar philanthropic work does not lose eligibility for resident classification as long as he or she is on continuous active duty and continuously claims Michigan as the state of legal residence for income tax purposes. Dependent children of such an individual also are eligible for resident classification provided: (i) that they are coming to the university directly from high school or they have been continuously enrolled in college since graduating from high school, and (ii) that they have not claimed residency elsewhere for tuition purposes.

- An individual who is domiciled in Michigan immediately preceding an absence from the state for full-time enrollment in school or for a medical residency program, internship or fellowship does not lose eligibility for resident classification provided that the individual has maintained significant ties to the state during his or her absence (e.g., parents still in the state, payment of state taxes, active business accounts), and that the individual has not claimed residency for tuition purposes in another state.

Residence status of aliens:

Notwithstanding the above, except for those aliens holding a permanent resident visa, the only aliens eligible for consideration for classification as a resident are those who are on a visa other than a student visa, and who are engaged in permanent employment in the United States, and whose employer has filed or is in the process of filing for permanent resident status on behalf of the alien. An alien will be eligible for consideration if the alien's parents or spouse meet(s) the alien requirements above and dependent status also exists.

Application of in-state tuition rates in special circumstances:

Regardless of domicile, in-state tuition rates apply to the following persons:

- Graduate students who hold an assistantship or fellowship awarded through Oakland University;
- Students employed in Michigan in full-time, permanent positions.

Appeal process:

Any student desiring to challenge his or her initial residency classification may appeal the determination to the Residency Reclassification Appeals Office, 101A O'Dowd Hall, (248) 370-3455. The Associate Registrar makes the initial determination of residency. The Registrar is the second level of appeal, and the Residency Reclassification Appeals Committee is the third level of appeal and is composed of two individuals: Vice Provost for Enrollment Management and a representative from the Provost's Office. The committee convenes only as necessary. The determination of the Residency Reclassification Appeals Committee is final.

Residency application process

It is the student's responsibility to apply for admission under the proper residency classification. If a student indicates Michigan resident status on the admissions application and the admissions office questions that status, the student will be classified as a nonresident and notified of the need to file an Application for Reclassification of Residence Status with the Residency Appeals Office. The fact that a student's claim to residency for university purposes is questioned does not necessarily mean that he or she will be ineligible for resident status; it simply means that the student's circumstances must be documented and reviewed. Failure on the part of admissions

staff to question a student's claim to resident eligibility does not relieve the student of the responsibility to apply and register under the proper residency classification. Furthermore, the university may audit enrolled or prospective students at any time with regard to eligibility for resident classification and may reclassify students who are registered under an improper residency classification.

The presence of any of the following factors will result in an initial classification as a nonresident:

- Out-of-state employment within the last three years;
- Living out of state at the time of application to the university;
- Attendance or graduation from an out-of-state high school (applies if the individual is 24 years of age or younger);
- Attendance or graduation from an out-of-state high school and involvement in educational pursuits for the majority of time since graduation from high school.

Residency reclassification documentation:

The following are required:

- a completed application,
- a written signed statement explaining why Michigan is one's true home,
- a letter from the employer of the family member providing the major support for the student, stating the family member's position title, when the Michigan employment began, and, for aliens, the status of any application for permanent residency; and
- documentation of the Michigan home (lease or home purchase document) must be included.

Applicants also are responsible for providing any other documentation necessary to support their claim to resident eligibility. Additional documentation may be required by the university.

Misrepresentation and falsification of information:

Applicants or students who provide false or misleading information or who intentionally omit relevant information in any document relevant to residency eligibility may be subject to legal or disciplinary measures including revocation of admission or expulsion. Students improperly classified as residents based on this type of information will have their residency classification changed and may be retroactively charged nonresident tuition for the period of time they were improperly classified.

■ Financial Aid, Assistantships and Scholarships

Financial Aid

The purpose of the financial aid program at Oakland University is to help pay the educational costs of qualified students who do not have sufficient funds to attend school. The program is operated under the assumption that the primary responsibility for financing a college education rests with students and their families. Aid offered by the university supplements, but does not replace, funds provided by students and their families.

In order to assist eligible graduate students in financing their education, the university participates in the following programs: the Perkins Loan program, the Federal College Work Study program, and the William Ford Federal Direct Loan Program.

Federal Financial Aid Programs

Perkins Loan

The Perkins Loan is a low interest (5 percent) loan to assist students in meeting their educational expenses. A student must demonstrate financial need and must be a U.S. citizen or an eligible non-citizen to be eligible for a loan.

College Work Study

The College Work Study Program provides jobs for students who wish to work to earn money to assist in meeting their educational expenses. To be eligible for employment through the work study program, a student must demonstrate financial need and must be a U.S. citizen or an eligible non-citizen.

William D. Ford Federal Direct Loan

The Ford Federal Direct Loan Program provides loans to assist students in meeting their educational expenses. Loans are made by Oakland University to eligible students. Students interested in obtaining this loan must first complete the financial aid application process.

Financial Aid Application Procedures

A Free Application for Federal Student Aid (FAFSA) should be completed as soon as possible after January 1.

Part-time employment

On-campus jobs of varying kinds and durations are provided for students registered at least half-time who wish to work during the school year. Students seeking employment should register in the financial aid office. Most students who have part-time jobs work 10 to 20 hours each week.

Graduate assistantships and scholarships

A limited number of graduate assistants are appointed in schools and departments offering graduate degree programs. Stipends depend on assignments, hours of work required and qualifications of the assistant. Scholarships in the amount of tuition and fees are available on a competitive basis. Both assistantship and scholarship nominations are made by the individual departments offering graduate programs. To be eligible, students may not be in a conditional admission or probationary status. Graduate assistants must be registered each fall and winter semester in which they hold assistantships.

The assistantship and the program of study constitute a full-time commitment; therefore, no additional employment may be undertaken without the permission of the Vice Provost for Research and Graduate Study.

Assistants are paid one-fourth of the semester stipend at the end of each month. The first payment in the fall semester is on September 30, the first in the winter semester is on January 31. International students should be aware that they will need approximately \$1,200 to cover their expenses until the end of the first month.

Extremely well-qualified students are invited to apply to the Department of Chemistry for consideration for the Bennett Scholarship in Chemistry. Awards will be granted to full-time students whose undergraduate records not only give evidence of exceptional past academic achievement, but promise future high accomplishment as well. All decisions will be based on a student's complete record, including grades, courses taken, test scores, letters of recommendation and a personal interview.

Graduate assistantship time limit policy

Master's degree students may be supported by Office of Graduate Study funds for a maximum of two years; for doctoral students the limit is four years.

Steven R. and Leah P. Vartanian Endowment Scholarship

Graduate students who may be physically challenged and confined to a wheelchair may apply to the Steven R. and Leah P. Vartanian Endowment Scholarship fund for financial assistance. Applicants for admission to Oakland University who wish to be considered for this scholarship should file a scholarship application with the Office of Graduate Study prior to April 1.

King/Chavez/Parks Future Faculty Fellowship Initiative

Additional scholarships and fellowships are available to qualified students through the Martin Luther King, Jr./Cesar Chavez/Rosa Parks Future Faculty program, which is a joint venture between the State of Michigan and Oakland University. The primary purpose of the program is to increase the pool of minority candidates pursuing academic careers in post-secondary educational institutions. Interested students may obtain additional information from the Office of Graduate Study.

■ UNIVERSITY LIBRARY

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Elaine K. Didier

Associate dean:

Julie Voelck

Office of the dean:

Brenda Pierce, Assistant to the Dean/Business Manager

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Professor Emeriti:

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Suzanne O. Frankie, D.P.A., George Washington University

George L. Gardiner, M.A., University of Chicago

Robert G. Gaylor, M.L.S., University of Oklahoma

Janet A. Krompart, M.L.S., University of California-Berkley

Associate professors:

Kristine S. Condic, M.S.L., Western Michigan University

Frank Lepkowski, A.M.L.S., University of Michigan

Mildred H. Merz, M.L.S., George Peabody University

Assistant professors:

William Cramer, M.S.L.S., Case Western Reserve University

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Ann M. Pogany, A.M.L.S., University of Michigan

Daniel F. Ring, M.L.S., University of Wisconsin (Madison)

Robert Slater, M.L.S.,

University of Illinois (Urbana-Champaign)

Managers:

Eric Condic, Library Systems

Louann Stewart, Access Services

Patricia Clark, Interlibrary Loans

Library Facilities

Located in the center of campus, the Kresge Library houses collections of books, journals, reference works, government documents, musical scores and recordings, as well as computer workstations to access an array of digital resources. The Library features seating for individual study, rooms for group work, meeting rooms, audiovisual rooms, rooms with adaptive equipment for students with disabilities, and a student lounge. There are also two networked instruction rooms with 25 workstations in each, two computer labs, and a multimedia lab.

Library Collections

The Kresge Library's collections include over 698,000 books, approximately 2,000 journal and newspaper subscriptions, over 225,000 federal and state documents, and more than 1.1 million microforms. The Library's Homepage and online catalog serve as gateways to dozens of specialized and general research databases, and hundreds of full-text electronic journals and e-books, covering a wide range of disciplines and research areas. In addition to electronic reference resources, the Matilda R. Wilson Reference Collection includes atlases, bibliographies, dictionaries, encyclopedias, indexes, yearbooks, and other print reference materials. Special collections include the Hicks Collection of Early Books By and About Women, the Springer Collection of Lincolniana, the James Collection of Books on Folklore and Witchcraft, and the Bingham Collection of Historical Children's Literature. The University Archives is a repository of materials relating to the history of Oakland University, and includes copies of all dissertations written at OU, as well as a substantial number of faculty authored monographs.

Library Services

Web site: www.kl.oakland.edu

Phone: (248) 370-4426

Send an e-mail message to a librarian: ref@oakland.edu

Reference assistance and research consultations

Librarians provide reference and research assistance in-person at the Reference Desk, by telephone, or by e-mail. Librarians also offer individualized and customized research consultation sessions by appointment. These in-depth, one-to-one sessions are designed to help students identify and use print and digital resources pertinent to their research topics.

Library instruction

As information literacy specialists, librarians provide extensive instruction for students on using print and digital resources, constructing effective research strategies, and evaluating the information identified. These instruction sessions are a core component of every Rhetoric 160 course. Librarians also provide customized, course-related sessions in the disciplines, as well as workshops on special topics.

Circulation and course reserve services

At the Circulation Desk, undergraduate students may borrow books for a period of 3 weeks, with unlimited renewals, unless another borrower has requested the materials. Students may also borrow Course Reserve materials that have been placed on reserve by their professors. An increasing number of reserve items are available in electronic format on the Web.

Interlibrary loan service

Students may request books and articles not owned by the Kresge Library through the Library's interlibrary loan service. Requests can be made in-person, or through the forms available on the Web.

COLLEGE OF ARTS AND SCIENCES

217 Varner Hall • (248) 370-2140 • Fax (248) 370-4280 • <http://www2.oakland.edu/cas>

Dean: David J. Downing • **Associate deans:** William A. Macauley, Mary A. Papazian, William W. Connellan

Assistant deans: Janice S. Elvekrog, Thomas F. Kirchner

Advisory Board

The Advisory Board for the College of Arts and Sciences is composed of outstanding corporate and professional leaders from the Detroit metropolitan area. Board members provide a vital link with our community, consult with us on goals and objectives for the college, and provide advice, direction, and support for the College of Arts and Sciences' educational, research and outreach activities.

Ronald B. Bennett, President, Clymer Manufacturing
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Steven M. Samet, Executive Vice President and
General Manager, King Pharmaceuticals
Robert I. Schostak, President, Schostak Brothers & Company
Susan J. Takai
Kimberly Whipple

The College of Arts and Sciences Graduate Programs

The College of Arts and Sciences offers the following programs leading to advanced degrees. College faculty affiliated with each degree program are listed in each departmental area of this catalog as are the specific requirements for each of the degree programs listed below.

The Doctor of Philosophy in Biomedical Sciences
with specializations in:

Health and Environmental Chemistry
(Department of Chemistry)
Medical Physics (Department of Physics)

The Doctor of Philosophy in Applied Mathematical Sciences
with specializations in:

Applied Continuous
Applied Discrete
Applied Statistics

Master of Arts in Biology

Master of Science in Biology

Master of Science in Chemistry

Master of Arts in English

Master of Arts in History

Master of Arts in Liberal Studies

Master of Arts in Linguistics with specializations in:

Linguistic Theory
Teaching English to Speakers of Other Languages
Teaching Language Arts

Master of Arts in Mathematics

Master of Science in Industrial Applied Mathematics

Master of Science in Applied Statistics

Master of Music with concentrations in:

Composition
Conducting
Music Education
Piano Pedagogy
Vocal Pedagogy
Vocal Performance

Master of Science in Physics

Master of Public Administration (M.P.A.) with
concentrations in:

Human Resources Management
Health Care Administration
Local Government Management

Graduate Certificate in Statistical Methods

Graduate Certificate in Teaching English as a Second Language

■ The Doctor of Philosophy in Biomedical Sciences

Biomedical Sciences Doctoral Program Committee: Michael D. Sevilla, Professor of Chemistry, Chair; Kathleen H. Moore, Professor of Chemistry; Norman Tepley, Professor of Physics

The College of Arts and Sciences offers a doctoral program in the biomedical sciences with specializations in health and environmental chemistry and in medical physics.

Specialization in health and environmental chemistry

The health and environmental chemistry specialization of the biomedical sciences doctoral program requires a strong academic background in the natural sciences. Graduates will have completed a unified program of formal course work, as well as independent research. Graduates will possess the theoretical background and practical skills necessary for successful contribution to the solution of environmental and health-related chemical problems. Scientists who graduate with this specialization will be capable of applying state-of-the-art methods to the detection, quantification and management of a wide variety of naturally occurring and synthetic chemical substances and the related chemical processes. No other doctoral program in Michigan focuses on these particular areas of chemistry, yet the contribution of highly trained doctoral-level scientists is essential to the resolution of major problems facing the nation in these areas.

Specialization in medical physics

Medical physicists are providing primary contributions to advances in diagnostic and therapeutic medicine. Laser surgery, ultrasonics, nuclear medicine, radio-therapy and nuclear magnetic resonance imaging are examples of medical modalities developed and implemented by medical physicists. The medical physics specialization of the biomedical sciences doctoral program is designed for students who plan careers in medical research in industrial, hospital and academic settings. The curriculum is designed to prepare the student to engage in research in areas of physics applied to medicine. Ph.D. candidates may elect to do their research either with one of a number of Oakland University faculty currently involved in biomedical research or with one of the scientists in area hospitals which collaborate closely with the university. Among these are Henry Ford Hospital, Detroit, and William Beaumont Hospital, Royal Oak.

Biomedical sciences doctoral program committee

The program committee appointed by the Dean of the College of Arts and Sciences, consists of one faculty member from each of the specialization areas as well as the coordinator of graduate programs in the College of Arts and Sciences, who serves as chair of the program committee. The program committee advises the

Dean of the College of Arts and Sciences on admission of students, selection of student committees, proposals for changes in degree requirements and approval of doctoral dissertations.

Specialization committees

Two specialization committees, appointed by the Dean of the College of Arts and Sciences on recommendations from the chairs of the chemistry and physics departments, are responsible for preliminary screening of applications for admission, preliminary approval of dissertation committees, approval of course selections by each student, certification of fulfillment of proficiency requirements by each student, administration and grading of preliminary examinations for each student, and proposal of any modifications in degree requirements for students in that specialization. Each specialization committee appoints specific faculty members to advise each incoming student selecting that specialization until the student's dissertation committee is established.

Dissertation committee

A dissertation committee consisting of at least three members, one of whom will serve as dissertation adviser, will be chosen by the specialization committee and the student in question and approved by the Dean of the College of Arts and Sciences. The student's dissertation adviser will be chairperson of the committee. The committee is charged with the guidance of the student in course selection, review of dissertation proposals before initiation of a project and approval of the completed dissertation.

Admissions

Students will be considered for admission if they hold baccalaureates in biology, chemistry, mathematics, physics, engineering or other disciplines related to a program specialization. Admission is highly selective; the prospective student should submit a graduate application, official transcripts from all colleges and universities previously attended, letters of recommendation from three faculty members capable of evaluating scholarly achievements and potential for independent research, and results of the Graduate Record Examination including the subject test appropriate to the desired specialization.

Requirements for the degree

The basic requirements for the Ph.D. in biomedical sciences are completion of a unified program of formal course work and independent research approved by the candidate's dissertation committee and the appropriate specialization committee. All requirements for the degree must be completed within seven years from the time of admission to the program.

Proficiency of entering students

Each student entering the program must demonstrate proficiency in specific areas of course work. Upon entering the program the student must consult with the appropriate specialization adviser who will plan a program of course work to eliminate any deficiencies in the student's preparation. Proficiency is defined as satisfactory knowledge of course work

equivalent to the following Oakland University courses:

- a. students in the health and environmental chemistry specialization must establish proficiency in analytical chemistry (CHM 426) and biochemistry (CHM 454); and in at least two of the following: inorganic chemistry (CHM 463), physical chemistry (CHM 343), cell biology (BIO 309), or physiology (BIO 321).
- b. students in the medical physics specialization must establish proficiency in modern physics (PHY 371), physical chemistry (CHM 343) and in at least three of the following: computer programming, differential equations (APM 257), electronics (PHY 341, 347), electricity and magnetism (PHY 381), physiology (BIO 207 or BIO 321) and statistics (STA 226).

In every case the appropriate specialization committee will approve course programs and will certify the student's proficiency in these subject areas.

Preliminary examination

Within two years after admission into the program the student must pass a comprehensive written and oral examination. The comprehensive written examination may consist of a single examination or a series of examinations. The examination is intended to determine the extent of the student's knowledge and fitness for the doctoral degree and will be designed and evaluated by the specialization committee. If the student does not pass the examination, the specialization committee may allow the student to retake the examination within one year. Failure to pass the examination within two attempts shall constitute failure in the Ph.D. program.

Research and dissertation

An integral and major component of the program is the successful completion of original research utilizing state-of-the-art experimental or theoretical methods to study a problem of current interest. Each student shall, in consultation with his/her adviser, prepare a dissertation proposal outlining the problem to be studied, a survey of the appropriate literature, a description of the appropriate techniques, and an outline of the experiments to be performed. The student shall, at the request of the

dissertation committee, orally defend the proposal or elaborate on the methods for data collection and analysis. Approval of the proposal by the committee is required prior to commencing research. The project shall be deemed ready for preparation of dissertation at such time as the student's committee agrees that the student has completed the project and that the student is an expert in the use of the specific methods required by the project. At that time, the student shall prepare a doctoral dissertation for submission to the committee and shall defend the dissertation in a public oral examination conducted by the committee and attended by the specialization committee. Acceptance of the dissertation by the Vice Provost for Research and Graduate Study requires favorable recommendations by the dissertation and specialization committees. All theses/dissertations must conform to university standards (see "Master's thesis and doctoral dissertation" in the Policies and Procedures section of this catalog).

Residence

All students are required to fulfill a residency requirement for this program. Although students may complete some of the program on a part-time basis, continuous full-time enrollment is highly preferred. The minimal residency requirement shall be full-time residency (12 credits per semester) for at least three consecutive full semesters (spring-summer terms are considered a full semester), with at least two of these devoted primarily to the student's research project.

Credit requirement

A minimum of 90 credits beyond the baccalaureate is required, including at least 30 credits of dissertation research. Transfer credits must meet graduate-level requirements and receive approval by the appropriate specialization committee and the Vice Provost for Research and Graduate Study. All courses taken by each student must be approved by a specialization committee. Each specialization has a set of required areas of graduate-level proficiency and may also require a minimum number of hours of elective courses. Specific requirements for each specialization are shown under the departmental sections.

DEPARTMENT OF BIOLOGICAL SCIENCES

375 Dodge Hall • (248) 370-3550 • Fax (248) 370-4225 • <http://www2.oakland.edu/biology>

Chair:

John D. Cowlshaw

Professors emeriti:

Francis M. Butterworth, Ph.D., Northwestern University
William C. Forbes, Ph.D., University of Connecticut; Ed.D.,
Columbia University
Esther M. Goudsmit, Ph.D., University of Michigan
Egbert W. Henry, Ph.D., The City University of New York
Asish C. Nag, Ph.D., University of Alberta
Nalin J. Unakar, Ph.D., Brown University

Professors:

George J. Gamboa, Ph.D., University of Kansas
Robert D. Hunter, Ph.D., Syracuse University
Charles B. Lindemann, Ph.D.,
State University of New York at Albany
Virinder K. Moudgil, Ph.D., Banaras Hindu University
John R. Reddan, Ph.D., University of Vermont

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G. Rasul Chaudhry, Ph.D., University of Manitoba
John D. Cowlshaw, Ph.D., Pennsylvania State University
Arik Dvir, Ph.D., Hebrew University of Jerusalem
Sheldon R. Gordon, Ph.D., University of Vermont
Thaddeus A. Grudzien, Jr., Ph.D., Virginia Polytechnic Institute
and State University
Fay M. Hansen-Smith, Ph.D., Medical College of Wisconsin
Anne L. Hitt, Ph.D., Vanderbilt University
Barkur S. Shastri, Ph.D., University of Mysore
Satish K. Walia, Ph.D., Mahrishi Dayanand University
Jill Zeilstra-Ryalls, Ph.D., Purdue University

Assistant professors:

Shailesh K. Lal, Ph.D., University of Nebraska
Gabrielle A. Stryker, Ph.D., Johns Hopkins University
Douglas L. Wendell, Ph.D., University of California (Davis)

Adjunct professors:

Jeffrey L. Garvin, Ph.D., Duke University
Tom Madhavan, M.D., University of Madras

Adjunct associate professor:

Nalini Motwani, Ph.D., Wayne State University

Adjunct assistant professors:

Sumit Dinda, Ph.D., Oakland University
Andrew F.X. Goldberg, Ph.D., Brandeis University

The Master of Science in Biology

The program leading to a Master of Science provides advanced training to students seeking employment in biological disciplines. The Master of Science in biology also prepares students for entrance into Ph.D. programs.

The Master of Science program consists of two tracks: the cellular/molecular biology track for those students interested in organ systems or lower levels of biological organization, and the ecology, evolution and behavior track for students interested in whole organisms or higher levels of biological organization. The graduate program affords students the opportunity to interact closely with the biology faculty as they complete their thesis work.

Admission

Admission to the program requires a bachelor's degree from a regionally accredited institution and an undergraduate grade point average of 3.00 or better (on a 4.00 scale). Exceptions to the GPA requirement may be made if evidence of the capacity for graduate study is provided. Students should have completed at least 20 credits in biology, 8 credits in mathematics, 8 credits in physics and 15 credits in chemistry. Students with deficiencies in these areas may be conditionally admitted with the stipulation that the deficiencies will be corrected. Applicants must send, together with their application, a biographical sketch stating career goals and provide transcripts of all college-level work, two letters of reference and scores on the Graduate Record Examination to the Graduate Admissions. International students must also submit official TOEFL scores, a transcript evaluation and meet all requirements for admission for international students.

Requirements for the degree

The candidate for the cellular/molecular biology track must complete 36 credits (16 of which must be in courses numbered 500 and above) including 4-credit topic courses (BIO 511, 513, 515, 517) or their equivalents as approved by the student's thesis committee. At least 8 credits must be a combination of credits received in graduate laboratory courses and credits received in graduate research (BIO 690).

The candidate for the ecology, evolution and behavior track must complete 36 credits: 8 credits of graduate research (BIO 690), four 3-credit topics courses (BIO 581, 582, 583, 584) or their equivalents as approved by the student's thesis committee, 4 credits of a 500-level biology course (not BIO 581-584) or its equivalent as determined by the student's thesis committee, and 12 credits of biology courses and cognates. Students, with the advice and consent of their committee, may select cognate courses in statistics, computer science, chemistry, physics, mathematics, psychology, education and environmental science.

During the first semester the candidate must choose a thesis adviser with whom he or she will plan and conduct the thesis research. The adviser and candidate will then select a thesis committee. A thesis proposal and a thesis are required for both tracks. The thesis proposal must be approved by the thesis committee and the department graduate committee before the end of the student's second semester. When completed, the thesis must also be approved by both committees before it can be submitted to the Office of Graduate Study for approval. All theses/dissertations must conform to university standards (see "Master's thesis and doctoral dissertation" in the Policies and Procedures section of this catalog). Students of both tracks must attend department seminars each semester. All M.S. students are required to enroll in BIO 691 and present a departmental seminar on their thesis work prior to graduation.

■ The Master of Arts in Biology

The M.A. in biology is a non-thesis master's program that has a larger course component, but a lesser research component, than the M.S. The M.A. is designed for those students who wish to teach at the secondary or community college level and students who hold full-time jobs.

The admissions requirements for the M.A. are identical to those of the M.S. The course requirements for the M.A. are as follows: BIO 511, 513, 515, 517, 581, 582, 583 and 584. In addition, M.A. students must complete 8 credits of BIO 690 or 4 credits of BIO 690 combined with a relevant, four-credit course in another discipline such as education, health sciences, chemistry, physics, or mathematics. The total number of credits for the M.A. degree is 36. The maximum number of credits that can be transferred from another institution is 9.

M.A. students will earn their 4-8 credit hours of BIO 690 by working with one or more faculty members on a research project. The student will be required to write a report on their BIO 690 research. The departmental graduate committee will determine if students have met the degree requirements for the awarding of the M.A. in biology.

Research areas and facilities

The department, housed in both Dodge Hall and the Science and Engineering Building, is engaged in a variety of research programs including angiogenesis, sperm motility, aquatic biology, hormone action, microbiology, parasitology, molecular biology, insect behavior, vertebrate ecology, physiology of the eye, cell physiology, gene regulation, genomics and bioinformatics.

COURSE OFFERINGS

Selected 400-level courses recommended to the student by the departmental graduate committee may carry graduate level credit if the courses are not used to redress undergraduate deficiencies.

BIO 501

Physiology and Pathophysiology I (3)

Application of physiological principles to pathological and clinical alterations in the nervous and respiratory systems.

Prerequisite: BIO 207 or BIO 321.

BIO 502

Physiology and Pathophysiology II (3)

Application of physiological principles to pathological and clinical alterations in the cardiovascular, renal, gastrointestinal and endocrine systems.

BIO 503

Gross Anatomical Dissection (3)

Human gross anatomy as it relates to the practice of anesthesiology. Includes a laboratory with cadaver dissection.

BIO 505

Directed Readings in Biology (2, 3 or 4)

Term paper based on library research of a current research-oriented biological topic. May be taken more than once.

BIO 507

Cellular Biochemistry (4)

Advanced topics in biochemistry. Mechanisms of RNA and DNA metabolism, mechanism of protein synthesis and degradation, regulation of enzyme activity and metabolic pathways, and regulation of gene expression.

Prerequisites: BIO 325.

BIO 508

Cellular Biochemistry Laboratory (1)

Modern research techniques: chromatography (paper, column, thin layers, etc.) electrophoresis, immunoelectrophoresis, ultracentrifugation and cell fractionation, isolation and density gradient analysis of the nucleic acids, etc. To accompany BIO 507.

BIO 511

Advanced Topics in Cellular Biochemistry and Biophysics (4)

A discussion and lecture course offered by faculty members with research interests in biophysics and biochemistry. Topics will be announced.

BIO 512

Graduate Tutorial Lab in Cellular Biochemistry and Biophysics (2)

Techniques course offered to small groups of students in faculty research laboratories.

Corequisite: BIO 511.

BIO 513

Advanced Topics in Cell Physiology (4)

A discussion and lecture course offered by faculty members with research interests in cell physiology. Topics will be announced.

BIO 514

Graduate Tutorial Lab in Cell Physiology (2)

Techniques course offered to small groups of students in faculty research laboratories.

Corequisite: BIO 513.

BIO 515

Advanced Topics in Mechanisms of Development (4)

Mechanisms of development and multicellular gene regulation.

BIO 516

Graduate Tutorial Lab in Developmental Biology and Morphology (2)

Techniques course offered to small groups of students in faculty research laboratories.

Corequisite: BIO 515.

BIO 517

Advanced Molecular Genetics(4)

Advances in molecular biology and genetics with emphasis on recent developments in applications of recombinant DNA technology in oncogenesis, retroviruses, genetic diseases/disorders and gene therapy.

Prerequisite: Permission of instructor.

BIO 518

Advanced Methods in Molecular Genetics (2)

Advanced research techniques in molecular biology and recombinant DNA: gene transfer techniques, cloning and expression of genes, Southern and Northern hybridizations and polymerase chain reaction (PCR).

Prerequisite: Permission of instructor.

BIO 521

Medical Microbiology (4)

Bacterial and viral human pathogens, emphasizing their etiology, physiology, pathogenesis, epidemiology, control and diagnosis.

Prerequisite: BIO 111.

BIO 522

Medical Microbiology Laboratory (2)

Basic skills of handling pathogenic bacteria and their diagnosis.

Prerequisite or corequisite: BIO 521 or permission of instructor.

BIO 523

Immunology (3)

Human immune response. Emphasis on components of the immune system, antibody structure and function, antigen processing and presentation, T cell responses, immune response to infectious diseases and disorders of the immune system. Offered fall semesters.

Prerequisite: BIO 111, 113; BIO 309 recommended.

BIO 541

Microbial Biotechnology (4)

Microbial genetics, emphasizing the basic aspects of bacteriophage and plasmid genetics applied to biotechnology.

Prerequisite: BIO 341 or BIO 319 or permission of instructor.

BIO 563

Topics in Cell Biology (4)

Topics vary, but may include model systems, the origin of life, tissue culture, experiments in tissue culture, atherosclerosis, gene sharing, stem cells, oxidative defense systems, cell division and discussion of breakthrough areas in cell biology.

Prerequisites: BIO 309 or 321 or 325 or 341.

BIO 565

Medical Parasitology and Mycology (4)

Study of medically important protozoan, helminth, arthropod, and mycotic organisms; their morphology, biology, clinical manifestations, pathogenesis, immunology, epidemiology and control. Includes laboratory methods for identification of medically important parasites. Offered winter semesters.

Prerequisites: BIO 111, 113 and 116.

BIO 581

Topics in Physiological Ecology (3)

Physiological responses of organisms to their environment including plant/herbivore interactions, adaptations of desert animals, allelopathy, energy cost of animal activities, communication on an organizational level. Offered alternate fall semesters.

Prerequisite: One course in ecology or physiology.

BIO 582

Topics in Evolutionary Biology (3)

Advanced topics in evolutionary biology including evolutionary rates, the nature of selection, adaptation, macroevolution, the application of molecular biology to evolution and philosophical issues of evolution. Offered alternate winter semesters.

BIO 583

Topics in Community and Population Biology (3)

Analytic and synthetic approaches to the biology of populations and communities utilizing both plant and animal studies. Topics will include population genetics, growth and regulation, inter- and intraspecific competition, predator-prey interactions, community structure and species diversity. Offered alternate fall semesters.

Prerequisite: One course in ecology or evolution.

BIO 584

Topics in Behavioral Biology (3)

The ecology, evolution, genetics and physiology of behavior, especially social behavior. Topics will include kin recognition, mate choice, dominance hierarchies and the mechanisms by which societies are organized. Offered alternate winter semesters.

Prerequisite: BIO 353 or permission of instructor.

BIO 591

Selected Topics in Biology (1-5)

Advanced topics in a specialized area of biological sciences. The topics may vary. May be repeated for additional credit.

Prerequisite: Permission of department.

BIO 601

Advanced Human Physiology (4)

Lectures and discussion emphasizing the human organism and the experimental basis for current concepts and techniques. Topics include: reproduction, circulation, respiration, electrophysiology and cellular mechanisms in physiological processes. Offered fall semesters.

Prerequisite: BIO 207 or 321.

BIO 605

Special Topics in Communication (4)

Special topics in scientific communication.

BIO 611

Ethics in Science (1)

Discussion of ethical issues in science and medicine.

BIO 671

Biological Communication I (4)

Extracellular and intercellular mechanisms of biological communication.

BIO 673

Biological Communication II (4)

Intracellular signaling pathways regulating cellular functions.

BIO 690

Graduate Research (1 to 8)

Research credits limited to graduate students in the biological sciences. This research will serve as the basic course leading to the preparation of a thesis.

BIO 691

Thesis Seminar (1)

A departmental seminar by M.S. candidates on their thesis research. The seminar is normally presented the last semester of graduate study.

DEPARTMENT OF CHEMISTRY

260 Science and Engineering Building • (248) 370-2320 • Fax (248) 370-2321
<http://www2.oakland.edu/chemistry/> • chemgradinfo@oakland.edu

Chair:

Michael D. Sevilla

Professors emeriti:

Kenneth M. Harmon, Ph.D., University of Washington
 Steven R. Miller, Ph.D., Massachusetts Institute of Technology
 Robert L. Stern, Ph.D., Johns Hopkins University

Professors:

Gottfried Brieger, Ph.D., University of Wisconsin
 Maria Bryant (Szczesniak), Ph.D.,
 University of Wroclaw (Poland)
 Arthur W. Bull, Ph.D., Wayne State University
 Denis M. Callewaert, Ph.D., Wayne State University
 Dagmar R. Cronn, Ph.D., University of Washington
 Isaac Eliezer, Ph.D., Hebrew University of Jerusalem
 Kathleen H. Moore, Ph.D., Wayne State University
 Joel W. Russell, Ph.D., University of California (Berkeley)
 Mark W. Severson, Ph.D., University of Minnesota
 Michael D. Sevilla, Ph.D., University of Washington
 R. Craig Taylor, Ph.D., Princeton University
 Paul Tomboulia, Ph.D., University of Illinois

Associate professor:

Julien Gendell, Ph.D., Cornell University
 John V. Seeley, Ph.D., Massachusetts Institute of Technology

Assistant professors:

Amanda Bryant-Friedrich, Ph.D.,
 Ruprecht-Karls University (Germany)
 Ferman Chavez, Ph.D., University of California (Santa Cruz)
 Roman Dembinski, Ph.D., Polish Academy of Science (Poland)
 Linda Schweitzer, Ph.D., University of California (Los Angeles)
 Xiangqun Zeng, Ph.D., State University of New York (Buffalo)

Adjunct professors:

David Becker, Ph.D., University of Washington
 Grzegorz Chalasinski, Ph.D., University of Warsaw (Poland)
 Anna C. Ettinger, Ph.D., University of Illinois
 Gholam-Abbas Nazri, Ph.D., Case Western Reserve University
 Fazlul Sarkar, Ph.D., Banaras Hindu University (India)

Adjunct associate professor and Special instructor:

Ghassan M. Saed, Ph.D., University of Essex (United Kingdom)

Adjunct assistant professors:

Janet Bennett, Ph.D., Oakland University
 Gerald Compton, M.S., Oakland University
 Naomi Eliezer, Ph.D., Hebrew University of Jerusalem

The Doctor of Philosophy in Biomedical Sciences: Health and Environmental Chemistry

Coordinator:

Kathleen H. Moore

The College of Arts and Sciences offers a doctoral degree in biomedical sciences with a specialization in health and environmental chemistry which is centered in the Department of Chemistry. The program requires a strong academic background in the physical sciences. Graduates will have completed a unified program of formal course work, as well as independent dissertation research, and will possess the theoretical background and practical skills necessary for successful contribution to the solution of environmental and health-related chemical problems. Scientists who graduate with this specialization will be capable of applying state-of-the-art methods to the determination, quantification and management of a wide variety of naturally occurring and synthetic chemical substances and the related chemical processes. No other doctoral program in Michigan focuses on these particular areas of chemistry, yet the contributions of highly trained doctoral-level scientists are essential to the resolution of major problems facing the nation in these areas.

Required areas of graduate level proficiency

Areas of graduate level proficiency required for the health and environmental chemistry specialization and the courses which fulfill them are as follows: analytical chemistry (CHM 521 or 522), biochemistry (CHM 550, 553, or 554), toxicology (ENV 484 and CHM 581), and environmental science (ENV 485 or 486). In addition to the five proficiency courses, students will take 12 credits of advanced course work which is related to their dissertation area and 2 credits of doctoral seminar (CHM 685). Attendance at departmental seminars is required.

For information on admission criteria, procedures and general degree requirements, see the Biomedical Sciences Doctoral Program section in this catalog. A detailed description of policies and procedures is also available from the program coordinator.

■ The Master of Science in Chemistry

The Master of Science in Chemistry can be viewed as either a terminal or non-terminal degree. By itself it serves as preparation for employment in chemical and related industries, a wide range of government agencies, and two-year college teaching. It also prepares the student for further study toward advanced degrees in chemistry, pharmacology, toxicology, oceanography, medicine, environmental science, and related fields. The program may be adapted to both full-time and part-time students.

The Master of Science in Chemistry is offered in both thesis and non-thesis plans. The thesis plan, which includes a significant laboratory or theoretical research component, is particularly valuable for persons planning to pursue a future Ph.D. degree, or for those preparing for or engaged in industrial laboratory employment. The non-thesis option is designed for those students who either cannot schedule or do not need the thesis research component, and offers opportunity for extended study of advanced chemistry for persons currently employed in industry or teaching professions, or for those who wish a more rigorous technical background ancillary to professional employment in business, law or medicine.

With appropriate course selection, the Master of Science candidate can focus his/her graduate work in a traditional area of chemistry (analytical, biochemistry, inorganic, organic or physical) or in an interdisciplinary area such as environmental chemistry, chemical education, polymer chemistry or toxicology.

Admission

The applicant for admission to regular status in the Master of Science program must have received a bachelor's degree from a regionally accredited institution. Students should have completed at least 36 credits in chemistry (including general, organic, physical and analytical chemistry), 8 credits in calculus, and 8 credits in physics. Students with deficiencies in these areas will need to correct them. Applicants with degrees over five years old may also need to complete additional course work. A grade point average of at least 3.00 (on a 4.00 scale) in these courses is usually required, but applicants will be considered on their individual merits upon recommendation of persons familiar with each applicant's academic background. The Graduate Record Examination may be required, specifically if the applicant does not hold a degree from a regionally accredited institution.

Applicants who do not meet the above requirements may be admitted with probationary status into special graduate status or into post-baccalaureate status.

Requirements for the degree

The candidate for the thesis plan Master of Science in chemistry must complete 32 credits in courses carrying graduate credit, of which 24 credits must be in chemistry. Courses with 400-level numbers may be included providing they do not duplicate courses in the student's undergraduate degree. At least one lecture course must be taken in each of four different areas

chosen from biochemistry, inorganic chemistry, organic chemistry, physical chemistry, polymer or industrial chemistry, analytical chemistry and environmental science. At least 8 of the 32 credits must be in CHM 690. The candidate must have demonstrated accomplishment in research and must complete a thesis approved by a departmental thesis committee before receiving the degree. All theses must conform to university standards (see "Master's thesis and doctoral dissertation" in the Policies and Procedures section of this catalog). No minimum time can be specified for the degree program. Students working on a continuing research project should be registered concurrently for at least 1 credit of CHM 690. Courses taken without an adviser's approval may be excluded from those to be applied to the degree.

The candidate for the non-thesis plan Masters of Science in chemistry must complete 32 credits in courses carrying graduate credit, of which 24 credits must be in chemistry. Courses with 400-level numbers may be included providing they do not duplicate courses in the student's undergraduate degree. At least one lecture course must be taken in each of four different areas chosen from biochemistry (or approved biology courses), inorganic chemistry, organic chemistry, physical chemistry, polymer or industrial chemistry, analytical chemistry and environmental science. Each student will be assigned a two-person committee responsible for planning a suitable set of courses which will meet the departmental requirements and the student's particular needs. This might include either concentration in a specialized area related to employment or a broad background in preparation for teaching. Courses taken without the committee's approval may be excluded from those to be applied to the degree. For students interested in a research experience, up to 6 credits of CHM 690 may be included in the program by arrangement with an individual faculty researcher. No minimum time can be specified for the degree program.

Research fields

Current research interests of the faculty include: chemistry of free radical species generated from biological intermediates; fate of toxic organic compounds in the environment; electroanalytical and surface chemistry at solid/liquid interface; computational modeling of intermolecular interactions and surface phenomena; metabolism and biological activity of modified fatty acids and xenobiotic carboxylic acids; physiologic and pathologic mechanisms that modulate immune responses; synthesis and characterization of novel organic, organometallic and inorganic compounds with potential biochemical significance; synthetic modeling of metalloenzyme active sites; chemical education software; trace environmental analyses and environmental modeling; and novel analytical instrumentation. For current, detailed information on individual research efforts, please consult the faculty section of the Department of Chemistry web site www2.oakland.edu/chemistry.2

COURSE OFFERINGS

(400-level courses may count for credit in a graduate program only with permission of the program adviser.)

CHEMISTRY

CHM 412 Atmospheric Chemistry (3)

Chemistry of atmospheric gases and aerosols. Environmental issues (stratospheric ozone depletion, global warming, photochemical smog, acid rain, biosphere/atmosphere interactions). Concepts (lifetimes, sources, sinks, transport, global cycles). Social issues (air quality standards, effects of air pollutants). Measurement techniques.

Prerequisite: CHM 342.

CHM 413 Environmental Aquatic Chemistry (3)

Applications of inorganic and organic chemistry in natural waters pertaining to environmental concerns. Topics include acid-base reactions, buffer systems, mineral precipitation, chemical complexation, redox reactions, adsorption phenomena, chemical equilibria, and the influence of organic chemicals on transfer and reaction processes in the environment.

Prerequisite: CHM 234.

CHM 426 Instrumental Analysis (3)

An integrated examination of contemporary analytical instrumentation, including spectroscopy, electrophoresis, chromatography, and mass spectrometry. Emphasis is placed on developing a functional understanding through the analysis of samples typical of those examined in industrial laboratories. Two hours of lecture and four hours of laboratory per week.

Prerequisite: CHM 325

CHM 427 Electrochemistry (3)

Survey of electroanalytical and spectroelectrochemical methods. Includes microelectrodes and selective electrodes in bioelectrochemistry as well as electrical phenomena of the biological membrane level.

Prerequisite: CHM 325.

CHM 432 Advanced Organic Chemistry (3)

Selected topics in synthetic, structural and physical-organic chemistry.

Prerequisite: CHM 235.

CHM 444 Advanced Physical Chemistry (3)

Introduction to statistical mechanics. Applications of quantum and statistical mechanics to chemical bonding, molecular structure and spectroscopy.

Prerequisites: CHM 342, 343 and MTH 254.

CHM 453 Biochemistry I (3)

First course in a comprehensive biochemistry sequence. Structure and function of proteins, carbohydrates and lipids; enzyme mechanisms, kinetics and regulation; bioenergetics and catabolism. Identical with BCM 453.

Prerequisite: CHM 235.

CHM 454 Biochemistry II (3)

Metabolic pathways and control; nucleic acid structure, function and processing, including regulation of gene expression. Selected topics in molecular physiology.

Identical with BCM 454.

Prerequisite: CHM/BCM 453.

CHM 457 Biochemistry Laboratory (2)

Techniques of extraction, separation, identification and quantification of biomolecules, including electrophoresis, chromatography, and radioisotope techniques, with emphasis on mathematical treatment of experimental data.

Prerequisite: CHM/BCM 453 may be taken concurrently.

CHM 463 Inorganic Chemistry (3)

Structure, bonding, and reactivity of inorganic and organometallic compounds, with emphasis on transition elements and selected main group elements.

Prerequisite: CHM 362.

CHM 470 Industrial Chemistry (3)

Survey of the major sources and uses of chemicals, industrial chemical processes, fundamental raw materials and career paths available in the chemical industry. More intensive treatment of selected industrial processes.

Prerequisite: CHM 235.

CHM 471 Macromolecular Chemistry (3)

Preparation, properties and structure of selected inorganic and organic polymers. Both chemical theory and technological applications will be discussed.

Prerequisite: CHM 235.

CHM 472

Physical Chemistry of Macromolecules (3)

The molecular principles governing the physical behavior of macromolecules in solution and in the glassy and crystalline states. The mechanical behavior and structure of macromolecules.

Prerequisites: CHM 471 and CHM 343 or permission of instructor.

CHM 477

Macromolecular Laboratory (2)

Introduction to the synthesis and physical characterization of synthetic polymers.

Prerequisite: CHM 237 and CHM 471;

CHM 471 may be taken concurrently.

CHM 521

Advanced Analytical Chemistry (3)

An in-depth analysis of the operating principles behind modern instrumental techniques. Emphasis on techniques that are used throughout the branches of chemistry such as mass spectrometry, HPLC, gas chromatography, infrared spectroscopy and NMR. Relative merits of each technique are examined along with a survey of typical applications. Three hours of lecture per week.

Prerequisite: CHM 426.

CHM 522

Topics in Analytical Chemistry (3)

Selected subjects chosen from current analytical chemical areas, such as separation methods, instrumentation and electrochemistry. May be repeated for credit.

Prerequisite: CHM 426.

CHM 534

Advanced Organic Chemistry (3)

Detailed discussion of aspects of modern synthetic methods, stereochemistry and reaction mechanisms.

Prerequisite: CHM 235.

CHM 535

Topics in Organic Chemistry (3)

Selected subjects drawn from modern research fields. May be repeated for credit.

Prerequisite: CHM 235.

CHM 539

Applied Organic Spectroscopy (3)

Introduction to theory, experimental methods and chemical application of molecular spectroscopy. Focus on nuclear magnetic resonance (NMR), electronic and vibrational spectroscopy (UV-Vis and IR), electron spin resonance (ESR), and mass spectrometry (MS). Emphasis on spectrometric interpretation and subsequent identification of organic molecules. Laboratory demonstration and/or experiment on each technique.

Prerequisite: CHM 235

CHM 540

Symmetry in Chemistry (3)

Detailed treatment of point group symmetry. Chemical applications of group theory with special emphasis on MO, ligand field theory and vibrational and electronic spectroscopy.

Prerequisite: CHM 343.

CHM 541

Advanced Physical Chemistry (3)

Application of quantum mechanics and statistical mechanics to chemical kinetics, molecular structure and molecular spectroscopy.

Prerequisite: CHM 444.

CHM 542

Topics in Physical Chemistry (3)

Selected topics drawn from current areas of interest, such as quantum mechanics, statistical mechanics, thermodynamics, spectroscopy, kinetics and group theory.

May be repeated for credit.

Prerequisite: CHM 343.

CHM 544

Advanced Computational Chemistry (3)

Application of advanced methods of computational chemistry to experimental problems. Emphasis on the capabilities and limitations of these techniques and on interpretation of results of state-of-the-art computational software.

Prerequisite: CHM 220 or equivalent, CHM 343.

CHM 550

Science and Business of Biotechnology (3)

Detailed analysis of key facets of modern biotechnology industry, including recent advances in biochemistry, molecular biology and immunology, and the application of these technologies to diagnosis and treatment of disease, forensic medicine, agriculture and other industries. Case studies illustrate successful commercialization of biomedical research.

Prerequisite: CHM/BCM 454.

CHM 553

Advanced Biochemistry (3)

Detailed treatment of aspects of biochemistry.

Prerequisite: CHM/BCM 454.

CHM 554

Topics in Biochemistry (3)

Selected subjects drawn from the current fields of interest, such as immunochemistry, biotechnology and molecular biology. May be repeated for credit.

Prerequisite: CHM/BCM 454.

CHM 555**Signal Transduction (3)**

Literature-based consideration of biochemical communication that occurs when extracellular signals interact with cell receptors and activate complex intracellular signaling pathways. Detailed analysis of molecular interactions (protein-protein and protein-DNA) that convert the external signal to changes in cellular gene expression. Emerging experimental techniques will be emphasized.

Prerequisite: CHM/BCM 454 or equivalent

CHM 563**Advanced Inorganic Chemistry (3)**

Detailed treatment of the chemistry of the elements.

Prerequisite: CHM 362 or permission of instructor.

CHM 564**Topics in Inorganic Chemistry (3)**

Selected topics chosen from current areas of interest, such as transition metal chemistry, boron chemistry, ligand field theory and organometallic chemistry. May be repeated for credit.

Prerequisite: CHM 362 or permission of instructor.

CHM 565**Bioinorganic Chemistry (3)**

Emphasis on the role of inorganic elements, especially transition metals, play in biochemical systems. Topics discussed include metalloenzymes, role of inorganics in medicine (chemotherapeutic agents), nutritional aspects, toxicity, physical methods of detection in biochemical systems.

Prerequisite: CHM/BCM 453, CHM 362 or permission of instructor.

CHM 573**Fundamentals of Materials Chemistry (3)**

Comprehensive coverage of the fundamentals of applied materials chemistry. Discussion of key issues in physics and chemistry of materials. Will provide basis for understanding of solid-state chemistry, solid-state physics, and materials science.

Prerequisite: CHM 342 or 343.

CHM 581**Biochemical Toxicology (3)**

Systematic treatment of toxicological principles at cellular and biochemical levels. Emphasis is on mammalian toxicology, including: uptake and distribution, activation and metabolism; modes of action; theories of carcinogenesis and mutagenesis.

Prerequisites: ENV 484 or 486; CHM/BCM 454; *physiology desirable.*

CHM 590**Graduate Projects (1-6)**

Advanced project-oriented laboratory and/or computer investigation focused in area relevant to student interest. Written report required. May be repeated for a total of 6 credits.

Prerequisite: Regular MS program status, completion of two graduate courses, permission of instructor.

CHM 685**Seminar in Health and Environmental Chemistry (1)**

Weekly seminars dealing with current issues and literature in health and environmental areas. For doctoral students only. May be repeated for up to 8 credits.

Graded S/U.

CHM 690**Graduate Research (1, 2, 3, 4, 5, 6 or 8)**

Prerequisite: Admission to regular graduate status. *Graded S/U.*

CHM 799**Doctoral Research in Chemistry****(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12)**

Prerequisites: Approval of dissertation topic. *Graded S/U.*

■ ENVIRONMENTAL STUDIES

ENV 484**Environmental Toxicology (3)**

Principles of toxicology applied to a variety of biological systems: exposure, biotransformations, mechanisms of toxicity; dose response relationships; and factors influencing toxicity.

Prerequisites: CHM 235; *biochemistry desirable.*

ENV 485**Environmental Fate and Transport (3)**

Distribution and transformation of chemical pollutants in air, water and soil. Topics include chemical equilibrium and mass transport processes, biotic and abiotic transformations, hydrology, and physiochemical properties of chemical pollutants that affect transport, accumulation and degradation.

Prerequisite: CHM 235.

ENV 486**Toxic Substance Control (3)**

Quantification and management of toxic substances, including production, use, distribution, exposure and control. Risk assessment and regulatory strategies will be emphasized.

Prerequisites: BIO 111 and BIO 113; CHM 234.

DEPARTMENT OF ENGLISH

517 Wilson Hall • (248) 370-2250 • Fax (248) 370-4429 • <http://www2.oakland.edu/english>

Chair:

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 Nancy L. Joseph, Ph.D., Florida State University
 Christopher C. Warley, Ph.D., Rutgers University

Special instructors:

Linda McCloskey, M.A., Oakland University
 Jimmy T. McClure, M.A., Oakland University
 Rachel V. Smydra, M.A., Eastern Michigan University

The Department of English offers a program leading to the degree of Master of Arts in English.

Admission

Admission to the department's advanced degree program is selective. Chief qualifications are a Bachelor of Arts degree from a regionally accredited institution and academic ability as indicated by the applicant's past record. Applicants must also explain in a statement their reasons for wishing to pursue the advanced study of literature and language. An English major, as such, is not regarded as indispensable background, but a substantial number of undergraduate English courses will normally be expected to appear in the applicant's record. Generally, successful candidates will have earned a 3.50 average in English courses.

In addition to the applicant's statement of purpose, applications should include the following materials:

- 1) Where possible, three letters of recommendation from professors familiar with the candidate's academic potential. These letters should speak to the candidate's record and potential in literary studies.
- 2) A writing sample, a critical or interpretive essay, of no more than 8 double-spaced typed pages, which demonstrates the candidate's qualification for graduate study in literature.

The application deadlines for the Master of Arts in English are April 1 for students entering in the fall semester and November 20 for students entering in the winter semester. There are no admits for spring or summer semesters. The program does not accept students into the Special Graduate status.

All entering graduate students must meet minimal university graduate admission standards. All will be enrolled conditionally until they are admitted by the department to degree candidacy. Consideration for candidacy comes after the student has successfully completed 16 credits of graduate work at Oakland University including the literary studies core. Normally, all courses offered toward candidacy must be completed with grades of 3.0 or better. Two grades below 3.0 will automatically render a student subject to evaluation and possible dismissal, as will one grade below 2.5. No transfer credits will be evaluated until a student is admitted to degree candidacy.

When students of specially-recommended ability, but with insufficient background—in extent or balance of previous studies—are admitted, they will be advised to improve their preparation and will usually be asked to take an appropriate number of departmental undergraduate courses before commencing graduate work. Accordingly, their degree programs may require a proportionately longer period to complete.

Enrollment for all courses is subject to the written approval of the chairperson or a graduate adviser.

The Master of Arts in English

The program leading to the degree of Master of Arts in English provides training for students interested in increasing their proficiency in the study of English and American literature and language.

The basic curriculum emphasizes major critical approaches rather than specialization within historical periods. Opportunity is offered for scholarly, pedagogical and creative application of such approaches to literature and language. The program serves the needs of those whose eventual goal is the Ph.D. degree; those who teach in secondary schools and who are preparing to teach in junior and community colleges; and those seeking an opportunity to enhance their analytical skills as they study literature from multiple perspectives.

Requirements for the degree

Nine courses (36 credits) are required, beginning with the three courses comprising the literary studies core: ENG 533, a course in the methods of literary history (ENG 543, 544, 545 or 546) and a course in literary kinds (ENG 563, 564, 565 or 566). The remaining six courses, chosen in consultation with an adviser, must include two 600-level seminars, or a 600-level seminar and ENG 690, the Master's Project. Completion of the literary studies core must occur before a student is considered for candidacy and is a prerequisite for all 600-level English courses. Within the 36 credits required for the degree, a student may be permitted to take one graduate course in a cognate liberal arts field, or ENG 510 in lieu of a cognate, but only with specific approval of the adviser. Students planning on obtaining a Ph.D. should become proficient in at least one foreign language.

Classification of Course Offerings

The graduate program of the Department of English offers four kinds of courses.

1 . Undergraduate courses (300 and 400 levels)

The student may take up to two undergraduate courses from regular departmental 300-level course offerings or, in rare cases, from 400-level courses exclusive of 498 and 499. This option exists primarily to prepare students for seminars in areas of language and literature for which they are not adequately trained. No undergraduate writing courses may be applied to the graduate program. Students must have prior written permission of a graduate adviser to register in an undergraduate course.

2 . Core courses (500 level)

500-level courses are designed to familiarize the student with the principal approaches to literature and language and with methods and tools appropriate to those approaches. These courses (ENG 533, 543, 544, 545, 546, 563, 564, 565, 566) are central to the graduate program because they prepare the student for the more specialized work of the seminars. (ENG 500, 510 and 534 are not core courses.)

3 . Seminars and the master's project (600 level)

The graduate seminar allows the student to do independent work in an area in which the instructor has special sophistication, and at the same time to gain criticism and support from other students working in the same area. The instructor will prescribe the subject matter of each course during any given semester. Completion of the literary studies core is a prerequisite for enrollment in a 600-level course. Seminars are limited to 12 students. ENG 690, The Master's Project (optional), involves completion of a project of a scholarly or pedagogical nature, proposed initially by the candidate. Any written work to be submitted in partial or total fulfillment of a project should not exceed 7,500 words. Projects normally arise out of graduate course work. The course is open only to students who can propose an independent project and who have made arrangements with a member of the department interested in supervising it. Students seeking approval to proceed should submit an application for ENG 690 (available in the department office) and a prospectus of the project prior to the beginning of the semester in which they will complete the project. For students undertaking the Master's Project during the winter or spring semester, this application is due four weeks prior to the start of the semester; for fall semester, it is due six weeks prior.

4 . Summer workshops

Concentrated four-week workshops on literature, language, writing and other topics of interest to high school teachers and post-baccalaureate students are offered in the summer session. They are designed as refresher courses or as introductions to topics of particular contemporary concern. Workshops grant one to four hours of graduate credit. Students may not offer more than 4 credits of workshops toward fulfillment of requirements for advanced degrees except by permission of the graduate committee of the department. Candidates for degrees must consult with their advisers before electing summer workshops.

When there is significant change in content, graduate courses may be repeated with permission of the chair of the Graduate Program Committee.

Cognate courses

Students in the M.A. program may, with written approval of the chairperson of the Graduate Program Committee, offer one graduate course from another department for credit toward their degrees. Such courses should be advanced work in a field relevant to the students' special interests and needs.

COURSE OFFERINGS

ENG 500

Advanced Topics in Literature and Language (2 to 4)

Special topics and problems selected by the instructor.
Not a core course.

ENG 510

The Teaching of Literature and Composition (4)

Focus on pedagogy, emphasizing practical applications to literature, language or composition.

ENG 515

Summer Workshop (1 to 4)

Concentrated four-week workshops on literature, language, writing, and other topics of interest to high school teachers and post-baccalaureate students. See listing above on "Summer Workshops."

ENG 533

Critical Theory and Practice (4)

Introduction to critical methodology, emphasizing practical applications. Required of all students.

ENG 534

Language History (4)

An intensive study of the development of standard English through an examination of texts that are representative of Early Modern English, Middle English and Old English.

LITERARY HISTORY

ENG 543

Early British (4)

The course will concentrate on some period of British literary history before the eighteenth century. Emphasis on concepts, approaches, methodology appropriate to the literary historian. Literature in historical perspective and in cultural and social contexts.

ENG 544

Later British (4)

The course will concentrate on some period of literary history from the eighteenth century to the present. Emphasis on concepts, approaches, methodology appropriate to the literary historian. Literature in historical perspective and in cultural and social contexts.

ENG 545

American (4)

The course will concentrate on some period of American literary history. Emphasis on concepts, approaches, methodology appropriate to the literary historian. Literature in historical perspective and in cultural and social contexts.

ENG 546

Special Topics (4)

As designated by instructor.

LITERARY KINDS

ENG 563

Fiction (4)

Studies of the novel and/or shorter fiction, including definitions of the form and attention to variations among different examples of the form.

ENG 564

Drama (4)

Studies of drama including definitions of the form and attention to variations among different examples of the form.

ENG 565

Poetry (4)

Studies of poetry including definitions of the form and attention to variations among different examples of the form.

ENG 566

Modes or Special Forms (4)

Studies of a particular mode (such as comedy, tragedy, satire, romance) or of an approach to literature through modes; or studies of another form such as film, biography, nonfictional prose and folklore.

■ SEMINARS

(Prerequisite: Completion of the literary studies core)

ENG 600

Studies in Language and Literature (4)

Special topics and problems as selected by instructor.

ENG 640

Studies in American Literature: Focus Pre-Civil War (4)

ENG 641

Studies in American Literature: Focus Post-Civil War (4)

ENG 642

Studies in Old and Middle English Literature (4)

ENG 643

Studies in Renaissance Literature (4)

ENG 644

Studies in Eighteenth Century Literature (4)

ENG 645

Studies in Nineteenth Century Literature (4)

ENG 646

Studies in Modern Literature (4)

ENG 647

Studies in the Structure of English (4)

ENG 648

Studies in Literary Theory (4)

ENG 680

Children's Literature Project (4)

Restricted to qualified students in the Children's Literature minor specialization for Ph.D. in Reading.

ENG 690

The Master's Project (4)

Completion of a modest project of a scholarly or pedagogical nature proposed by the degree candidate.

Prerequisite: Permission of the Graduate Program Committee.

DEPARTMENT OF HISTORY

378 O'Dowd Hall • (248) 370-3510 • Fax (248) 370-3528 • <http://www.oakland.edu/history/>

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Carl R. Osthaus

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W. Patrick Strauss, Ph.D., Columbia University
S. Bernard Thomas, Ph.D., Columbia University
Anne H. Tripp, Ph.D., University of Michigan
Richard P. Tucker, Ph.D., Harvard University

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Karen A. J. Miller, Ph.D., Columbia University
Seán Farrell Moran, Ph.D., American University

Assistant professors:

Derek Hastings, Ph. D., University of Chicago
Weldon C. Matthews, Ph.D., University of Chicago
Mark Metzler, Ph.D., University of California (Berkeley)

The Master of Arts in History

This program may serve either as a terminal degree or as a bridge to more advanced study and is designed to accommodate both full- and part-time students. In addition to a complete daytime schedule, late afternoon and evening courses are also available.

Admission

Admission to the Master of Arts program in history is selective. The department will consider applicants who hold the degree of Bachelor of Arts or Bachelor of Science from a regionally accredited institution and whose credentials, including transcripts and letters of recommendation, give evidence of academic distinction. A detailed statement of purpose or justification for entering the graduate program, and evidence

of mastery of scholarly research techniques in history (such as the submission of a research paper or the completion of an undergraduate history seminar or history research course), are required as part of the application. An undergraduate major in history is not an absolute requirement for admission, but a significant number of undergraduate history courses—for example, a history minor or its equivalent—should appear on the applicant's records.

A grade point average of 3.20 (on a 4.00 scale) in undergraduate history courses and a GPA of 3.00 in all undergraduate work will ordinarily be considered the minimum standards for admission. Students of superior promise but with deficient preparation in history may be admitted on condition of completing additional undergraduate history courses or earning grades of 3.2 or above in each of the first two graduate history courses. The department reserves the right to waive any of its requirements in exceptional circumstances with the concurrence of the Vice Provost for Research and Graduate Study.

Students may be admitted at four different times: fall semester, winter semester, spring or summer session.

Requirements for the degree

Candidates for the degree of Master of Arts in history must complete 38 graduate-level credits in history (in special cases the Department of History graduate committee may permit a candidate to substitute up to 12 graduate credits in related fields for history credits). At the time of admission, each candidate will choose a major field from the following three areas: United States; Europe (including Great Britain and Russia); Africa, Asia, and Latin America. The candidate must take at least 20 credits in the major field. All candidates must complete at least one colloquium (HST 610), two research seminars (HST 680), or two research tutorials (HST 681), or one of each, and the field examination or thesis (HST 600). Students may not enroll for graduate courses corresponding in title and/or coverage with undergraduate history courses for which they have previously gained credit at Oakland University. Upon the successful completion of three or four graduate courses (12-16 credits), candidates will (a) elect to complete their degree by thesis or by field examination; and (b) select a departmental Mentor and Co-mentor, notifying the graduate adviser of their choices.

Candidates who elect to offer a thesis in partial fulfillment of the degree requirements will fulfill all the requirements listed above; they will take research seminars or tutorials in the major field as thesis-writing courses, and their comprehensive oral examination will concentrate on the thesis and historical problems related to it. A detailed thesis prospectus is to be provided to the Mentor and graduate adviser, preferably upon completion of 24 credits in the candidate's program. All theses/dissertations must conform to university standards (see "Master's thesis and doctoral dissertation" in the Policies and Procedures section of this catalog).

Candidates who do not elect to offer a thesis will fulfill all the requirements listed above; they must take at least one seminar or research tutorial in the major field, and their examination will be devoted to the history of the major field, as described below under Field or Thesis examination (HST 600).

There is no general foreign language requirement for the M.A. in history, but to study certain fields the candidate may need a reading knowledge of a foreign language. Candidates must consult their advisers for the language requirements of specific courses and programs.

Field or Thesis Examination (HST 600)

The examination is taken in the last semester of the student's program; each student must secure permission of the faculty adviser before registering. Candidates who submit a thesis will be examined orally for up to one hour on the thesis and historical problems related to it. The thesis oral examination may not be retaken. Candidates who do not submit a thesis will be examined on the major field; the examination will be adapted to the student's individual program, and the examining committee may assign special readings to be completed for the examination. Candidates taking the examination will be allowed one week to write take-home essays responding to the committee's questions; if the essays are acceptable, the candidate will be tested in a one-hour oral examination. Satisfactory performance on both written and oral selections is required for graduation. A student who fails may retake the field examination in any succeeding semester.

COURSE OFFERINGS

HST 501

History of American Cities (4)

History of American Cities from pre-industrial America to the present, emphasizing the effect of such forces as industrialization, immigration, migration, trade, economic patterns and transportation upon city organization and life.

HST 502

American Labor History (4)

The economic, social and political history of the American work force and labor movement with emphasis on the history of organized labor.

HST 504

History of the American Industrial Economy and Society (4)

The development of the American industrial system and its impact on business organization, labor, government and the international economy.

HST 505

The History of American Mass Media (4)

The establishment and growth of mass communication in the United States, focusing on the development of print, film, radio and television and their impact on society and popular culture.

HST 506

U.S. Colonial History (4)

Examines the major themes and developments of the Colonial period with an emphasis on regional settlement and development patterns, political and social growth, and the maturation of the colonies.

HST 508

The American Revolution (4)

Considers the broad social and political movements leading to the Revolution as well as the many different meanings and interpretations of the event, and the immediate and long-term effects of legacies of the Revolution.

HST 509

The U.S. Early National Period, 1787-1815 (4)

Examines the political and social development of the new nation from the Constitution through the end of the War of 1812.

HST 510

Jacksonian America (4)

Examines the chief political, social, cultural, economic, and religious developments from the War of 1812 to the end of the Mexican War.

HST 511

The Development of Political Practices in Early America (4)

The development of politics and political culture in the U.S. from the Colonial period through the Age of Jackson. Emphasis will be placed on defining, recognizing and understanding political culture, and the variations in political development and practices by region and social class.

HST 512
The Civil War and Reconstruction, 1850-1876 (4)

The origins of secession, the wartime problems of the Union and the Confederacy, the principal military campaigns, the Reconstruction Era and the creation of a new Union, and the significance of the Civil War and Reconstruction in American history.

HST 513
American History, 1876-1900 (4)

The New South, industrial consolidation, the origins of the modern labor movement, the rise of the city, immigration, agrarian protest movements, the businessman's philosophy and the challenge to laissez faire.

HST 514
American History, 1900-1928 (4)

The social, political and economic developments in the U.S. during the progressive era and the decade of the 1920s.

HST 515
American History, 1928-1945 (4)

A history of the Great Depression and World War II. Topics will include the One Hundred Days, the foundation of the modern welfare state, the foundation of the modern civil rights movement, the reorganization of American corporate enterprise and the role of the United States in international peacekeeping.

HST 516
The American Mind to 1861 (4)

American thought from the colonial period to the Civil War, emphasizing Puritanism, evangelical religion, the Enlightenment, republicanism, democracy, and sectional conflict.

HST 517
The American Mind since 1861 (4)

Major intellectual trends in the United States from the Civil War to the 1970s, including the conflict between nationalism and localism, the impact of evolutionism, and responses to the challenges of modernity, inequality, global involvement and war.

HST 519
History of the American South (4)

The South from colonial times to the 1960s, emphasizing the transition from the agrarian, slave South of the antebellum period to the modern South of the 20th century.

HST 520
Cold War America, 1945-1990 (4)

The origins of the Cold War, its impact on American foreign relations and domestic politics, its decline and demise.

HST 521
History of American Foreign Relations in the Twentieth Century (4)

American foreign policy and diplomacy from the Spanish-American War to the present, including such topics as American imperialism, Caribbean and Far Eastern policies, involvement in the world wars and the Cold War and nuclear diplomacy.

HST 523
Topics in African American History (4)

The economic, social, and political activities, status, organizations and institutions of African-American people, emphasizing the twentieth century.

HST 524
Ancient Greece and Rome (4)

An overview of the various intellectual, political and cultural legacies of ancient Greece and Rome, ranging in aspect from Homeric warfare, the mysteries of Dionysus and Delphi, Platonic and Aristotelian inquiry, Hellenic artistic ideals and Athenian democracy, to Roman legalism and jurisprudence, ideologies of imperial political control and Christianity.

HST 525
Medieval Europe, 300-1100 (4)

Examines the foundations of medieval Europe, including the Roman, Germanic and Christian roots; Charlemagne's Europe; cultural developments and the Church; the first crusade.

HST 526
The Italian Renaissance (4)

The European Renaissance period, with emphasis on the Italian experience.

HST 527
The Reformation (4)

European humanism, with emphasis on the Lowlands, France and Germany; the background, development and impact of the Protestant Reformation.

HST 528
Medieval Europe, 1100 to 1500 (4)

Examines Medieval Europe at the height of its socio-cultural development; the papacy; royal and imperial administration; the disturbed final centuries of war and plague.

HST 529
Europe in the Seventeenth Century (4)

A comparative analysis of European societies: the articulation of absolutism and constitutionalism, the emergence of the European state system, the origins and impact of modern science, the culture of the baroque and the development of commercial capitalism.

HST 530
England, 1066-1485 (4)

Emphasizes the history of England between the Conquest and the Tudors, including cultural and social trends, as well as political and dynastic developments and conflicts, domestic and foreign.

HST 534
Britain, 1815-1911 (4)

A consideration of the political, cultural, social and intellectual life of the British peoples from the passage of the Corn Laws to the Parliament Act of 1911.

HST 535
Britain, 1911 to Present (4)

An analysis of British political, cultural and social history from the eve of World War I to the present.

HST 538
Ireland, 1691 to Present (4)

History of modern Ireland from the Williamite wars to contemporary Ireland. Emphasis on the question of Irish national identity. Topics include colonial Ireland, revolution and the union, Catholic emancipation, the Great Famine, nationalism and republicanism, the 1916 Easter Rising, forging the new state and society, and the North.

HST 539
Women in Early Modern Europe, 1500-1789 (4)

Assesses women's contributions to the changes and events of early modern Europe, examines women in the private and public spheres, and explores the dynamic of gender in studying the impact of women in politics, the economy, literacy and culture, and religious practices and beliefs.

HST 541
Europe since 1914 (4)

An analysis of Europe in world perspective since World War I.

HST 542
Society and Culture in Early Modern Europe (4)

The lives of common men and women in early modern Europe. Topics include family and work, sexuality and gender, religion and folklore, riots and rebellion, printing and literacy.

HST 543
Germany since 1740 (4)

German politics, society and diplomacy from Frederick the Great to the present.

HST 544
Modern Italy: National Unification and the 20th Century (4)

An examination stressing political and institutional history, of early efforts to create Italian national unity, the means by which Italy was held together following unification of 1861, and the fate of the Republic from 1946 onward.

HST 545
France since 1789 (4)

French politics, society and international relations from the Great Revolution to the present.

HST 547
The French Revolution (4)

Survey of the revolutionary era in France beginning with the reign of Louis XVI (1774) and ending with the Battle of Waterloo (1815). Course will examine the origins, development and impact of the French Revolution with an emphasis on topics in political and cultural history.

HST 548
Europe in the Eighteenth Century (4)

A comparative analysis of European societies: the old regime in Europe, beginnings of industrial development, the Enlightenment as a political and social movement, reform under monarchy and the emergence of democratic ideologies and the French Revolution.

HST 549
France in the Age of Absolutism and Enlightenment (4)

The ancient regime in France from the end of the wars of religion to the beginning of the Revolution (1589-1789).

HST 550
The European Mind to 1700 (4)

Major developments in European thought from the God-oriented world views of the Middle Ages to the development of scientific concepts in the seventeenth century. Emphasis is on reading original materials.

HST 551
European Thought and Ideology, 1797 to Present (4)

A topical and thematic history of modern European thought and ideology: romanticism; liberalism and progress; science and technology; socialism; conservatism, pessimism, and the "revolt against reason"; fin de siècle culture; the effects of the Great War; fascism, genocide and totalitarianism; religious and existentialist thought.

HST 554
History of Modern Russia (4)

The historical development of Russia from its roots to the present. Special emphasis will be placed on events after World War II and perestroika.

HST 555
Eastern European History

The historical development of the peoples and states of Eastern Europe and the Balkans from the Middle Ages to the present will be examined in broad outline.

HST 561**History of American Families (4)**

History of American families as social institutions emphasizing the impact of historical events and trends upon family composition, family functions and family life. Includes research in the student's personal family history.

HST 562**History of African American Women (4)**

Covers the collective and individual experiences of African American women from slavery to the present, including the quality of family life, economic roles, and their activities in women's, civil rights and political organizations.

HST 563**History of Southern South America (4)**

The social, political and economic history of Argentina, Brazil and Chile in the nineteenth and twentieth centuries; frontier expansion and Indian warfare, slavery and Empire in Brazil, regionalism and nationalism, industrialization and urbanization, and international relations.

HST 566**Slavery and Race Relations in the New World (4)**

A comparative study of slavery in North America, Latin America and the Caribbean, and the present state of race relations in these areas.

HST 567**History of Mexico (4)**

The scope and achievements of pre-Columbian civilizations, the Spanish Conquest, the emergence of a multiracial society, the achievement of political independence and nation-building in the twentieth century.

HST 570**Origins of Modern Japan (4)**

Japan from the "late feudalism" of the Tokugawa period through the first phase of Western-style modernization in the Meiji period. Themes include the perfection and decay of the samurai state, the Meiji revolution, nationalism, imperialism, and movements for social and political democracy.

HST 571**Twentieth-Century Japan (4)**

Japan since the Meiji period: the Taisho democracy movement, the changing position of women, fascism and militarism, total war, the American occupation, and the rise to economic superpower status.

HST 572**The Political Economy of Japan (4)**

Japan's economic development since 1600: merchant versus samurai, the opening to world trade, industrial revolution, the war economy, the "Japanese miracle," and the ongoing aftermath of the stock market collapse. Special attention to the subjective experiences of the men and women who built Japan's unique economic achievements.

HST 573**China's Last Dynasty: The Qing, 1644-1911 (4)**

History of China's last great dynasty, from its founding by the Manchus in 1644, through its powerful early emperors, to its collapse in 1911. Course includes discussion of traditional Chinese culture and institutions, territorial expansion, the Opium Wars and the 19th century revolutionary movement.

HST 574**China in Revolution, 1911-1949 (4)**

China's 20th century revolutionary experience, focusing on the 1911, 1928 and 1949 revolutions. Topics include the struggle between China's two revolutionary parties, the Nationalists and Communists; social change under the young republic; World War II in Asia; and the civil war which brought the Chinese Communist Party to power in 1949.

HST 576**Contemporary China: The People's Republic from 1949 to Present (4)**

History of contemporary China from the 1949 revolution to the present, focusing on major social and political issues facing the Chinese Communist Party and attempted solutions. Topics include economic development, political and social change and the 1980s era of reform.

HST 577**China and Inner Asia (4)**

Examination of China's historical relations with Inner Asia, focusing on Chinese policy toward steppe empires north of the great wall and including discussion of the nomadic Xiongnu, Turks, early Tibetans, and Mongols. Emergence of modern Inner Asian peoples such as the Uyghurs, Kazaks, and Manchus, and the role of Inner Asia in shaping modern China.

HST 580**Technology and Culture (4)**

Explores the history and relationship between technology and artistic creativity. Key themes include interaction of travel and landscape, relationship between aircraft and modern art, and the representation of technology in film.

HST 581**History of India (4)**

The evolution of politics, social structure and the economy of India, from early Hindu Kingdoms through Muslim conquests and British colonialism to the era of independence since 1947.

HST 582**History of Transportation Since 1800 (4)**

Explores the history of transportation in the United States and Europe in the 19th and 20th centuries. Key themes include the geographical unification of the U.S. with the railroads, the demise of public transportation, and the benefits and problems of our current car culture. No engineering knowledge necessary.

HST 583

History of Information Technologies from 1500 (4)

History of information technologies from 1500 to 2001. Topics include printing with movable type, telegraphy, telephones, sound recording, and the Internet. The emphasis is on the social context and meaning of these communication devices. No engineering knowledge necessary.

HST 584

Global Environmental History (4)

Examines the way humans have shaped, used, and misused the environment. Topics range from the Neolithic Revolution to the Industrial Revolution and the rise of conservationism and ecology.

HST 585

Ancient Egypt and Africa (4)

A cultural history of ancient African civilizations, focusing primarily on Egyptian national culture from its beginning (c.3100 B.C.E.) until the Islamic Age (c.640-). Introduces ancient arts and religions from Kush, Ethiopia, Carthage and Roman Africa, culminating in the contributions that Africans like St. Augustine made to the growth of early Christianity.

HST 586

African History Since 1900 (4)

A socio-cultural and political history of 20th-century Africa, focusing particularly on social change, nationalist leaders and constructive critics in such modern nations as Ghana, Senegal, Kenya and Tanzania.

HST 587

History of Southern Africa (4)

A regional introduction to historical trends in the development of ethnic conflicts, economic classes, political ideologies and family relationships in southern Africa since 1500, with special emphasis on such trends during the development of apartheid in South Africa since 1948.

HST 588

African Cultural History (4)

A cultural history of medieval and early modern Africa (c.640-1900), beginning with such Islamic civilizations as Egypt and Mali. Explores how indigenous cultural traditions in such nations as Mali, Benin and Asante (Ashanti) guided the historic development of West African national cultures. Includes historic cultures from East and Central Africa.

HST 590

Selected Topics in History (4)

Directed reading and research at the graduate level, in fields of history in which advanced graduate courses are not available. *Prerequisite: Permission of supervising instructor.*

HST 591

Directed Readings for Graduate Students (4)

Directed individual readings on specific topics. *Prerequisite: Permission of supervising instructor.*

HST 592

Working Detroit (4)

Explores the history of 20-century Detroit from the perspectives of its workers and unions. Key themes include immigration and ethnic diversity, the rise of mass production, the union movement, race relations, gender and the labor force, the postwar boom, and de-industrialization.

HST 593

Oral History (4)

Explores the complexities of a methodology widely used in historical research: interviewing people to learn about the past. Students will design their own oral history projects and conduct their own interviews.

HST 600

Field or Thesis Examination (2)

Examination taken in the last semester of the student's program; student must secure permission of the faculty adviser before registering. *Prerequisite: Permission of faculty adviser.*

■ GRADUATE COLLOQUIUM

HST 610

Colloquium in History (4)

Intensive reading and discussion on a significant period or broad topic in history. Students will present the results of study for group discussion. May be repeated for credit. *Prerequisite: Permission of supervising instructor.*

■ RESEARCH SEMINAR

HST 680

Seminar in History (4)

Research seminars are designed to develop skills in historical investigation and exposition; usually involve writing a major paper on a carefully selected topic. May be repeated for credit.

Prerequisite: Permission of supervising instructor.

HST 681

Research Tutorial (4)

Directed individual research leading to the writing of a scholarly paper of substantial length. May be repeated for credit.

Prerequisite: Permission of supervising instructor.

DEPARTMENT OF LINGUISTICS

320 O'Dowd Hall • (248) 370-2175 • Fax (248) 370-3144 • <http://www.pro.lin.oakland.edu>

Chair:

Peter J. Binkert

Professors emeriti:

Daniel H. Fullmer (Linguistics and English), Ph.D.,
University of Michigan

Don R. Iodice (French and Linguistics), M.A.T., Yale University

William Schwab (Linguistics and English), Ph.D.,
University of Wisconsin

Professor:

Peter J. Binkert (Linguistics and Classics), Ph.D.,
University of Michigan

Associate professor:

Madelyn Kissock, (Linguistics), Ph.D., Harvard University

Michael B. Smith (Linguistics), Ph.D., University of California
(San Diego)

Assistant professors:

Rose M. Lethsholo (Linguistics), Ph.D., University of Michigan

Samuel Rosenthal (Linguistics), Ph.D.,
University of Massachusetts (Amherst)

Associated faculty professors:

Carlo Coppola (Modern Languages and Literature, Linguistics),
Ph.D., University of Chicago

Alice S. Horning (Rhetoric, Communications and Journalism,
Linguistics), Ph.D., Michigan State University

The Master of Arts in Linguistics

The Master of Arts degree in linguistics provides post-baccalaureate instruction in current linguistic theory and in applied linguistics to teaching language arts or to teaching English to non-native speakers. The degree is intended to accommodate students who have done previous work in linguistics, as well as those who have had little exposure to the subject.

Admission

Admission is selective. The department will consider applicants who hold a baccalaureate degree from a regionally accredited institution and whose credentials, including transcripts and two letters of recommendation, give evidence of academic distinction. Applicants must explain, in a statement of purpose, their reasons for wishing to pursue graduate work in linguistics. Although an undergraduate major in linguistics is not a requirement for admission, applicants must demonstrate a knowledge of the basic principles of linguistics, as would be encountered in an introductory linguistics course.

A grade point average of 3.00 (on a 4.00 scale) in undergraduate work is ordinarily the minimum standard for admission.

At its discretion, the department may admit students of superior promise but deficient preparation provided that such students correct their deficiencies before commencing graduate work.

Students may be admitted during any semester of the University calendar. Applicants to the program must have all their credentials in to the Office of Graduate Study no later than six weeks before the beginning of their initial semester of registration. After that time, and until the beginning of classes, they may apply for admission as special graduate students. However, not more than 12 credits earned as a special graduate can be applied toward the degree; therefore, the application must be completed as soon as possible.

Upon completion of LIN 503 and LIN 504, students will be evaluated for admission to candidacy and will choose an area of specialization in consultation with the graduate adviser.

Requirements for the degree

The Master of Arts degree in linguistics will be awarded to the student who earns 36 credits in nine courses as specified below.

Upon admission to candidacy, the student will choose an area of specialization from among the following three: linguistic theory, teaching English as a Second Language or teaching language arts. Other specializations may be developed in consultation with the graduate adviser. At least 16 credits (four courses) of work must be in the area of specialization.

All students must complete LIN 503 (Introduction to Phonology) and LIN 504 (Introduction to Syntax). All students must also complete LIN 680 (Graduate Seminar in Linguistics) or LIN 690 (The Master's Thesis). The requirements for LIN 690 will be a thesis of considerable detail in which students must present the results of their independent research. LIN 690 may be elected only with departmental approval. All theses/dissertations must conform to university standards (see "Master's thesis and doctoral dissertation" in the Policies and Procedures section of this catalog).

When graduate courses are cross listed with undergraduate courses, graduate students will be required to complete additional work at the graduate level, usually an essay or a project decided in conjunction with the professor.

General Requirements

1. Nine courses (36 credits)
2. No more than 8 credits in courses from other departments
3. No more than 8 credits in 400-level LIN or ALS courses.
4. Either (a) two years of foreign language study, or (b) one year of foreign language study and LIN 410; in either case, demonstrated first year proficiency in at least one foreign language is required. First year proficiency can be demonstrated by satisfactory completion of a foreign language course at the 115-level.

Core program (12 credits)

- 1 . LIN 503 Introduction to Phonology
- 2 . LIN 504 Introduction to Syntax
- 3 . LIN 680 Seminar in Linguistics or
LIN 690 The Master's Thesis

Specializations

Linguistic theory (24 credits)

- 1 . LIN 603 Phonological Theory or
LIN 613 Advanced Phonology
- 2 . LIN 604 Syntactic Theory or
LIN 624 Advanced Syntax
- 3 . LIN 502 Historical Linguistics or
LIN 507 Introduction to Semantics
- 4 . One (1) of LIN 401 (Phonetics), 507 (Introduction to
Semantics), or 557 (Cognitive Linguistics)
- 5 . Two (2) electives

Teaching English as a second language (24 credits)

- 1 . LIN 401 Phonetic Theory
- 2 . ALS 518 The Teaching of English as a Second Language
- 3 . ALS 519 Practicum
- 4 . Two (2) of ALS 534 (Language Development in Children),
535 (Psycholinguistics), ALS 517 (Models of Second
Language Acquisition), 574 (Cross-Cultural
Communication), or 575 (Language and Culture)
- 5 . One (1) elective.

Teaching language arts (24 credits)

- 1 . ALS 520 Linguistics and Reading or
ALS 538 Theory and Practice in Language Testing
- 2 . ALS 534 Language Development in Children
- 3 . ALS 535 Psycholinguistics or ALS 518 The Teaching of
English as a Second Language
- 4 . LIN 604 Syntactic Theory or LIN 614 Advanced Syntax
- 5 . Two (2) electives

TESL Certificate

Students may earn a certificate in Teaching English as a Second Language (TESL) by taking the following 12 credits: ALS 518 The Teaching of English as a Second Language, ALS 519 Practicum (for those with no ESL experience) or ALS 517 Models of Second Language Acquisition (for those with ESL experience), and LIN 503 Phonology or LIN 504 Syntax. Interested students should contact the graduate adviser for linguistics to determine their eligibility. Please note: LIN 201 Introduction to Linguistics or its equivalent is prerequisite to these courses.

Graduate Certificate in Teaching English as a Second Language (TESL)

The program consists of 20 credits in Applied Language Studies (ALS) and Linguistics (LIN) as set forth below. It is designed for completion in one or two years by individuals who are already teaching and seeking further professional development or by those seeking additional preparation in order to enter the field of English as a Second Language (ESL).

Admission

All applicants with baccalaureate degrees from a regionally accredited institution will be considered. Ordinarily, a minimum undergraduate grade point average of 3.00 is required for admission to the program (as is the case for admission to the Master of Arts degree program in linguistics). After completion of 12 credits, students enrolled in the program will be evaluated to determine whether they should be allowed to complete the program. Previous training should include one introductory course in linguistics equivalent to LIN 201, Introduction to Linguistics.

Requirements for the certificate

Students must complete an approved program of at least 20 credits with an overall average of 3.00 in all courses, including ALS 518, LIN 503 or LIN 504, and ALS 517 or ALS 538. ALS 510 is also required for students with little or not ESL teaching experience. Students will choose at least 8 additional credits from among the following: ALS 517, 519, 538, 534, 535, 574, 575, 576; LIN 401, 503, 504, 507. Other ALS or LIN courses may be substituted with the approval of the certificate adviser. Courses included in the certificate should be selected to enhance competency in his/her specific field of interest and/or application.

Relationship to the Master of Arts in Linguistics

All courses taken to fulfill the requirements for the graduate certificate will count toward the Master of Arts (M.A.) degree program in linguistics with a TESL specialization. It is anticipated that a graduate of the certificate program who has all the prerequisites for the M.A. in linguistics can apply for admission to the program and complete the additional credits in about two calendar years as a part-time student or in one calendar year as a full-time students. The department will consider applications from students who complete the certificate program with less than 3.00 grade point average on an individual basis.

ESL Endorsement

The Department of Linguistics in conjunction with the School of Education has received approval from the State of Michigan Board of Education to offer an ESL Endorsement to teacher certification. The program consists of 20 credits taken in five successive semesters. The first cohort is slated to begin classes in Winter 2004. For further information, please contact the graduate adviser.

■ COURSE OFFERINGS

■ APPLIED LANGUAGE STUDIES

ALS 517

Models of Second Language Acquisition (4)

Development of second language ability among children and adults. Topics include first language acquisition theory, the relationship of second language acquisition to linguistic theory, and review and evaluation of competing models of second language development.

ALS 518

The Teaching of English as a Second Language (4)

Approaches, methods and techniques of teaching pronunciation, grammar and vocabulary. The use of language tests and laboratory techniques.

Prerequisite: LIN 201 or equivalent.

ALS 519

Practicum (4)

Supervised experience in some area of applied linguistics, such as working with non-native speakers of English, tutoring or other appropriate field work or internship to be approved by the Department of Linguistics.

Prerequisite: LIN 201 and either ALS 418/518 or permission of instructor.

ALS 520

Linguistics and Reading (4)

Linguistic description and analysis of the process of getting meaning from print. Course will review competing linguistic models of the reading process and insights from first and second language acquisition, psycholinguistics, reading disorders and studies in writing.

ALS 534

Language Development in Children (4)

Language acquisition in normal and abnormal children: stages of the acquisition process, the role of the environment, the relationship between language and the development of other skills, language acquisition in children with sensory and psychological disorders, and the relationship between language, reading and writing.

ALS 535

Psycholinguistics (4)

A study of the psychology of language, the accommodation between the cognitive and physical structure of human beings and the structure of language, the nature of the language learning process and the consequences of language use.

ALS 538

Theory and Practice in Language Testing (4)

A study of the different types of aptitude and achievement tests used in different language settings, including research and educational situations. Brief introduction to test statistics and computerized analysis of test scores. Practical aspects of testing: design, scoring and administration.

Prerequisite: ALS 517 or permission of instructor.

ALS 540

The Biology of Language (4)

Animal communication and the evolution of human capacity for language, development of language in normal and abnormal children, disorders of speech, hearing and language, language and the brain and genetic aspects of language.

ALS 560

Neurolinguistics (4)

The neurology of language: essentials of neuroanatomy; neurological mechanisms underlying language; aphasia and kindred disorders of speech; the relationship of language to memory, intelligence and cognition; language and mental retardation and psychological disorders.

ALS 574

Cross-Cultural Communication (4)

A theoretical and practical examination of the role of language and nonverbal modes in cross-cultural communication. Problems and strategies for developing awareness of and operational skills in cross-cultural processes.

ALS 575

Language and Culture (4)

Language viewed as cultural behavior, its system, acquisition and use; its relation to history, attitudes and behavior; standard languages; social dialects; pidgins; and creoles.

ALS 576

Language and Society (4)

Language in its social context: intrasocietal variation; social evaluation of language varieties (style, dialect) as an influence in language change; and the choice of a language variety as an index of group solidarity, social ideology and individual attitudes.

■ LINGUISTICS

LIN 401

Phonetic Theory (4)

Introduction to articulatory and acoustic descriptions of spoken language, and training in the recognition and production of sounds found in languages other than English.

Prerequisite: LIN 201.

LIN 410

Studies in the Structure of a Language (4)

Study of the structural aspects of an individual language to be determined by the instructor. Among the languages for study are French, German, Hindi-Urdu and Sanskrit.

Prerequisite: LIN 201.

LIN 480

Seminar in Linguistics (4)

Topics and problems selected by the instructor.

Prerequisites: LIN 201 and permission of department.

LIN 490

Independent Study (2 or 4)

Special research projects in linguistics.

Prerequisite: LIN 201 and permission of department.

LIN 500

Studies in Linguistics and Language (4)

Designed to introduce students with or without previous formal study in linguistics to topics selected by instructor.

LIN 501

Linguistic Structures (4)

Introduction to synchronic linguistic analysis, with structural problems in natural languages.

LIN 502

Historical Linguistics (4)

Diachronic linguistic analysis: language change, dialect geography, establishment of genealogical relationships, the reconstruction of earlier stages of languages and the relationship of language change to synchronic analysis.

LIN 503

Introduction to Phonology (4)

Fundamentals of phonological analysis using data from a variety of languages. Exploration of the sound system of English and its historical development

LIN 504

Introduction to Syntax (4)

Fundamentals of syntactic analysis using data from English and other languages.

LIN 507

Introduction to Semantics (4)

An introduction to the study of meaning and how it is encoded in human language. Survey of classic and recent approaches to the analysis and description of semantic structures in natural languages.

LIN 515

Computer Parsing of Natural Language (4)

An examination of the syntactic and semantic properties of natural language and a survey of the techniques for computer parsing. Student projects in the computer analysis of language.

LIN 557

Cognitive Linguistics (4)

A cognitive/functional approach to grammatical theory focusing on the relation between language and cognition in the study of semantic, lexical and grammatical structure.

LIN 580

Proseminar in Linguistics (4)

Overview of current major issues and research in theoretical and applied linguistics.

Prerequisite: LIN 503 and LIN 504.

LIN 590

Directed Readings (4)

Directed individual research on specific topics.

Prerequisite: Permission of instructor.

LIN 600

Special Topics in Linguistics (4)

Topics and problems selected by the instructor.

Prerequisite: Permission of instructor.

LIN 601

The History of Linguistic Theory (4)

Study of the development of linguistic sciences from ancient grammatical explanation to the nineteenth century Indo-European scholars and twentieth century structuralism and transformational grammar.

Prerequisite: Permission of instructor and LIN 503 or LIN 504.

LIN 603

Phonological Theory (4)

Theory and application of phonological analysis, with emphasis on original work.

Prerequisite: LIN 503.

LIN 604

Syntactic Theory (4)

Theory and application of morphological and syntactic analysis, with emphasis on original work.

Prerequisite: LIN 504.

LIN 607
Semantic Theory (4)

Inquiry into contemporary efforts to formulate and articulate a theory of meaning adequate for the analysis of natural language, with emphasis on the relation between syntactic and semantic analysis.

Prerequisite: LIN 507.

LIN 610
Contrastive Analysis (4)

A comparative structural analysis of individual languages and/or language groups.

Prerequisite: Permission of instructor and LIN 503 or LIN 504.

LIN 613
Advanced Phonology (4)

An advanced course in phonology with emphasis on current issues in phonological theory.

Prerequisite: LIN 603

LIN 614
Advanced Syntax (4)

An advanced course in syntax with emphasis on current issues in syntactic theory.

Prerequisite: LIN 604.

LIN 615
Problems in Computational Linguistics (4)

Directed research projects on special topics in computational linguistics.

Prerequisite: Permission of instructor.

LIN 617
Advanced Semantics (4)

An advanced course in semantics with emphasis on current issues in semantic theory.

Prerequisite: LIN 607.

LIN 680
Seminar in Linguistics (4)

A research seminar designed to develop a student's skill in linguistic investigation and exposition. Students must complete a research paper.

Prerequisite: LIN 503 and LIN 504 and permission of instructor.

LIN 690
The Master's Thesis (4)

Completion of a project proposed by a degree candidate in consultation with his/her adviser.

Prerequisite: LIN 503 and LIN 504, and permission of department.

DEPARTMENT OF MATHEMATICS AND STATISTICS

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Interim chair:

Louis J. Nachman

Professors emeriti:

Harvey J. Arnold, Ph.D., Princeton University
 Louis R. Bragg, Ph.D., University of Wisconsin
 John W. Dettman, Ph.D., Carnegie Institute of Technology
 George F. Feeman, Ph.D., Lehigh University
 William C. Hoffman, Ph.D.,
 University of California (Los Angeles)
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 Donald G. Malm, Ph.D., Brown University
 James H. McKay, Ph.D., University of Washington

Professors:

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 Baruch Cahlon, Ph.D., Tel Aviv University
 Charles Ching-an Cheng, Ph.D., Rutgers University
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 Massachusetts Institute of Technology
 Ravindra Khattree, Ph.D., University of Pittsburgh
 Louis J. Nachman, Ph.D., Ohio State University
 Subbaiah Perla, Ph.D., University of Rochester
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 J. Barry Turett, Ph.D., University of Illinois
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Associate professors:

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 David J. Downing, Ph.D., University of Iowa
 Bo-nan Jiang, Ph.D., University of Texas (Austin)
 Robert Kushler, Ph.D., University of Michigan
 Theophilus Ogunyemi, Ph.D., Kansas State University
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 Peter Shi, Ph.D., University of Delaware
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 Anna Spagnuolo, Ph.D., Purdue University

Visiting professors:

Gary McDonald, Ph.D., Purdue University

Adjunct professors:

Joseph R. Assenzo, Ph.D., Oklahoma University
 Seth Bonder, Ph.D., Ohio State University
 Edward F. Moylan, M.A., University of Detroit

The Department of Mathematics and Statistics offers programs leading to the degrees of Ph.D. in applied mathematical sciences, Master of Arts in mathematics, Master of Science in industrial applied mathematics and Master of Science in applied statistics. The department also offers a graduate certificate program in statistical methods.

The Ph.D. in Applied Mathematical Sciences

The Ph.D. Program is designed with three specialization areas in applied mathematical sciences: applied continuous mathematics, applied discrete mathematics and applied statistics.

Admission Requirements

The students admitted to the program must have a bachelor's degree from a regionally accredited institution with at least a 3.00 grade point average, with a major in one of the mathematical sciences, engineering, computer science, the physical sciences, the biological sciences or the health sciences. Specific course prerequisites for regular admission into the program (with relevant Oakland University course numbers) include courses in Multivariable Calculus (MTH 254), Linear Algebra

(MTH 256), and Advanced Calculus (MTH 351). In addition, there are specialization prerequisites of: Differential Equations (APM 257) for Applied Continuous; Abstract Algebra (MTH 475) and Data Structures (CSE 231) for Applied Discrete; and 12 credits in Statistics (e.g., STA 226, STA 322, STA 323) for Applied Statistics. In addition, Complex Variables (MTH 352) is recommended for Applied Continuous students. Students who lack the necessary background may need to complete a few pre-requisite undergraduate courses prior to regular admission into the program.

Applicants for admission must present transcripts of all previous undergraduate and graduate level academic work, three letters of recommendation from individuals who are capable of evaluating scholarly achievements and potential for independent research, and results of the Graduate Record Examination. The Test of English as a Foreign Language (TOEFL) must be submitted by applicants who are graduates of programs taught in a

language other than English. In addition, all applicants should submit a brief personal statement (not more than 500 words) describing their goals in pursuing the Ph.D.

Requirements for the degree

A minimum of 90 credits beyond the bachelor's degree is required for the Ph.D. degree in Applied Mathematical Sciences, consisting of 60 credits (15 courses) of course work, 3 credits of APM 695 or STA 695 (Problem Solving Seminar) and 27 credits of APM 790 or STA 790 (Dissertation Research). Students who have earned a master's degree may petition to have prior course work applied toward the 60 credits. The Committee on Graduate Programs will evaluate the student's prior master's degree work and allow Ph.D. credits for courses judged to be relevant to the proposed Ph.D. course of study. A maximum of 36 credits may be applied; all candidates must complete at least 24 credits of additional course work exclusively at Oakland University. In the Ph.D. program, credit will not be awarded for courses in which a grade less than 3.0 is earned; however, all numerical grades earned are used in computing a student's GPA and an overall 3.00 GPA must be maintained.

The course requirements and options for each specialization are as follows:

Details for the Applied Continuous Specialization:

Specialization requirements:

Nine courses are required in the Applied Continuous specialization consisting of:

APM 533 Numerical Methods

APM 557 Advanced Partial Differential Equations

APM 566 Computational Geometry

APM 634 Numerical Methods for Partial Differential Equations

APM 658 Mathematical Modeling in Industry:
Continuous Models

MOR 554 Mathematical Programming

MTH 551 Real Analysis

MTH 651 Functional Analysis

and one course selected from:

APM 605 Applied Continuous Mathematics: Selected Topics

MOR 558 Mathematical Modeling in Industry:
Research Operations Models

MTH 555 Complex Analysis

In addition, the requirements include completion of at least three credits (included in dissertation research credit requirements) in the one-credit seminar:

APM 695 Problem Solving Seminar (1 credit).

Distribution requirements:

Two courses are required in the Applied Statistics area consisting of:

STA 613 Mathematical Statistics I

and one other course selected from the Applied Statistics specialization list.

Two courses are required in the Applied Discrete area consisting of:

APM 563 Applied Mathematics: Discrete Methods I

and one other course selected from the Applied Discrete specialization list.

In addition, there are two free elective courses for a total of fifteen courses to satisfy the 60-credit course requirement, exclusive of dissertation research credit.

Details for the Applied Discrete Specialization:

Specialization requirements:

Eight courses are required in the Applied Discrete specialization consisting of:

APM 563 Applied Mathematics: Discrete Methods I

APM 567 Algorithms and Complexity

APM 568 Mathematical Modeling in Industry: Discrete Models

APM 569 Graph Theory and Applications

APM 577 Computer Algebra

APM 664 Combinatorial Optimization

APM 673 Coding Theory

MTH 571 Algebra I

In addition, the requirements include completion of at least three credits (included in dissertation research credit requirements) in the one-credit seminar:

APM 695 Problem Solving Seminar (1 credit).

Distribution requirements:

Two courses are required in the Applied Statistics area consisting of:

STA 613 Mathematical Statistics I

and one other course selected from the Applied Statistics specialization list.

Two courses are required in the Applied Continuous area consisting of:

MTH 551 Real Analysis

and one other course selected from the Applied Continuous specialization list.

In addition, there are three free elective courses for a total of fifteen courses to satisfy the 60-credit course requirement, exclusive of dissertation research credit.

Details for the Applied Statistics Specialization:

Specialization requirements:

Nine courses are required in the Applied Statistics specialization consisting of:

STA 613 Mathematical Statistics I

STA 614 Mathematical Statistics II

STA 527 Linear Statistical Models

and six courses selected from:

STA 504 Discrete Data Analysis

STA 506 Statistical Computing

STA 515 Stochastic Processes I

STA 521 Multivariate Statistical Methods I

STA 522 Statistical Process Control

STA 526 Nonparametric Methods

STA 528 Reliability and Life Data Analysis I

STA 529 Statistical Methods in Sample Surveys

STA 530 Time Series I

STA 603 Advanced Design of Experiments

STA 615 Stochastic Processes II

STA 621 Multivariate Statistical Methods II

STA 628 Reliability and Life Data Analysis II

STA 630 Time Series II

These six courses must include one of the following sets of courses {STA 515, STA 615}, {STA 528, STA 628},

{STA 530, STA 630} or {STA 521, STA 621}. In addition, the requirements include completion of at least three credits (included in dissertation research credit requirements) in the one-credit seminar:

STA 695 Problem Solving Seminar (1 credit)

Distribution requirements:

Two courses are required in the Applied Continuous area consisting of:

MTH 551 Real Analysis

and one other course selected from the Applied Continuous specialization list.

Two courses are required in the Applied Discrete area consisting of:

APM 563 Applied Mathematics: Discrete Methods I

and one other course selected from the Applied Discrete specialization list.

In addition, there are two free elective courses for a total of fifteen courses to satisfy the 60-credit course requirement, exclusive of dissertation research credit.

The General Examination and the Dissertation

The General Examination is intended to assess the student's overall knowledge of mathematical sciences at the graduate level and the student's ability to pursue the doctoral degree in his or her selected specialization. The General Examination is administered by the Committee on Graduate Programs and consists of two parts. Both parts of the General Examination must be passed within 13 months of the initial attempt at Part I, and a student may attempt each part of the General Examination no more than twice. Part I consists of three written section exams and is offered once near the beginning of the fall term (normally in September) and once near the beginning of the winter term (normally in January). Each section exam covers material in one of the areas of continuous mathematics, discrete mathematics and statistics. Part II of the General Examination may only be attempted after passage of Part I. Part II consists of a single written exam and is offered within a month after the results of Part I are announced. The material covered in this single exam involves only the area of the student's prospective specialization. Detailed guidelines about the material to be covered on both parts of the General Examination are available from the Graduate Coordinator. Exception to the above must be approved by the Committee on Graduate Programs.

A student must have completed at least 12 credits of graduate course work at Oakland with a GPA of 3.00 or better before taking the General Examination. No student with a GPA below 3.00 will be permitted to take the General Examination. Students in the Ph.D. program will not be allowed to accumulate more than 32 credits toward the Ph.D. degree without taking the General Examination. A student must have passed the General Examination to be eligible to register for Doctoral Dissertation Research.

Dissertation Committee

Each student who has passed the General Examination will have a dissertation committee prior to registration for doctoral research credit.

The dissertation committee will be appointed by the Committee on Graduate Programs, with the approval of the Vice Provost for Research and Graduate Study. The dissertation committee will consist of five faculty members, at least three of whom will be in the specialization area of the student. Prior to the formation of the committee, the student will nominate one faculty member from the student's area of specialization with the concurrence of the faculty member. At least one member of the committee will be selected by the Committee on Graduate Programs from faculty in the department but outside the student's area of specialization. The chair of the dissertation committee will be the intended supervisor of the doctoral dissertation for the student and is normally the faculty member nominated by the student. The membership of the committee may be changed by action of the Committee on Graduate Programs, with the approval of the Vice Provost for Research and Graduate Study.

For the first five Ph.D. candidates who take a final oral examination, one of the five members of each dissertation committee shall be faculty members from other research universities with

long standing Ph.D. programs in the mathematical sciences. The outside member of the dissertation committee will normally be in the broad area of specialization of the student.

Final Oral Examination and Dissertation Defense

The chair of the dissertation committee is responsible for keeping the committee members informed about the progress of the dissertation research and making preliminary drafts of the dissertation available to all members of the dissertation committee in a manner which permits timely suggestions for improvements. When the chair of the committee determines that the dissertation is ready for oral presentation, the chair will request that a colloquium talk be scheduled where the student presents the dissertation. Immediately following the colloquium, the committee will continue an oral examination of the candidate. Others are welcome to attend this portion of the final examination, with the consent of the candidate and the committee. When this oral examination is concluded, the committee will meet privately and decide whether the candidate, with possible modifications in the dissertation, will be recommended by the committee to receive the Ph.D. Every member of the committee must be present at the oral examination and be willing to sign the dissertation (after suitable and specified modifications, if any) for the student to pass this final oral examination.

Time Limits

If more than five years have elapsed since passing the General Examination, the student may be required to retake the General Examination before the dissertation committee considers the dissertation for possible acceptance. The decision to require the student to retake the General Examination is made by the Committee on Graduate Programs in consultation with the present members of the dissertation committee.

Residency Requirements

A minimum residency requirement is full-time residency (a minimum of 8 credits per semester) for at least three consecutive full semesters (fall-winter-fall, fall-winter-spring/summer, winter-spring/summer-fall, etc.) with at least two of these devoted to dissertation research. The demands of this research activity imply that the student may not be employed in work which is not directly related to dissertation research, for more than twenty hours a week while satisfying this residency requirement. Petitions for exceptions to this policy may be submitted to the Committee on Graduate Programs.

■ The Master of Arts in Mathematics

The program leading to the degree of Master of Arts in mathematics provides students with a sound theoretical knowledge of modern mathematical sciences and ample opportunity to learn something of the applications of the mathematical sciences, the construction of mathematical models and the art of problem solving. The program is designed to serve those who wish to enter a Ph.D. program in mathematical sciences or to teach in secondary schools or community colleges.

Admission

Admission is selective. The requirements for regular admission into the program include a baccalaureate from a regionally accredited institution with a 3.00 GPA. Exceptions to this requirement may be made if evidence of the capacity for graduate study is provided. Normally the mathematical preparation requires at least 30 semester credits in undergraduate mathematics including calculus, multivariable calculus, linear algebra and differential equations. Students who have not had an undergraduate course in abstract algebra or advanced calculus may be required to complete one or both of these courses as a prerequisite to regular admission.

Requirements for the degree

Candidates for the Master of Arts in mathematics will need 36 credits of graduate work. Students must earn at least a 2.5 in each course and an overall GPA of 3.00 or better. In general, they will take at least seven 4-credit courses in mathematical sciences, arranged by the department's Committee on Graduate Programs, and up to two approved electives outside of mathematical sciences. Among the courses arranged by the Department of Mathematics and Statistics there must be included 4 credits in directed reading and research (MTH 590, APM 590 or MTS 590) either in mathematics or in an interdisciplinary area involving mathematics. Candidates must prepare a written report based on this reading and research. Each candidate must take a 4-credit course in analysis (MTS 517 or MTH 551) and a 4-credit course in abstract algebra (MTH 571).

In addition to these requirements, each candidate must pass a combined written and oral examination, which is devised by a candidate's committee appointed by the Committee on Graduate Programs. Details on the format of this exam can be obtained from the department's graduate coordinator.

■ The Master of Science in Industrial Applied Mathematics

The primary goal of this program is to provide the appropriate mathematical knowledge and experience for persons seeking positions in industry. The program focuses on those mathematical theories and techniques which are applicable in the industrial setting. Emphasis is on the construction of mathematical models of industrial problems and on the mathematical tools that can be applied to such models. Courses required for the program are offered in the late afternoon or evening to accommodate the part-time student. Assistantships for students wishing to enroll full time are available on a competitive basis.

Admission

Admission is selective. All applicants who have received a baccalaureate from a regionally accredited institution with a cumulative GPA of 3.00 or more will be considered. The successful candidate's background should include courses in multivariable calculus, linear algebra and differential equations, and a knowledge of at least one high-level scientific programming language such as Pascal, Fortran, C or PL/1. Students admitted without some aspects of the required background will be expected to remedy the deficiency before enrolling in many of the courses of the program.

Requirements for the degree

To fulfill the requirements for a Master of Science degree in industrial applied mathematics a student must have successfully completed, with at least a 2.5 in each course and an overall GPA of 3.00 or better, a 36-credit program consisting of:

1. Six 4-credit courses that satisfy the following conditions:
 - a) At least one course from APM 533 and APM 534.
 - b) One course from MOR 558 and APM 658.
 - c) At most one course in statistics from courses numbered STA 504 or higher.
 - d) The remaining courses, in this six-course requirement, from MOR 554, APM 557, APM 566 and APM 634.
2. A 4-credit project course APM 595. The student should contact the graduate coordinator for information about the procedures to be followed.
3. Elective courses to complete the 36-credit requirement. These are courses in a related area that must be approved by the graduate coordinator. Generally, these courses will be engineering, statistics, computer science, applied mathematics or operations research. A student who has not completed a course in advanced calculus may be required to complete such a course as one of these elective courses.

■ The Master of Science in Applied Statistics

By offering this program the department seeks to increase the number of people with broad training in statistical methodology which is suitable for application in industrial, business and governmental settings. The program's primary goal is to provide the basis for the skilled and competent application of modern statistical methods. Areas of methodology in the program, in addition to a basic theoretical foundation, include design of experiments, regression analysis, discrete data, statistical computing, statistical process control, non-parametric, multivariate, reliability, sample survey and time series methodology. All applied courses make use of and stress the importance of modern statistical computing software. Because of the wide diversity of

backgrounds of entering students, course selection for completion of the program is developed in consultation with a faculty adviser. Selection of courses will reflect the goal of broad training and any special needs of the student. All courses for the program are offered in the late afternoon or evening to accommodate the part-time student who is engaged in professional development. Teaching and research assistantships are available to well qualified full-time students; internships with industry are also available.

Admission

Admission is selective. All applicants who have received a baccalaureate from a regionally accredited institution with a cumulative GPA of 3.00 or more will be considered. Previous mathematical training should include the satisfactory completion of courses in single and multivariate calculus and linear algebra, as well as at least one course in elementary statistics. Applicants should also have some scientific computing training.

Requirements for the degree

To fulfill the degree requirements the student must:

- 1 . Have completed, with at least a 2.5 in each course and an overall average of 3.00 in all courses, a program of at least 36 credits.
- 2 . Have completed at least 24 credits in courses labeled STA as approved by an adviser. STA 513 and STA 514 are required unless the student has completed the equivalent course before admission. Students with the necessary mathematics background are encouraged to complete the STA 513-514

sequence in their first year in order to satisfy prerequisites for more advanced courses. The set of elective courses not labeled STA must also be approved by the student's adviser.

- 3 . Have not included more than six credits of STA 590.
- 4 . Have demonstrated competence in applying statistical methods and theory in the solution of a practical problem or problems. This requirement is administered by the Committee on Graduate Programs.

■ The Graduate Certificate in Statistical Methods

The program consists of 20 credits of statistical methods as set forth below. It is designed for completion in either one year or two years by students who are employed full time. The aim of the program is to provide knowledge in modern statistical methods for industrial managers. Graduates of the program will be capable of standard statistical treatment of industrial problems arising in research, development and production. They also will be able to recognize difficult problems and communicate well with fully-trained statistical experts.

Admission

All applicants will be considered who have received a baccalaureate from a regionally accredited institution. Previous training should include one introductory statistics course and some exposure to calculus.

Requirements for the certificate

To fulfill the certificate requirements, the student must have completed an approved program of at least 20 credits with at least a 2.0 in each course and an overall average of 3.00 in all courses. The courses normally included are STA 501, 502, 503 and 8 additional credits chosen from STA courses numbered 504 or higher. The course selections for a particular student will be chosen to complement previous statistics study and to enhance the competency of the individual in his/her chosen field of application.

Relationship to Master of Science in Applied Statistics

Three courses (STA 501, 502, 503) each count as two credits toward the M.S. degree. Other STA courses numbered 504 or higher count fully toward the degree. It is anticipated that a graduate of the certificate program who has all of the prerequisites for the Master of Science in applied statistics can apply for admission to that program and complete the additional credits needed for that degree in two calendar years as a part-time student or in one calendar year as a full-time student.

COURSE OFFERINGS

Courses are listed and grouped according to the following designations: MTH—mathematics; APM—applied mathematics; STA—statistics; MTS—mathematics for teachers; MOR—operations research.

MATHEMATICS

MTH 405 Special Topics (2 or 4)

Advanced study of some topic in mathematics. May be taken more than once.

Prerequisite: Permission of the instructor.

MTH 415 Foundations of Mathematics: Mathematical Logic and Set Theory (4)

An examination of the logical foundations of mathematics including analysis of the axiomatic method, basic set theory, cardinal and ordinal numbers and the axiom of choice.

Prerequisite: MTH 302.

MTH 453 Advanced Calculus II (4)

Improper integrals, derivatives and integrals in non-dimensional Euclidean space, implicit and inverse function theorems, differential geometry and vector calculus, Fourier series. Offered every winter.

Prerequisite: MTH 351.

MTH 461 General Topology (4)

A study of topological spaces and continuous functions. Separation and countability properties, connectedness, compactness and local properties.

Prerequisite: MTH 302.

MTH 465 Differential Geometry (4)

Theory of curves and surfaces in Euclidean space with an introduction to the theory of matrix Lie groups.

Prerequisite: MTH 453.

MTH 475 Abstract Algebra (4)

Groups, subgroups, cosets, homomorphisms; rings and ideals, integral domains; field and field extensions. Applications. Offered every winter.

Prerequisite: MTH 302.

MTH 505 Special Topics (2 or 4)

Study of some topics in mathematics. May be taken more than once.

Prerequisite: Permission of the graduate coordinator.

MTH 551 Real Analysis (4)

Lebesgue measure, measurable functions and the Lebesgue integral; convergence theorems; monotone functions, bounded variation and absolute continuity. The L_p spaces; product measures and Fubini's theorem; the Radon-Nikodym theorem.

Prerequisite: MTH 351.

MTH 555 Complex Analysis (4)

Analytic functions and the Cauchy-Riemann equations. Cauchy Integral Theorem, Cauchy integral formula, argument principle, Rouché's theorem. Taylor and Laurent series. Singularities and residues. Conformal mapping.

Prerequisites: MTH 351; MTH 352 is recommended.

MTH 561-562 Topology (4 each)

MTH 561 is an introduction to algebraic topology. Topics include elementary homotopy and homology theory. MTH 562 covers various topics in algebraic and general topology at the discretion of the instructor.

Prerequisite: MTH 461 or permission of the instructor.

MTH 571-572 Algebra (4 each)

Group theory, rings and modules, linear and multilinear algebra, and field extensions. Categorical properties and functorial relationships are emphasized, where possible.

Prerequisite: MTH 475 or permission of the instructor.

MTH 590 Directed Reading and Research (2 or 4)

Prerequisite: Permission of the graduate coordinator.

MTH 651 Functional Analysis (4)

Metric spaces, category, compactness. Banach, Hilbert and Sobolev spaces. The Hahn-Banach theorem, open mapping theorem and Banach-Steinhaus theorem. Weak and weak* topologies. Elementary operator and spectral theory.

Prerequisite: MTH 551.

■ APPLIED MATHEMATICS

APM 407

Mathematics for Engineering (4)

Elementary ordinary differential equations, linear algebra, matrix methods and numerical methods. Closed to math majors and minors.

Prerequisite: MTH 155.

APM 455

Intermediate Ordinary Differential Equations (4)

Review of elementary techniques, existence and uniqueness theory, series methods, systems of equations, oscillation and comparison theorems, Sturm-Liouville theory, stability theory and applications.

Prerequisites: APM 257 and MTH 351.

APM 505

Special Topics (2 or 4)

Study of some topics in applicable analysis and mathematical modeling. May be taken more than once.

Prerequisite: Permission of the instructor.

APM 533

Numerical Methods (4)

Approximations and interpolations, propagation of errors, numerical differentiation and integration, solutions of equations, Newton's method, solutions of differential equations and initial value problems, Runge-Kutta and predictor-corrector methods. Credit will not be granted for both APM 533 and CSE 517.

Prerequisites: MTH 256, APM 257 and knowledge of a scientific programming language, or permission of the instructor.

APM 534

Applied Numerical Methods: Matrix Methods (4)

Systems of linear equations, Gaussian elimination, LU factorization, successive overrelaxation, approximation theory, curve fitting, eigenvalue problems, iterative techniques and non-linear systems of equations, some aspects of boundary value problems and introduction to numerical solutions of partial differential equations. Credit will not be granted for both APM 534 and CSE 518.

Prerequisites: MTH 254, MTH 256 and knowledge of a scientific programming language, or permission of the instructor.

APM 541

Mathematical Analysis for Engineers I (4)

Laplace transforms; linear algebra; matrices, vectors, determinants, linear systems of equations, matrix eigenvalue problems; vector differential calculus; vector integral calculus, integral theorems; Fourier series, integrals and transforms.

Prerequisites: MTH 254, MTH 256 and APM 257.

APM 542

Mathematical Analysis for Engineers II (4)

Series solutions of differential equations, special functions, partial differential equations, complex numbers and functions, conformal mapping, complex integration, power series, Taylor and Laurent series, residue theory, potential theory.

Prerequisite: APM 541.

APM 553

Advanced Ordinary Differential Equations (4)

Existence and uniqueness, dependence on initial point, asymptotic behavior of solutions, periodic solutions, self-adjoint problems, stability theory, Liapunov functions, Poincare-Bendixson theory and topological methods.

Prerequisites: APM 257 and MTH 351.

APM 557

Advanced Partial Differential Equations (4)

Characteristic surfaces and classification; existence, uniqueness and stability; fundamental solutions and Green's functions; variational principles; spectral theory, distributions and generalized solutions.

Prerequisites: APM 257 and MTH 351.

APM 563-564

Applied Mathematics:

Discrete Methods I and II (4 each)

A two-course sequence in those areas of discrete mathematics relevant to industrial applications. Topics will be drawn from combinatorics, graph theory and discrete optimization.

Prerequisites: MTH 256 and APM 263.

APM 565

Differential Geometry (4)

Theory of curves and surfaces in Euclidean space with an introduction to the theory of matrix Lie groups.

Prerequisite: MTH 351.

APM 566

Computational Geometry (4)

A detailed study of the differential geometry of curves and surfaces in Euclidean 3-space, an introduction to several mathematical models for computer representation of curves and surfaces, and the use of the geometry of these models in computer-aided design and manufacturing systems.

Prerequisites: MTH 254 and MTH 256.

APM 567

Algorithms and Complexity (4)

A general introduction to algorithm design and analysis, including study of the following algorithmic techniques: divide-and-conquer, greedy methods, backtracking, preconditioning and precomputation, probabilistic and approximation algorithms. Topics covered also include: the fast Fourier transform, lower bound theory, reduction and NP-completeness.

Prerequisite: APM 263 and knowledge of data structures.

APM 568**Mathematical Modeling in Industry:
Discrete Models (4)**

Scheduling problems, optimality measures and schedules, single machine processing, parallel machine models, flow-shop scheduling, job-shop scheduling, project scheduling, dynamic programming approaches, branch and bound methods, integer programming formulations.

Prerequisite: APM 563.

APM 569**Graph Theory and Applications (4)**

A selected view of advanced topics in graph theory and their applications. Topics drawn from: paths, connectivity, Euler tours, Hamilton cycles, trees, matchings and coverings, vertex and edge colorings, planarity and its generalizations, Ramsey theory and extremal theory, graphical enumeration, random graphs, network flows, graphs and groups, graph algorithms.

Prerequisite: APM 563.

APM 577**Computer Algebra (4)**

A study of the mathematics and algorithms which are used in symbolic algebraic manipulation packages. Topics include computer representation of symbolic mathematics, polynomial ring theory, field theory and algebraic extensions, modular and p -adic methods, subresultant algorithm for polynomial GCD's, Groebner bases for polynomial ideals and Buchberger's algorithm, factorization and zeros of polynomials.

Prerequisites: MTH 256 and knowledge of a scientific programming language or permission of the instructor.

APM 581**The Theory of Computation (4)**

A study of what kinds of computation can, in principle, be accomplished by what kinds of computing devices, and how efficiently such computations can be done. Finite automata, pushdown automata, Turing machines, languages, grammars, undecidability, complexity theory, intractability.

Prerequisite: APM 263.

APM 590**Directed Reading and Research (2 or 4)**

Prerequisite: Permission of the graduate coordinator.

APM 595**Master of Science Research Project (4)**

This is the project course for the Master of Science in Industrial Applied Mathematics. It involves independent research under the supervision of an approved adviser, the preparation of a detailed report on the research and a presentation to a group of faculty members selected by the Committee on Graduate Programs.

Prerequisite: Permission of the graduate coordinator.

APM 605**Applied Continuous Mathematics: Selected Topics (4)**

An in-depth treatment at the advanced graduate level of topics of importance for applications of analysis. Such topics may include: advanced ordinary differential equations, applied operator theory, calculus of variations, geometric methods in mechanics, integral equations, nonlinear functional analysis, or other topics.

Prerequisites: Permission of the instructor.

APM 634**Numerical Methods for
Partial Differential Equations (4)**

A study of major numerical techniques used to solve initial and boundary value problems for partial differential equations. Includes finite difference schemes, Rayleigh-Ritz and Galerkin methods, projection and steepest descent methods and finite element methods. The stability, efficiency and convergence of such methods will be considered as well as their implementation.

Prerequisite: APM 533 and APM 557.

APM 658**Mathematical Modeling in Industry:
Continuous Models (4)**

Mathematical modeling, using P.D.E., for industrial problems. Topics will vary, depending on instructor and industry contacts, but some possibilities are: contact and friction problems in elasticity, electropainting and electrochemistry, solid-liquid transitions and Stefan problems, wave phenomena, fluid flows, granular materials, heat conduction and diffusion.

Prerequisite: Permission of instructor.

APM 664**Combinatorial Optimization (4)**

A survey of algorithmic solutions to combinatorial optimization problems. Topics drawn from: network flows, path problems, matching and covering problems, matroids, spanning trees, dynamic programming, and scheduling problems.

Prerequisites: APM 563 or permission of the instructor.

APM 673**Coding Theory (4)**

Linear codes, non-linear codes, B.C.H. codes, dual codes and their weight distribution, perfect codes and cyclic codes. Additional topics drawn from Reed-Solomon codes, Justesen codes, M.D.S. codes, Reed-Muller codes, Golay codes, self-dual codes and invariant theory.

Prerequisites: MTH 571.

APM 695

Problem Solving Seminar (1)

Applied problems and solutions using advanced mathematical methods presented by students and faculty. Each Ph.D. student is required to earn at least three credits.

Prerequisite: Permission of the graduate coordinator.

APM 790

Doctoral Dissertation Research (2-12)

Prerequisite: Permission of the graduate coordinator.

■ STATISTICS

STA 501

Statistical Methods in Research and Production (2 or 4)

Descriptive statistics — graphical and quantitative, confidence limits and statistical tests, sample size requirements, linear regression and correlation, multiple and curvilinear regression, count data and contingency tables, control charts, sampling and specifications. This course counts two credits toward the M.S. in applied statistics.

Corequisite: A first course in calculus.

STA 502

Applied Regression Analysis (2 or 4)

Simple linear regression, comparing two straight lines, polynomial and multiple regression analysis, multiple and partial correlations, dummy variables, covariance, residual analysis, transformations and weighted least squares, ridge regression. This course counts two credits toward the M.S. in Applied Statistics.

Prerequisite: STA 501 or permission of the instructor.

STA 503

Design and Analysis of Industrial Experiments (2 or 4)

Planning of experiments; completely randomized, randomized block, Latin squares and incomplete block designs; factorial experiments, confounding, blocking, fractional factorial experiments, surface fitting designs. This course counts two credits toward the M.S. in Applied Statistics.

Prerequisite: STA 501 or permission of the instructor.

STA 504

Discrete Data Analysis (4)

Models for count data, goodness of fit statistics, association and agreement measures, matched samples, ordinal variables, association in multidimensional tables, loglinear and logit models.

Prerequisite: STA 502 or STA 503 or permission of the instructor.

STA 505

Special Topics (2 or 4)

Study of some topics in statistics. May be taken more than once.

Prerequisite: Permission of the instructor.

STA 506

Statistical Computing (4)

Floating point calculations, approximating probabilities and quantiles, random number generation for simulation, variation analysis, computational linear algebra, methods for linear models, simulated annealing, optimization and methods for non-linear models, static and dynamic graphical methods for data analysis, and presentation graphics. (This is not a course in how to use statistical packages.)

Corequisites: One or more of STA 502, STA 503, STA 513 or permission of the instructor, and knowledge of a programming language.

STA 513-514

Introduction to Mathematical Statistics (4 each)

The distribution of random variables, conditional probability and stochastic independence, special distributions, functions of random variables, interval estimation, sufficient statistics and completeness, point estimation, tests of hypothesis and analysis of variance.

Prerequisite: MTH 254, MTH 256 and STA 501; or permission of the instructor.

STA 515

Stochastic Processes I (4)

Random walk models, Markov chains and processes, birth and death processes, queuing processes, diffusion processes and non-Markov processes.

Prerequisite: STA 513. APM 257 recommended.

STA 521

Multivariate Statistical Methods I (4)

Samples from multivariate normal distribution, tests of hypotheses on means, multivariate analysis of variance, multiple comparisons, independence of sets of variates, canonical correlations, principal components, factor analysis.

Corequisites: STA 514 and either STA 502 or STA 503, or permission of the instructor.

STA 522

Statistical Process Control (4)

Process control charts for measurement and count data, including Shewhart, CUSUM and EWMA charts; multivariate methods; economic design issues; process capability analysis; process variation studies; analysis of means; evolutionary operation.

Corequisites: STA 513 or STA 502 or STA 503 or permission of the instructor.

STA 526**Nonparametric Methods (4)**

Exploratory data analysis, rank tests for location and scale, power of competing tests, confidence intervals, nonparametric analysis of variance methods.

Corequisites: STA 502 or 503 or 513 or permission of the instructor.

STA 527**Linear Statistical Models (4)**

General linear model, multivariate normal, regression and design models, variance components.

Corequisites: STA 514 or STA 614 and either STA 502 or STA 503, or permission of the instructor.

STA 528**Reliability and Life Data Analysis I (4)**

Failure models, estimation procedures for exponential, Weibull, gamma and lognormal distributions, hypothesis testing, sample size determination, accelerated life testing.

Corequisite: STA 514 or permission of the instructor.

STA 529**Statistical Methods in Sample Surveys (4)**

Simple random sampling, stratified sampling, systematic sampling, cluster sampling, sub-sampling, probabilities proportional to size sampling; estimation of parameters; applications.

Prerequisite: STA 501 or permission of the instructor.

STA 530**Time Series I (4)**

Introduction to and characteristics of autoregressive moving average models; autocorrelation functions, modeling, estimation and forecasting; deterministic and stochastic trends and seasonality; multiple time series, miscellaneous topics.

Corequisite: STA 514 or permission of the instructor.

STA 590**Directed Reading and Research (2 or 4)**

Prerequisite: Permission of the graduate coordinator.

STA 595**Statistical Consulting (2 or 4)**

Prerequisite: Permission of the graduate coordinator.

STA 603**Advanced Design of Experiments (4)**

Introduction to response surface methodology; graduating functions; least squares for response surface work; the use of steepest ascent to achieve process improvement; fitting second order models; adequacy of estimation and the use of transformations; exploration of maxima and ridge systems with second order response surfaces; links between empirical and theoretical models; response surface methods in parameter design.

Prerequisites: STA 502 and STA 503.

STA 610**Probability Theory (4)**

Borel fields, probability, Lebesgue, Lebesgue-Stieltjes and counting measures, random variables, Radon-Nikodym theorem, independent events, product spaces, probability inequalities, conditional probability, generating functions, modes of convergence, central limit theorems, empirical distribution function.

Prerequisite: MTH 551

STA 613**Mathematical Statistics I (4)**

Random variables, univariate distributions and their interrelations, expectation, moments, generating functions, exponential families, location and scale families; joint, marginal, and conditional distributions; independence, hierarchical and mixture models, covariance and correlation, random sample, convergence concepts, sampling from normal distributions, exact sampling distributions, order statistics.

Prerequisite: MTH 551

STA 614**Mathematical Statistics II (4)**

Statistical models; methods of estimation; comparison of estimates; optimality theory; optimal tests and confidence intervals; linear models, decision theory.

Prerequisite: STA 613

STA 615**Stochastic Processes II (4)**

Markov chains, random walks, pure birth process, Poisson processes, birth and death processes, renewal theory, models of epidemic and accident occurrences, diffusion processes, queuing models, applications in biological and physical sciences.

Prerequisite: STA 515 and STA 613

STA 621**Multivariate Statistical Methods II (4)**

Analysis of repeated measures data; analysis with missing data; EM algorithm; covariance structures; directional data analysis; discrimination and pattern recognition; advanced clustering methods.

Prerequisite: STA 521 or permission of instructor.

STA 628**Reliability and Life Data Analysis II (4)**

Review of life distributions; point process models, system structure, system reliability, cost models and maintenance policies, reliability growth, competing risks, statistical methods for repairable system data, Bayesian methods, sequential methods.

Prerequisite: STA 528.

STA 630

Time Series II (4)

Multivariate autoregressive moving average time series. Model building and forecasting. Multivariate special analysis. Canonical analysis and principal components for multivariate time series.

Other special topics in time series.

Prerequisite: STA 530.

STA 695

Problem Solving Seminar (1)

Applied problems and solutions using advanced statistical methods presented by students and faculty. Each Ph.D. student is required to earn at least three credits in the Problem Solving Seminar.

Prerequisite: Permission of the graduate coordinator.

STA 790

Doctoral Dissertation Research (2-12)

Prerequisite: Permission of the graduate coordinator.

■ MATHEMATICS FOR TEACHERS

MTS 505

Special Topics (2 or 4)

Study of some topics in mathematics. May be taken more than once.

Prerequisite: Permission of the instructor.

MTS 510

The Secondary Mathematics Curriculum (4)

A seminar that examines problems of the secondary mathematics curriculum. Topics will be determined by the instructor and the students. Emphasis is on the role and responsibility of the secondary teacher in developing curriculum.

Prerequisite: Permission of the instructor.

MTS 514

Concepts in Abstract Algebra (4)

Includes topics from groups, rings, fields, matrices, linear transformations and vector spaces.

Prerequisite: MTH 256.

MTS 517

Concepts in Analysis I (4)

Includes a study of real and complex numbers, functions, limits, differentiation, integration and infinite series, with emphasis on careful proofs of theorems.

Prerequisites: MTH 254 and MTH 256.

MTS 518

Concepts in Analysis II (4)

Improper integrals, derivatives and integrals in n-dimensional Euclidean space, implicit and inverse function theorems, differential geometry and vector calculus, Fourier series.

Prerequisite: MTS 517

MTS 590

Directed Reading and Research (2, 4, 6, or 8)

Prerequisite: Permission of the graduate coordinator.

MTS 614

History of Mathematics (4)

Mathematics from ancient to modern times: its growth, development and place in culture.

Prerequisite: MTH 351 or MTS 514 or MTS 517.

MTS 619

Foundations of Mathematics (4)

Examination of the logical foundations of mathematics including analysis of the axiomatic method, basic set theory, cardinal and ordinal numbers, and the axiom of choice.

Prerequisite: MTH 351 or MTS 514 or MTS 517, or permission of the instructor.

MTS 620

Concepts of Geometry (4)

Development of elementary Euclidean geometry from an advanced standpoint; introduction to and basic properties of non-Euclidean geometry.

Prerequisite: MTH 256 or permission of the instructor.

MTS 627

Introduction to Probability Theory (4)

The distribution of random variables, conditional probability and stochastic independence, special distributions, and functions of random variables.

Prerequisites: MTH 254, MTH 256, and STA 226; or permission of the instructor.

MTS 635**Introduction to Numerical Analysis I (4)**

Approximations and interpolations, propagation of errors, numerical differentiation and integration, solutions of equations, Newton's method, solutions of differential equations and initial value problems, Runge-Kutta and predictor-corrector methods.

Prerequisites: MTH 256, APM 257 and knowledge of a scientific programming language, or permission of the instructor.

MTS 636**Introduction to Numerical Analysis II (4)**

Systems of linear equations, Gaussian elimination, LU factorization, successive overrelaxation, approximation theory, curve fitting, eigenvalue problems, iterative techniques and non-linear systems of equations, some aspects of boundary value problems and introduction to numerical solutions of partial differential equations.

Prerequisites: MTH 254, MTH 256 and knowledge of a scientific programming language, or permission of the instructor.

MTS 663**Graph Theory and Combinatorial Mathematics (4)**

Introduction to combinatorics. Topics include techniques of enumeration, fundamental concepts of graph theory, and applications to transport networks, matching theory and block design.

Prerequisites: MTH 256 and APM 263.

MTS 672**Number Theory (4)**

Number-theoretic functions, diophantine equations, congruences and quadratic residues, including some experimental work aided by the computer.

Prerequisite: MTH 155.

■ OPERATIONS RESEARCH

MOR 554**Mathematical Programming (4)**

Linear, integer, nonlinear and dynamic programming. Particular topics include the simplex method, duality theory, the dual simplex method, sensitivity analysis, special problem classes, total unimodularity, branch and bound techniques, unconstrained optimization, first and second order conditions, quadratic programming, separable convex programming, sequential decision process, principle of optimality, forward and backward recursion.

Prerequisites: MTH 254 and MTH 256 or permission of the instructor.

MOR 558**Mathematical Modeling in Industry: Operations Research Models (4)**

Models will be drawn from linear, integer, nonlinear and dynamic programming, stochastic processes, queuing theory, Markov chains, decision analysis, network theory and scheduling theory. Topics will vary but particular applications may include production planning and inventory control, capacity expansion, equipment replacement, optimal routing, project management, flow-shop and job-shop scheduling, Markov decision models, game theory and control theory.

Prerequisite: MOR 554 or permission of the instructor.

MOR 590**Directed Reading and Research (2 or 4)**

Prerequisite: Permission of the graduate coordinator.

DEPARTMENT OF MUSIC, THEATRE AND DANCE

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Chair:

Karl Boelter

Coordinator of Graduate Studies:

Jacqueline Wiggins

Professors emeriti:

David Daniels, Ph.D., University of Iowa

John Dovaras, M.M., Northwestern University and D.Litt.
(Honorary), Alma College

Robert Facko, Ed.D., Columbia University

Carol Halsted, Ed.D., Wayne State University

Adeline G. Hirschfeld-Medalia, Ph.D., Wayne State University

Stanley Hollingsworth, B.Mus., Curtis Institute of Music and
Fellow of the American Academy of Rome

Professors:

Laurie Eisenhower, M.F.A., Arizona State University

Flavio Varani, M.M., Manhattan School of Music

John Paul White, Dipl., Curtis Institute of Music

Jacqueline Wiggins, Ed.D., University of Illinois

Associate professors:

Lettie Beckon Alston, D.M.A., University of Michigan

Karl Boelter, D.M.A., University of Michigan

Michael Gillespie, Ph.D., Stanford University

Kerro Knox, M.F.A., Yale School of Drama

Gregory Patterson, M.F.A., University of Michigan

Karen Sheridan, M.F.A., Goodman School of Drama,
DePaul University

Assistant professors:

Greg Cunningham, Ed. D., University of Illinois

David Kidger, Ph.D., Harvard University

Michael Mitchell, D.M.A., University of Missouri (Kansas City)

Diane H. Petrella, D.M.A., University of North Texas

Visiting assistant professor:

Mariah Malec, M.F.A., Arizona State University

Special Lecturers:

Mark Stone, Phyllis White

Adjunct assistant professors:

Janice Albright, B.Mus.Ed., Indiana University

Edith Diggory, D.M.A., Indiana University

Danny Jordan, M.M., Wayne State University

Thomas Suda, M.F.A., Wayne State University

James Well, M.M., Westminster Choir College

Lecturers:

Barbara Bland, Donna Buckley, Terry Carpenter, Nadine DeLeury,
Frederic DeHaven, Ronald DeRoo, Edith Diggory, Kitty Dubin,
Cornelia Dugger, Patricia Gibbons, John Hall, Rebecca Happel,
Suzanne Hawkins, Terry Herald, Jacob Lascu, Thomas Mahard,
Eric Maher, Daniel Maslanka, Cheryl Ogonowski, Patrick
O'Sullivan, Kianne Raymond, Phyllis Relyea, Alayne Rever,
Elizabeth Rowin, David Reed, Alex Ruthmann, Debra Siegel,
August Thomas, Debra Wicks, Carol Yamasaki

Applied music instructors:

Janice Albright (voice), Kerstin Allvin (harp), Barbara Bland
(voice), Candace deLattre (voice), Douglas Cornelsen (clarinet),
Frederic DeHaven (organ), Nadine Delevry (cello), Edith
Diggory (voice), Kirkland Ferris (bassoon), John Hall (guitar),
Rebecca Hammond (oboe), Rebecca Happel (piano), Maxim
Janowsky (double bass), Danny Jordan (jazz piano), Mark Kieme
(jazz saxophone), William King (clarinet), Richard Kowalewski
(bass guitar, jazz bass), Daniel Maslanka (percussion), Alayne
Rever (saxophone), Elizabeth Rowin (violin, viola), Mary
Siciliano (piano), Gordon Simmons (trumpet), Flavio Varani
(piano), Corbin Wagner (French horn), John Paul White (voice)

Accompanists:

Shari Fiore, Vladimir Kalmsky, Tatyana Zut, Stanley Zydek

■ The Master of Music

The Master of Music program is designed to enhance students' understanding of and proficiency in music and to provide opportunities for student growth as performers, conductors, composers, arrangers, studio instructors and school music teachers.

The Master of Music is a program of 36 credits: a core program of 12 credits, with the remaining 24 credits consisting of a concentration (16-22 credits) and electives.

A student can earn a Master of Music with any of the following concentrations: composition, conducting (choral or instrumental), music education, pedagogy (instrumental, piano, or voice), or performance (instrumental, piano, or voice).

Admission

1. Bachelor's degree in music from a regionally accredited institution (background must include minimum two years music theory; one year music history; performance ability in some instrument or voice).
2. Official transcripts from all institutions attended and two official letters of recommendation.
3. Candidate's goals which are compatible with the goals of the Master of Music program at Oakland University (via departmental questionnaire).
4. Audition or other personal evaluation by designated music faculty
 - a) Performance, pedagogy and conducting concentrations: audition
 - b) Music education: interview and writing sample
 - c) Composition: review of portfolio, interview

Remedial work may be required before full admission.

Degree Requirements

The Master of Music degree is awarded upon satisfactory completion of 36 credits in approved program of study, successful performance on an oral examination and successful completion of a culminating project or recital.

If the faculty deems areas of the candidate's undergraduate preparation deficient, undergraduate courses may be prescribed. Such work will not count as part of the 36 credits of the master's program.

As work progresses, the following may be grounds for dismissal from the program:

1. One grade below 2.5.
2. Two grades below 3.0.

Program of study

The 36-credit degree program consists of two major components: a core requirement of 12 credits, plus 24 credits of a major concentration, and electives.

Core

MUS 500	Introduction to Graduate Study in Music	2
MUT 530	Seminar in Theory and Analysis	4

Music history: chosen from: MUS 521, 522, 523, 528, 529, 555, 557, 590 (history topics) 6

Students must take at least one class in a pre-1800 area.

Classes required for the student's major concentration may not be used to fulfill the music history core requirement.

Each class taken toward this requirement requires students to write a research paper and present that research to the class.

Major concentration

Concentrations are offered in the following areas:

Composition - a program for experienced composers, designed to help individuals expand their knowledge base for and experience in the compositional process.

The composition concentration requirements are:

MUT 540	Composition (4 semesters)	8
MUT 550	Composition Seminar	2
MUS 599	Elective studies in related areas (orchestration, arranging, conducting)	6
MUA 601	Master's Recital	2
	Electives	6

Conducting - designed to meet the needs of music teachers and other music professionals who are interested in developing high-level skills and understanding in instrumental and/or choral conducting.

The conducting concentration requirements are:

MUS 580	Advanced Choral Interpretation and Conducting Techniques	2
MUS 581	Advanced Instrumental Interpretation and Conducting Techniques	2
MUS Electives	in related studies (orchestration, literature, analysis, voice, diction, score study)	4
	Literature course (MUS 576 or other as appropriate)	2
MUS 620	Conducting Apprenticeship (3 semester)	6
MUA 601	Master's Recital	2
	Electives	6

Music Education - designed to meet the needs of the music teachers, to help them expand and extend their professional skills and understandings with a long-range goal of enabling educators to study and improve their own practice.

Piano Pedagogy - a program for experienced pianists, designed to enable them to explore approaches to teaching piano, to expand their knowledge of piano repertoire and

technique, and to further their personal performance skills and musical understanding.

Performance - (piano, voice, instrumental) a program for highly experienced pianists, singers, or orchestral instrumentalists, designed to enable them to explore approaches to teaching their major instrument or voice; to expand their knowledge of repertoire and technique, and to further their personal performance skills and musical understanding.

Pedagogy concentration requirements:

	Instrumental	Piano	Voice
Applied Study, MUA 500 level (4 semesters)	8	8	8
MUS 533 Learning Theory for Studio Teachers	2	2	2
Pedagogy	4	6	4
Music Literature in major area	4	4	4
Ensembles, MUE 500 level (2 semesters)	2	0	0
MUS 690 Master's Project (includes teaching practicum)	2	2	2
Electives	4	4	4

Performance - a program for highly-experienced pianists, singers, or orchestral instrumentalists, designed to enable them to expand their knowledge of repertoire and technique, and to further their personal performance skills and musical understanding.

Performance concentration requirements:

	Instrumental	Piano	Voice
Applied Study, MUA 500 level (4 semesters)	8	8	8
Pedagogy	4	4	4
Music Literature in major area	4	4	4
Ensembles, MUE 500 level (2 semesters)	2	2	2
MUA 601 Recital	2	2	2
Electives: (additional performance study rec)	4	4	4

Culminating Projects

The culminating project differs depending upon which concentration is chosen.

1. For candidates for a Master of Music with concentrations in composition, conducting or performance, the culminating project is a recital.
2. For candidates for a Master of Music with a concentration in pedagogy, the culminating project consists of written work plus the teaching practicum.
3. For candidates for a Master of Music with a concentration in music education, the culminating project consists of a thesis or equivalent project.

Students are urged to plan ahead for the culminating projects. Obtain information about the expectations for culminating projects from your adviser early in the degree program.

Oral examination

After completion of the culminating project, thesis or recital, the student will be asked to make a 10 to 15 minute presentation for his or her project committee. In the case of a recital, this might include discussion of interpretation, editions chosen, historical aspects, and so on. In the case of a thesis or project, this might take the form of a research presentation, including discussion of intentions, methodology, interpretation of data and findings.

1. Each student will be prepared to discuss the culminating project. In the case of a recital, this might include discussion of interpretation, editions chosen, historical aspects, and so on. In the case of a master's thesis or project, this might take the form of a research presentation, including discussion of intentions, interpretation of data and findings.
2. At the time of examination, the student will also be given some time to listen to recordings of musical selections and will be asked to comment on various stylistic aspects of the works.

A satisfactory presentation of material reflective of a satisfactory thesis, project or recital constitutes passing the Oral Examination for the degree of Master of Music. Any student who does not pass this examination may be offered the examination again one semester later, upon the approval of the student's adviser.

Ph. D. in education: major in educational leadership Music Education Cognate

The department of Music, Theater and Dance has designed a Music Education Cognate for the educational leadership major of the Ph.D. in Education program. This cognate prepares candidates for leadership in music education as teacher educators, music education administrators, and music education curricular leaders. Individuals interested should contact the Graduate Coordinator in the Department of Music.

COURSE OFFERINGS

APPLIED MUSIC

Individual lessons on a particular instrument or in voice. May be repeated for up to 10 credits.

MUA 500Voice (1 or 2)	MUA 514Trombone (1 or 2)
MUA 501Piano (1 or 2)	MUA 515Tuba (1 or 2)
MUA 502Organ (1 or 2)	MUA 516Timpani (1 or 2)
MUA 503 Harpsichord (1 or 2)	MUA 517Percussion (1 or 2)
MUA 504Violin (1 or 2)	MUA 518Harp (1 or 2)
MUA 505Viola (1 or 2)	MUA 519Guitar (Classical) (1 or 2)
MUA 506 Violoncello (1 or 2)	MUA 524Saxophone (1 or 2)
MUA 507 Double Bass (1 or 2)	MUA 530Piano (Jazz) (1 or 2)
MUA 508Flute (1 or 2)	MUA 531Guitar (Jazz) (1 or 2)
MUA 509Oboe (1 or 2)	MUA 532Trumpet (Jazz) (1 or 2)
MUA 510Clarinet (1 or 2)	MUA 533Saxophone (Jazz) (1 or 2)
MUA 511Bassoon (1 or 2)	MUA 534Percussion (Jazz) (1 or 2)
MUA 512 French Horn (1 or 2)	MUA 535Double Bass (Jazz) (1 or 2)
MUA 513Trumpet (1 or 2)	MUA 536Euphonium (1, 2 or 4)

MUA 561

Vocal Repertoire I (2)

A survey of literature for the voice with emphasis on historical style, covering the Middle Ages through the 19th century, with emphasis on German song.

MUA 562

Vocal Repertoire II (2)

A survey of literature for the voice with emphasis on historical style, covering the 19th and 20th centuries, emphasizing French, British and American song.

MUA 601

Master's Recital (2)

A concert or recital demonstrating the candidate's creative and artistic strengths. Credit will be awarded only upon approval of a specially-appointed jury committee.

MUSIC ENSEMBLES

MUE 501

University Chorus (0 or 1)

Performance of the large choral masterpieces from all music periods. One of the following activities or duties will also be assigned: a musicological study of the work performed, section leader, section rehearsal assistant, assistant conductor, or ensemble manager.

MUE 502

Community Chorus (0 or 1)

Festival-type mixed chorus for citizens of the surrounding communities who possess vocal experience. Performance of varied choral literature. Meets in the evening. Graduate students are expected to perform one of the following activities or duties in addition: a musicological study of the work performed, section leader, section rehearsal assistant, assistant conductor, ensemble manager. May be repeated for credit.

MUE 504

Oakland Chorale (0 or 1)

Performance of a wide range of choral chamber repertoire from Renaissance to the present. May be repeated for credit. One of the following activities or duties will also be assigned: a musicological study of the work performed, section leader, section rehearsal assistant, assistant conductor, or ensemble manager.
Prerequisite: Permission of instructor.

MUE 515

Vocal Jazz Ensemble (0 or 1)

Ensemble performance of complex jazz works. Development of jazz style and blend, scat-singing, solo production and microphone technique. One of the following activities or duties will also be assigned: a musicological study of the work performed, section leader, section rehearsal assistant, assistant conductor, or ensemble manager.
Prerequisite: Permission of instructor.

MUE 520
Pontiac-Oakland Symphony (0 or 1)

Orchestral performance of repertoire from the 18th, 19th and 20th centuries. Several concerts per year, on and off campus. Accompaniments for solo concertos and university choral groups. At least one of the following activities or duties will be assigned: a musicological study of the work performed, section leader, section rehearsal assistant, assistant conductor, or ensemble manager. Graded S/U.

Prerequisite: Membership by audition.

MUE 531
Symphonic Band (0 or 1)

An ensemble of wind instruments performing standard concert band literature. One of the following activities or duties will also be assigned: a musicological study of the work performed, section leader, section rehearsal assistant, assistant conductor, or ensemble manager.

Prerequisite: Permission of instructor.

MUE 540
Oakland University Jazz Ensemble (0 or 1)

A big band jazz ensemble performing traditional and contemporary jazz literature. Experience will be gained in ensemble and improvisational performance. One of the following activities or duties will also be assigned: a musicological study of the work performed, section leader, section rehearsal assistant, assistant conductor, or ensemble manager.

Prerequisite: Membership by audition.

MUE 545
African Ensemble (0 or 1)

Study and performance of drumming and xylophone traditions as related to African oral culture using authentic Ghanaian and Ugandan instruments.

MUE 546
Steel Band (0 or 1)

Study and performance of various Trinidadian and Caribbean styles using handcrafted steel drums.

MUE 547
Rhythm and Movement Workshop (0 or 1)

A study of percussion as related to dance. Emphasis will be on the inter-related nature of these two art forms.

MUE 550
Opera Workshop (0 or 1)

Study and experience in various forms of operatic music theatre. One of the following activities or duties will also be assigned: a musicological study of the work performed, section leader, section rehearsal assistant, assistant conductor, or ensemble manager.

Prerequisite: Permission of instructor.

MUE 551
Musical Theatre Workshop (0 or 1)

Performance and study of repertory of the musical theatre. One of the following activities or duties will also be assigned: a musicological study of the work performed, section leader, section rehearsal assistant, assistant conductor, or ensemble manager.

Prerequisite: Permission of instructor.

MUE 575
Piano Ensemble (0 or 1)

Class instruction in performance and repertory of multiple keyboard literature. One of the following activities or duties will also be assigned: a musicological study of the work performed, section leader, section rehearsal assistant, assistant conductor, or ensemble manager.

Prerequisite: Permission of instructor.

MUE 580
Chamber Music (0 or 1)

Preparation for public concert under the supervision of a chamber music coach. May be repeated for up to 4 credits.

Prerequisite: Permission of department.

MUE 590
Accompaniment Practicum (0 or 1)

Experience in piano accompaniment of vocal and instrumental solo and/or ensembles. May be repeated once for credit.

■ MUSIC HISTORY, LITERATURE, AND APPRECIATION; MUSIC EDUCATION

MUS 500

Introduction to Graduate Study in Music (2)

Provides a foundation in library and Internet usage and a review of resources and approaches to enable students to prepare for graduate courses in music theory and history. Offered every other spring and fall.

MUS 502

Teaching for Music Understanding (2)

Principles and practices of teaching music and their relationships to current theories of learning. Emphasis on the development of musical understanding through an interactive, constructivist approach.

MUS 503

The School Choral Program (2)

Principles and practices for organizing and running a successful choral program in elementary school, middle school and high school: e.g., recruiting, criteria for selection of repertoire, performance and management techniques. Emphasis on developing musical understanding through the performance experience.

MUS 504

The School Instrumental Program (2)

Provides practical information related to the teaching of middle school and high school instrumental music, e.g., teaching strategies, repertoire, materials and techniques. Emphasis on developing musical understanding through the performance experience.

MUS 515

Introduction to Music Technology (2)

Basic introduction to music technology, including MIDI, sequencing, notation software, music software, multimedia and Internet resources. Includes a one-hour, hands-on laboratory session weekly.

Prerequisite: Basic familiarity with personal computer operation, use of mouse, Internet skills.

MUS 521

Seminar in Medieval and Renaissance Music (2)

Study of topics in Medieval and Renaissance music with emphasis on current musicological research. Can be repeated for credit.

Prerequisite: MUS 500 or permission of instructor.

MUS 522

Seminar in Baroque and Classical Music (2)

Study of topics in Baroque and Classical music with emphasis on current musicological research. Can be repeated for credit.

Prerequisite: MUS 500 or permission of instructor.

MUS 523

Seminar in Music from 1800 to Present (2)

Study in topics in music for 1800 to the present with emphasis on current musicological research. Can be repeated for credit.

Prerequisite: MUS 500 or permission of instructor.

MUS 524

History of the Musical Theatre (4)

Survey and analysis of styles and technical aspects of Broadway and musical theatre.

MUS 528

Opera I (2)

History of opera from Monteverdi to Mozart. Detailed study of selected examples, concentration on the interaction of musical and dramatic form, and consideration of performance practice issues.

Prerequisite: MUS 320 and 321.

MUS 529

Opera II (2)

History of opera from Beethoven to present. Detailed study of selected examples, concentration on the interaction of music and text, and consideration of musical and dramatic characterization

Prerequisite: MUS 320 and 321.

MUS 531

Historical and Philosophical Foundations of Music Education (4)

Philosophical bases of learning and musical learning, their roots, historical contexts, assumptions and implications for education and music education practice.

MUS 532

Psychological Foundations of Music Education (4)

Theories of learning and musical learning, their roots, assumptions and implications for music education practice. Some assignments connected to work in the field.

Prerequisite: MUS 531 or permission of instructor.

MUS 533

Learning Theory for Studio Teachers (2)

Theories of learning and musical learning, their roots, assumptions and implications for music education practice.

Same as MUS 532 without the field component.

MUS 541**Piano Pedagogy I (2)**

Instructional strategies for teaching the beginning piano student, including methods, materials and the use of music technology. Various aspects of establishing and managing a piano studio will be addressed. Weekly observations required.

Prerequisite: Instructor permission.

MUS 542**Piano Pedagogy II (2)**

Instructional strategies for teaching the intermediate and advanced piano student, including methods, materials and the use of music technology. Includes weekly observations and supervised teaching.

Prerequisite: Instructor permission.

MUS 548**Advanced Group Piano Pedagogy (2)**

Overview of class piano laboratory technology, text selection, student placement, curriculum development, and assessment of student achievement. Includes observation and field experience assisting in the piano lab.

Prerequisite: MUS 541, 542.

MUS 550**Vocal Pedagogy I (2)**

An examination of the scientific and aesthetic principles of voice production, focusing on teaching others to sing. The diagnosis and correction of vocal faults and working with a damaged voice will also be addressed.

Prerequisite: MUA 300 or higher.

MUS 551**Applied Music (1)**

Independent study for graduate students in the technique and literature of a performing medium. Offered spring and summer terms.

Prerequisite: Permission of department.

MUS 552**Vocal Pedagogy II (2)**

Continuation of Vocal Pedagogy I, wherein the science and art of teaching voice is given practical application. Students research and present on a variety of topics concerning vocal health and vocal pedagogy and work with singers in a studio setting to gain practical experience in solving vocal problems.

Prerequisites: MUS 550, MUA 300 or higher.

MUS 555**Piano Repertoire I (2)**

Survey of piano repertoire from the baroque to classic (ca. 1600-ca. 1820).

Prerequisite: Permission of instructor.

MUS 557**Piano Repertoire II (2)**

Survey of piano repertoire from the classic to the present (ca. 1820 to the present).

Prerequisite: MUS 555 or permission of instructor.

MUS 560, 561**Church Music I and II (2 each)**

Study of liturgy and hymnology. Development of skill in service-playing at the organ, chant accompaniment, modulation and improvisation. Coordination of organ and choral repertoire for the church service.

MUS 571**Brass Literature and Pedagogy (2)**

Study of the elementary and secondary level solo and ensemble literature for brass instruments and the pedagogy used to deal with the music's performance problems.

Prerequisite: Admission to graduate program in music or permission of instructor.

MUS 576**Literature for the Middle School and High School Band (2)**

A study of elementary and secondary level literature for the wind band with specific emphasis on the selection of curricular material that will enable and facilitate the teaching of musical concepts in a performance setting.

Prerequisite: Admission to graduate program in music or permission of instructor.

MUS 580**Advanced Choral Interpretation and Conducting Techniques (2)**

Techniques and problems of interpreting and conducting choral literature through style analysis, performance practices, choral tradition and vocal production. May be repeated for credit.

MUS 581**Advanced Instrumental Interpretation and Conducting Techniques (2)**

Techniques and problems of interpreting and conducting major orchestral works through style analysis, performance practices and various instrumentations, including works for a wide range of ensemble combinations.

MUS 590**Special Topics in Music (1, 2 or 4)**

Topics and issues in music performance, literature, and research.

MUS 595

Innovations in Music Education (1 to 4)

Innovative ideas in music instruction. Materials, methods and curricula appropriate to changing philosophies of music education and current research on learning and teaching. May be repeated for credit.

MUS 599

Independent Study (1, 2 or 4)

A program of independent study under the guidance of a faculty adviser. The study plan is subject to final approval by the departmental graduate committee. May be repeated for credit.

MUS 600

Graduate Seminar (2)

Special seminars in music performance, literature and education. An in-depth study of current topics and issues. *Prerequisite: Completion of all other core courses.*

MUS 620

Conducting Apprenticeship (2)

An individual program under the supervision and in association with one of the major ensemble conductors of the music area. *Prerequisite: Permission of instructor.*

MUS 680

Directed Research in Music Education (2 or 4)

Independent or group research in music education methods, measurement and curriculum. *Prerequisite: Approval of an adviser and the departmental graduate committee.*

MUS 686

Apprentice College Teaching (1 to 4)

Supervised teaching in college courses together with participation in developing and exploring objectives and materials.

MUS 689

Research Methods in Music Education (2)

Research methodologies for music education with a focus on qualitative inquiry and the arts. Develops skills necessary for engaging in a master's project.

MUS 690

Master's Project (2 or 4)

A thesis or equivalent project based on research. Projects must be approved by the candidate's adviser and a departmental committee.

MUS 720

Conducting Apprenticeship (4, 8, 12, 16)

An individual program under the supervision and in association with one of the major ensemble conductors of the music area. *Prerequisites: Admission to doctoral program. Permission of instructor.*

MUS 730

Doctoral Seminar: Music Education (1)

Forum for advanced-level discussion of issues in education, arts education, and music education from a variety of perspectives and their implications for music teaching and learning. Students must enroll a minimum of 4 times for 1 credit each, during their first two years in the program. *Prerequisite: Admission to doctoral program.*

MUS 731

Historical and Philosophical Foundations of Music Education (2 or 4)

Philosophical bases of learning and musical learning approaches, their roots, historical contexts, assumptions and implications for education and music education practice. *Prerequisite: Admission to doctoral program.*

MUS 732

Psychological Foundations of Music Education (2 or 4)

Theories of learning and musical learning, their roots, assumptions, and implications for music education practice. *Prerequisite: Admission to doctoral program.*

MUS 756

Survey and Study of Choral Literature (2)

Study of choral literature from the Renaissance to the present. Examination of music from each period with emphasis on literature selection for choral groups, understanding and interpretation of the scores, historical accuracy in performance, and program building, with an overall eye toward practical usage. *Prerequisite: Admission to doctoral program.*

MUS 780

Advanced Choral Interpretation and Conducting Technique (2)

Techniques and problems of interpreting and conducting choral literature through style analysis, performance practices, choral tradition, and vocal production. *Prerequisite: Admission to doctoral program.*

MUS 790

Special Topics in Music and Music Education (1, 2, 3, or 4)

Current topics and issues in music education, research, performance and literature. *Prerequisite: Admission to doctoral program.*

MUS 799

Independent Study (1, 2, 3 or 4)

A program of independent study under the guidance of a faculty adviser. The study plan is subject to approval by the departmental graduate committee. *Prerequisite: Admission to doctoral program.*

MUS 851**Field-Based Project I (2)**

A mentorship experience under the guidance of a professional in the field. May be a research mentorship, an administrative mentorship, or a college teaching mentorship, depending on the professional goals of the student.

Prerequisite: Admission to doctoral program.

MUS 852**Field-Based Project II (2)**

A mentorship experience under the guidance of a professional in the field. May be a research mentorship, an administrative mentorship, or a college teaching mentorship, depending on the professional goals of the student.

Prerequisite: Admission to doctoral program.

MUS 995**Dissertation Proposal Development Seminar (4)**

Drawing on readings, field-based projects, coursework, seminars, and practical experience, students prepare a dissertation proposal.

Prerequisite: Passing Comprehensive Examination.

MUS 999**Dissertation Research (4, 8, 12 or 16)**

Students independently pursue their own dissertation research projects and writing.

Prerequisite: Passing Comprehensive Examination.

■ MUSIC THEORY

MUT 530**Graduate Seminar in Theory and Analysis (4)**

A comprehensive review of advanced harmony and a survey of analytical techniques with their applications to styles and forms.

MUT 540**Composition (2 or 4)**

Private and group lessons in composition and composition laboratory: technique and individual style are emphasized. May be repeated for up to 10 credits.

MUT 550**Composition Seminar (2)**

Critical assessment and discovery of idioms and concert literature in modern times.

DEPARTMENT OF PHYSICS

190 Science and Engineering Building • (248) 370-3416 • Fax (248) 370-3408 • <http://www.oakland.edu/physics>

Interim Chair:

David Garfinkle

Professors emeriti:

Abraham R. Liboff, Ph.D., New York University
John M. McKinley, Ph.D., University of Illinois
Ralph C. Mobley, Ph.D., University of Wisconsin
Paul A. Tipler, Ph.D., University of Illinois
William D. Wallace, Ph.D., Wayne State University
Robert M. Williamson, Ph.D., University of Wisconsin

Professors:

Michael J. Chopp, Ph.D., New York University
David Garfinkle, Ph.D., University of Chicago
Andrei Slavin, Ph.D., Leningrad Technical University (Russia)
Gopalan Srinivasan, Ph.D., Indian Institute of Technology
(Bombay, India)
Norman Tepley, Ph.D., Massachusetts Institute of Technology
Uma Devi Venkateswaran, Ph.D., University of Missouri

Associate professors:

Ken Elder, Ph.D., University of Toronto (Canada)
Albert Rojo, Ph.D., Instituto Balseiro Boriloché (Argentina)
Bradley Roth, Ph.D., Vanderbilt University
Yang Xia, Ph.D., Massey University (New Zealand)

Adjunct professors of physics:

Carl Bleil, Ph.D., University of Oklahoma
Joseph Mantese, Ph.D., Cornell University

Adjunct professors of medical physics:

Peter M. Corry, Ph.D., University of Texas
Howard J. Dworkin, M.D., Albany Medical College
Adrian Kantrowitz, M.D., Long Island College of Medicine
Jae Ho Kim, Ph.D., Kyungpook University (University of Iowa)
Harold Portnoy, M.D., Wayne State University
Paul D. Stein, M.D., University of Cincinnati
John Wai Chiu Wong, Ph.D., University of Toronto (Canada)

Adjunct associate professors of medical physics:

Stephen Brown, Ph.D., University of Toronto (Canada)
James R. Ewing, Ph.D., Oakland University
Robert Knight, Ph.D., Oakland University
S.D. Nathanson, M.D., University of Witwatersrand
(South Africa)
Joseph S. Rosenshein, Ph.D.,
Massachusetts Institute of Technology

Adjunct assistant professors of medical physics:

Elwood P. Armour, Ph.D., University of Texas
Susan Bowyer, Ph.D., Oakland University
Qian Jiang, Ph.D., Oakland University
Mark Oldham, Ph.D., University of Newcastle Upon Tyne
(United Kingdom)
Michael Bryan Sharpe, Ph.D., University of Western Ontario
(Canada)
Di Yan, D.Sc., Washington University
Zheng-Gang Zhang, Ph.D., Oakland University

Adjunct instructor of medical physics:

Ray Carlson, M.S., Wayne State University
Clara Castoldi, Ph.D., University of Milan (Italy)

The Doctor of Philosophy in Biomedical Sciences: Medical Physics

Coordinator:

Norman Tepley

The College of Arts and Sciences offers a biomedical sciences doctoral program with a specialization in medical physics which is centered in the Department of Physics.

Medical physicists are providing primary contributions to advances in diagnostic and therapeutic medicine. Laser surgery, ultrasonics, nuclear medicine, radiotherapy and nuclear magnetic resonance imaging are examples of medical modalities developed

and implemented by medical physicists. The medical physics specialization of the biomedical sciences doctoral program is designed for students who plan careers in medical research in industrial, hospital and academic settings. The curriculum is designed to prepare the student to engage in research in areas of physics applied to medicine. Ph.D. candidates may elect to do their dissertation research either with one of a number of Oakland University faculty currently involved in biomedical research or with one of the scientists in area hospitals which collaborate closely with the university. Among these are: Henry Ford Hospital, Detroit; and William Beaumont Hospital, Royal Oak. In addition to the graduate assistantships described on page 32, hospitals participating in this program may provide support for qualified students. Interested students should consult the program coordinator for details.

Required areas of proficiency

Within twelve months after entering the program, each student must demonstrate proficiency at the intermediate undergraduate level in the following areas: modern physics (PHY 371); physical chemistry (CHM 343); and at least three of the following: computer sciences, statistics (STA 226), differential equations (APM 257), electronics (PHY 341, 347), electricity and magnetism (PHY 381), and physiology (BIO 321). Proficiency may be demonstrated through previous course work or special examinations. Students may satisfy proficiency requirements by completion with a grade of 3.0 or higher in the appropriate courses listed above.

Areas of graduate-level proficiency required for the medical physics specialization are: theoretical physics, mathematical methods in scientific research, biophysical sciences and laboratories. Proficiency in theoretical physics would typically be established by taking several of the following courses: PHY 472, 482, 522, 552 and 562. Courses used to satisfy the mathematical methods area might include: STA 425, 427, or 501 and APM 533, 534. The biophysical sciences area proficiencies could be met by taking: BIO 401, CHM 234, 235 and 342, PHY 525 and 726. Laboratory proficiency may be satisfied by laboratory courses or by research.

For further information on admission criteria and general degree requirements for the biomedical sciences Ph.D. programs, see the Biomedical Sciences Doctoral Program section in this catalog.

■ The Master of Science in Physics

The program leading to the degree of Master of Science in physics consists of courses, research, seminar participation and a final research report or critical essay. A formal thesis is not required. Students receiving the degree will be prepared to work toward the Doctor of Philosophy in physics, to teach at the junior college level or to work in industry.

The average candidate entering in the fall semester will usually require two academic years to complete the degree. A very well-prepared candidate should complete the required courses and research credits in three semesters. Each student's program will be adjusted to his/her interests and background.

Admission

An applicant for admission to the M.S. program must have a bachelor's degree from a regionally accredited. The applicant's background should be strong in physics and mathematics.

Requirements for the degree

The basic degree requirement is successful completion of 36 credits of graduate courses distributed as follows: 4 credits of PHY 673 (Quantum Mechanics); 1 credit of PHY 600 (Seminar); 23 credits of additional 400-, 500-, or 600-level courses approved by the department; 8 credits of research, including a final written report or critical essay.

Research Fields and Facilities

The Department of Physics faculty are currently involved in research in three broad areas: biophysics and medical physics, condensed matter physics theory and experiment, and gravitational physics theory. Specifically, the biophysics and medical physics group has been studying the mechanisms underlying bioelectromagnetic interactions, biomedical aspects of biomagnetism, NMR imaging, NMR microscopy, in vivo NMR spectroscopy, neuromagnetism, photodynamic therapy, and the biophysics and biomechanics of osteoarthritis, stroke, cerebrovascular disease, brain tumor, migraine headache, and hyperthermia. The condensed matter physics group conducts theoretical studies of the linear and nonlinear dynamics of spin waves and phenomena associated with phase transitions and experiments on magnetic properties of technologically useful materials, optical properties of semiconductors and carbon nanotubes under high pressure, and crystal growth of diamond films and silicon ribbons. The gravitational theory group's research centers on critical phenomena, chaos, and the nature of generic singularities in Einstein's theory of general relativity.

Research facilities in the high pressure optics laboratory include Raman spectrometers with single or multi-channel detectors, facilities for photoluminescence studies in the visible and infrared regions, argon ion and Ti: sapphire lasers, high pressure cells capable of generating 10 GPa, and closed cycle helium refrigerators. Research facilities in the condensed matter physics laboratories include a Faraday Magnetometer, an AC susceptometer, a ferromagnetic resonance spectrometer at x-band, a Philips x-ray diffractometer, one and two kilowatt RF power supplies with 50W matching networks for silicon ribbon growth, and a vacuum facilities for thin film evaporation and fullerene preparation. Research facilities in the biomagnetism laboratories include the non-magnetic environment of the Kettering Magnetics Laboratory and an underground shielded room for research demanding ultra-low AC backgrounds. Research facilities in the NMR microscopy laboratory include a Bruker AMX 300 NMR spectrometer with a 7-Tesla/89-mm vertical bore superconducting magnet and micro-imaging accessories. The department also has ultrasonic equipment in the frequency range from 100 kHz to 10 GHz. Supporting facilities include electronics and mechanical workshops staffed by experienced technical personnel. Computer facilities include a number of DEC-alpha and SGI workstations, and numerous Macintosh and IBM computers. Most research laboratories are located in the modern Science and Engineering Building on campus.

Among research facilities in neighboring hospitals available to medical physics students are a 3.0-Tesla whole-body NMR system and a 7.0-Tesla/20-cm horizontal bore magnet NMR system for imaging and in vivo spectroscopy, a megawatt tuneable dye laser and argon ion laser for photodynamic therapy research, a 148-channel whole-head SQUID neuromagnetometer, a nuclear medicine laboratory, radiology and CT scanning facilities, advanced modalities cancer therapy laboratory, including radiotherapy and hyperthermia, diagnostic ultrasonic equipment, a laser surgery laboratory, and major hospital medical libraries.

COURSE OFFERINGS

Selected 400-level courses may carry graduate credit.

PHYSICS

PHY 418

Modern Optics Laboratory (2)

Experiments illustrating geometric and physical optics principles, lasers, fiber optics, holography, and spectroscopy. Equipment used ranges from simple to sophisticated lasers, interferometers, digital cameras and a Raman spectrometer. Offered winter even-numbered years only.

Prerequisites: PHY 317 and 371. Also PHY 331 or permission of instructor.

PHY 421

Thermodynamics (4)

The zeroth, first, and second laws of thermodynamics with applications to pure substances. Introduction to the kinetic theory of gases and to statistical mechanics. Offered winter odd-numbered years only.

Prerequisites: PHY 361 and APM 257.

PHY 470

Relativity (4)

Special relativity in mechanics and electromagnetism. Introduction to general relativity and gravitation. Offered winter even-numbered years only.

Prerequisite: PHY 361 or 371 or 381.

PHY 472

Quantum Mechanics I (4)

Principles of nonrelativistic quantum mechanics, Schrodinger wave equation, expectation values of energy, position, momentum and angular-momentum operators, spin, perturbation theory, identical particles. With applications to atomic systems. Offered winter only.

Prerequisites: PHY 351, 361, 371, and APM 257.

PHY 482

Electricity and Magnetism II (4)

Multipole fields, solutions of Laplace and Poisson equations, electromagnetic waves in insulators and conductors, radiation and derivation of the laws of optics from Maxwell's equations. Offered fall.

Prerequisites: PHY 381, APM 257, and MTH 256.

GRADUATE COURSES

PHY 504

Advanced Astrophysics I (4)

Observational properties of stars, galactic structure, stellar dynamics.

Prerequisites: PHY 305, 361, 472, and 482.

PHY 505

Advanced Astrophysics II (4)

Stellar structure and evolution, interstellar medium, galaxies, cosmology.

Prerequisite: PHY 504.

PHY 522

Statistical Thermodynamics (4)

Review of classical thermodynamics. Kinetic theory of gases, transport phenomena, classical and quantum statistics, partition functions and thermodynamic properties, ensembles and fluctuations.

Prerequisites: PHY 421 and 552.

PHY 525

Radiation Biophysics (4)

The study of molecular and cellular radiation biology, theories of biological effects of radiation, repair of radiation damage, effects of irradiation on human tissue and organs and radio-sensitivity of human tumors.

Prerequisites: BIO 401 and PHY 372 or permission of instructor.

PHY 530

Bioelectric Phenomena (4)

The physics of bioelectric phenomena: the electrical behavior of nerves, skeletal muscle and the heart; the electrocardiogram and the electroencephalogram; and biomedical devices such as the pacemaker.

Prerequisite: PHY 102 or 152, and MTH 155. PHY 381 desirable.

PHY 542

Advanced Electronics (4)

Selected topics in the analysis and design of electronic circuits.

Prerequisite: PHY 341 or equivalent.

PHY 545

Nuclear Magnetic Resonance (4)

Basic principles, imaging techniques, in vivo spectroscopy.

Prerequisite: Permission of the instructor.

PHY 548
Advanced Electronics Laboratory (2)

Prerequisite: PHY 347 or equivalent.

PHY 552
Theoretical Physics (4)

Topics and techniques common to graduate physics courses: partial differential equations, eigenvalue problems, special functions, spherical harmonics, Green's functions, variational methods, linear vector spaces, tensors.

Prerequisites: PHY 361, 371 and 381.

PHY 553
Numerical Methods in Theoretical Physics (4)

Numerical differentiation and integration. Numerical solution of linear, transcendental and differential equations. Numerical modeling and data analysis. Accuracy and stability of algorithms.

Prerequisites: PHY 552 and knowledge of a scientific programming language (FORTRAN preferred).

PHY 562
Mechanics II (4)

Lagrange's and Hamilton's equations of motion, rotation of rigid bodies, coupled oscillations, nonlinear dynamics.

Prerequisites: PHY 361 and APM 257, or equivalent.

PHY 565
Physics of Continuous Media (4)

Introduction to elasticity and fluid mechanics, including tensors, stress, strain, flow, conservation principles, constitutive equations, elasticity and fluid mechanics.

Prerequisite: PHY 361.

PHY 573
Nuclear Physics (4)

Nuclear properties, forces, models, decays and reactions; nuclear energy, elementary particles.

Prerequisites: PHY 372 and 472 or equivalent.

PHY 574
Introduction to Solid-State Physics (4)

Introduction to the thermal, electrical and magnetic properties of solids, including periodic structure, lattice dynamics, electron interactions and behavior, transport properties, Fermi surface, optical behavior and superconductivity. Emphasizes current experimental techniques.

Prerequisite: PHY 371 or 472.

PHY 583
Classical Electrodynamics (4)

Review of electrostatics, magnetostatics, Maxwell's equations and electromagnetic waves. Relativistic description of particles, fields and interactions. Radiation by moving charges, bremsstrahlung, radiation damping, self fields.

Prerequisites: PHY 482 and 552.

PHY 600
Seminar (1)

Prerequisite: Permission of instructor.

PHY 610
Current Topics in Medical Physics (4)

Lectures on current areas of research in medical physics.

Prerequisite: Admission to Ph.D. program or permission of instructor.

PHY 615
Ethics and Law in Science and Engineering (4)

The purpose of this course is to provide graduate students in the sciences and engineering with an awareness of the current activities and discussions related to the legal and ethical conduct of modern-day science. This course will consist of lectures and seminars which will examine a number of specific topic areas, such as constitutional rights and protections, the U.S. and Michigan court systems, fundamental theories of contract, rights and responsibilities, conflict of interest (real and apparent), scientific fraud and misconduct, and patent rights.

PHY 631
Biomechanics (4)

This course will include topics in statics, kinematics and dynamics, elastic and viscoelastic theory as applied to the physical properties of biological materials and body motion, as well as fluid properties in the mechanics of the circulatory system.

Prerequisites: PHY 361, APM 257, or equivalent.

PHY 632
Introduction to Lasers and Masers (4)

Theory and principles of quantum electronics as applied to lasers and masers, properties of laser light, selected applications.

Prerequisite: PHY 472 or permission of the instructor.

PHY 665
Physics of Fluids in the Body (4)

Newtonian fluid flow; respiration, micturition and non-Newtonian fluid, mucous and blood, circulation; fluid flow in elastic tubes, blood, CSF, lymph.

Prerequisites: PHY 152 and MTH 254.

PHY 673
Quantum Mechanics (4)

Development of formal approach to quantum mechanics, selected illustrations and applications.

Prerequisites: PHY 472 and 552; PHY 562 advisable.

PHY 674
Advanced Quantum Mechanics (4)

Continuation of PHY 673. Additional illustrations and applications of formal quantum mechanics.

Prerequisite: PHY 673.

PHY 690
Master of Science Research (2 to 12)

PHY 721
The Interaction of Non-Ionizing Radiation with Tissue (4)

Review of electromagnetic theory, dielectric properties of tissue, piezoelectric effects, streaming potentials, dielectrophoresis, passive and active transport, cell-field interactions; observed effects in development, behavior and tissue repair; geomagnetic coupling. Interactions of ultrasound and lasers with cells.

Prerequisite: Admission to Ph.D. program or instructor's permission.

PHY 726
Advanced Radiation Biophysics (4)

In depth study of selected topics in Radiation Biophysics. Areas such as target theory, cell cycle distribution influences, molecular and cellular repair theories and concepts of micro dosimetry will be covered.

Prerequisites: PHY 525 and instructor's permission.

PHY 790
Doctoral Research (2 to 12)

■ PHYSICS FOR TEACHERS

PHT 515
Physics Teaching: Experiments and Equipment (2)

Secondary physics and physical science teachers will design, perform and critique laboratory and demonstration experiments selected to match individual teaching situations and available equipment. Related physical principles, potential open-ended questions and sources of experimental difficulties will be viewed.

■ DEPARTMENT OF POLITICAL SCIENCE

418 Varner Hall • (248) 370-2352 • Fax (248) 370-4299 • <http://www.oakland.edu/mpa>

Chair:

C. Michelle Piskulich

Director of Master of Public Administration program:

Dale Nesbary

Professors emeriti:

Thomas W. Casstevens, Ph.D., Michigan State University
Edward J. Heubel, Ph.D., University of Minnesota
Roger H. Marz, Ph.D., Michigan State University
James R. Ozinga, Ph.D., Michigan State University

Distinguished professor:

Sheldon Appleton, Ph.D., University of Minnesota

Professors:

Robert J. Goldstein, Ph.D., University of Chicago
Vincent B. Khapoya, Ph.D., University of Denver
John S. Klemanski, Ph.D., Wayne State University

Associate professors:

Paul J. Kubicek, Ph.D., University of Michigan
*Emmett Lombard, Ph.D., Colorado State University
William A. Macauley, Ph.D., University of Houston
*Dale Nesbary, Ph.D., Northeastern University
*C. Michelle Piskulich, Ph.D., State University of New York
at Binghamton
*J. Patrick Piskulich, Ph.D., State University of New York
at Binghamton
Martha T. Zingo, Ph.D., University of Maryland (College Park)

Assistant professors:

*John Bohte, Ph.D., Texas A & M University
David A. Dulio, Ph.D., American University
Peter F. Trumbore, Ph.D., University of Connecticut

Adjunct assistant professors:

*Annette Graziani-Lozen, M.P.A., Wayne State University
*Gerald W. Hall, M.P.A., Wayne State University
*Robert Mourning, J.D., University of Michigan
*Donna Petras, M.P.A., Oakland University
*Anthony R. Tersigni, Ed.D., Western Michigan University

*Participants in the public administration program

■ The Master of Public Administration (M.P.A.)

Graduate adviser:

Dale Nesbary

Director of internships:

J. Patrick Piskulich

The master's degree program in public administration and public policy has been established to provide a challenging education for persons seeking professional careers in governmental and other public and not-for-profit agencies. The need for such programs is recognized, given the growth in the number and the complexity of agencies at the state and local levels and the concern for both responsive and effective public service at all levels. The M.P.A. program seeks a generalist focus through a set of core courses and provides an opportunity for specialization through the electives and the directed project/internship option. Persons with significant experience in public service will be advised to undertake a directed project; those seeking a transition to a public service career will be assisted in an assignment to a public administration internship in one of the area agencies.

Admission

Admission to the program is selective. Applicants must hold a baccalaureate from a regionally accredited undergraduate institution and must have a grade record that indicates superior work. The program is designed to accommodate students with a wide variety of undergraduate preparations, provided that certain courses have been taken and skills acquired as part of those programs. Applicants must meet the university's general requirements for admission to graduate studies. Conditional admission status may be granted to students who need minor improvements to their records, subject to approval by the Vice Provost for Research and Graduate Study. In addition to these requirements, the Department of Political Science will interview the applicants and assess their writing abilities.

Undergraduate preparation for the M.P.A.

Degrees in a wide variety of majors will prepare the student for admission, providing that the record includes:

- 1 . Basic courses in political science, government, or public administration
- 2 . Principles of micro and macro economics
- 3 . Principles of accounting.

Students otherwise qualified for admission to the program but lacking in these areas may be admitted conditionally with the requirement that the deficiency be corrected during the first year of the program by an appropriate undergraduate course. A departmental adviser will plan with the student an appropriate way of meeting these prerequisites. Undergraduate credits earned to meet these standards will not be counted toward the total of graduate credits needed for the degree.

Requirements for the degree

The requirement for the M.P.A. is 40 credits. All required courses are offered during weekday evenings. If the student successfully carries a normal load, it will be possible to complete the program in two calendar years, starting in the fall of one year and ending in the spring/summer of the next academic year.

Core program

The following core courses are required. All of these courses must be taken at Oakland University unless prior departmental written permission is obtained.

PA 601	Public Administration:Theory	4
PA 620	Quantitative Methods in Public Administration*	4
PA 621	Government Information Systems**	4
PA 653	Public Budgeting and Finance	4
PA 654	Managing Human Resources in the Public Sector	4
PA 655	Program and Policy Evaluation	4
		24

*Students with little or no experience with statistics are advised to enroll in PA 522 prior to taking PA 620.

**Students with little or no experience with computers are advised to enroll in PA 523 prior to taking PA 621.

Electives	12
Internship or Project	4
Total M.P.A. credits	40

The student is expected to complete 12 credits of electives from the public administration offerings and from designated graduate course listings in other schools or programs at Oakland University. At the end of course work, the student who has not had significant public service experience will be assigned an internship; others will be expected to complete a research project.

Assuming a yearly fall admission to the program, students may take core courses and electives as follows:

	Fall	Winter	Spring/Summer
Year 1	PA 601 PA 653	PA 621 PA 654	Electives
Year 2	PA 655 Elective	PA 620	Internship or Project Elective

Conditional and special graduate status

Students who are conditionally admitted to the program must have the condition removed before undertaking the second year of the program. Students who have special graduate status may take up to three courses in the program without formal admission to the program; to proceed further in the course sequence requires admission to the program. Upon attaining full graduate status, the student will receive credit toward the program for the work done as a special graduate student.

Academic progress

Although credit for completion of a course in the M.P.A. program will be given for grades of 2.0 or above, the minimum satisfactory grade for graduate work is 3.0. A student's academic progress is monitored by the director of the M.P.A. program. If a student receives a grade for any M.P.A. course below 3.0, an academic warning letter is sent to the student. With a second grade below a 3.0, the student receives written notification that he or she is on academic probation. A student placed on probation may be required to meet new standards to remain in the M.P.A. program. With a third grade below a 3.0, the student is notified in writing that he or she is subject to dismissal pending a review of the student's entire record by the M.P.A. director and the Vice Provost for Research and Graduate Study. Regardless of their standing, all M.P.A. students are encouraged to consult with their individual instructors and the M.P.A. academic adviser concerning their academic progress.

■ Concentrations in Human Resources Management; Health Care Administration; Nonprofit Organization and Management; or Local Government Management

In addition to the 24 credits in the core curriculum, a student may take all 12 of his or her elective credits in one of human resources management, health care administration, non-profit organization and management or local government management. Such a focus in one of these concentrations can provide the student with those special skills necessary to cope with the many changes occurring in these dynamic fields. Students who pursue a concentration may need an additional semester to complete elective requirements.

The courses making up the Human Resources Management concentration include at least:

PA 548 Administrative Ethics
 PA 603 Contemporary Public Management Techniques
 PA 632 Public Sector Collective Bargaining
 PA 633 Workshop in Fair Employment Practices
 PA 638 Public Sector Employee Relations
 PA 644 Public Sector Human Resources Management

The courses making up the Health Care Administration concentration include at least:

PA 548 Administrative Ethics
 PA 559 Public Policy and Health Care
 PA 568 Health Planning: Policies and Processes
 PA 569 Organization and Administration of Health and Medical Care Programs
 PA 603 Contemporary Public Management Techniques
 PA 610 Strategic Planning
 PA 634 Risk Management

The courses making up the Nonprofit Organization and Management concentration include at least:

PA 510 Nonprofit Organization and Management
 PA 511 Fundraising and Philanthropy
 PA 548 Administrative Ethics
 PA 603 Contemporary Public Management Techniques
 PA 610 Strategic Planning
 PA 631 Grants: Politics and Administration
 PA 634 Risk Management

The courses making up the Local Government Management concentration include at least:

PA 503 Intergovernmental Relations
 PA 542 Administrative Law: Local Perspectives
 PA 543 Law and Administration: State Perspectives
 PA 548 Administrative Ethics
 PA 603 Contemporary Public Management Techniques
 PA 610 Strategic Planning
 PA 630 Local Government Management
 PA 631 Grants: Politics and Administration
 PA 634 Risk Management
 PA 669 Community Planning and Zoning

COURSE OFFERINGS

PA 503

Intergovernmental Relations (4)

Conflict and cooperation between, and among, national, state and local governments. Illustrations are drawn from programs in social services, community development and regulation.

Prerequisite: Graduate standing, or junior/senior status with at least three courses in political science or permission of M.P.A. director.

PA 510

Nonprofit Organization and Management (4)

Fundamentals of nonprofit organization and management. Differences between the nonprofit and the for-profit and public sectors. Board and staff relations. Management theories; leadership styles. Human resource development; financial management; planning and accounting. Marketing, public relations and ethical issues. Case studies and specific management techniques.

PA 511

Fundraising and Philanthropy (4)

Issues of fundraising and philanthropy in the nonprofit sector. Case studies of nonprofit fundraising from a variety of nonprofit organizations. Sources of funding: government, public and private foundations, corporate giving, and individual contributions. Ethics and values in fundraising. Strategies and techniques of fundraising.

PA 522

Research Perspectives and Techniques (2)

Introduction to descriptive statistics, research design and methods of data analysis.

PA 523

Computer Applications in Administration (2)

Using and evaluating microcomputer applications such as spreadsheet analysis, business graphics, database management, productivity and planning software. Exercises will develop proficiency in solving problems in small agency settings.

PA 541

Law and Public Policy (4)

The impact of "the rule of law" concept on administrative policy, practice and decision making. Examines the effects of existing procedural requirements on the exercise of administrative discretion, the role of the courts and the likely consequences of proposed "reforms."

Prerequisite: Graduate standing, or junior/senior status with at least three courses in political science, or permission of M.P.A. director.

PA 542

Law and Administration: Local Perspectives (2)

The relationships between local government and the legal system with special attention to: 1) legal constraints on administrative discretion; 2) tensions between corporation counsels or prosecutors and administrators; 3) civil vs. criminal procedures and their impact on local decision making; and 4) federal/local and state/local relationships and the courts.

PA 543

Law and Administration: State Perspectives (2)

State administrators and the legal system: 1) the roles of the administrative and agency hearing offices; 2) tensions between the administrative and agency hearing offices; 3) agencies and civil courts; and 4) agencies and the attorney general.

PA 548

Administrative Ethics (2)

Exploration of ethical components of administrative decision making and activities in public and not-for-profit agencies. Includes personnel decisions, service delivery procedures and measures of program performance. Provides a forum for judging ethical behavior, to help understand how ethical considerations permeate all job-related activities and to assist ethical decision-making skills.

PA 559

Public Policy and Health Care (4)

An examination of the status and evolution of public policies relating to health and health care, the policy-making processes in health care and the various implications of trends in health care policy.

PA 568

Health Planning: Policies and Processes (4)

The roles and functions of planning in the health care system. Concepts, techniques, issues and policies relating to health planning and other human services will be examined. Analytic tools will be applied to a number of health problems.

PA 569

Organization and Administration of Health and Medical Care Programs (4)

Emphasis on the application of administrative and organizational analytical perspectives to health and human service organizations. Concepts and perspectives from the governmental and public interest concerns will be applied.

PA 601
Public Administration: Theory (4)

Fundamental concepts of public administration, their origin and development. Distinguishes between public and private and between government and administration.

PA 602
Public Administration: Issues and Problems (4)

Contemporary controversies and trends in public administration systems.

PA 603
Contemporary Public Management Techniques (4)

Application of contemporary public management techniques, such as Total Quality Management (TQM). Managers as change agents and leaders of quality improvement and excellence in the workplace. Strategies for implementing these programs. Counts as credit for all concentrations in the M.P.A. program.

PA 610
Strategic Planning (4)

Theoretical and historical perspectives of strategic planning. Components of a strategic planning model; leadership issues. Planning environment. Planning in nonprofit, health care, and public sector organizations. Internal data assessments. Developing and implementing operating plans. Contingency plans. Practical issues associated with strategic planning. Counts as credit for health care, nonprofit organization and management, or local government concentrations.

PA 620
Quantitative Methods in Public Administration (4)

A study of quantitative methods for use in the public sector. Emphasis on data analysis for decision making and attention to common computer techniques are included.
Prerequisites: PA 522 or permission of instructor.

PA 621
Government Information Systems (2 to 4)

Essential tools for management decision making and program evaluation; data management, information retrieval, selected computer packages and report writing are covered.

PA 630
Local Government Management (4)

Fundamentals of local government management. Topics to be covered include: politics and management; the management environment; leadership; staffing and personnel; employee motivation; local budgets; the local economy; and ethics. This course is required for students electing the Local Government Management concentration.

PA 631
Grants: Politics and Administration (2 to 4)

An examination of the grant process from the varying perspectives of the granting agencies, the requesting agencies, the institutional offices responsible for compliance and the ultimate recipients.

Prerequisite: Permission of instructor.

PA 632
Public Sector Collective Bargaining (2)

Policy, law and process of public sector bargaining.
Prerequisite: Permission of M.P.A. director.

PA 633
Workshop in Fair Employment Practices (2)

Statutes, court cases and federal guidelines for equal opportunity and affirmative action. Exercises with application to local government agencies.
Prerequisite: Permission of M.P.A. director.

PA 634
Risk Management (2)

This course will provide a description of the concept of risk management in the public sector. Topics include: risk identification, loss control and safety, insurance and the law, loss prevention and evaluation, placement of insurance and financial responsibility.

PA 638
Public Sector Employee Relations (2 to 4)

Policies and practices relating to employee relations and collective bargaining in the public sector.

PA 644
Current Issues in Public Sector Human Resources Management (2, 4)

Selected topics in human resources management, emphasizing state, county and local experiences. Topics can include: contract maintenance and compliance, merit systems, comparable worth, drug testing, employee assistance programs, affirmative action, mediation, arbitration and others as they emerge over time.

PA 653
Public Budgeting and Finance (4)

How governments raise funds and allocate them among competing purposes. Relations between agencies and executive budget offices and between executive and legislative branches of government. The elements of budget preparation, defense and review under various systems, line-item, performance, program, PPBS and zero-base budgets are presented.

PA 654

Human Resources Management in the Public Sector (4)

Study of human resources management in public agencies, the legal and political environment, managerial concerns and employee rights, and the problems of public employee collective bargaining.

PA 655

Program and Policy Evaluation (4)

How to judge the success of programs; problems of design, data collection and analysis to sort out causes and evaluate effects; cost-benefit analysis; the organizational and political aspects of evaluation studies.

PA 657

Workshop in Capital Budgeting (2)

Basic principles of government budgeting for capital projects from the perspective of a practitioner at the state and local level.
Prerequisite: Permission of M.P.A. director.

PA 658

Internship (4)

Supervised assignment in a public agency for approximately 32 weeks; periodic reports and evaluations.
Prerequisite: Permission of M.P.A. director.

PA 660

Public Administration Workshop (1 to 4)

Selected applied problems and exercises led by regular adjunct faculty or with the cooperation of practicing public administrators.

PA 669

Community Planning and Zoning (4)

A comprehensive study of municipal planning, zoning and general government from the perspective of the public administrator. Topics include: state legislation, state and federal grant programs, making a Master Plan, the impact of court decisions, housing and fiscal impact analysis, impact fee calculation and public works and capital improvements programming.

PA 690

Research Project (4)

Individual research project related to work or program of a public agency.
Prerequisite: Permission of M.P.A. director.

PA 691

Directed Readings (2 to 4)

Special readings designed to supplement or augment the course offerings. Not more than 6 credits of directed readings may be counted towards fulfillment of degree requirements.
Prerequisite: Fully admitted students with at least 20 credits in the M.P.A. program and permission of the M.P.A. director.

PA 692

Special Topics in Public Administration (2 to 4)

Special topics in public administration offered by the department.
Prerequisite: Permission of M.P.A. director.

PA 693

Special Topics in Public Policy (2 to 4)

Special topics in public policy offered by the department.
Prerequisite: Permission of M.P.A. director.

■ THE MASTER OF ARTS IN LIBERAL STUDIES

217 Varner Hall (248) 370-2140 • Fax (248) 370-4280 • <http://www2.oakland.edu/cas>

■ THE MASTER OF ARTS IN LIBERAL STUDIES

The College of Arts and Sciences offers a graduate degree program leading to a Master of Arts in Liberal Studies. This program is an innovative and rigorous interdisciplinary approach to graduate education designed for adult post-baccalaureate students wishing to explore new subjects, develop their intellectual resources, and extend their range of knowledge. The objectives of this program are in harmony with the goals of a liberal education: that is, to cultivate the individual's ability to integrate diverse fields of human knowledge and activity.

This program is neither vocational nor professional in its orientation. It is not be intended for students seeking to certify or credential; nor is it an intermediate step into a Ph.D. program. It is rather intended to help students develop critical thinking skills, encourage creativity and intellectual flexibility, and cultivate exploration of the liberal arts.

Admission Criteria

Admission to the Master of Arts in Liberal Studies degree program is selective. Applicants must hold a bachelor's degree from a regionally accredited college or university, must have earned a minimum 3.00 grade point average on a 4.00 point scale in the latter half of the undergraduate program. Applicants must write a one-page statement outlining their objectives in entering the program. (Students who do not meet the grade requirements may be admitted on a provisional basis, pending completion of three liberal-arts courses with grades of 3.0 or above and favorable recommendations from the instructors.)

Prospective students must submit transcripts verifying their previous academic record, and an admission interview with the program director will be required. All students in the program will be expected to maintain at least a 3.00 average, or they may be subject to dismissal from the program. Two grades below 3.0 automatically render a student subject to dismissal, as does one grade below 2.5. No credit will be granted for courses in which students have received grades below 2.7.

Degree Requirements

Candidates for the degree of Master of Arts in Liberal Studies will complete 37 credit hours of course work beyond the bachelor's degree. All students must complete a core of three courses (3 credit hours each, 9 credit hours total): an introductory colloquium and two core seminars. The introductory colloquium will serve as the prerequisite for the core seminars. Students will then choose six liberal studies electives (4 credit hours each, 24 credit hours total), cross listed with the college's graduate course offerings (or in the case of departments with no graduate program, 300-400 level courses in which extra advanced work would be required), taking a minimum of four (4) credit hours in each of the four designated areas: languages and literatures, humanities, social sciences, and science, and the master's project. No more than eight (8) credit hours may be taken as independent study or independent reading courses at the graduate level.

All students admitted to the program will be assigned a faculty adviser.

Master's Project

All students will complete a final master's project which will integrate at least two of the designated areas (4 credit hours). Students must complete the core courses and four electives before beginning their master's project, for the project represents the culmination of the student's liberal studies. Project proposals must be approved by the program's executive committee and will require a three-person project committee which also must be approved by the program's executive committee, and which will consist of a chair and two additional members. In addition, in the semester in which students write their projects, they will also enroll in the master's project seminar in which they will be expected to share their research and writing with fellow students writing projects that semester.

Transfer credits

Up to eight (8) graduate credits completed in residence at another accredited institution may be applied toward the 37-credit minimum degree requirement. Transfer of credits must be approved by the program's executive committee and is subject to the conditions indicated in Oakland University's "Transfer Credit Policy" in the graduate catalog.

In addition, up to eight (8) graduate credit hours may be transferred from another Oakland University school, subject to the approval of the program's executive committee.

COURSE OFFERINGS

LBS 500

Introductory Colloquium (3)

Introduction to liberal studies. Acquaints students with graduate-level skills, methods and materials. Considers problems specific to interdisciplinary study and research, as well as ongoing debates about the nature of the liberal arts. Offered each fall and winter term.

Prerequisite: Graduate standing.

LBS 501

Seminar in Language and Literature(3)

Seminar organized around a single topic or question from language and literature.

Prerequisite: LBS 500

LBS 502

Seminar in the Humanities (3)

Seminar organized around a single topic or question from the humanities.

Prerequisite: LBS 500

LBS 503

Seminar in the Social Sciences (3)

Seminar organized around a single topic or question from the social sciences.

Prerequisite: LBS 500

LBS 504

Seminar in the Sciences (3)

Seminar organized around a single topic or question from the sciences.

Prerequisite: LBS 500

LBS 511

Topics in Language and Literature (4)

A course to be cross listed with a graduate course in language or literature, which includes English, linguistics, modern languages and literatures, rhetoric, communication and journalism. May be repeated for up to 12 credits.

Prerequisites: LBS 500, graduate status, and prerequisites as specified for cross-listed courses.

LBS 512

Topics in the Humanities (4)

A course to be cross listed with a graduate course in the humanities, which includes art and art history, history, philosophy, and music, theatre and dance. May be repeated for up to 12 credits.

Prerequisites: LBS 500, graduate status, and prerequisites as specified for cross-listed courses.

LBS 513

Topics in the Social Sciences (4)

A course to be cross listed with a graduate course in the social sciences, which includes economics, political science, psychology, sociology and anthropology. May be repeated for up to 12 credits.

Prerequisites: LBS 500, graduate status, and prerequisites as specified for cross-listed courses.

LBS 514

Topics in the Sciences (4)

A course to be cross listed with a graduate course in the social sciences, which includes biology, chemistry, mathematics and statistics, and physics. May be repeated for up to 12 credits.

Prerequisites: LBS 500, graduate status, and prerequisites as specified for cross-listed courses.

LBS 600

Master's Project and Seminar(4)

Students are expected to enroll in this course during the semester in which they write their master's project.

Prerequisites: LBS 500, two of LBS 501, 502, 503, and 504, and four LBS electives.

■ SPECIAL COURSES

Occasionally, with the approval of the Office of Graduate Study, departments which do not have graduate programs may offer certain courses which carry graduate credit. The following courses have been approved by the Graduate Council for these special offerings.

■ ART AND ART HISTORY

AH 505 African Art (4)

The arts of the indigenous peoples of West, Central and East Africa.

AH 555 Michigan Architecture (4)

The development of the commercial domestic, industrial, public and religious architecture of Michigan from the period of early settlement to the present.

■ MODERN LANGUAGES

ML 504 Foreign Language Seminar: Language and Culture (3)

Focus on conversational skills in business contexts. Designed for students in the MBA and MACC programs who require language proficiency for business. Typical activities in the business environment will be taught.

ML 505 Foreign Language Seminar: Conversation and Culture (3)

Emphasis on broadening students' conversational skill in the foreign language in the business. Cultural differences, geography and business practices will be explored.

Prerequisite: ML 504

ML 520 Grammar Review Through Translation: French, German or Spanish (4)

Review of grammar through translation of a wide variety of materials from the foreign language into English. Emphasis on theory of more complex grammatical structures. Introduction to translation theory. Term paper required.

ML 521 Advanced Composition: French, German or Spanish (4)

Practice in written composition. Techniques of textual analysis and exposition are introduced. Term paper in the foreign language required.

ML 522 Advanced Oral Practice: French, German or Spanish (4)

Practice in speaking at an advanced level, which may include style and delivery appropriate to formal and informal speaking situations. May include oral presentations, self-recording and critique. Students will research underlying principles and current issues in the concept of communicative competence in second language learning.

PSYCHOLOGY

PSY 510

Developmental Psychology (4)

Description and evaluation of principles and theories of development from birth to maturity. Maturation processes, learning and emotional disturbances are considered.

Prerequisite: Permission of instructor or acceptance into a graduate program.

PSY 552

Sensation and Perception (4)

Approaches to the basic sensory systems and perceptual processes.

Prerequisite: Permission of instructor.

PSY 553

Cognitive Psychology (4)

The information processing approach to problems in pattern recognition, selective attention, mental operations, short- and long-term memory, the psychology of reading, problem solving and probabilistic reasoning.

Prerequisite: Permission of instructor.

PSY 590

Seminar: The Psychology of Reading (4)

Cognitive models of reading and reading-related information processing tasks. Empirical studies of the adult reading process.

Prerequisite: Admission to Ph.D. program in reading.

SCHOOL OF BUSINESS ADMINISTRATION

432 Elliott Hall • (248) 370-3287 • Fax (248) 370-4964 • <http://www.sba.oakland.edu>

Dean: John C. Gardner, Sr.

Office of the dean:

associate dean, academic programs: Eileen Peacock • **assistant dean:** Marcia Lichty

coordinator, graduate business programs: Donna D. Free

Department chairpersons:

Mukesh Bhargava, Management and Marketing

Edward Farragher, Accounting and Finance

Paul Licker, Decision and Information Sciences

Addington M. Coppin, Economics

Distinguished Professor Emeritus:

Karl D. Gregory, Ph.D., University of Michigan

Professor Emeriti:

Eleftherios N. Botsas, Ph.D., Wayne State University

Daniel N. Braunstein, Ph.D., Purdue University

Ronald M. Horwitz, Ph.D., Michigan State University, CPA

Sid Mittra, Ph.D., University of Florida

Professors:

Lizabeth A. Barclay, Ph.D., Wayne State University, SPHR

Mohammad S. Bazaz, Ph.D., University of Oklahoma

Addington M. Coppin, Ph.D.,

University of Illinois (Urbana-Champaign)

Gadis J. Dillon, Ph.D., University of Michigan, CPA

David P. Doane, Ph.D., Purdue University

Edward J. Farragher, Ph.D.,

University of Illinois (Urbana-Champaign)

John C. Gardner, Sr., Ph.D., Michigan State University

Oded Izraeli, Ph.D., University of Chicago

Thomas W. Lauer, Ph.D., Indiana University

Paul Licker, Ph.D., University of Pennsylvania

Donald O. Mayer, LL.M., Georgetown University

J. Austin Murphy, Ph.D., University of Georgia

Kevin J. Murphy, Ph.D., Michigan State University

Ravi Parameswaran, Ph.D., Georgia State University

Eileen Peacock, Ph.D., University of Birmingham,

England, CPA, CMA

Anandi P. Sahu, Ph.D., Washington University

Howard S. Schwartz, Ph.D., Cornell University

Miron Stano, Ph.D., Cornell University

Associate professors:

Mukesh Bhargava, Ph.D., University of Texas at Austin

Eugene B. Fliedner, D.B.A., Indiana University

Sherman T. Folland, Ph.D., University of Iowa

John W. Henke, Jr., Ph.D., Michigan State University

John D. Kim, Ph.D., University of Cincinnati

Kieran Mathieson, Ph.D., Indiana University

Nivedita Mukherji, Ph.D.,

Virginia Polytechnic Institute and State University

Mohinder Parkash, Ph.D., University of Arizona

Sandra S. Pelfrey, M.B.A., Wright State University, CPA

R. Mohan Pisharodi, Ph.D., University of Tennessee

Balaji Rajagopalan, Ph.D., University of Memphis

Srinarayan Sharma, D.B.A.,

Southern Illinois University at Carbondale

Mark Simon, Ph.D., Georgia State University

Vijayan Sugumaran, Ph.D., George Mason University

Ronald L. Tracy, Ph.D., Michigan State University

T. J. Wharton, Ph.D., University of Minnesota

Floyd G. Willoughby, Ph.D., Michigan State University

Kenneth M. York, Ph.D., Bowling Green State University

Assistant professors:

Henry Aigbedo, Ph.D., University of Tsukuba, Japan

Joann Bangs, Ph.D., University of Minnesota

Matej Blasko, Ph.D., University of Georgia

Anthony J. Cataldo, Ph.D., Virginia Polytechnic Institute

Xiaodong Deng, Ph.D., University of Toledo

Mark Isken, Ph.D., University of Michigan

Yonk-Shik Lee, M.A., B.A. in Law,

University of Cambridge, England

Cynthia Miree, Ph.D., Florida A&M

Arline Savage, Ph.D., University of Port Elizabeth,

South Africa

Rajeev Singhal, Ph.D., University of Utah

Deepak Sethi, Ph.D., University of Texas at Dallas

Kristina Setzekorn, Ph.D.,

Southern Illinois University at Carbondale

Kasaundra Tomlin, Ph.D., University of Oregon

Jean Yu, Ph.D., Florida State University

Special instructor:

David D. Sidaway, M.Acc., Ohio State University, CPA

■ Board of Visitors

The Board of Visitors of the School of Business Administration provides a direct link between the industrial community and the School. The Board is composed of outstanding corporate and professional leaders from the Detroit metropolitan area. Board members assist the faculty on several projects and provide consultation on goals and objectives, curricula designs and research programs.

The board members are:

Michael W. Grieves, Chairman, Board of Visitors;
Chairman, Interactive Frontiers
Joseph B. Anderson Jr., Chair and Chief Executive Officer,
Vibration Control Technologies Inc.
John Bamberger, Chief Executive Officer,
Analysts International - Sequoia Services Group
Paul H. Campbell, Chief Executive Officer,
Hutchinson FTS, Inc.
Ralph A. Caponigro, President, Caponigro Financial Counselors
John R. Crary, Vice President, Information Technology,
Lear Information Technology Center
A. Jacqueline Dout, Chief Financial Officer, Pella Corporation
Stuart A. Doyle, Senior Vice President, General Motors,
Electronic Data Systems
Gerald L. Elson, Vice President General Motors Corp. and
General Manager of GM Vehicle Operations
Glenn C. Gouldey, Vice President and General Manager,
Eaton Corp.
Dale E. Greene, Executive Vice President and Chief Credit
Officer, Corporate Banking Division, Comerica, Inc.
Danette E. Gregory, Co-Founder and Technology Director,
Dynamic Business Strategies, Inc.
Karen L. Healy, Vice President, Corporate Affairs and Facilities,
Delphi Automotive Systems
Timothy Healy, Executive Vice President,
Takat (TK Holdings, Incorporated)
Gregory C. Jamian, President and Chief Executive Officer,
Americare Medical, Inc.
Susan P. Kampe, Vice President, Information Technology,
Johnson Controls, Inc., Automotive Systems Group
Cleve Killingsworth, President and Chief Executive Officer,
Health Alliance Plan
William Kroger, Vice President of Human Resources,
The Budd Company
Roman T. Kulich, President and Chief Executive Officer,
Molina Healthcare of Michigan
Jacqueline Lewis-Kemp, Chief Executive Officer,
Lewis Metal Stamping
John G. Marshall, Vice President, ALCOS
Thomas C. McAlear, Retired Chief Operating Officer,
DaimlerChrysler Services, North American LLC
Kenneth J. McCarter, Vice President, Union Relations and
Security Operations, DaimlerChrysler Corp.
Craig B. Parr, Director, Cargo Management Systems Operations,
Sports Resorts International

William H. Sandy, Retired Chairman and Chief Executive
Officer, Sandy Corporation
John M. Savio, Vice President, Branch Operations,
Oakland University Branch, MSU Federal Credit Union
Rebecca R. Smith, Executive Vice President,
Commercial Banking Division, Fifth Third Bank
Craig Stinson, Senior Vice President and President,
Light Vehicle Systems, ArvinMeritor, Incorporated
Dennis Toffolo, Director, Community and
Economic Development, Oakland County
Joseph Tori, Senior Vice President, Sales and Marketing,
Delco Remy International
Peter VanHull, Retired Managing Partner, Accenture
Ted D. Wasson, President and Chief Executive Officer,
William Beaumont Hospital Corp.
Tommi A. White, Chief Operating Officer, Compuware Corp.
James R. Wilbert, Managing Partner,
PricewaterhouseCoopers LLP

Complementing the Board of Visitors of the School of Business Administration are the following department or program advisory boards:

The Accounting and Finance Advisory Board is a group of distinguished individuals in public accounting, industry and government. The Board's objective is to enhance the ties between the School of Business Administration's accounting faculty and students and the business and professional accounting community.

The Marketing Advisory Board enhances the relationship between the marketing faculty and students and the business marketing community in southeastern Michigan. Students and faculty benefit by having access to a variety of business resources, which enhances the marketing program's educational, research and service activities. Members of the Marketing Advisory Board benefit by having the opportunity to provide advice, direction and support for Oakland University's educational and research activities.

The Human Resources Management Advisory Board enhances the relationship between the human resources faculty and students and the business human resources community. Students and faculty benefit by having access to a variety of resources that improve the HRM program's educational, research and service activities.

The Decision and Information Sciences Advisory Board enhances the education of MIS students at Oakland University and assists in providing well-educated MIS professionals to the business community.

The Executive MBA in Health Care Management Advisory Board is made up of senior executives from major hospitals, HMOs and healthcare community organizations, as well as business representatives. They help the Dean and Director formulate strategic program policies and provide a focus on emerging health care issues which will be treated in special topic courses.

■ Graduate Business Degree Programs

The School of Business Administration offers evening and weekend graduate programs leading to:

Executive MBA in Health Care Management (EMBA-HCM)
Master of Business Administration (MBA) with concentrations in:

- Accounting
- Business Economics
- Entrepreneurship
- Finance
- Financial Information Systems
- Human Resources Management
- International Business
- Management Information Systems
- Marketing
- Production/Operations Management

Master of Accounting (MAcc) with tracks in:

- Public Accounting
- Managerial Accounting
- Systems Accounting

Master of Science in Information Technology Management (MSITM)

The SBA also participates in the Master of Science in Engineering Management offered by the School of Engineering and Computer Science and detailed in the engineering section of this catalog.

■ Post-Master's Certificate Programs

For students with an MBA, the School of Business Administration offers post-master's certificate programs in:

- Accounting
- Business Economics
- Entrepreneurship
- Finance
- Human Resources Management
- International Business
- Management Information Systems
- Marketing
- Production/Operations Management

For students with a master's degree in a non-business field, the School of Business Administration offers the Post-Master's Certificate in:

- General Management

■ General Information

Accreditation

Oakland University's School of Business Administration programs are accredited by AACSB International—the Association to Advance Collegiate Schools of Business. AACSB International is the premier accreditation organization for business schools.

Assessment

To assist in the continuous improvement of its programs, the SBA engages in a range of assessment efforts. Students are expected to actively participate in these assessment and improvement efforts.

Graduate assistantships

A limited number of graduate assistantships are awarded each academic semester, on a competitive basis, to full-time students in the MBA, MSITM and MAcc programs. Assistantships include an academic year stipend and an award of 9 credits of tuition and accompanying fees. In return, graduate assistants work 20 hours per week assisting one or more faculty members in their research efforts. Additional information and applications may be obtained from the Office of Graduate Business Programs.

Transfer credit

In accordance with the regulations of the Graduate Council, up to 9 credits of relevant course work may be transferred from an MBA, MSITM or MAcc program at a regionally accredited institution. Up to 3 credits of relevant graduate course work may be transferred for the post-master's certificate programs. For credit to transfer, the student must have earned a grade of 3.0 (B) or better in the course. The transfer credit will reduce the number of credits required in the graduate business program. The acceptance of transfer credit and the related course exemptions are determined after an evaluation of a student's transcript. They must be approved by the Office of Graduate Business Programs and the Office of Graduate Study.

Student evaluation and grading

In accordance with the university requirements for graduate students, a grade point average of 3.00 is required for graduation. Students, therefore, should maintain at least a 3.00 GPA. Students may be dismissed if they do not maintain a GPA of 3.00 or appropriate progress toward the degree as determined by the Office of Graduate Business Programs. Any course resulting in a grade below 2.0 must be repeated. Students who do not complete a graduate course for two years must formally apply for readmission to the MBA, MAcc, MSITM or Post-Master Certificate program.

Graduate Management Admission Test (GMAT)

All applicants for admission to the EMBA, MBA, MSITM or MAcc programs must submit official scores for the GMAT. This test is administered throughout the world by the Education Testing Service. For more information visit the Graduate Management Admissions Council website at www.mba.com or write GMAT, Educational Testing Service, P.O. Box 6103, Princeton, New Jersey 08541-6103 or call (609) 771-7330. The GMAT is an important part of the admission process and either careful study of a GMAT review manual or the completion of a review class is strongly recommended. Applicants with GMAT test scores older than five years may be required to retake the GMAT.

■ The Executive MBA in Health Care Management

Description

The Executive MBA in Health Care Management (EMBA-HCM) is designed to give health care professionals a fuller understanding of the concepts and skills necessary to become more effective managers. The program consists of 39 credit hours taken over 21 months. In addition to foundation courses, students will also take 10 credit hours of health care-related electives. Course content has a definite health care focus. Special topic courses that deal with emerging issues in health care will be presented each semester. Courses are designed and taught by a combination of faculty from Oakland University's School of Business Administration and experienced professionals and practitioners from various health care fields.

Likely candidates for the program include physicians; middle managers at hospitals, HMOs, and other health care facilities; insurance company administrators; and corporate benefits administrators. Enrollment in the program will be selective, based on candidates' backgrounds. Certain competencies, including knowledge of quantitative methods and basic computer-related skills, are required. Candidates will have the opportunity to attend workshops to meet competency requirements.

In order to assure effective instruction and interaction, classes will be strictly limited to a maximum of 30 students. This "cohort group" will move through the program together, with all participants taking the same classes and electives. Classes are scheduled to accommodate the time demands of busy health care professionals. They meet Friday afternoon and all day Saturday on alternate weekends, over a period of 21 months.

Admission Terms and Deadlines

Students may be admitted only in the fall term.

All application materials for the EMBA-HCM must be received by June 1.

Application Requirements

Required application materials include:

- 1 . Application for Admission to Graduate Study
- 2 . \$30 application fee
- 3 . official transcripts from all previous colleges and universities attended
- 4 . official GMAT scores (for those not holding a graduate degree)
- 5 . a letter of endorsement from the employer to attend alternate weekend classes on Friday afternoons and Saturday

Admission Requirements

The EMBA-HCM is selective and limited to an entering class of 30 students per year. The requirements for consideration for admission include:

- A minimum of five years experience in health care or a related field for applicants who possess a graduate degree.
- A minimum of five years of administrative/managerial experience in health care or a related field for applicants without a graduate degree.
- An undergraduate degree in any discipline.
- Employer endorsement to attend alternate weekend classes on Friday afternoons and Saturday.
- Scores from the Graduate Management Admission Test (GMAT) taken in the past five years for applicants not holding a graduate degree.

In general, applicants with a total score in the 60th percentile or above on the GMAT, placement in the 30th percentile or above in both the verbal and quantitative sections of the test, and an overall GPA of 3.20 or better will be considered for non-conditional admission. Applicants holding professional medical degrees (i.e., M.D., D.O.) will be exempt from taking the GMAT. Applicants with strong letters of recommendation from their employers or who have demonstrated the ability to handle such a rigorous program may be considered for conditional admission.

Degree Requirements

The EMBA-HCM is a 39-credit-hour program consisting of traditional MBA courses that have been specifically geared toward the health care industry. Coursework in the program consists of foundation classes in the functional areas of business, as well as coursework dealing with specific issues currently facing health care managers. Classes will be highly interactive and will include individual and team projects and presentations. The foundation courses will be similar to those offered in the regular MBA program but geared toward managing in the health care industry.

Students in the program without evidence of the required skills in quantitative methods, computer skills and organizational behavior will be expected to complete the appropriate workshops in the summer before entering the EMBA-HCM program. The workshops in Quantitative Methods, Computer Skills and Organizational Behavior will be offered on the same Friday and Saturday schedule as the EMBA-HCM program schedule on three weekends during the summer before the EMBA-HCM program starts. A workshop fee will be assessed in addition to the program costs.

■ Program of Study

Foundation Courses

Each student will be expected to complete the following 29 credit hours of foundation coursework:

Course Title	Credits
HCM 504 Statistical Methods	2
HCM 512 Financial and Managerial Accounting	3
HCM 521 Managerial Economics	3
HCM 527 Health Economics	2
HCM 530 Teambuilding, Leadership and Communication	2
HCM 531 Human Resources Management	2
HCM 535 Strategic Management	3
HCM 540 Operations Management	2
HCM 545 Health Care Information Systems	2
HCM 550 Legal and Ethical Issues	2
HCM 560 Marketing Management	3
HCM 570 Financial Management	3
Total	29

Elective Courses

Each student will be expected to complete 10 credit hours of elective coursework. The actual electives chosen will be based upon input from the students in the program, the faculty in the program, and health care professionals on the EMBA-HCM Advisory Board.

Possible Elective Courses	Credits
HCM 605 Forecasting in Health Care	2
HCM 606 Quality Assurance in Health Care	2
HCM 612 Cost Management in Health Care	2
HCM 624 Government Policy in Health Care	2
HCM 625 International Comparisons in Health Care	1
HCM 633 Managing Cultural Diversity	1
HCM 634 Hospital Administration	2
HCM 635 Transforming the Health Care Organization	2
HCM 636 Contracts and Negotiation in Health Care	1
HCM 637 Outcomes Assessment in Health Care	1
HCM 638 New Ventures in Health Care	1
HCM 642 Facilities Planning and Evaluation	1
HCM 643 Project Management in Health Care	1
HCM 645 Managing Technology in Health Care	2
HCM 646 Data Warehousing in Health Care	1
HCM 661 Health Care Marketing and Consumer Satisfaction	2
HCM 662 New Health Care Services Development	1
HCM 670 Hospital Finance and Managed Care	2
HCM 673 Mergers and Acquisitions in Health Care	2

For additional information on the EMBA-HCM, please contact Dr. Miron Stano, Director of EMBA-HCM Program, at (248) 370-3298; fax: (248) 370-4604; e-mail: embahcm@oakland.edu.

■ The Master of Business Administration

A program leading to the Master of Business Administration (MBA) with special emphasis in information technology and international business is offered by the School of Business Administration (SBA). It is designed to educate students for managerial roles in private, public or not-for-profit sectors of the economy. Courses are offered Monday through Thursday evenings at the Rochester campus and the Birmingham campus. It is offered Friday evenings and Saturday mornings at the Macomb University Center.

Program philosophy

The MBA program is designed for undergraduate majors from any discipline, including business or management. It is preferred that students with an undergraduate degree in business or one of the functional areas of management have two years of work experience before entering the MBA program. A typical entering class may consist of undergraduate majors from engineering, the natural sciences, the social sciences, computer science, mathematics, business, health care, education and the humanities.

The program is based on the belief that an education in management should:

- 1 . Prepare students for careers involving problem identification, problem solving, decision making and leadership in any type of organization.
- 2 . Emphasize the determination of goals and the effective utilization of scarce resources.
- 3 . Help students understand and effectively interact with the emerging workplace issues of globalization and diversity.
- 4 . Assist students in understanding the effects of, and successfully deal with, the changing social, legal, ethical and technological environments of the organization.
- 5 . Stress understanding of human behavior and the organizational setting, for much of management relates to people — understanding them, communicating with them, working with them and leading them.
- 6 . Stress the importance of the management of information and information resources in the successful operation of an organization.

MBA concentrations

In addition to the standard MBA program, students may choose to concentrate their elective work in a given discipline or inter-disciplinary area. Currently the MBA program at Oakland University has areas of concentration in Accounting, Business Economics, Entrepreneurship, Finance, Financial Information Systems, Human Resources Management, International Business, Management Information Systems, Marketing, and Production/Operations Management.

Part-time status

The MBA program must be completed within six years from the date of entry into the program. The scheduling of MBA classes is based on the assumption that students will be enrolled in a standard part-time program: six courses per year (two courses in each of the 15-week fall and winter semesters, and one course in each of the eight-week spring and summer sessions).

Length of program

The length of the MBA program varies from 36 to 48 credits, depending on the student's prior preparation. The minimum program consists of 36 credits of required courses and electives that must be completed by all candidates.

Full-time students normally take 12 credits (four courses) in the fall and winter semesters and three credits (one course) in the spring and summer sessions. The full-time student can finish the complete 48-credit program in less than two years. Students with sufficient background in business courses may be able to complete the minimum 36-credit MBA program in 16 months of full-time study.

The part-time student taking six courses per year should finish the complete 48-credit program in two and two-thirds calendar years (32 months) in a year-round program.

In accordance with university regulations, all course credits used to meet requirements of the MBA program must be earned within six years of the date that the MBA is awarded.

Admission Terms and Deadlines

Students may begin the MBA program in the fall, winter, spring or summer sessions, depending upon their background.

All application materials for the MBA must be received by:

- August 1 for the fall semester
- December 1 for the winter semester
- April 1 for the spring session
- June 1 for the summer session

Deadlines for international students are May 1 for the fall semester and September 1 for the winter semester.

Application Requirements

A complete application must be on file in the Office of Graduate Admissions, 160 North Foundation Hall. The applicant must submit:

- 1 . Application for Admission to Graduate Study
- 2 . \$30 application fee
- 3 . supplemental application for the graduate business programs
- 4 . official transcripts from all previous colleges and universities attended
- 5 . official GMAT scores

International students will have additional application requirements. See the Graduate Study web site for these additional requirements.

Applicants should take the GMAT at least three weeks before the deadline for their application to allow time for the official scores to be sent to Oakland University.

Admission Requirements

Admissions to the MBA program are selective and depend on several elements, including scholarship and an ability to communicate effectively. Before an applicant can be admitted to the MBA program he or she must have completed:

- 1. a bachelor's degree from a regionally accredited institution. (Oakland University students admitted to the joint baccalaureate/MBA degree program are exempt from this requirement.)
- 2. The Graduate Management Admission Test (GMAT).

MBA program of study

The MBA program consists of four parts: the prerequisite courses, the core program, the integrative business policy course (MGT 535) and a set of at least five electives. Each part of the program is detailed below.

Prerequisite courses

Students admitted to the MBA program must demonstrate proficiency or complete course work in the following areas. Students may be conditionally admitted with the condition that they complete those prerequisites during their first year of study in the MBA program.

- 1. A college course in the principles of microeconomics
- 2. A college course in the principles of macroeconomics
- 3. A college course in financial accounting
- 4. A recent college algebra course or mathematics at a higher level
- 5. A college course in calculus or a continuing education course in quantitative methods which included basic calculus
- 6. A college course, workshop, continuing education course or self-study in computer applications. Students who have not taken a college course must submit a letter detailing their training and experience with word processors, spreadsheets, graphics, database management systems, and the Internet.

MBA core program

The core program is designed to develop basic skills in management for the MBA student.

Only students formally admitted into the MBA program, another graduate program at Oakland University (with approval of the Office of Graduate Business Programs), or guest students from an MBA program at another university may register for the MBA core classes.

Applicants must also meet the general admission requirements for graduate study at Oakland University. Applications are considered by the Graduate Admission Committee of the School of Business Administration. In making admission recommendations, the admission committee assesses the potential of applicants for success in the MBA program by examining their undergraduate records, their GMAT scores, their responses to questions on the supplemental application and their work experience. Letters of recommendation are not required.

Core course exemptions

To be exempted from the core courses the applicant must have passed an equivalent undergraduate course with a grade of 2.0 (C) or better within the previous 10 years. Exemption from a core course reduces the total credit requirement for the MBA. Students exempted from some or all the core courses will be required to take a minimum program of 36 MBA credits. As part of his or her program, the MBA student must take at least one graduate level course in each of the functional areas (i.e., at least one graduate course in ACC, FIN, MKT, & POM/QMM) either as one of the five MBA electives or in addition to these electives. Exemptions from core courses are determined by the Office of Graduate Business Programs after an evaluation of the student's transcript. A student will be allowed to take a core course from which he/she had been exempted only with prior written approval from the Office of Graduate Business Programs. Repeating waived courses will increase a student's MBA program beyond the minimum of 36 credit hours.

Core courses

ACC 512	Managerial Accounting Systems
QMM 510	Statistical Analysis for Managers
ECN 521	Economics for Managers
ORG 530	Organizational Behavior
MGT 550	Legal Environment of Business
MIS 524	Enterprise Information Systems
MKT 560	Marketing Management
POM 521	Operations Management
FIN 533	Financial Management
MGT 526	International Business

Integrative business policy course

The integrative business policy course, MGT 535, draws on all the coursework in the core of the MBA program in the analysis of real world cases in a team setting. MGT 535 is required of all MBA candidates.

MBA electives

MBA candidates complete their program by selecting a minimum of 15 credits of MBA electives. Of these, one course must be an information technology elective and one must be an international business elective (see website for current list of acceptable courses www.sba.oakland.edu/mba). The remaining 9 credits may be drawn from MBA elective courses offered by the School of Business Administration or from approved courses offered by other units of Oakland University. Six of the elective credits may be a master's project. MBA electives are numbered 500 and above for accounting and MIS electives and 600 and above for all other areas.

Concentrations

If MBA students want a more structured set of electives, they can take one of the MBA concentrations. A maximum of two concentrations can be noted on their transcripts. The MBA concentrations consist of the electives structured as noted under each MBA concentration listed below. A single class may not be counted toward more than one concentration. All courses are 3 credits, unless otherwise noted.

Accounting Concentration:

To provide more background in accounting the student would be required to complete three electives from the following list for the concentration in Accounting:

ACC 601	Financial Analysis and Reporting
ACC 612	Non-Business Accounting and Control
ACC 617	International Accounting
ACC 620	Cost Management
ACC 621	Federal Income Taxation II
ACC 625	Federal Income Taxation for Business
ACC 650	Professional Issues in Accounting
ACC 680	Special Topics in Accounting
ACC 690	Independent Study in Accounting

Business Economics Concentration:

To provide more background in the application of economics in business, the student would be required to complete three electives from the following program for a concentration in Business Economics:

ECN 605	Econometrics
ECN 618	Seminar in Economic Policy
ECN 620	Money, Financial Institutions and Markets
ECN 656	Public Finance
ECN 667	Economics of Health Care
ECN 673	International Trade and Finance
ECN 685	Economics of Industries
FIN 627	International Financial Management
FIN 633	Advanced Financial Management
QMM 652	Forecasting
ECN 680	Special Topics in Economics
ECN 690	Independent Study in Economics

Entrepreneurship Concentration

To provide more background in the strategic aspects of entrepreneurship, startups and small businesses, the student would be required to complete the following program for a concentration in Entrepreneurship:

MGT 656	Entrepreneurship
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Two electives from the following list:

ACC 625	Federal Income Taxation for Business
FIN 633	Advanced Financial Management
FIN 650	Real Estate Investment Analysis
MGT 660	Launching and Managing Small Businesses
MGT 670	Business Ethics
MGT 682	Special Topics in Entrepreneurship
MGT 692	Independent Study in Entrepreneurship
MKT 608	Strategic Marketing
ORG 635	Decision Making in Organizations
ORG 636	Leadership and Group Performance
ORG/POM 640	Total Quality Management
POM 648	Project Management Techniques

Finance Concentration:

To provide more background in finance, the student would be required to complete the following program for a concentration in Finance:

FIN 618	Investment Analysis
FIN 633	Advanced Financial Management

One elective from the following list:

FIN 627	International Financial Management
FIN 650	Real Estate Investment Analysis
ACC 601	Financial Analysis and Reporting
ACC 625	Federal Income Taxation for Business
ECN 620	Money, Financial Institutions and Markets
FIN 680	Special Topics in Finance
FIN 690	Independent Study in Finance

Financial Information Systems Concentration

To provide more background in financial information systems, the student would be required to complete the following program for a concentration in Financial Information Systems:

FIS 618	Introduction to Financial Information Systems and Databases
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Two electives from the following list:

FIS 631	Financial Information Systems: Analysis (previously ACC 618)
FIS 632	Financial Information Systems: Design (previously ACC 619)
FIS 633	Financial Information Systems: Audit and Control and Databases (previously ACC 611)
FIS 635	Financial Information Systems: Applications
FIS 680	Special Topics in Financial Information Systems
FIS 690	Independent Study in Financial Information Systems

Human Resources Management Concentration:

To provide more background in human resources management and personnel, the student would be required to complete the following for a concentration in Human Resources Management:

ORG 631	Human Resources Management
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Plus two electives from the following list:

MGT 638	Labor-Management Relations
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MGT 670	Business Ethics
ORG 635	Decision Making in Organizations
ORG 636	Leadership and Group Performance
ORG 637	Motivation and Work Behavior
ORG/POM 640	Total Quality Management
ORG 670	International Organizational Behavior and Human Resources
ORG 680	Special Topics in Organizational Behavior
ORG 690	Independent Study in Organizational Behavior

International Business Concentration:

To provide more background in international business, the student would be required to complete three electives from the following list for a concentration in International Business:

ACC 617	International Accounting
ECN 673	International Trade and Finance
FIN 627	International Financial Management
MKT 650	International Marketing
ORG 670	International Organizational Behavior and Human Resources
MGT 681	Special Topics in International Business
MGT 691	Independent Study in International Business

Management Information Systems Concentration:

To provide more background in MIS, the student would be required to complete three MIS electives (600-level courses) for a concentration in Management Information Systems. Example courses are listed below. For a complete list of possible electives, see the MIS course offerings.

MIS 604	Database Management
MIS 606	Advanced Database Management Systems
MIS 618	Network Management
MIS 620	Electronic Commerce
MIS 622	Business Object Development
MIS 624	Business Application Architecture
MIS 625	IT Planning and Strategy
MIS 636	Decision Support Systems
MIS 638	Knowledge Management
MIS 640	IS Security
MIS 641	Privacy and Intellectual Property
MIS 642	IS Issues in Supply Chain Management
MIS 646	Business Analysis and Modeling

Marketing Concentration:

To provide more background in marketing, the student would be required to complete three electives from the following list for a concentration in Marketing:

MKT 604	Consumer Behavior
MKT 605	Marketing Research
MKT 608	Strategic Marketing
MKT 620	Distribution Channels Management and Logistics
MKT 650	International Marketing
MKT 670	Business to Business Marketing
MKT 680	Special Topics in Marketing
MKT 690	Independent Study in Marketing

Production/Operations Management Concentration:

To provide more background in production and operations management, the student would be required to complete the following for a concentration in Production/Operations Management:

POM 641	Manufacturing Planning and Control
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Plus two electives from the following list:

ACC 620	Cost Management
POM/ORG 640	Total Quality Management
POM 645	Cases in Operations Management
POM 648	Project Management Techniques
POM 680	Special Topics in POM
QMM 652	Forecasting
POM 690	Independent Study in POM

Master's project (optional)

The optional master's project (equal to six elective credits) requires the application of classroom training and extra-classroom study to a practical management problem. It must involve collection and analysis of data in an actual organizational setting as well as cogent recommendations to management for resolving the problem. The master's project is not designed to be a theoretical master's "thesis." However, the student must follow presentation guidelines set forth by the Office of Graduate Study on the preparation of a master's thesis/project. Two copies of the final project must be bound by the Office of Graduate Study, with one copy being retained by the sponsoring faculty member and one by the Office of Graduate Business Programs. It should be organized around a management problem which requires input from several functional areas of management. Additional information about the master's project may be obtained from the Office of Graduate Business Programs.

Joint baccalaureate/MBA degree program

The School of Business Administration, in conjunction with other schools and departments of the university, offers an accelerated program that can result in a student earning an MBA and a baccalaureate in a non-business field, in the equivalent of five years of full-time study. Students interested in this joint baccalaureate/MBA degree program should apply after they have earned a total of 80 credits and at least one term before they plan to take MBA courses. Students who participate in this track must satisfy all undergraduate degree requirements for their major. They may meet part of these requirements by counting the MBA courses taken before receiving the baccalaureate as "free" undergraduate electives. The Graduate Management Admission Test (GMAT) must be completed before any MBA courses can be taken. This program is available to both full-time and part-time students.

The departments that administer the majors of the joint baccalaureate/MBA degree program must certify that the students have a GPA in the top 25% of their class and approve their application for the joint baccalaureate/MBA degree program. Upon acceptance into the program, the students are considered undergraduates (paying undergraduate tuition) until the baccalaureate is earned and a graduate student (paying graduate tuition) thereafter. MBA courses used to satisfy undergraduate degree requirements will be reflected on the undergraduate transcript only. Formal admission into the MBA is presumed subject to satisfactory performance in the final courses taken to meet the undergraduate degree requirements. Joint baccalaureate/MBA degree program students must satisfy all MBA degree requirements, and must take at least 33 graduate credits in the MBA program after receiving the baccalaureate. Additional information and applications may be obtained from the Office of Graduate Business Programs.

■ The Master of Accounting

The Master of Accounting (MAcc) is offered in the Department of Accounting and Finance within the School of Business Administration. The MAcc is designed for students who are interested in careers in public, corporate and non-business accounting.

The degree will assist accounting professionals in the dynamic corporate environment. Professionals in the field are required to be effective communicators, maintain a high level of expertise and uphold ethical responsibilities, while providing financial information, analysis of the economic environment and input in decision-making activities.

Keeping these qualities in view, the MAcc is designed to achieve the following goals:

- 1 . Offer a graduate-level program developing superior technical knowledge and application skills beyond the baccalaureate accounting program
- 2 . Enhance students' analytical, communication and decision making skills
- 3 . Provide a sound base in ethics and professional behavior
- 4 . Prepare students for careers in public, corporate and non-business accounting positions
- 5 . Provide students with the educational requirements necessary to be eligible to take professional exams

Admission Terms and Deadlines

Students may begin the MAcc program in the fall, winter, spring or summer sessions depend-ing upon their background.

All application materials for the MAcc must be received by:

- August 1 for the fall semester
- December 1 for the winter semester
- April 1 for the spring session
- June 1 for the summer session

Deadlines for international students are May 1 for the fall semester and September 1 for the winter semester.

Application Requirements

A complete application must be on file in the Office of Graduate Admissions, 160 North Foundation Hall. The applicant must submit:

- 1 . Application for Admission to Graduate Study
- 2 . \$30 application fee
- 3 . supplemental application for the graduate business programs
- 4 . official transcripts from all previous colleges and universities attended
- 5 . official GMAT scores

International students will have additional application requirements. See the Graduate Study web site for these additional requirements.

Applicants should take the GMAT at least three weeks before the deadline for their application to allow time for the official scores to be sent to Oakland University.

Admission Requirements

Admission to the Master of Accounting program is selective and depends on several elements, including scholarship and ability to communicate effectively. Before an applicant can be admitted to the Master of Accounting program, he/she must have completed:

- 1 . A bachelor's degree from a regionally accredited institution
- 2 . The Graduate Management Admission Test (GMAT)
- 3 . College courses in:
 - Introductory Financial Accounting
 - Intermediate Financial Accounting I
 - Intermediate Financial Accounting II
 - Managerial and Cost Accounting I
 - Managerial and Cost Accounting II
- 4 . A college course in either the principles of macroeconomics or microeconomics

Applicants must also meet the general admission requirements for graduate study at Oakland University. Applicants are required to have minimum proficiency in personal computing skills (i.e., word processing and spreadsheets). Applicants deemed deficient in this area may be required to complete a prerequisite course in computer workstation skills. Applications are considered by the Accounting Graduate Admissions Committee. In making admission recommendations, the admissions committee assesses the potential of applicants for success in the master's program by examining their undergraduate records, their GMAT scores, their responses to questions on the supplemental application and their work experience.

Program Requirements

The MAcc program requires a minimum of 33 credits. It consists of three parts: the required courses, a set of at least 15 credits of accounting electives and a set of at least 9 credits of open electives. No more than 12 credits of Oakland University courses may be obtained from courses numbered 400-499. No course numbered below 400 will apply toward the graduate degree. Each part of the program will be detailed below. In compliance with University policy, no undergraduate courses will be transferred from another college or university and apply toward graduate degree requirements. Students must meet the prerequisites for all MAcc courses.

Required Courses

The following three courses are required of all MAcc students:

ACC 630	Accounting and Communication
ACC 650	Professional Issues in Accounting
FIN 533	Financial Management

Students who have taken an equivalent undergraduate course with a grade of 2.0 (C) or better within the previous 10 years will be exempt from the required course. Students exempted from some or all of the required courses will be required to take additional open elective courses to maintain the 33-credit minimum required for the degree.

Accounting Electives

Each MAcc student will be required to take a minimum of 15 credits of accounting electives from the following list. All courses are 3 credits unless otherwise noted.

ACC 401	Advanced Financial Accounting
ACC 411	Auditing
ACC 412	Government and Not-for-profit Accounting
ACC 415	Federal Income Taxation
ACC 601	Financial Analysis and Reporting
ACC 612	Non-Business Accounting & Control
ACC 617	International Accounting
ACC 620	Cost Management
ACC 621	Federal Income Taxation II
ACC 625	Federal Income Taxation for Business
ACC 680	Special Topics in Accounting
ACC 690	Independent Study in Accounting
FIS 618	Introduction to Financial Information Systems and Databases
FIS 631	Financial Information Systems: Analysis
FIS 632	Financial Information Systems: Design
FIS 633	Financial Information Systems: Audit and Control and Databases
FIS 635	Financial Information Systems: Applications
FIS 680	Special Topics in Financial Information Systems
FIS 690	Independent Study in Financial Information Systems

Other Electives (9 credits)

Each MAcc student will be required to take a minimum of nine open elective credits. Six of the nine credits must be in non-accounting courses.

Specializations

Students meeting the listed requirements can receive the MAcc, but the program allows for specialization in different technical areas. Currently, three specialized track options are offered in the program.

The **Public Accounting Track** prepares students for entry into public accounting. It includes training in financial accounting and auditing with analytical and professional emphasis, and helps develop students' skills and capabilities for rapid advancement in public accounting and financial management career options. This option requires courses in:

ACC 401	Advanced Financial Accounting
ACC 411	Auditing
ACC 415	Federal Income Taxation
ACC 621	Federal Income Taxation II
and two non-accounting courses:	
FIN 618	Investment Analysis and
MIS 524	Enterprise Information Systems.

The **Managerial Accounting Track** offers preparation in planning and control for a career in managerial accounting controllership. This track requires accounting courses including:

ACC 612	Non-Business Accounting and Control
ACC 617	International Accounting
ACC 620	Cost Management
and two non-accounting courses:	
POM 521	Operations Management and
MIS 604	Database Management.

The **Systems Accounting Track** option provides expertise in the design and management of information control systems with an emphasis on accounting practices. This option provides professional opportunities with larger corporations and consulting firms. The sequence of courses includes:

FIS 618	Introduction to Financial Information Systems and Databases
FIS 631	Financial Information Systems: Analysis
FIS 632	Financial Information Systems: Design
and two non-accounting courses:	
MIS 524	Enterprise Information Systems
MIS 604	Database Management.

■ The Master of Science in Information Technology Management

The Master of Science in Information Technology Management (MSITM) is offered in the Department of Decision and Information Sciences within the School of Business Administration. The goal of the program is to provide a strong technical and managerial background to those who are interested in using information technology for competitive advantage. It is intended to provide business professionals with the knowledge they need to effectively manage information technology in support of their decision making. It is also intended to provide information systems professionals with knowledge on the latest technologies and their use in application development.

Admission Terms and Deadlines

Students may begin the MSITM program in the fall, winter, spring or summer sessions depend-ing upon their background.

All application materials for the MSITM must be received by:

- August 1 for the fall semester
- December 1 for the winter semester
- April 1 for the spring session
- June 1 for the summer session

Deadlines for international students are May 1 for the fall semester and September 1 for the winter semester.

Application Requirements

A complete application must be on file in the Office of Graduate Admissions, 160 North Foundation Hall. The applicant must submit:

1. Application for Admission to Graduate Study
2. \$30 application fee
3. supplemental application for the graduate business programs
4. official transcripts from all previous colleges and universities attended
5. official GMAT scores

International students will have additional application requirements. See the Graduate Study web site for these additional requirements. Applicants should take the GMAT at least three weeks before the deadline for their application to allow time for the official scores to be sent to Oakland University.

Admission Requirements

Admission to the Master of Science in Information Technology Management program is selective and depends on several elements, including scholarship and ability to communicate effectively. Before an applicant can be admitted to the MSITM Program, he/she must have completed:

1. A bachelor's degree from a regionally accredited institution
2. The Graduate Management Admission Test (GMAT)
3. A college course in Financial Accounting. (May be taken during the first year of study in the MSITM program)

Applicants must also meet the general admission requirements for graduate study at Oakland University. Applications are considered by the Graduate Admissions Committee. In making admission recommendations, the committee assesses the applicants' undergraduate records, their GMAT scores, their responses to questions on the supplemental application and their work experience.

Program Requirements

The MSITM program requires a minimum of 33 credits. It consists of six parts: a prerequisite course, a management core consisting of four courses; an IS core consisting of two courses; IS foundations consisting of three courses; a set of at least 21 credits of MIS graduate electives; and a capstone project course. No course numbered below 400 will apply toward the degree requirements. Each part of the program is detailed below.

Prerequisites

All applicants must complete a course in financial accounting prior to admission to the MSITM program. Applicants may be admitted with the condition that they complete this prerequisite within the first year of the program. Students must meet the prerequisites for all MSITM courses. Specific course prerequisites are listed in the course offerings.

Business Core (4 Courses totaling 12 credits)

ACC 512	Managerial Accounting Systems
MKT 560	Marketing Management
ORG 530	Organizational Behavior
and one of the following:	
POM 521	Operations Management
FIN 533	Financial Management

Most IT management activities call for a general understanding of cost-related issues, marketing of technology and its application to users/other clients, and an understanding of the organizational behavior for the purposes of change management and strategy. Depending on a student's orientation with regard to service or manufacturing firms, we provide a choice of either finance or operations management.

These courses may be waived based on evidence of an equivalent course taken within ten years. Each of these courses is offered regularly as part of the MBA program at Oakland University.

IS Core (2 Courses totaling 6 credits)

MIS 504	Introduction to IS Management
MIS 505	Technology of Information Systems

These courses may be waived based on experience or evidence of an equivalent course taken within five years.

IT Foundation (3 Courses totaling 9 credits)

MIS 514	Systems Analysis
MIS 515	Systems Design
MIS 516	Software Project Management

These three courses provide a common foundation for all MSITM students. The courses consider the way business processes are analyzed, designed and implemented for IT support. Database and network management will be integrated throughout.

These courses may be waived, given evidence of an equivalent course taken within five years. If waived, a foundation course must be replaced by an elective course.

Elective Courses (7 Courses totaling 21 credits)

After the students have built a solid foundation, they will be able to choose seven courses from a host of electives on emerging information technologies and topics of contemporary interest. Students seeking a more technical focus will be able to select from courses on advanced database management systems, decision support systems, and electronic commerce, among others. Students seeking to work more closely with business process issues may tailor their program using courses on IS planning and strategy, supply chain management, IS privacy and security, business analysis and modeling, etc.

Electives:

Related to IS Development

MIS 618	Network Management
MIS 620	Electronic Commerce
MIS 622	Business Object Development
MIS 624	Business Application Architecture

Related to IT Strategy and Management

MIS 625	IT Planning and Strategy
MIS 640	IS Security
MIS 641	Privacy and Intellectual Property
MIS 642	IS Issues in Supply Chain Management

Related to Data Management and Decision Making

MIS 606	Advanced Database Management Systems
MIS 636	Decision Support Systems
MIS 638	Knowledge Management
MIS 646	Business Analysis and Modeling

The seven electives include, but are not limited to the courses listed above. Other selected courses offered by the School of Business Administration in accounting and finance (e.g., Financial Information Systems), marketing, economics and selected courses offered by the School of Engineering and Computer Science may also be accepted for the program

Capstone Course

MIS 650	Project Seminar
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All students are required to take the Project Seminar course that ties IT strategy to business strategy. As part of this capstone course each student will complete a project that integrates strategic and technical IT issues.

■ Post-Master's Certificate in General Management

Description

The Post-Master's Certificate Program in General Management is a 15 credit-hour course of study designed for individuals with a graduate degree in a non-business field who seek core business knowledge. The program emphasizes coursework that covers the major disciplines within the field of business. Upon completion, students will have general knowledge of common business practices and corporate procedures.

Completing the prescribed course of study leads to a certificate officially granted by the university. Coursework completed within this program can be transferred to a graduate business degree program if the student wishes to continue. This transfer must be completed before the certificate is issued.

The Post-Master's Certificate Program requires the following of all admitted students:

1. Personal Computer (PC) Skills: Students will be required to have proficiency in the use of word processors, spreadsheets, graphics, database management systems, and the Internet. If a student is deficient in these skills, the student would be required to take a college course, workshop or continuing education course in PC skills as a prerequisite to the program.
2. Minimum Grade Requirement: To qualify for the certificate, the student must complete the designated set of courses with a grade of 3.0 or better in each course.

Admission Terms and Deadlines

Students may begin the Post-Master's Certificate (PMC) program in the fall, winter, spring or summer sessions depending upon their background.

All application materials for the PMC must be received by: August 1 for the fall semester, December 1 for the winter semester, April 1 for the spring session, and June 1 for the summer session. Deadlines for international students are May 1 for the fall semester and September 1 for the winter semester.

Application Requirements

A complete application must be on file in the Office of Graduate Admissions, 160 North Foundation Hall. The applicant must submit:

1. Application for Admission to Graduate Study
2. \$30 application fee
3. supplemental application for the graduate business programs
4. official transcripts from all previous colleges and universities attended

Admission Requirements

Applicants to the Post-Master's Certificate Program must hold a graduate degree in a non-business field. The applicant should have a cumulative GPA of 3.00 or better in their graduate degree. The applicant must have completed a college course in calculus and statistics to be eligible for the program. The GMAT is not required for admission to the Post-Master Certificate Program.

Program Requirements

Required is five courses (15 credits) from the following list of courses. (All course prerequisites will apply.)

ACC 511	Financial Accounting
ACC 512	Managerial Accounting
ECN 521	Economics for Managers
FIN 533	Financial Management
MGT 526	International Business
MGT 550	Legal Environment of Business
MIS 524	Enterprise Information Systems
MKT 560	Marketing Management
ORG 530	Organizational Behavior
POM 521	Operations Management

■ Post-Master's Certificate Programs

The School of Business Administration offers Post-Master's Certificates in each of the major areas of business. These programs are designed to provide students who have an MBA degree, or the equivalent of an MBA degree, with additional course work in a specialized area of business.

These Post-Master's Certificate Programs require the following of all admitted students:

1. **Personal Computer (PC) Skills:** Students will be required to have proficiency in the use of word processors, spreadsheets, graphics, database management systems, and the Internet. If a student is deficient in these skills, the student would be required to take a college course, workshop or continuing education course in PC skills as a prerequisite to the program.
2. **Minimum Grade Requirement:** To qualify for the certificate, the student must complete the designated set of courses with a grade of 3.0 or better in each course.

Number of Certificates

A student may earn more than one certificate, but may not apply any specific course toward the requirement of more than one program. Certificates are available in Accounting, Business Economics, Entrepreneurship, Finance, Human Resources Management, International Business, Marketing, Management Information Systems, and Production/Operations Management. Each certificate requires a minimum of 15 credits.

Upon completion of a Post-Master's Certificate, the student must file an Application for Certificate with the Office of Academic Records to receive an Oakland University certificate and have it appear on his or her Oakland University transcript.

Admission Terms and Deadlines

Students may begin the Post-Master's Certificate program in the fall, winter, spring or summer sessions depending upon their background.

All application materials must be received by August 1 for the fall semester, December 1 for the winter semester, April 1 for the spring session, and June 1 for the summer session. Deadlines for international students are May 1 for the fall semester and September 1 for the winter semester.

Application Requirements

A complete application must be on file in the Office of Graduate Admissions, 160 North Foundation Hall. The applicant must submit:

1. Application for Admission to Graduate Study
2. \$30 application fee
3. supplemental application for the graduate business programs
4. official transcripts from all previous colleges and universities attended

Admission Requirements

Applicants to the Post-Master's Certificate Program must hold an MBA or the equivalent of an MBA degree to be considered for admission. Applicants who do not hold an MBA degree may have their degree evaluated by the Office of Graduate Business Programs to determine eligibility for the program. Graduates of the Oakland University Master of Science in Engineering Management program are eligible for admission. The applicant should have a cumulative GPA of 3.00 or better in the MBA or MBA equivalent master's degree. The GMAT is not required for admission to the Post-Master's Certificate Program.

■ Post-Master's Certificate Program in Accounting

Required is a course in financial accounting and:

ACC 512 Managerial Accounting Systems

Four additional courses (12 credits) from the following:

ACC 601 Financial Analysis and Reporting
 ACC 612 Non-Business Accounting and Control
 ACC 617 International Accounting
 ACC 620 Cost Management

ACC 621 Federal Income Taxation II
 ACC 625 Federal Income Taxation for Business
 ACC 650 Professional Issues in Accounting
 ACC 680 Special Topics in Accounting
 ACC 690 Independent Study in Accounting
 FIS 618 Introduction to Financial Information Systems and Databases
 FIS 633 Financial Information Systems: Audit and Control and Databases

Students who have completed ACC 512 or its equivalent will be required to take an additional course from the accounting elective list above to produce a total of 15 credits, beyond the credits earned in their master's degree program or another certificate program.

■ Post-Master's Certificate Program in Business Economics

Required Course:

ECN 521 Economics for Managers

Four additional courses (12 credits) from the following:

ECN 605 Econometrics
 ECN 618 Seminar in Economic Policy
 ECN 620 Money, Financial Institutions and Markets

ECN 656 Public Finance
 ECN 667 Economics of Health Care
 ECN 673 International Trade and Finance
 ECN 685 Economics of Industries
 FIN 627 International Financial Management
 FIN 633 Advanced Financial Management
 QMM 652 Forecasting
 ECN 680 Special Topics in Economics
 ECN 690 Independent Study in Economics

Students who have completed ECN 521 or its equivalent will be required to take an additional course from the Business Economics elective list above to produce a total of 15 credits, beyond the credits earned in their master's degree program or another certificate program.

■ Post-Master's Certificate Program in Entrepreneurship

Required Course:

MGT 656 Entrepreneurship

Four additional courses (12 Credits) from the following:

ACC 625 Federal Income Taxation for Business
 FIN 633 Advanced Financial Management
 FIN 650 Real Estate Investment Analysis
 MGT 526 International Business

MGT 660 Launching and Managing Small Businesses
 MGT 670 Business Ethics
 MGT 682 Special Topics in Entrepreneurship
 MGT 692 Independent Study in Entrepreneurship
 MKT 608 Strategic Marketing
 ORG 635 Decision Making in Organizations
 ORG 636 Leadership and Group Performance
 ORG/POM 640 Total Quality Management
 POM 648 Project Management Techniques

Students who have completed MGT 656 or its equivalent, will be required to take an additional course from the Entrepreneurship elective list above to produce a total of 15 credits, beyond the credits earned in their master's degree program or another certificate program.

■ Post-Master's Certificate Program in Finance

Required Courses:

FIN 533 Financial Management
 FIN 618 Investment Analysis
 FIN 633 Advanced Financial Management

Two additional courses (6 credits) from the following:

FIN 627 International Financial Management
 FIN 650 Real Estate Investment Analysis
 ACC 601 Financial Analysis and Reporting
 ACC 625 Federal Income Taxation for Business
 ECN 620 Money, Financial Institutions and Markets
 FIN 680 Special Topics in Finance
 FIN 690 Independent Study in Finance

Students who have completed FIN 533, FIN 618, FIN 633, or their equivalents, will be required to take additional courses from the Finance elective list above to produce a total of 15 credits, beyond the credits earned in their master's degree program or another certificate program.

■ Post-Master's Certificate Program in Human Resources Management

Required Courses:

ORG 530	Organizational Behavior
ORG 631	Human Resources Management

Three additional courses (9 credits) from the following:

MGT 638	Labor-Management Relations
MGT 670	Business Ethics
ORG 635	Decision Making in Organizations
ORG 636	Leadership and Group Performance
ORG 637	Motivation and Work Behavior
ORG/POM 640	Total Quality Management
ORG 670	International Organizational Behavior and Human Resources
ORG 680	Special Topics in Organizational Behavior
ORG 690	Independent Study in Organizational Behavior

Students who have completed ORG 530, ORG 631, or their equivalents, will be required to take additional courses from the Human Resources Management elective list above to produce a total of 15 credits, beyond the credits earned in their master's degree program or another certificate program.

■ Post-Master's Certificate Program in International Business

Required Course:

MGT 526	International Business
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Four additional courses (12 credits) from the following:

ACC 617	International Accounting
ECN 673	International Trade and Finance
FIN 627	International Financial Management
MKT 650	International Marketing
ORG 670	International Organizational Behavior and Human Resources
MGT 681	Special Topics in International Business
MGT 691	Independent Study in International Business

Students who have completed MGT 526 or its equivalent will be required to take an additional course from the International Business elective list above to produce a total of 15 credits, beyond the credits earned in their master's degree program or another certificate program.

■ Post-Master's Certificate Program in Management Information Systems

Required Course:

MIS 524 Enterprise Information Systems

Four additional courses (12 credits) from the following:

MIS 618	Network Management
MIS 620	Electronic Commerce
MIS 622	Business Object Development
MIS 624	Business Application Architecture
MIS 625	IT Planning and Strategy
MIS 636	Decision Support Systems
MIS 638	Knowledge Management
MIS 640	IS Security
MIS 641	Privacy and Intellectual Property
MIS 642	IS Issues in Supply Chain Management
MIS 646	Business Analysis and Modeling
MIS 680	Special Topics in Management Information Systems
MIS 690	Independent Study in Management Information Systems

Students who have completed MIS 524 or its equivalent will be required to take an additional course from the Management Information Systems elective list above to produce a total of 15 credits, beyond the credits earned in their master's degree program or another certificate program.

■ Post-Master's Certificate Program in Marketing

Required Courses:

MKT 560 Marketing Management
MKT 608 Strategic Marketing

Three additional courses (9 credits) from the following:

MKT 604	Consumer Behavior
MKT 605	Marketing Research
MKT 620	Distribution Channels Management and Logistics
MKT 650	International Marketing
MKT 670	Business to Business Marketing
MKT 680	Special Topics in Marketing
MKT 690	Independent Study in Marketing

Students who have completed MKT 560, MKT 608, or their equivalents, will be required to take additional courses from the Marketing elective list above to produce a total of 15 credits, beyond the credits earned in their master's degree program or another certificate program.

■ Post-Master's Certificate Program in Production and Operations Management

Required Course:

POM 521 Operations Management

Four additional courses (12 credits) from the following:

ACC 620	Cost Management
POM/ORG 640	Total Quality Management
POM 641	Manufacturing Planning and Control
POM 645	Cases in Operations Management
POM 648	Project Management Techniques
QMM 652	Forecasting
POM 680	Special Topics in Production and Operations Management
POM 690	Independent Study in Production and Operations Management

Students who have completed POM 521 or its equivalent will be required to take an additional course from the Production and Operations Management elective list above to produce a total of 15 credits, beyond the credits earned in their master's degree program or another certificate program.

For more information on Graduate Business Programs

For more information on Oakland University's graduate business programs, including an application for graduate study, a GMAT booklet, and answers to common questions, please either:

Write to:

Office of Graduate Business Programs
School of Business Administration
Oakland University, Rochester, MI 48309-4493.

Fax a request to:

Graduate Business Programs at (248) 370-4964.

E-mail a request to the following Internet address:
gbp@oakland.edu

Call the staff of the Office of Graduate Business Programs at:
(248) 370-3287.

Or visit our website: www.sba.oakland.edu/mba.

■ The Master of Science in Engineering Management

The Master of Science program in engineering management is offered by the School of Engineering and Computer Science in cooperation with the School of Business Administration. Intended for students with a bachelor's degree in engineering or computer science, the program has as its goal the provision of the tools and skills necessary for making sound management decisions in industry and business while retaining one's commitment to a specialized field of endeavor. Please consult the engineering section of this catalog for information on the Master of Science in Engineering Management.

COURSE OFFERINGS

ACCOUNTING

ACC 511

Financial Accounting (3)

Focus is on financial accounting for external reporting: communications addressed to shareholders, government agencies, potential investors and the public.

ACC 512

Managerial Accounting Systems (3)

Emphasizes recording, reporting and the use of data within the enterprise. Cost accounting, budgeting and internal control systems are covered.

Prerequisite: PC skills proficiency and a course in financial accounting.

ACC 601

Financial Analysis and Reporting (3)

A study of financial accounting and reporting from the perspective of the user of accounting information. The course will emphasize the interpretation and analysis of specific accounting treatments rather than accounting methodology.

Prerequisite: ACC 512 or equivalent course, and FIN 533.

ACC 612

Non-Business Accounting and Control (3)

The characteristics of not-for-profit entities are analyzed and used to define the basic concepts of accounting for funds. Accounting and reporting principles applicable to governmental units, hospitals, schools and other nonprofit entities are discussed.

Prerequisite: ACC 512 or equivalent course.

ACC 617

International Accounting (3)

The study of financial accounting, reporting and disclosure in different nations and across international borders. Includes study of foreign currency translation and efforts to harmonize accounting standards.

Prerequisite: ACC 512 or equivalent course.

ACC 620

Cost Management (3)

This course will give the student an introduction to cost management, which is a set of techniques and methods for planning and measuring and providing feedback to improve a company's products and processes. Examples of items covered include cost issues related to product life cycle, quality, advanced technologies, strategy and customer/supplier relationships.

Prerequisite: ACC 512 or course in managerial accounting.

ACC 621

Federal Income Taxation II (3)

To study the basic federal income tax laws relating to corporations, partnerships, estates and trusts. Topics include the formation, operation and taxation of corporations, S corporations, partnerships and other taxable entities.

Prerequisite: A course in financial accounting and income taxation.

ACC 625

Federal Income Taxation for Business (3)

Examination of the concepts of business taxation and the essential logic underlying the federal tax laws. The class will analyze individual and corporate income tax laws relating to business rather than train students to prepare current-year tax returns.

Prerequisite: A course in financial accounting.

ACC 630

Accounting and Communications (3)

The development of effective communication skills both in writing and speaking. This course offers strategies for thinking through and developing a communication plan for a variety of communication contexts in the accounting/business field.

(ACC 630 can not be used as a designated accounting elective in the MBA program. It is an open elective.)

Prerequisite: Admission to the MAcc or MBA Program.

ACC 650

Professional Issues in Accounting (3)

Addresses contemporary issues that affect the accounting profession and the professional accountant, including regulation of accounting and accountants; accounting standard setting; admission to professional status; professional ethics; professional liability; and the impact of technology.

Prerequisite: Admission to MAcc program or permission of instructor.

ACC 680

Special Topics in Accounting (3)

An in-depth study of the application of accounting theory to a specialized accounting topic. Topics vary. See Schedule of Classes for current offering. A maximum of two Special Topics courses may be taken in one rubric.

Prerequisite: ACC 512 or equivalent course.

ACC 690

Independent Study in Accounting (3)

Independent individual research on a topic chosen by the student. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisites: ACC 512 or equivalent course and prior approval of instructor.

■ ECONOMICS

ECN 521

Economics for Managers (3)

Explores microeconomic and macroeconomic topics of importance to managerial decision-making. Topics include: Constrained decision making, demand analysis, cost analysis, alternative market structures, determinants of inflation and unemployment, economic indicators and the business cycle, and the role of monetary and fiscal policy in an open and closed economy.

Prerequisite: QMM 510.

ECN 605

Econometrics (3)

Estimation and testing of economic models using regression techniques. Includes experience with violations of regression assumptions, binary variables, autoregression and distributive lag models and the structure of "large" simultaneous equation models.

Prerequisite: ECN 521.

ECN 618

Seminar in Economic Policy (3)

Analysis of economic policy. Topics vary but may include resource allocation, macroeconomic stability, economic growth, energy, public choice, global economic interdependence and the environment.

Prerequisite: ECN 521.

ECN 620

Money, Financial Institutions and Markets (3)

This course provides an analytical foundation for the understanding of the way money and capital markets serve as a conduit through which economic policies and internal and external shocks affect the multitude of financial instruments and the overall economy. The role of financial intermediaries within the context of the saving/investment process and the supply of money and credit is discussed. The asset/liability management process of various financial institutions is investigated. Finally, the regulatory environment under which U.S. financial institutions operate is examined. Generally offered fall semester of odd years and spring semester of even years.

Prerequisite: FIN 533.

ECN 656

Public Finance (3)

The course studies the role and impact of the public sector in a market economy. It examines government spending programs and taxes within the context of efficiency and equity. There is a strong emphasis on current policy issues.

Generally offered winter semester of odd years.

Prerequisite: ECN 521.

ECN 667

Economics of Health Care (3)

The course explores application of tools of economic analysis to the health care industry and government health care policy. It examines the impact of the special characteristics of health care and the medical services industry on the pattern of health care produced, its distribution and resource allocation within the industry. Generally offered winter semester of even years.

Prerequisite: ECN 521.

ECN 673

International Trade and Finance (3)

Examination of the theory of international trade, international monetary mechanisms, exchange-rate regimes, the balance of payments and economic interdependence. Generally offered winter semester of odd years.

Prerequisite: ECN 521.

ECN 680

Special Topics in Economics (3)

An in-depth study of the application of economic theory to a specialized economics topic. Topics vary. See Schedule of Classes for current offering.

Prerequisites: ECN 521 or permission of instructor.

ECN 685

Economics of Industries (3)

The course studies the structure of American industry and the factors affecting it, with emphasis on economies of scale; barriers to entry; structure-behavior relationships, including pricing, product differentiation and technical change; evaluation of performance, antitrust and regulation. Generally offered fall semester of even years.

Prerequisite: ECN 521.

ECN 690

Independent Study in Economics (3)

Independent individual research on a topic chosen by the student. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisites: ECN 521 and prior approval of instructor.

■ FINANCE

FIN 533

Financial Management (3)

Introduction to the institutions, instruments, theories and analytical tools of financial management. Emphasis is placed on return versus risk valuation tradeoff. Topics include capital budgeting, cost of capital, capital structure, dividend policy, cash management, accounts receivable, short-term debt, financial statement analysis, international financial management and financial forecasting.

Prerequisites: A course in financial accounting, ECN 521 and QMM 510.

FIN 618

Investment Analysis (3)

This course provides a comprehensive coverage of investments, with a particular emphasis on the practical valuation of stocks and bonds. International investing, portfolio management, mutual funds, options, futures, hedging, trading, taxes, ethics and market efficiency topics are also covered.

Prerequisite: FIN 533.

FIN 627

International Financial Management (3)

Application of finance theory to international financial decision making. Topics include foreign exchange rates, markets and management, inter-national sources of capital, capital budgeting for foreign projects, international diversification and working capital management for the multinational firm.

Prerequisite: FIN 533.

FIN 633

Advanced Financial Management (3)

Expands on the theories introduced in FIN 533. Topics include capital budgeting under uncertainty, agency theory, financial signaling, leasing, capital restructuring and cash management. Cases may be used to illustrate the application and limitations of finance theory.

Prerequisite: FIN 533.

FIN 650

Real Estate Investment Analysis (3)

Application of finance theory to investment in income-producing real estate. Topics include market feasibility, property appraisal, income taxation, construction, permanent and creative financing, and investment analysis. Students must prepare and present an investment analysis of an actual property.

Prerequisite: FIN 533.

FIN 680

Special Topics in Finance (3)

An in-depth study of the application of finance theory to a specialized financial management topic. Topics vary. See Schedule of Classes for current offering.

Prerequisite: ACC 512 or equivalent course.

FIN 690

Independent Study in Finance (3)

Independent individual research on a topic chosen by the student. Written approval must be obtained from a finance faculty member prior to registering for this course. Offered every term.

Prerequisites: FIN 533 and prior approval of instructor.

■ FINANCIAL INFORMATION SYSTEMS

FIS 618

Introduction to Financial Information Systems and Databases (3)

The course focuses on information systems, project management, data modeling, database design, querying a database, and use of computerized financial databases.

Prerequisites: ACC 512 or a course in managerial accounting.

FIS 631

Financial Information Systems: Analysis (3)

Students will learn how to analyze modern, technologically relevant, financial information systems. The Systems Development Life Cycle (SDLC) is used as the course's logical framework and appropriate modeling methodologies are used to analyze real-world business systems, using an integrated systems development (Previously ACC 618.)

Prerequisites: FIS 318 or FIS 618.

FIS 632

Financial Information Systems: Design (3)

This project-based course involves design and construction of computer information systems, using appropriate methodologies and a Model-Oriented-Tool-Enhanced approach. Designs will be implemented using innovative technologies.

(Previously ACC 619.)

Prerequisites: FIS 631 or FIS 431 or MIS 514.

FIS 633

Financial Information Systems: Audit and Control and Databases (3)

This course deals with audit and control aspects of information systems. Students will study the risks, control, audit techniques, computer fraud detection techniques related to key information systems areas and will perform audit tests and fraud prevention and detection procedures. (Previously ACC 611.)

Prerequisites: ACC 512 or a course in managerial accounting and FIS 618 or an equivalent course.

FIS 635

Financial Information: Applications (3)

The content of this project-based course will vary depending on changing business needs and information technologies. Topics include XML-XBRL, electronic commerce, executive decision support systems, and new technologies that emerge.

Prerequisites: FIS 632 or FIS 432 or equivalent course.

FIS 680

Special Topics in Financial Information Systems (3)

Intensive study of a special financial information system topics. See Schedule of Classes for current offering. May be repeated for a total of 6 credits.

Prerequisites: FIS 618 or admission to a graduate business program.

FIS 690

Independent Study in Financial Information Systems (3)

Qualified and highly motivated individuals may engage in individual research, directed readings, or group study under the supervision of a faculty member. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisites: FIS 618 and approved contract prior to registration.

■ HEALTH CARE MANAGEMENT

HCM 504

Statistical Methods (2)

Emphasizes health care applications using spreadsheets and computer software. Topics include summarizing and describing data; a review of visual displays and their uses; sampling and survey methods; sample size and parameter estimation for numerical and attribute data; hypothesis testing for one, two or several groups, including analysis of variance and multiple regression; analysis of trends and seasonal patterns; and the statistical tools of quality control. Includes report writing and team project presentations.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 512

Financial and Managerial Accounting (3)

Financial accounting topics include the nature of accrual accounting and generally accepted accounting principles, especially as they affect financial statements. Financial statement content for health care organizations will be reviewed with emphasis on understanding the information presented. Reporting disclosures will also be reviewed. Managerial accounting topics include internal financial reporting needs, budgeting, overhead allocation methods, product costing/pricing, responsibility accounting, control and decision making, especially as it relates to capital asset acquisitions.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 521
Managerial Economics (3)

This course focuses on microeconomic principles for health care decision making. Topics include the study of demand, production and cost, market structure and professional labor markets. Health care applications are emphasized including those involving insurance, nonprofit organizations, and government policies. In addition, the course provides a selective overview of macroeconomic concepts including: national income accounting, principles of money and banking, the Federal Reserve System, and stabilization policies.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 527
Health Economics (2)

Applies tools of economic analysis to the health care industries. Topics may include: the production aspect of health, demand for health and health care information and agency problems; technology; insurance and managed care; hospitals and long-term care; regulation and other government policies; health system reform; and benefit-cost analysis.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 530
Teambuilding, Leadership, and Communications (2)

Comprehensive examination of group and team dynamics, diversity within teams, decision making skills, and planning and implementing change. Theories of leadership and leadership styles, and communication within the organization, including communication with employees and across cultures, will also be explored. Includes team projects.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 531
Human Resources Management (2)

Theoretical and empirical issues of the personnel function in health care organizations. Includes job analysis and design, employee recruiting, compensation policies and practices, research techniques, government policy, law and social and environmental factors related to decision making.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 535
Strategic Management (3)

Application of the management tools of economics, statistics, organizational behavior, accounting, marketing, finance, operations management, and management information systems to the analysis of health care organization case studies. International and ethical issues related to strategic management are discussed.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 540
Operations Management (2)

Study of the operations of health care service organizations. Introduction to operational design and control issues such as forecasting, capacity planning, facility location and layout, production control, material requirements planning, inventory control, scheduling and quality assurance.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 545
Health Care Information Systems (2)

Examines the strategic use of information technology (IT) and business process reengineering in health care organizations. Topics include intra-organizational (including intranets) and inter-organizational systems (including extranets and the Internet), the use of IT in a competitive environment, the control of IT, IT resource planning and business process improvement through the use of IT.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 550
Legal and Ethical Issues (2)

This course surveys the legal and ethical environment as it affects health care organizations. Legal topics include: the U.S. and international legal systems; functions and powers of regulatory agencies; and the laws relating to securities, business organizations, employment practices, antitrust and the environment. Ethics related topics include: business ethics vs. health care ethics, organizational philosophy and mission statements, professional codes of ethics, conflicts of interest, ethical committees, informed consent, confidentiality, human experimentation, death and dying, and the ethics of managed care.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 560
Marketing Management (3)

Focus on the application of marketing concepts in the context of health care management and the application of marketing to the delivery of health care services. Topics covered include the environment of health care marketing, the institutional structure of health care marketing, the role of marketing research and information in the formulation of and implementation of the strategic marketing of health care services, ethical perspectives in health care marketing, global perspectives in health care marketing and trends in health care marketing.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 570**Financial Management (3)**

Application of financial concepts such as cash flow analysis, capital budgeting, sources of capital, and working capital management to the health care environment. Financial implications of managed care and HMO strategies will be discussed. Major emphasis will be on financial management of not-for-profit health care delivery organizations with some comparisons.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 605**Forecasting in Health Care (2)**

Methods of analysis of trends and seasonal patterns in demand for health care. Survey of common forecasting methods and their applications in business. Readings, case studies, and discussion of behavioral issues affecting the use of forecasting information within an organization. Use of a variety of computer tools to analyze trends and prepare forecasts. Presentation of written and oral forecasts based on real data.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 606**Quality Improvement in Health Care (2)**

Examines the philosophy and history of quality control. Topics include identifying customer requirements and critical product characteristics, supplier quality assurance, the continuous quality improvement cycle, the costs of poor quality, strategic planning and policy deployment, robust process design and capability analysis, control charts for numerical and categorical data, recent advances in control charts, and the application of management theory and behavioral research in implementing quality assurance programs.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 612**Cost Management in Health Care (2)**

Activity-based costing, budgeting, and management. Strategic cost management, cost of quality and quality initiatives, and performance measurement.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 624**Government Policy in Health Care (1)**

Exploring the role of federal and state governmental policy related to the management of health care organizations. Topics include political environment of management; concepts and processes central to political analysis; bureaucratic politics and the manager.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 625**International Comparisons in Health Care (1)**

Examines and compares the health care systems in the United States and six other industrialized nations: Canada, France, Germany, the Netherlands, the United Kingdom, and Sweden. The course deepens students' understanding of how the U.S. health care system operates and how it compares with those of other nations. It also explores features of other systems that may have potential applicability to the United States.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 633**Managing Cultural Diversity (1)**

Provides students an opportunity to examine their own feelings, attitudes, and behavior about people who are different from them, and how these feelings could affect their ability to manage effectively in an increasingly diverse work environment.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 634**Hospital Administration (2)**

This course examines the organization and operation of hospitals. The roles and responsibilities of the board, management and medical staff of a hospital are examined as well as strategic planning, current issues and trends in hospital administration.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 635**Transforming the Health Care Organization (2)**

Examines the leadership challenges in transforming a health care organization from a more traditional fee-for-service system to a managed care and marketing-focused system. Topics include organizational design, technology, organizational culture, compensation, staffing, selection and implementing organizational change.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 636**Contract and Negotiation in Health Care (1)**

Examines the contract negotiation process in the health care industry. It looks at contract negotiation from the points of view of the covered individual's employer, insurance/managed care firm, medical practice group, and hospital/integrated health care system. Special attention is placed on the problems of cost analysis at each step in the process.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 637

Outcomes and Assessment in Health Care

Examines the techniques for assessing the outcomes of various processes in health care organizations. Topics include the overall concepts of outcomes management, disease state management and demand management.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 638

New Ventures in Health Care (1)

The emphasis of the course is to introduce the student to the process of developing a medical services company. This requires the introduction of new concepts and the application of management and organizational theory to the entrepreneurial process in health care delivery. Contemporary and emerging issues in developing a new medical services company will be examined.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 642

Facilities Planning and Evaluation (1)

An introduction to the field of facility planning and evaluation in the health care industry.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 643

Project Management in Health Care (2)

Examination of the various technologies and software for managing projects. Topics include Program Evaluation Review Technique (PERT) and Critical Path Method (CPM). Includes computer exercises using Microsoft Project and similar project management software.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 645

Managing Technology in Health Care (2)

Provides a framework for examining the diffusion of health care technologies, methods for assessing technologies, and policies affecting the adoption and use of technology. Topics include FDA regulation, Certificate of Need, payment policies, and utilization review mechanisms. The course also examines strategies for managing the acquisition of technology by health care organizations, especially in managed care settings.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 646

Data Warehousing in Health Care (1)

Examines the application of data warehousing and data mining technologies in the health care setting.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 661

Health Care Marketing and Consumer Satisfaction

Examines the influences on consumer choices in the health care market. Topics include the role of physicians and other staff, offering new services, identifying key sources of information, the role of the market in strategic planning, and developing differential market advantages. Also integrates concepts from operations management and human resource management.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 662

New Health Care Services-Development (1)

Analysis of the process for developing new health care products or services. Topics include the techniques to identify new markets, develop new product ideas, measure consumer benefits, position and design new products and services, as well as test them prior to launch. Use of analytical techniques will be emphasized.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 670

Hospital Finance and Managed Care (3)

Examines the underlying theories and features of third party payment systems. An in-depth study is made of the Medicare and Michigan Blue Cross payment systems for hospitals. The role of managed care programs, particularly those of capitated HMOs will also be studied. Also examined are the internal and external financial reporting, operating, and capital budgeting issues related to these payment systems.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 680

Special Topics in Health Care Management (1)

Examines emerging issues in health care management.

Prerequisite: Admission to the Executive MBA in Health Care Management program.

HCM 690

Independent Study in Health Care Management (1-3)

Independent individual research on a topic chosen by the student. Written approval must be obtained from a health care management faculty member prior to registering for this course. Offered every term.

Prerequisite: Admission to the Executive MBA in Health Care Management program and prior approval of instructor and Director of EMBA program.

■ MANAGEMENT

(Including Policy, Strategy and Goals, International Business and Legal Environment of Business)

MGT 526

International Business (3)

Examination of the international business environment, including cultural, economic, social, political, legal and financial dimensions. Topics include: strategic planning, production and distribution logistics, technology, transfer pricing, risk analysis. Accounting, finance, marketing, information systems and human resources in a global setting will be introduced. Multinational corporations, regional agreements and public policy round out the course.

Prerequisites: Admission to the MBA program.

MGT 535

Policy, Strategy and Goals (3)

Application of management tools of economics, statistics, organizational behavior, accounting, marketing, finance, operations management and management information systems to the analysis of organizational case studies. International and ethical issues related to strategic management are discussed.

Prerequisites: Completion of the MBA core courses and permission of Coordinator of Graduate Business Programs.

MGT 536

Policy, Strategy and Goals-International (3)

Application of management tools of economics, statistics, organizational behavior, accounting, marketing, finance, operations management and management information systems to the analysis of organizational case studies. International and ethical issues related to strategic management are discussed. To appreciate U.S. businesses' concerns while operating in other countries, there is a mandatory requirement of international travel for this course. This course may substitute for MGT 535.

Prerequisites: Completion of the MBA core courses and permission of Coordinator of Graduate Business Programs.

MGT 550

Legal Environment of Business (3)

Examination of the legal environment as it affects business, emphasizing the U.S. and inter-national legal systems, ethical analysis of public policy and managerial decisions, functions and powers of regulatory agencies, and the laws relating to securities, business organizations, employment practices, antitrust and the environment.

Prerequisite: Admission to the MBA program.

MGT 611

Master's Project (6)

An intense study of a practical management problem that requires the collection and analysis of data in an actual organizational setting and the presentation of recommendations to solving the problem to the management of the organization.

The final project report is to be submitted in approved format to the Office of Graduate Business Programs and the sponsoring faculty member.

Prerequisites: Completion of the MBA core courses, MGT 535, and an approved contract

MGT 638

Labor-Management Relations (3)

Analysis of management-employee relations in modern organizations and public policy in labor-management areas.

Prerequisites: ECN 521, MGT 550 and ORG 530.

MGT

656 Entrepreneurship (3)

Study of entrepreneurship (including intrapreneurship) for students who are thinking of starting their own company or are striving to promote innovation within an established company. The course focuses on assessing venture feasibility, analyzing and planning product and service initiatives, and obtaining financing. The course will also provide a realistic preview of the challenges and excitement of entrepreneurship.

Prerequisites: ACC 512, FIN 533 and MKT 560

MGT 660

Launching and Managing Small Businesses (3)

Analysis of the role of small businesses in the U.S. economy, the Small Business Administration, franchise opportunities, consulting as a business and the launching, financing and managing of a small business. A significant project is required.

Prerequisites: ACC 512, ECN 521, FIN 533, MIS 524, MKT 560 and POM 521.

MGT 670

Business Ethics (3)

The examination of business ethics and morality as they shape and influence the business environment. The student will develop an awareness of problem areas in the conduct of business.

Some of the issues discussed can include but are not limited to: conflicts of interest, honesty, environmental issues, whistle blowing and ethical theory.

Prerequisites: MKT 560 and MGT 550.

MGT 680

Special Topics in Management (3)

The analysis of topics of current interest in management. See Schedule of Classes for current offering. Topics vary. Topics may include: Doing Business in Japan, Doing Business in the Pacific Rim, Competitive Strategy and the Not-For-Profit Organization.

Prerequisite: As specified in the schedule for the term.

MGT 681

Special Topics in International Business(3)

The analysis of topics of current interest in international business. See Schedule of Classes for current offering.

Prerequisite: As specified in the schedule for the term.

MGT 682

Special Topics in Entrepreneurship (3)

The analysis of topics of current interest in entrepreneurship. Topics vary. See Schedule of Classes for current offering.

Prerequisite: MGT 656

MGT 690

Independent Study in Management (3)

Independent individual research on a topic chosen by the student. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisites: Completion of the MBA core courses and prior approval of instructor.

MGT 691

Independent Study in International Business(3)

Independent individual research on a topic chosen by the student in consultation with the instructor. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisites: MGT 526 and permission of the instructor.

MGT 692

Independent Study in Entrepreneurship (3)

Independent individual research on a topic chosen by the student in consultation with the instructor. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisites: MGT 656 and prior approval of instructor.

■ MANAGEMENT INFORMATION SYSTEMS

MIS 504

Introduction to IS Management (3)

This course provides an introduction to various information systems and how they support the operations, control, planning and communication functions of a business. The role of technologies in support of various systems is discussed, along with some introduction to IT strategy and development methodologies.

Prerequisite: Admission to MSITM program or instructor's permission.

MIS 505

Technology of Information Systems (3)

This course introduces information technology as an enabler of the development, operation and management of information systems. A business process perspective is emphasized.

Prerequisite: Admission to MSITM program or instructor's permission.

MIS 514

Systems Analysis (3)

This course looks at the analysis of user requirements in support of various business processes that are redesigned to meet organizational objectives. Given that systems are designed to support decisions at various levels in the organization, the life cycle as well as prototyping methodologies are used to develop user requirements and assess information systems development feasibility.

Prerequisite: MIS 504 or MIS 524 and MIS 505 or instructor's permission

MIS 515

Systems Design (3)

This course presents an overview of the theory and practice of designing information systems to meet users' requirements. The course focuses on tools and techniques that one can use in the design of IS systems. Issues such as physical data modeling, system implementation and testing are emphasized.

Prerequisite: MIS 514 or instructor's permission.

MIS 516

Software Project Management (3)

This course presents an overview of general project management techniques and their application to software project management. The course also addresses specific software planning issues such as effort estimation, contingency planning, risk management and the application of user acceptance software process maturity models.

Prerequisite: Admission to MSITM program or instructor's permission.

MIS 524

Enterprise Information Systems (3)

The strategic use of information technology (IT) in the enterprise. Topics include intra-organizational systems, inter-organizational systems, the use of IT in a competitive environment, control of IT, IT resource planning and organizational issues for the management of information systems.

Prerequisite: Admission to the MBA program.

MIS 525

Business Process Innovation and Management (3)

Focus on business performance improvement through the identification and analysis of key processes and their redesign using technological and organizational resources. Topics include process identification, process analysis and modeling, process redesign, and new process implementation.

Prerequisite: MIS 524.

MIS 604**Database Management (3)**

Technology, organization, use and administration of database management systems (DBMS). Includes exercises using microcomputer and mainframe DBMS packages.

Prerequisite: MIS 524.

MIS 606**Advanced Database Management Systems (3)**

This course addresses the problems encountered by organizations with distributed and networked databases. Topics include transaction management, concurrency control, deadlocks, replicated data management, query processing and reliability. Database performance and recovery are also covered.

Prerequisite: MIS 514 and MIS 515 or instructor's permission.

MIS 618**Network Management (3)**

This course provides a general overview of communications network design. Relevant data communication hardware and software characteristics are examined. Students are introduced to network models, and design of local area networks and wide area network along with intranet and extranet. The impact of communications technology on organizations as well as trends in the telecommunications industry are explored.

Prerequisite: MIS 504 or MIS 524 or instructor's permission.

MIS 620**Electronic Commerce (3)**

This course provides students with an analytical and technical framework to understand the emerging world of e-commerce. Topics include the complexities of the marketplace, design and implementation of an Internet business, and issues surrounding privacy, security and the protection of intellectual property on the Internet.

Prerequisite: MIS 504 or MIS 524 or instructor's permission.

MIS 622**Business Object Development (3)**

The primary focus of the course is on the principles and applications of object-oriented methods in information systems. Object-oriented concepts and software design and programming principles will be introduced. The purpose of the course is to train students to write reasonably complex business application programs using higher level languages such as Java.

Prerequisite: MIS 504 or MIS 524 or instructor's permission.

MIS 624**Business Application Architecture (3)**

This course focuses on the issues related to server-side aspects of web-based applications. In particular, it introduces the different solution architectures utilized and their relative advantages and disadvantages. Students are introduced to several server-side technologies such as Java Servlets, Java Server Pages and Java

Beans. This project-based course will allow students to get hands-on experience through designing and building reasonably complex server-side applications.

Prerequisite: MIS 622 or instructor's permission.

MIS 625**IT Planning and Strategy (3)**

Using a variety of case studies, this course links the business strategy of a firm to its IT/IS strategy and assesses the impact of the strategy on performance and competitiveness. Issues such as project prioritization and risk management are also addressed.

Prerequisite: MIS 504 or MIS 524 or instructor's permission.

MIS 636**Decision Support Systems (3)**

This course provides an introduction to data warehousing, data warehouse architecture, online analytical processing, data mining and related development tools. Business applications using OLAP and data mining tools are covered.

Prerequisite: MIS 524 or MIS 505 or instructor's permission.

MIS 638**Knowledge Management (3)**

This course provides students exposure to the issues and challenges both users and systems developers face as they analyze and evaluate the potential support of knowledge to meet the qualitative decision-making processes, as well as support the operational heuristics within an organization.

Prerequisite: MIS 504 or MIS 524 or instructor's permission.

MIS 640**IS Security (3)**

This course addresses issues pertaining to ensuring the security of organizational and personal information systems. Topics covered include: cryptography, analysis of threats, problems particular to networks, vulnerability and risk assessment, identification and authentication, certificates, credentials, organizational security policies, and the human factor. An emphasis is placed on practical problems and ethical dilemmas that face those concerned with information system security.

Prerequisite: MIS 504 or MIS 524 or instructor's permission.

MIS 641**Privacy and Intellectual Property (3)**

This course addresses issues pertaining to privacy and intellectual property both from the standpoint of the organization and the individual. It focuses on issues that have become increasingly relevant with the spread of information technology. Topics include: regulatory and technological choices for privacy, the impact of the use of database technology on privacy, global differences in privacy laws, uses of marketing and privacy, intellectual property law and software, software contracts, the concept of intellectual property piracy, and historical change in patents, copyrights, and trademarks. The course also explores ethical dilemmas associated with both privacy and intellectual property.

Prerequisite: MIS 504 or MIS 524 or instructor's permission.

MIS 642

IS Issues in Supply Chain Management (3)

Information technologies have enabled the efficient flow of information, materials and services from raw materials suppliers through to final consumers by advancing supply chain integration and coordination. Aspects related to logistics, operations and information systems, as well as coordination strategies and supply chain partnerships are included.

Prerequisite: MIS 504 or MIS 524 or instructor's permission.

MIS 646

Business Analysis and Modeling (3)

This course focuses on the design and development of decision support systems. The emphasis is on end-user development of model and data-based systems to support managerial decision making using various software tools.

Prerequisite: MIS 504 or MIS 524 or instructor's permission.

MIS 650

Project Seminar (3)

This course will explore a variety of topics related to IT Management in a seminar format. Each student will also complete an in-depth analysis of an IT Management issue. Specific project topics will be chosen by the student and approved by the instructor.

Prerequisite: Final semester of the MSITM program or instructor's permission.

MIS 680

Special Topics in Management Information Systems (3)

An advanced course involving study of current research issues and recent developments in IT and IS management.

Topics vary. See Schedule of Classes for current offering.

Prerequisite: MIS 504 or MIS 524 or instructor's permission.

MIS 690

Independent Study in Management Information Systems (3)

Independent individual research on a topic chosen by the student. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisite: MIS 516 or MIS 524, and prior approval of instructor.

MARKETING

MKT 560

Marketing Management (3)

Comprehensive study of the foundations of marketing and the management of the marketing function including the role of marketing in society and within the business enterprise; the use of marketing to gain competitive advantage, and the practice of marketing in a rapidly changing business environment.

Prerequisite: Admission to the MBA, MSITM, MAcc, or Post-Master Certificate program.

MKT 604

Consumer Behavior (3)

Study of basic factors in influencing consumer behavior, with emphasis on structuring and managerial use of consumer decision-making models. Social-psychological and economic variables, including learning, motivation, attitude, personality, small groups, demographic and cultural factors are examined.

Prerequisite: MKT 560.

MKT 605

Marketing Research (3)

Focus on the generation and management of information in marketing decisions. Covers the evaluation of additional marketing information; how it is acquired and used; the manager's role in market research; the researcher's role in supplying marketing information.

Prerequisite: MKT 560.

MKT 608

Strategic Marketing (3)

This course examines issues such as market definition based on customer-oriented approaches, developing a competitive advantage and making an organization market-driven. In addition, the tools and techniques covered are recent, and likely to be useful in developing core competencies in strategic analysis not typically covered elsewhere.

Prerequisite: MKT 560.

MKT 620

Distribution Channels Management and Logistics (3)

The management of the distribution function. Study of the management of marketing channels systems comprising of wholesalers, agents, retailers and other agencies. Logistics management and supply chain management in the fulfillment of marketing objectives.

Prerequisite: MKT 560.

MKT 650**International Marketing (3)**

The application of marketing principles to problems associated with marketing products and services to different nations. Cases in international marketing will be analyzed.

Prerequisite: MKT 560.

MKT 670**Business to Business Marketing (3)**

Study of the area of marketing that addresses the needs of the organizational customer in industry, government and institutions. The special challenges of the industrial market, such as assessing marketing opportunities, the organizational buying process, and formulating and evaluating industrial marketing strategy and performance are discussed.

Prerequisite: MKT 560.

MKT 680**Special Topics in Marketing (3)**

Applications of recent theoretical and empirical findings in marketing. Students may work on a project, in cooperation with local firms, where they apply the tools acquired in marketing and related courses to a current managerial problem. Topics vary. Recent topics included industrial marketing, promotional strategies and international marketing. See Schedule of Classes for current offering. A maximum of two Special Topics courses may be taken in one rubric.

Prerequisite: MKT 560.

MKT 690**Independent Study in Marketing (3)**

Independent individual research on a topic chosen by the student. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisites: MKT 560 and prior approval of instructor.

■ ORGANIZATIONAL BEHAVIOR

ORG 530**Organizational Behavior (3)**

Organizational behavior is analyzed at individual, group and organizational levels. Individual and group processes such as perception, learning, motivation, communication, and conflict are studied in depth. Organizational-level topics include size, structure, complexity and effectiveness. Where appropriate, cross-cultural issues will be discussed.

Prerequisite: Admission to the MBA, MSITM, MAcc, or Post-Master Certificate program.

ORG 631**Human Resources Management (3)**

Theoretical and empirical issues of the personnel function in modern organizations. Includes job analysis and design, employee recruiting, compensation policies and practices, research techniques, government policy, law, and social and environmental factors related to decision making.

Prerequisites: QMM 510 and ORG 530.

ORG 635**Decision Making in Organizations (3)**

A comparison of current cognitive, social and organizational approaches to the study of decision making. Behavioral information processing concepts will be used as an aid to understanding how managerial decisions are made. Examples are introduced from functional management, as well as policy and strategy.

Prerequisite: ORG 530.

ORG 636**Leadership and Group Performance (3)**

Comprehensive examination of different leadership theories, with emphasis on relevant empirical evidence and application of the theories to case studies.

Prerequisite: ORG 530.

ORG 637**Motivation and Work Behavior (3)**

Analysis of the individual and organizational factors affecting employee motivation, performance and satisfaction. Includes the role of leadership, job design, environmental variation, compensation policies, goal-setting techniques and group influences.

Prerequisite: ORG 530.

ORG 640**Total Quality Management (3)**

Surveys the history and basic concepts of total quality management (TQM). Includes the discussion of approaches to quality of Deming, Crosby, Durand, Bernhard-Walsh and others. Teams of students will apply TQM principles to real world projects.

Prerequisites: QMM 510, ORG 530 and POM 521.

ORG 670**International Organizational Behavior and Human Resources (3)**

This course examines international organizations' behavior resource management in preparation for work in a global environment. Cross-cultural training, managing global managers, compensation, labor relations and repatriation are among the topics covered. Offered every other year.

Prerequisite: ORG 530.

ORG 680

Special Topics in Organizational Behavior (3)

Analyzes topics related to organizational behavior and/or human resources management. Topics may include: job design, total quality management, compensation, management across cultures, research methods and “the dark side” of the organization. See Schedule of Classes for current offering.

Prerequisite: ORG 530.

ORG 690

Independent Study in Organizational Behavior (3)

Independent individual research on a topic chosen by the student. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisites: ORG 530 and prior approval of instructor.

■ PRODUCTION AND OPERATIONS MANAGEMENT

POM 521

Operations Management (3)

Study of operations of manufacturing and service organizations. Introduction to operational design and control issues such as forecasting, capacity planning, facility location and layout, production control, material requirements planning, scheduling and quality assurance. Includes international, legal and ethical aspects, as well as computer exercises.

Prerequisite: QMM 510 or instructor's permission.

POM 640

Total Quality Management (3)

Surveys the history and basic concepts of total quality management (TQM). Includes the discussion of approaches to quality of Deming, Crosby, Durand, Bernhard-Walsh and others. Teams of students will apply TQM principles to real world projects.

Prerequisites: QMM 510, ORG 530 and POM 521.

POM 641

Manufacturing Planning and Control (3)

Definitions, techniques and practices in manufacturing applications, including traditional manufacturing techniques as well as current issues such as cellular and flexible manufacturing systems. Emphasizes differences between American and foreign manufacturing techniques.

Prerequisite: POM 521.

POM 645

Cases in Operations Management (3)

Analysis of diverse cases from the perspective of the operations function in service and manufacturing organizations. Cases are descriptive of actual operating situations. Covers situations which lend themselves to analytical and computer techniques, as well as problems involving subjective judgment and creativity in translating theory into practice.

Prerequisite: POM 521.

POM 648

Project Management Techniques (3)

An examination of the various math-based techniques for managing projects. The topics include Program Evaluation Review Technique (PERT) and Critical Path Method (CPM). Includes computer exercises.

Prerequisite: POM 521.

POM 680

Special Topics in Production and Operations Management (3)

An advanced course involving study of current research issues and recent developments in Production and Operations Management. Topics vary. See Schedule of Classes for current offering.

Prerequisite: POM 521.

POM 690

Independent Study in Production and Operations Management (3)

Independent individual research on a topic chosen by the student. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisite: POM 521 and prior approval of instructor.

■ QUANTITATIVE METHODS

QMM 501

Quantitative Methods for Management (3)

Theory and application of mathematical skills required for courses in the MBA program. Covers basic algebra, functions, graphing functions, matrix algebra, linear programming, basic differential and integral calculus and their application to problem definition and problem-solving in business.

Prerequisites: College algebra.

QMM 510

Statistical Analysis for Managers (3)

Statistical methods useful in management. Includes describing and exploring data, visual presentation of data, discrete and continuous probability models, estimation, hypothesis testing, quality control, regression, and time-series models and forecasts. Real-world applications and use of computer workstation tools are stressed.

Prerequisites: Admitted to Graduate Business Program.

QMM 640

Operations Research (3)

Topics in modeling of managerial decision problems under certainty and under uncertainty. Includes linear programming, game theory, PERT and CPM, Bayesian analysis, simulation, chance-constrained programming, queuing theory and Markovian analysis. Designed to refine the student's scientific problem-solving skills with emphasis on application of these skills.

Prerequisite: POM 521.

QMM 652

Forecasting (3)

Survey of analytical forecasting methods for financial and operational planning, including exponential smoothing, time series decomposition, Box-Jenkins, econometric and distributed lag models, seasonality and autocorrelation, Delphi and other qualitative methods, assessment of commercial forecasting services, and case studies. Extensive use of computer packages to prepare actual forecasts for written and oral presentation.

Prerequisite: QMM 510.

QMM 680

Special Topics in Quantitative Methods (3)

An advanced course involving study of current research issues and recent developments in Quantitative Methods. Topics vary. See Schedule of Classes for current offering.

Prerequisite: QMM 510.

QMM 690

Independent Study in Quantitative Methods (3)

Independent individual research on a topic chosen by the student. Written contract must be prepared and approved by Department Chair and Office of Graduate Business Programs before registration is permitted.

Prerequisites: QMM 510 and prior approval of instructor.

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Marc E. Briod, Ph.D., Northwestern University
James F. Cipielewski, Ph.D., Oakland University
Elyce A. Cron, Ph.D., University of Toledo
Robert S. Fink, Ph.D., State University of New York-Buffalo
William C. Fish, Ed.D., Columbia University
Sarah L. Gibson, Ph.D., Wayne State University
Andrew S. Gunsberg, Ph.D., University of Illinois
James T. Hansen, Ph.D., University of Detroit
William G. Keane, Ed.D., Columbia University
Michael P. Long, J.D., Detroit College of Law
John E. McEneaney, Ph.D., University of Georgia

M. Shannon McNair, Ed.D., University of Michigan
Billy Joe Minor, Ph.D., Indiana University
Duane H. Moore, Ph.D., Michigan State University
Sherri L. Oden, Ph.D., University of Illinois
Linda M. Pavonetti, Ed.D., University of Houston
Dawn M. Pickard, Ph.D., Purdue University
Richard C. Pipan, Ed.D., University of North Carolina
Anne E. Porter, Ph.D., Wayne State University
James Quinn, Ph.D., University of Iowa
Luellen Ramey, Ph.D., University of Florida
Julia B. Smith, Ed.D., University of Michigan
Mary T. Stein, Ph.D., State University of New York-Buffalo
Lynn R. Surrey, Ph.D., University of Missouri-Kansas City
Carol A. Swift, Ph.D., University of Arizona
B. Joyce Wiencek, Ph.D., University of Maryland
Robert A. Wiggins, Ph.D.

University of Illinois (Urbana-Champaign)

Assistant professors:

Jennifer I. Berne, Ph.D., Michigan State University
Ambika P. Bhargava, Ph.D., University of Texas (Austin)
Karen Bolak, Ed.D., Wayne State University
Celina Byers, Ph.D., University of North Texas
Kathleen F. Clark, Ph.D., University of Minnesota
Maria Cseh, Ph.D., University of Georgia
Tomas R. Giberson, Ph.D., Wayne State University
Lisa D. Hawley, Ph.D., University of South Carolina
Ilene L. Ingram, Ed.D., Wayne State University
James M. Javorsky, Ph.D., Purdue University
Constantine I. Kontoghiorghe, Ph.D., Georgia State University
Ledong Li, Ph.D., Oakland University
Mary K. Lose, Ed.D., Drake University
Michael G. MacDonald, Ph.D., University of Calgary
Nancy A. Melamed-Brown, M.Ed., University of Michigan
Gwendolyn M. McMillon, Ph.D., Michigan State University
Carolyn J. O'Mahony, Ph.D., Michigan State University
Richard W. Pontius, Ph.D., Ohio State University
Erica A. Ruegg, Ed.D., Texas Technological University
Chaunda L. Scott, M.Ed., Harvard University
Monica W. Tracey, Ph.D., Wayne State University
Olivia A. Williams, Ph.D., Michigan State University

Visiting assistant professors:

Mary L. Anderson, M.A., Oakland University
Brian Clark, Ph.D., University of Detroit
S. Yvette Jenkins, Ph.D., University of Michigan
Diane L. Parfitt, M.A., Eastern Michigan University
Beverly J. Paurazas, Ph.D., University of Michigan
James J. Rivard, Ed.D., Wayne State University

Adjunct professor:

Asa G. Hilliard, III, Ed.D., University of Denver

Special instructor:

Mary F. Zepplin, M.S., Oakland University

Visiting instructor:

Babette M. Benken, M.S., University of Michigan

The School of Education and Human Services offers programs leading to:

- Doctor of Philosophy in reading education
- Doctor of Philosophy in education with majors in:
 - counseling
 - early childhood education
 - educational leadership
- Education Specialist in school administration
- Master of Arts in Teaching in reading and language arts
- Master of Arts in Teaching (secondary education)
- Master of Education in four areas:
 - early childhood
 - educational leadership
 - educational studies
 - special education
- Master of Arts in counseling
- Master of Training and Development
- Professional Certification
- Graduate Certificate in Educational Administration
- Graduate Certificate in Early Mathematics Education
- Graduate Certificate in Microcomputer Applications

In order to remain in good standing, students must earn a grade point average of 3.00. No grade below 2.0 (2.8 for CIL and MTD) can be applied toward a graduate degree. Two course grades below 3.0 or one below 2.0 automatically lead to an evaluation of progress and possible dismissal.

Students will be allowed to take no more than 12 credits before admission to a program.

Michigan professional certification requirements

General information

To meet the professional (formerly continuing) certification requirements of the State of Michigan, candidates must complete the following: 1) three years of experience within their certificate level; 2) 18 semester hours of course work in an approved planned program or master's degree; and 3) both elementary and secondary candidates must show evidence of completing course work in methods of teaching reading. (Course work taken in the undergraduate degree will apply.) Six semester hours of reading are required for elementary candidates and three semester hours are required for secondary candidates. If additional courses in reading need to be taken, the approved course work for Oakland University is as follows:

For elementary teachers:

RDG 500	Foundations of Reading Instruction	4
RDG 534	Reading and Language Arts Instruction	4

For secondary teachers:

RDG 538	Guiding Reading-Learning in Content Subjects	4
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For those students enrolled in the MAT in reading and language arts only, RDG 632 and RDG 633 may be used. This reading requirement applies to students seeking professional certification after July 1, 1983.

Candidates for professional certification are urged to complete their 18 semester hours as part of a master's degree. This choice offers maximum flexibility. As an alternative, students may choose non-degree planned programs. Oakland University will accept 6 to 9 credits from another institution toward certification requirements upon adviser approval.

Those teachers who wish to renew a lapsed provisional certificate may be recommended to the State of Michigan upon successful completion of 10 semester hours of course work within their planned program. For more information about planned programs, consult the following department sections in this catalog:

- Educational Leadership
- Educational Studies
- Early Childhood
- Microcomputer Applications in Education
- Reading and Language Arts

Upon successful completion of course work (3.0 for graduate courses, 2.0 for under-graduate), students must apply for certificate renewal or professional certification through the Office of Academic Records, 102 O'Dowd Hall. The Michigan Department of Education charges for all certifications and

renewals. A copy of the fee structure is available through the Office of Academic Records.

Those teachers who wish to renew a lapsed continuing or permanent certificate, and do not possess a master's degree, must complete six credits at the graduate or undergraduate level. These credits do not have to be in a planned program. On completion, the student must apply for validation directly to the Michigan Department of Education, Teacher Certification, Box 30008, Lansing, MI, 48909.

Professional teacher certification renewal

As of July 1, 1992, persons receiving a professional (formerly continuing) certificate are required to renew that certificate every five years on the basis of six semester hours of academic credit earned from an approved teacher preparation institution or the equivalent in State Board approved teacher development programs or activities that will award credits obtained as State Board Continuing Education Units (SB-CEUs). Continuing certificates issued before the above date remain valid as long as the holder serves in an educational capacity 100 days within a five-year period.

Initial certification in elementary education

Students who hold a bachelor's degree and wish to obtain initial teaching certification must complete a second undergraduate degree in elementary education. Contact the SEHS Advising Office (248) 370-4182 for an advising appointment.

Initial certification in secondary education

Initial certification in secondary education is available for students who already hold a bachelor's degree. Please contact the SEHS Advising office (248) 370-4182 for more information. Please note; secondary certificates are given in the following subjects only: mathematics, biology, chemistry, physics, French, German, Spanish, English, music and history.

Endorsements

Endorsements refer to any subject areas, specializations or changes of grade level which are added to a certificate. No under-graduate grade below 2.0 or graduate grade below 3.0 can be applied to an endorsement program.

1. These endorsements require the completion of a master's degree at Oakland University:

- Counseling
- Reading
- Special Education
(Learning Disabilities and Emotionally Impaired)

Students who wish to pursue these programs should apply to the master's program in the appropriate department.

2. The following endorsements do not require completion of a master's degree:

Major/minor subject area endorsements

Endorsements may be added in any of the areas approved by the State of Michigan for Oakland University. They are as follows:

Secondary Education:

biology, chemistry, computer sciences, dance, economics, English, history, mathematics, modern languages (French, German, Russian and Spanish), physics, political science, sociology.

Elementary Education:

language arts, mathematics, modern languages (French, German, Russian and Spanish), science, social studies.

Early childhood endorsement

Course work follows the planned program listed under the Department of Human Development and Child Studies (Early Childhood).

Special education endorsement

An endorsement may be earned in Autistically Impaired, for students holding a prior endorsement in another area of special education.

Graduate Certificate in Educational Administration

The Department of Educational Leadership offers an administrator certificate in the areas of elementary/middle school principal, secondary/middle school principal and central office administration. Contact that department for more information at (248) 370-3070.

Admission

Initial certification

Apply for admission through the Office of Admissions and Scholarship (undergraduate admissions) at 101 North Foundation Hall.

Major/minor subject area endorsement

Apply through the Office of Admissions and Scholarship for post-baccalaureate status (PB).

Departmental planned program

Students who wish to complete requirements for professional certification in a non-degree departmental planned program apply through Graduate Admissions, 160 North Foundation Hall.

Master's program

Students who wish to obtain a master's degree apply through Graduate Admissions, 160 North Foundation Hall.

Advising

All students must schedule a program planning appointment with an adviser after being notified of acceptance to a program, as follows:

Students accepted into master's programs should call the faculty advisers identified in their letters of acceptance.

All other students must contact the SEHS Advising Office at (248) 370-4182 for an appointment to complete a required plan of work.

■ The School of Education and Human Services

Doctor of Philosophy Degrees

The School of Education and Human Services offers two Doctor of Philosophy degrees:

1. The Doctor of Philosophy in Reading Education
See Department of Reading and Language Arts section for program requirements.
2. The Doctor of Philosophy in Education with a major in counseling, early childhood education or educational leadership.

Degree Requirements

The Ph.D. program majors require a minimum of 76 credits beyond the master's degree. Each student develops an individual plan of study with the assistance and approval of a Doctoral Advisory Committee, taking into consideration the student's goals, previous academic work and professional experiences, and the program goals. The plan of study includes the following coursework:

Foundation Core: 12 credit hours

Professional Seminar I (2)
Professional Seminar II (2)
Research Methodology (4)
Analytical Methods (4)

Department Core: 20-32 credit hours

Courses designated by major departments

Cognate: 20-28 credit hours

See major department for cognate requirements.

Dissertation: minimum 16 credit hours

The foundational core develops an understanding of doctoral inquiry, leadership, multicultural and diversity issues, and an interdisciplinary view of education. The department core increases the student's general knowledge base in the major area of study. The cognate develops specialized knowledge and skills related to the major area of study. The dissertation requires the student to add new knowledge to the major area of study. Policies, procedures and other requirements relating to residence, examinations, candidacy and the dissertation are developed by the major department.

DEPARTMENT OF COUNSELING

491B Education and Human Services Building • (248) 370-4179 • <http://www.oakland.edu/~aeolson/index.html>

Chair:

Luellen Ramey

Professor emeritus:

Howard Splete

Professor:

Mary L. Otto

Jane S. Goodman

Associate professors:

Thomas W. Blume

Elyce A. Cron

Robert S. Fink

James T. Hansen

Luellen Ramey

Lynn R. Surrey

Assistant professors:

Lisa D. Hawley

Visiting instructors:

Mary L. Anderson

Diane L. Parfitt

The Department of Counseling offers:

Ph.D. Doctor of Philosophy in Education with
a major in counseling

M.A. Master of Arts in Counseling,
emphasis in community/agency settings

M.A. Master of Arts in Counseling,
emphasis in school settings

Advanced specializations are available in career counseling, child and adolescent counseling, couple and family counseling, and mental health counseling. A post-master's school counseling specialization for students without teacher certification is available through Professional Development.

The Doctor of Philosophy in Education: major in counseling

Coordinator: Thomas W. Blume

The Ph.D. in Education with a major in counseling prepares students for leadership roles within the field in the areas of advanced clinical practice, administration, research and supervision. The curriculum has been established according to the guidelines set forth by the Council on the Accreditation of Counseling and Related Educational Programs (CACREP), and CACREP accreditation of the program is being requested.

The program allows students to pursue one of five cognate areas: career counseling, child and adolescent counseling, couple and family counseling, wellness counseling, and mental health counseling. Additionally, in compliance with the CACREP guidelines, the program provides for advanced preparation in the following content areas: theories pertaining to the principles and practice of counseling, career development, group work, systems, and consultation; theories and practices of counselor supervision; instructional theory and methods relevant to counselor education; pedagogy relevant to current social and cultural issues, including social change theory and advocacy action planning; design and implementation of quantitative research and methodology, including univariate, multivariate, and single-subject design; design and implementation of qualitative research, including grounded theory, ethnographic, and phenomenological methodologies; models and methods of assessment and use of data; ethical and legal considerations in counselor education and supervision (e.g., the ACA Code of Ethics); and the role of racial, ethnic, and cultural heritage, nationality, socioeconomic status, family structure, age, gender, sexual orientation, religious and spiritual beliefs, occupation, physical, and mental status, local, regional, national, international perspective, and equity issues in counselor education programs

Admission

Admission to the Ph.D. program is a multi-step process. First, the admissions committee evaluates candidates in the following areas: prior coursework at the graduate level, professional experience, written statement of purpose, professional letters of recommendation, and official standardized test scores (GRE or MAT). Applicants selected for further consideration are required to pass a departmental written examination and an interview by the faculty.

Final admission recommendations are forwarded to Graduate Admissions by the counseling department faculty. The program is cohort based and allows for the admission of no more than eight doctoral students every year. Applications will be accepted until March 1 of each year.

Academic Advising

Upon admission to the program each student is assigned an interim faculty adviser. Within the first year of study, the student is required to select an advisory committee consisting of a tenured chair and a second tenure-track faculty member. The committee assists the student in developing and implementing a plan of study, meeting at least annually to evaluate the student's progress. In order to remain in good standing, a student must maintain an overall GPA of at least 3.00 and make satisfactory progress toward the degree.

Ethical Standards and Counselor Fitness

Oakland University's CACREP accreditation obligates the program to comply with the American Counseling Association's Code of Ethics which requires the faculty to be "aware of the academic and personal limitations of students and supervisees that might impede performance" and to "assist students and supervisees in securing remedial assistance when needed, and dismiss from the training programs supervisees who are unable to provide competent service due to academic or personal limitations." (ACA Code of Ethics and Standards of Practice, Section F.3). Applicants to counseling programs are assessed for interpersonal competence in the admission process, and those rated unacceptable on academic or personal fitness for counseling will not be admitted. Students are assessed for fitness throughout their coursework, including practical experience courses in which performance is an essential part of the grade. A student whose ethical behavior or psychological health is questionable will be reviewed according to published departmental policies and may be referred for external evaluation. Such evaluation may lead to a remediation plan or dismissal from the program.

Course of Study

The program requires a minimum of 84 credit hours beyond the master's degree: 12 credits in the foundation core, 32 credits in the department core, 20 credits in the cognate, 4 credits in the internship, and a minimum of 16 credits for work toward the completion of a dissertation.

Foundation Core - 12 credit hours

CNS 730	Doctoral Professional Seminar I	2
CNS 731	Doctoral Professional Seminar II	2
CNS 732	Research Methodology	4
CNS 733	Analytical Methods	4

Department Core - 32 credit hours

CNS 667	Advanced Theories of Counseling	4
CNS 669	Legal and Ethical Issues in Counseling	2
CNS 670	Sociocultural Issues in Counseling	2
CNS 671	Instructional Theory and Methods in Counseling	4
CNS 672	Seminar in Counselor Supervision	4
CNS 673	Advanced Group Counseling	4
CNS 674	Advanced Consultation Techniques	2
CNS 683	Advanced Appraisal: Models and Methods	4
or CNS 684	Intelligence and Personality Assessment	4
CNS 691	Program Evaluation	2
CNS 780	Advanced Practicum	4

Cognate - 20 minimum credit hours

Each student's cognate includes one of the areas of advanced specializations. The student in conjunction with the Advisory Committee selects courses from other cognate areas to complete the 20-credit hour requirement.

Internship - 4 credit hours

CNS 790	Doctoral Internship	4
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Qualifying examinations and candidacy

Comprehensive examinations must be passed after the completion of all coursework except the dissertation sequence. The examinations, consisting of written responses to a series of questions written and graded by department faculty, are administered at least annually. Content includes required program elements and specialized information unique to the student's cognate. A student may be required to orally defend a response and the student's advisory committee may recommend additional learning experiences before the student is encouraged to retake portions not passed; all portions must be satisfactory before the student is advanced to doctoral candidacy and permitted to assemble a dissertation committee.

Dissertation - 16 minimum credit hours

The dissertation is an original scholarly contribution that is designed and conducted under the supervision of an advisory committee of four members. The committee is formed under the guidance of a chairperson nominated by the candidate, who must be a tenured faculty member within the department. With advice from the chairperson, the candidate identifies two additional members who are full-time faculty within the department, and a fourth doctoral-level committee member who does not hold a full-time appointment within the department. Selection of the doctoral committee is not official until it is

approved by the departmental doctoral committee. The candidate is required to remain continuously enrolled during the dissertation process.

The candidate is required to submit a formal proposal to the committee before beginning the dissertation project, and to schedule and pass a defense of the proposal before the committee. If the proposal is not accepted, the candidate is required to coordinate with the chair to receive specific feedback and to reschedule. The committee is charged with ensuring that the dissertation meets acceptable standards of scholarly originality and rigor in its conceptualization and implementation. To this end, the committee may strongly encourage a doctoral candidate to participate in seminars, study groups, or research teams to refine specialized knowledge and skills.

Upon completion of the approved dissertation project, the candidate is required to secure approval from all committee members and schedule a public dissertation defense. At the defense, attended by the committee and members of the academic community, the candidate must successfully present the project and address questions. At the end of the defense, conditions for satisfactory completion can be set by the committee and the candidate must demonstrate that these conditions have been met before the candidate is recommended for graduation.

The following course sequence is an essential part of the dissertation process; if a student's dissertation is completed ahead of a scheduled seminar the student will be expected to sign up for an equivalent number of credit hours of CNS 799.

CNS 794	Counseling Inquiry: Proposal Planning and Development	4
CNS 795	Dissertation Research I: Data Analysis Lab	4
CNS 796	Dissertation Research II: Group Seminar	4
CNS 799	Dissertation Research III: Implementation and Writing	(minimum) 4

■ The Master of Arts in Counseling

The Department of Counseling offers a Master of Arts degree in counseling for individuals who wish to work in professional counseling roles with children, youths, adults and families in school and community settings. The program can accommodate both full-time and part-time students.

Accreditation

The master's degree program is fully accredited by the Council for the Accreditation of Counseling and Related Educational Programs (CACREP) in two areas: Community Counseling and School Counseling. Graduates are prepared for state counseling licensure.

Admission to program

The department will consider applicants who hold a bachelor's degree from a regionally accredited institution and whose credentials, including transcripts and letters of recommendation, provide clear evidence of academic distinction.

Admission is selective.

A grade point average of 3.00 in all undergraduate course work is ordinarily considered the minimum standard for admission. Applicants must have completed a minimum of 24 semester hours of undergraduate or graduate credits in the behavioral sciences such as psychology and sociology before admission to the program (this requirement is evaluated by the admissions committee). Transcripts of previous work can be evaluated by the counseling department faculty before formal application is made.

All applicants must submit a written statement of purpose that explains reasons for entering the counseling program and employment goals. Applicants should describe experiences and accomplishments in working with children, youth and adults.

Recommendations are important to the application procedure. The two required references must be from professionals who can attest to the applicant's academic ability and effective interaction with youth and adults.

All applicants must successfully complete a group interpersonal skills interview with the Department of Counseling.

Admission is a selective process; meeting minimum criteria does not guarantee acceptance into the program.

Application deadlines

The application deadlines are as follows:

Full-time or part-time Fall Admission on OU campus: April 15

Full-time Macomb University Program: April 15

Winter Admission: October 1

Academic standing

In order to remain in good standing a student must maintain an overall GPA of at least 3.00 and make satisfactory progress toward the degree. Satisfactory progress toward the degree is evaluated by the student's adviser in consultation with the department chair and program faculty. No grade below 2.0 can be applied toward a degree and two grades below 3.0 or one below 2.0 will automatically lead to an evaluation of progress and possible dismissal.

Code of ethics

Along with scholarship preparation, high levels of ethical conduct are considered essential for those who are involved in counseling adults and children. Students are expected to comply with current Code of Ethics of the American Counseling Association. Violations will be brought before the faculty and could result in dismissal from the program.

Graduation requirements

At least 48 graduate-level credits are required for the degree.

Students who complete the degree and who have a valid teaching certificate may be recommended for counselor endorsement at the K-9, 7-12 or K-12 level, depending on completion of the specific course -requirements for each endorsement level. Students must consult with the internship instructor or internship coordinator regarding endorsement.

All graduates of the program are eligible to apply for a professional counselor license issued by the State of Michigan. Graduates may also qualify for other credentials; consult your adviser for further information.

Required core courses

All candidates for the M.A. in counseling must take five core courses:

CNS 500*	Introduction to the Counseling Profession	2
CNS 510*	Multicultural Counseling	2
CNS 520	Theories of Counseling	4
CNS 530	Developmental Counseling	4
CNS 540	Testing and Assessment in Counseling	4

*CNS 500 and CNS 510 are prerequisite or corequisite to all other counseling courses. Students must select an emphasis either in school or community counseling as the setting for their course work, research and internship. The courses required for each emphasis and setting are listed below. A plan of work must be on file by the completion of the first course.

Both concentrations permit students to gain expertise and experience in areas of interest and required disciplines by taking four credits of electives, as well as the following six courses:

CNS 640	Career Development Theory and Practice	4
Prerequisite: Core courses.		
CNS 660	Research in Counseling	4
Prerequisite: Core courses.		
CNS 661	Techniques of Counseling	4
Prerequisite: Core courses.		
CNS 663	Group Counseling	4
Prerequisites: Core courses, CNS 661. CNS 661 may be taken as a co-requisite.		
CNS 664	Counseling Practicum	4
Prerequisite: CNS 564/574 or CNS 561/571, 640, 661, 663. CNS 640, 661, and 663		
Must be completed with a grade of 3.0 or better.		
CNS 666	Internship in Counseling	4
Prerequisite: Completion of final course work as specified in the student's authorized degree program plan, including completion of CNS 664 with a grade of 3.0 or better.		

NOTE: Since clinical courses must be taken in sequence, students are urged to take CNS 661 immediately after their core courses.

Counseling emphasis in community/agency settings

Students who are preparing for counseling positions in community, business and agency settings take:

CNS 564	Introduction to Community/Agency Counseling	2
CNS 574	Case Conceptualization and Treatment Planning in Counseling	2

Internship work is then done at an appropriate community/agency site.

Counseling emphasis in school settings

Students who are seeking endorsement as a school counselor or who are preparing for the School Counselor License must take:

CNS 561	Introduction to School Counseling	2
CNS 571	Consultation Theory and Practice	2

Students in this emphasis must take sections of all of the following courses which are designated as school counseling emphasis:

CNS 540	Testing and Assessment in Counseling	4
CNS 640	Career Development Theory and Practice	4
CNS 663	Group Counseling	4

Internship work is then done at an appropriate school site. Michigan now has provisions for Preliminary Authorizations for Employment as a School Counselor, which allows students to become employed after all coursework is completed except the internship and the elective. Preliminary Authorization for Employment expires after three years, at which time the master's must have been completed.

With the above coursework, students with valid Michigan teaching certificates can be endorsed in Guidance and Counseling on their teaching certificate. A state exam is required.

Those who choose not to be teacher certified will need to take the additional 12 credit hours in the post-master's school counseling specialization which leads to OU recommendation for the new School Counselor License.

Electives (4 credits are required)

CNS 573	Introduction to Family and Couple Counseling	4
CNS 577	Reaction to Significant Loss	4
CNS 578	Introduction to Chemical Dependency Prerequisites: Core courses or instructor permission.	4
CNS 697	Seminar in Couple and Family Counseling: Ethics	2
CNS 697	Seminar in Couple and Family Counseling: Human Sexuality Prerequisites: Admission to specialization program or Ph.D. program or permission of instructor.	2

Note: A proposal for independent research in an area of special interest may also be submitted for approval as an elective under CNS 560. The student must first obtain a commitment from an interested faculty member to sponsor this work.

Petition of Exception

Students may request waivers or modifications of specific program requirements by filing a Petition of Exception form with the Chair of the department. The Chair will make recommendations to the Vice Provost of Research and Graduate Study, who will review the petition and notify students of any action taken. Petition of Exception forms may be obtained in the Office of Graduate Study or from the administrative secretary.

Student Advising

Upon admission to the counseling program, students are assigned faculty advisers. All students are required to complete a degree program plan, which must be approved by their assigned adviser before the completion of CNS 500. It is expected that students will maintain contact with their adviser throughout their program. Open advising is also available. Contact the Counseling Department for open advising hours.

Program Options

Intensive two-year program

An intensive two-year, concentrated program is most appropriate for students with strong undergraduate preparation in areas such as psychology, sociology, social work, or other related helping fields. Students who enroll in the full-time (two year) program are usually not employed full-time during the program.

The two-year planned program allows completion of the degree in two academic years. Students receive intensive practicum and internship experiences and attend both day and evening classes.

Admission is selective. A completed application is to be received before April 15 for admission in September. However, early application is recommended.

Sample two-year program plan

	Year 1	Year 2
Fall	CNS 500 CNS 510 CNS 520 CNS 530	CNS 664 CNS 660
Winter	CNS 661 CNS 540 CNS 640	CNS 666 Elective
Spring	CNS 564/574 (Community/Agency emphasis) CNS 663	
Summer	CNS 561/571 (School setting emphasis) CNS 663	

Macomb University Center

The Macomb University Center Program is an off-campus master's program in counseling for students residing or working in the Macomb County area. The program is cohort based and allows completion of the degree in two full years and one semester. Students are admitted to the program as a cohort in fall only and must take all courses (except laboratory classes and electives) at the Macomb Center and in the prescribed sequence. Admission to the program is selective and applicants must meet all regular admission requirements. A completed application for fall admission must be received by April 15.

Typical Macomb University Center cohort program plan

	Year 1	Year 2	Year 3
Fall	CNS 500 CNS 510 CNS 520	CNS 640 CNS 660	CNS 666
Winter	CNS 530 CNS 540	CNS 663 Elective	
Spring	CNS 661 CNS 564/574	CNS 664	
Summer	CNS 561/571 CNS 661	CNS 664	

Part-time program

A part-time flexible program is appropriate for students who are employed and/or have other responsibilities that prohibit participation in one of the planned programs of study. Although the flexible program offers students the opportunities to be either part-time or full-time, they still must meet all regular admission requirements and complete the degree requirements within six calendar years. Students are admitted to the flexible program for the fall and winter semesters. These students must adhere to all prerequisite requirements when registering for courses.

Sample part-time program plan

	Year 1	Year 2	Year 3	Year 4
Fall	CNS 500 CNS 510	CNS 540	CNS 660	CNS 664
Winter	CNS 520	Elective	CNS 661	CNS 666
Spring	CNS 564/574	CNS 640	CNS 663	
or				
Summer	CNS 530	CNS 561/571		

Advanced Specializations

The department offers advanced specializations for current students who desire to specialize at the master's level and for post-master students who wish to add advanced skills. (Specializations may be taken concurrently with the master's program.) Admission to specializations is limited and competitive. Prospective students can obtain admission information from the specialization coordinator. Students who are admitted are expected to complete the specializations in sequence and within one calendar year. Each specialization consists of advanced theoretical course work, advanced techniques and an advanced clinical internship.

Specialization in Advanced Career Counseling - 12 credits (Begins Fall 2004)

Jane Goodman, Coordinator

Prerequisite: CNS 640 and coordinator permission.

CNS 675	Advanced Career Counseling	4
CNS 676	Leadership in Career Counseling	4
CNS 677	Fieldwork in Career Counseling	4

Specialization in Child and Adolescent Counseling - 12 credits (Begins each Fall)

Bob Fink, Coordinator

Prerequisites: CNS 661 and coordinator permission.

CNS 680	Counseling in Infancy and Early Childhood	4
CNS 681	Counseling the Older Child and Adolescent	4
CNS 682	Fieldwork in Child and Adolescent Counseling	4

Specialization in Couple and Family Counseling - 12 or 20 credits* (Begins Fall 2003)

Elyce Cron, Coordinator

Prerequisite: CNS 573 and coordinator permission.

CNS 693	Advanced Couple and Family Theory	2
CNS 694	Couple and Family Methods and Techniques	2
CNS 695	Advanced Couple and Family Development	2
CNS 696	Couple and Family Assessment	2
CNS 697	Seminar in Couple and Family Counseling	2 + 2
CNS 698	Advanced Couple and Family Practicum	4 or 8
CNS 699	Fieldwork in Couple and Family Counseling	4

* 12 credits for certificate, 20 credits for LLMFT license eligibility

Specialization in Mental Health Counseling 12 credits (Begins Spring term each year)

Jim Hansen, Coordinator

Prerequisites: CNS 540, CNS 661 and coordinator permission

CNS 684	Intelligence and Personality Assessment	4
CNS 685	Psychopathology	4
CNS 686	Fieldwork in Mental Health Counseling	4

Specialization in Addiction Counseling - 12 credits

Thomas Blume, Coordinator

Prerequisite: CNS 578 or equivalent

CNS 668	Conceptual Models of Addiction	4
CNS 678	Counseling the Chemically Dependent	4
CNS 679	Fieldwork in Addiction Counseling	4

Specialization in School Counseling 12 credits (Begins each Fall)

Must apply through Professional Development: 248-370-3033

TD 500	Introduction to the School and Society	2
TD 511	Learning Theory	2
TD 554	Advanced Interaction Laboratory for Teacher Development	4
SE 500	The Exceptional Student	2
CNS 688	Issues in School Counseling Prerequisites: CNS 661 and coordinator's permission.	2

COURSE OFFERINGS

CNS 500

Introduction to the Counseling Profession (2)

A study of the counseling profession. Topics include: professional identity, legal and ethical issues, historical and social/cultural foundations. Required for core program.

Corequisite: CNS 510.

CNS 510

Multicultural Counseling (2)

A study of methods and techniques of counseling in a pluralistic and multicultural society. Includes a focus on cultural awareness and sensitivity, gender issues and individuals with special needs.

Corequisite: CNS 500.

CNS 520

Theories of Counseling (4)

Study of the major theories of personality and counseling including historical development, philosophical tenets and current applications. Required for core program.

Prerequisites or corequisites: CNS 500 and CNS 510.

CNS 530

Developmental Counseling (4)

An overview of life-span developmental theories for counseling children, adolescents and adults. Includes the use of case studies to assess developmental needs of clients in a variety of settings.

Prerequisites or corequisites: CNS 500 and CNS 510.

CNS 540

Testing and Assessment in Counseling (4)

Introduction to assessment procedures and instruments, including vocational, educational, intelligence and personality tests, for working with children, adolescents and adults. Covers basic statistics, technical aspects of an instrument and ethical considerations. Provides for supervised experiences in assessment and report writing.

Prerequisites or corequisites: CNS 500 and CNS 510.

CNS 560

Special Problems in Counseling (2 or 4)

Study of specialized problems in various areas of counseling. Specific topics are based on student needs. May be taken more than once, but for no more than a total of 8 credits. May be elected for independent study.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540) and permission of instructor.

CNS 561

Introduction to School Counseling (2)

Provides an overview of the role of the school counselor at all grade levels, K-12. Includes a study of techniques appropriate for school counseling and guidance programs, provides an overview of issues facing school counselors and examines procedures for organizing and administering such programs.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540).

Corequisite: CNS 571.

CNS 564

Introduction to Community/Agency Counseling (2)

Surveys key issues in providing mental health consultation and human services. Legal, historical and social factors are examined. Includes examples of systems approaches to the delivery of employment, mental health, vocational rehabilitation and welfare services. Includes delivery of human services in business and industry settings.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540).

Corequisite: CNS 574.

CNS 567

Workshop in Counseling (2 or 4)

Evaluation and development of counseling and personnel programs and practices through the study of a particular area of professional service for implementation in school, college, community agency or business setting. Offered on request by school or agency personnel.

CNS 571

Consultation Theory and Practice (2)

Consultation roles, methods of establishing collaborative working relationships with various populations, and introduction to individual and group consulting approaches.

Corequisite: CNS 561.

CNS 573

Introduction to Family and Couple Counseling (4)

A study of the major theoretical approaches to counseling families and couples. Case studies, analysis of one's own family and simulations may be used to facilitate the transition from theory into practice.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540) or permission of instructor.

CNS 574

Case Conceptualization and Treatment Planning in Counseling (2)

Introduction to case conceptualization and diagnostics from the vantage point of the predominant mental health theoretical systems. Implications of these conceptualizations for treatment planning will also be discussed.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540).

Corequisite: CNS 564.

CNS 577

Reaction to Significant Loss (4)

Covers the concept of significant loss, behavioral and psychosocial reactions to loss, and effective counseling strategies. Among losses covered are those resulting from death, divorce and loss of self-esteem and mobility.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540) or instructor permission.

CNS 578

Introduction to Chemical Dependency (4)

Covers information about drugs and alcohol, including history, categories, definitions, misuse, abuse, attitudes and reasons for use. Studies the modes of prevention and treatment programs for substance abuse.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540).

CNS 640

Career Development Theory and Practice (4)

Covers theories of career development and techniques of career assessment with individuals from early childhood to adulthood. Emphasizes the processes for providing career guidance and counseling for self-understanding, decision making and employability.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540).

CNS 651

Mind-Body Medicine (2)

Through analysis of scientific literature, students analyze and critically appraise the role of stress, emotions and other psychological states that bring about physiological changes affecting health and disease. Topics include stress management, psychoneuroimmunology, biofeedback, nutrition, humor and laughter, and theories of various alternative/complementary approaches, emphasizing their application to practice.

Prerequisite: Graduate status or permission of instructor.

CNS 652**Advanced Mind-Body Medicine (2)**

Builds upon previous learning involving synthesis and evaluation of mind-body phenomena. Includes modules on the use of research and biostatistics in data analysis and theory formulation. Involves analysis of case histories, the theory and practice of stress management, and critical review of current studies related to health, mind-body medicine and psychoneuroimmunology.

Prerequisite: CNS 651 or permission of instructor.

CNS 653**Counseling for Wellness (4)**

Focuses on psychological aspects of wellness and rehabilitation. Presents information on philosophical and pragmatic aspects of wellness, and reviews the concept as a choice or decision to gravitate towards optimal health, implying not just the absence of illness, but an integration of psychological, social and spiritual components with physical health. Explores the actual and potential roles in the fields of health maintenance organizations and preventative medicine in designing and implementing plans to improve the wellness of individual patients/clients, and groups.

CNS 660**Research in Counseling (4)**

Study of research techniques and procedures in counseling designed to prepare students to critically evaluate the counseling research literature and to conduct independent research projects. Topics include sampling, data collection techniques, research design, statistical analysis and professional report writing. May be elected for independent study.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540).

CNS 661**Techniques of Counseling (4)**

Laboratory training in counseling skills and application of theory to practice. Development of a personal theory of counseling is expected. Includes audio and videotaping of counseling interviews with clinical supervision.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540) and full admission to the counseling program.

CNS 663**Group Counseling (4)**

Theory, practice and ethics of group counseling. Provides opportunities to develop group counseling skills under supervision.

Prerequisites: Core courses (CNS 500, 510, 520, 530 and 540), CNS 661. CNS 661 may be taken as a corequisite.

CNS 664**Counseling Practicum (4)**

Application of counseling and consultation theories and techniques to practice with clients in a supervised lab environment. Includes individual and group clinical supervision of audio and video taped counseling sessions. May be elected a second

time with instructor's permission for a total of not more than 8 credits.

Prerequisites: Full admission to program in counseling and completion of CNS 564/574 or CNS 561/571, 640, 661 and 663. CNS 640, 661 and 663 must be completed with a grade of 3.0 or better.

CNS 666**Internship in Counseling (4)**

A field counseling experience supervised by a qualified counseling professional. Placement is at a site suitable to the counseling emphasis requirements and interests of the student. Related course seminars are conducted by the university instructor.

Prerequisite: Completion of final course work as specified in the student's authorized degree program plan, including completion of CNS 664 with a grade of 3.0 or better.

CNS 667**Advanced Theories of Counseling (4)**

Studies major theories and cultural discourses used by supervisors, counselors, and clients, with an emphasis on understandings of problem formation and change. Assumptions about normal behavior and pathology will be examined, and theories will be compared for their applicability to a variety of client groups, community needs, presenting problems and practice settings.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 668**Conceptual Models of Addiction (4)**

A study of research findings and theories that attempt to explain biological, social and psychological influences on addiction; patterns and impact of pre-addictive and addictive behavior; and recovery from addiction.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 669**Legal and Ethical Issues in Counseling (2)**

Discussion of ethical and legal traditions and standards, their evolution, methods of change and applications to various professional activities. Students will be expected to address issues relevant to supervision and counseling (e.g., confidentiality, record keeping, duty-to-warn, etc.) from multiple perspectives.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 670**Sociocultural Issues in Counseling (2)**

Examines theories and research addressing social and cultural issues as they impact human behavior and counseling processes. Students will study innovations in culturally sensitive counseling practice and explore the implications of social change and conflict among groups in society.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 671

Instructional Theory and Methods in Counseling (4)

An overview of learning theory as it relates to effective teaching and counselor supervision. Psychological issues and cross-cultural issues in teaching and learning will be discussed.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 672

Seminar in Counselor Supervision (2, 4 or 6)

Topics include theories of supervision, major supervision models, methods of assessing counseling effectiveness and the role of ethics and values in the supervision process. The lab portion of the course will consist of assisting graduate faculty members in supervising counseling education students enrolled in CNS 661 and CNS 664.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 673

Advanced Group Counseling (4)

Study of theory and research pertaining to group leadership, composition, selection, intervention, termination, evaluation and follow-up. Students develop a written description of their group counseling approach and have concurrent supervised group counseling experiences.

Prerequisite: Admission to Ph.D. program or instructor permission.

CNS 674

Advanced Consultation Techniques (2)

Study of theories of consultation will be reviewed and related consultant roles will be presented. The course will include demonstrations of consulting techniques, development of a consultation model and concurrent supervised consultation experiences.

Prerequisite: Admission to Ph.D. program or instructor permission.

CNS 675

Advanced Career Counseling (4)

An advanced course for the practicing or prospective career counselor. It provides opportunities for in-depth study of current issues in career assessment and for practice of a structured career counseling model.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 676

Leadership in Career Counseling (4)

An advanced class which reviews career counseling competencies and prepares a counselor to develop, implement and evaluate a career development program in a variety of sites.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 677

Fieldwork in Career Counseling (4)

A field experience supervised by a qualified careers specialist. Related seminars are coordinated by a university supervisor.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 678

Counseling the Chemically Dependent (4)

An in-depth examination of traditional and innovative approaches to assessing, preventing, treating and evaluating program outcomes for addictive behavior problems.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 679

Fieldwork in Addiction Counseling (4)

A field experience in a licensed substance abuse facility, supervised by a qualified specialist. Participants will meet in a seminar to integrate theory and experience.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 680

Counseling in Infancy and Early Childhood (4)

Examines specialized assessment, prevention and intervention approaches to the developmental challenges appearing from the prenatal period through age seven. The family is treated as the primary system for intervention, with additional emphases on play therapy, group experiences, and school and community approaches.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 681

Counseling the Older Child and Adolescent (4)

Focuses on assessment, prevention and intervention for the emotional, behavioral and academic concerns typically seen from age seven through adolescence. A variety of approaches is taught, including work with families, groups and individuals.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 682

Fieldwork in Child and Adolescent Counseling (4)

A field experience supervised by a qualified child/adolescent counselor. Placement is at a site conducive to enhancing child/adolescent counseling skills. Related seminars are conducted by university supervisors.

Prerequisite: CNS 680 and CNS 681.

CNS 683

Advanced Appraisal: Models and Methods (4)

Advanced study of the theory, models, methods and practice of appraisal as it relates to counseling. The course covers a broad range of evaluation procedures with respect to a wide range of issues. Students carry out supervised appraisal projects as part of the course.

Prerequisites: Admission to specialization or Ph.D. program or permission of instructor.

CNS 684**Intelligence and Personality Assessment (4)**

The assessment of intellectual functioning and objective and projective personality assessment will be covered. The course will provide for supervised experience in administration of tests, integration of findings and psychological report writing.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 685**Psychopathology (4)**

An overview of abnormal psychology as it relates to diagnostic criteria from the current DSM manual into formulations of abnormal behavior. Reviews relevant research findings for evaluation and treatment. Explores a variety of intervention strategies appropriate for mental health counselors.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 686**Fieldwork in Mental Health Counseling (4)**

A field experience supervised by a qualified mental health professional. Placement is at a site conducive to enhancing mental health counseling skills. Related seminars are conducted by university supervisors.

Prerequisite: CNS 684 and CNS 685.

CNS 688**Issues in School Counseling (2)**

Provides an opportunity for graduate students to investigate and discuss issues facing school counselors. Provides counselors beginning internships or counselor careers an opportunity to interact and support one another while practicing in the context of school guidance programs. Communication skills, counseling strategies and an understanding of adolescent behavior required.

Prerequisite: Admission to specialization.

Corequisite: Secondary school counselor internship.

CNS 690**Topical Seminar (4)**

Specific topics covering a wide range of specific counseling interest areas may be offered under this course heading. Some possible topics include, but are not limited to, human sexuality, wellness counseling, stress management, employee assistance counseling and specific disorders.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 691**Program Evaluation (2)**

A comprehensive overview of program evaluation. Included in the overview are qualitative and quantitative approaches, data collection procedures, data analysis, and planning and managing evaluation for maximum effectiveness.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 693**Advanced Couple and Family Theory (2)**

Major theories of couple and family counseling will be studied in depth. Ethnic and cultural differences in family systems will be explored. Future trends in the field of systems counseling will be examined.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 694**Couple and Family Methods and Techniques (2)**

Examines the theory and research for a broad-based approach to conceptualizing families' counseling needs. The course emphasizes the variety of family experiences and recognizes the implications of economic, family structural, cultural and other diversities.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 695**Advanced Couple and Family Development (2)**

Approaches couple and family functioning from a developmental orientation. The course emphasizes the variety of family experiences, recognizing the implications of economic, family structural, cultural, sexual, and other diversities. Students are encouraged to identify issues that need further research and/or development of specialized intervention techniques.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 696**Couple and Family Assessment (2)**

Emphasizes a theory-based approach to the assessment of family interactions and areas of dysfunction. Coverage includes ethical issues in family assessment and the implications of economic, family structural, cultural, sexual, and other diversities. Students explore the range of existing assessment approaches and their use with a variety of populations.

Prerequisite: Admission to specialization or Ph.D. program or instructor permission.

CNS 697**Seminar in Couple and Family Counseling (2)**

Specific topics of interest in the study of couple and family counseling, based on the need of the program, may be offered under this course heading. Some possible topics include, but are not limited to, Multicultural Family Counseling, Counseling the Gay and Lesbian Couple, Counseling the Blended Family, Sexual Development and Adjustment in Couples, Spiritual Issues in Families, and Conflict Resolution for Couples and Families.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 698

Advanced Couple and Family Practicum (4)

Practical application of Couple and Family theories. Includes supervised one-way mirror practice with clients in a lab environment and group supervision of clinical experience. May be elected a second time with instructor's permission for a total of eight hours.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 699

Fieldwork in Couple and Family Counseling (4)

A field experience supervised by a qualified couple and/or family counseling professional. Placement is at a site conducive to enhancing systems counseling skills. Related seminars/supervision are conducted by the university instructor.

Prerequisite: Admission to specialization or Ph.D. program or permission of instructor.

CNS 730

Doctoral Professional Seminar I (2)

Provides a forum for advanced-level inquiry, discussion and analysis of leadership issues in human services and education from a multi-disciplinary perspective. The seminar examines issues such as human development, knowledge base of education, multiculturalism and diversity, as well as the implications and applications of technology on the study of these topics.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 731

Doctoral Professional Seminar II (2)

Provides a forum for advanced-level inquiry, discussion and analysis of leadership issues in human services and education from a multi-disciplinary perspective. The seminar examines issues such as human development, knowledge base of education, multiculturalism and diversity, as well as the implications and applications of technology on the study of these topics.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 732

Research Methodology (4)

Considers various modes of research inquiry appropriate to the fields of education and human services. Examines a range of conceptions and strategies in light of students' emerging research interests. Studies tools of research, research planning and design, research methodologies and communication of results of research.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 733

Analytical Methods (4)

Offers a variety of research methods for analyzing empirical data. Considers the appropriateness of fit between various analytical procedures and diverse sets of data drawn from a range of

settings in education and human services. Examines assumptions underlying different research questions, methods of analysis, statistical designs and procedures, and ways of interpreting data.
Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 760

Independent Study in Counseling (2 or 4)

Course involves guided independent investigation of a student's self-selected topic.

Prerequisite: Admission to Ph.D. program.

CNS 780

Advanced Practicum (4)

An advanced course in the techniques of counseling. The student will learn advanced intervention techniques and will gain supervised clinical experience.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 790

Doctoral Internship (4)

A field of experience supervised by a qualified counseling or mental health professional. Placement is at a site consistent with the student's career goals. Related seminars/supervision are conducted by the university supervisor.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 794

Counseling Inquiry: Proposal Planning and Development (4)

A course designed to prepare the student to conduct advanced research. Specifically, the course will help the student with doctoral dissertation proposal.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 795

Dissertation Research I: Data Analysis Lab (4)

An overview of statistical software, file management, data entry and data analysis methods.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 796

Dissertation Research II: Group Seminar (4)

Students pursue their own independent dissertation research. Weekly seminars are held to discuss methodology, research problems and data collection.

Prerequisite: Admission to Ph.D. program or permission of instructor.

CNS 799

Dissertation Research III: Implementation and Writing (2, 4 or 6)

Students pursue their own independent dissertation research with scheduled seminars held to discuss and review student progress.

Prerequisite: Admission to Ph.D. program or permission of instructor.

DEPARTMENT OF EDUCATIONAL LEADERSHIP

480D Education Building • (248) 370-3070 • <http://www.oakland.edu/sehs> • Fax (248) 370-4605

Chair:

Duane H. Moore

Professor emeriti:

James W. Hughes, Patrick J. Johnson, Sharon P. Muir

Professors:

Eric J. Follo, Jacqueline I. Lougheed, Sandra P. Packard

Associate professors:

Sarah L. Gibson, William G. Keane, Duane H. Moore, Julia B. Smith, Robert A. Wiggins

Assistant professors:

Ilene L. Ingram

Visiting assistant professors:

Brian O. Clark

The Department of Educational Leadership offers:

Ph.D. in Education with a major in educational leadership

Ed.S. Education Specialist in school administration

M.Ed. Masters of Education in educational leadership

Oakland University graduate certificate in educational administration

The Doctor of Philosophy in Education: major in educational leadership

Coordinator:

William G. Keane

The Ph.D. in education with a major in educational leadership is designed to develop individuals who can provide leadership to educational practice in the 21st Century, whether through roles in public and private schools and district leadership or by contributing to research and teaching about educational policy and practice. Core concepts in the program include systems thinking, the leadership capacity and roles of all staff, the application of theory to practice, data-based management and grounded theory.

Admission

Candidates for the Ph.D. in education with a major in educational leadership will be selected based on experience, especially leadership experience, as reflected in an analysis of several criteria:

- 1 . the vita
- 2 . the content of three references to be solicited by the applicant
- 3 . the candidate's graduate grade point average as reported on official transcripts
- 4 . the score on the Graduate Record Examination (GRE)
- 5 . a goal statement
- 6 . the score on a department examination
- 7 . for finalists, an interview with the department

Official GRE scores should be submitted with other application materials.

Applications will be accepted until March 1 of each year.

Academic Advising

Upon acceptance into the program, students are advised initially by the Ph.D. program coordinator. Students who must complete a cognate will be assigned to a program adviser to assist in planning a cognate course of study. Within the second year of study, each student will seek a dissertation chairperson.

Course of Study

The program requires a minimum of 76 credits beyond the master's degree: 12 credits in the foundation core, 28 credits in the department core, 20 credits in the cognate, and a minimum of 16 credits for the dissertation.

Students must complete a residency for the purpose of concentrating study and fostering close and continuous contact with faculty, fellow graduate students and other professionals. The residency is met by completing 16 credits, excluding dissertation, in two consecutive semesters or 20 credits, excluding dissertation, in one calendar year.

Foundation Core

ED 730	Professional Seminar I	2
ED 731	Professional Seminar II	2
ED 732	Research Methodology	4
ED 733	Analytical Methods	4
	Total	12

Department Core

ED 801	Philosophical and Ethical Issues in Leadership	4
ED 802	Advanced Education Politics and Policy	4
ED 804	Learning Theories and Psychological Issues in Education	4
ED 901	Field-Based Mentorship Issues I	2
ED 902	Field-Based Mentorship Issues II	2
ED 903	Leadership Research Issues/ Proposal Development	4
	Total	20

Cognate 28

Students may complete their cognate requirement in an allied field of study or through a personalized cognate plan developed in conjunction with the program adviser.

Students who have completed an Education Specialist degree from Oakland University or another accredited university may receive cognate credit up to 28 credits for their work on this degree. Students who have completed doctoral level work in Leadership at another university may also receive up to 28 credits toward the cognate requirement.

Cognate in Higher Education Administration

A cognate in Higher Education Administration is available for students interested in higher education administration in a college or university, or in higher education planning and policy formation in a governmental, accreditation, or other related agency or organization. Prior admission into the Ph.D. in Education program is not required for enrollment in Higher Education Administration Cognate courses.

The Higher Education Cognate

credits of required courses	12
credits of internship	6
credits of internship seminar	2
credits of internship project	4
credits of electives	4
Total	28

Required Courses

ED 911	Contemporary American Higher Education	4
ED 912	Administering the College or University	4
ED 913	Executive Processes of Leadership and Management	4
	Total	12

Internship Courses

ED 914	Internship in Higher Education*	(each) 3
ED 915		
ED 916	Internship Seminar in Higher Education	(each) 1
ED 917		
ED 918	Internship Project in Higher Education	4
Electives		4
	Total	12

Students may use any four credits earned in one or more related courses at the 500 level or above.

* ACC 612 Non-Business Accounting and Control may be substituted for ED 915. Students interested in taking ACC 612 with little accounting or budget experience are encouraged to first take ACC 511 Financial Accounting (3 credit hours) and one credit hour of EL 570 Issues in Educational Leadership for the 4 credits of elective. Enrollment in School of Business Administration courses requires instructor approval.

Cognate in Music Education

The Department of Music, Theatre and Dance has designed a music education cognate for the educational leadership major of the Ph.D. in Education program. This cognate prepares candidates for leadership in music education as teacher educators, music education administrators and music education curricular leaders.

To be eligible for the Music Education cognate, a student must hold a master's degree in either music education or music. Teaching experience relevant to the candidate's intended area of study is also required. Students must adhere to guidelines established by the School of Education and Human Services, with the doctoral committee being responsible for final approval of all cognates.

The dissertation committee would consist of at least one faculty member from:

- the Leadership faculty of the School of Education and Human Resources and at least one faculty member from the Department of Music, Theatre and Dance,

or

- a combination of Department of Music, Theatre and Dance, School of Education and Human Services, and/or College of Arts and Sciences faculty with appropriate expertise.

The Music Education Cognate consists of 20 credits plus 8 leadership electives:

MUS 730	Doctoral Seminar: Music Education	4
MUS 731	Historical and Philosophical Foundations of Music Education	4
MUS 732	Psychological Foundations of Music Education	4
MUS 789	Research in Music Education	4
MUS xxv	Music Education elective:	4

MUS 720	Conducting Apprenticeship (2)
MUS 756	Survey and Study of Choral Literature (2)
MUS 780	Advanced Choral Interpretation and Conducting Technique (2)
MUS 790	Special Topics in Music and Music Education (1-4)
MUA 5xx	Applied Study (vocal or instrumental studio instruction) (2)
MUS 799	Independent Study (1-4)

Educational Leadership electives:		8
ED 911	Contemporary American Higher Education (4)	
ED 912	Administering the College or University (4)	
ED 913	Executive Processes of Leadership and Management (4)	
EA 740	School as a Formal Organization (4)	
EA 744	Long-Range Planning (2)	
EA 746	Curriculum and Staff Development (4)	
EA 747	Program Assessment (4)	
EA 754	Human Resource Management and Supervisions (4)	
Total		28

Dissertation:		(minimum 16 credits)
ED 999	Dissertation Research	1, 2, 4, or 8
Total:		76

Education Specialist

Co-Coordinators: Brian O. Clark, Ilene L. Ingram, Duane H. Moore, Sandra Packard

Admission

The Faculty Council for the Education Specialist program will screen candidates in five areas after the following have been received by Graduate Admissions:

- application for admission and \$30 application fee
- official transcripts from all undergraduate and graduate work
- evidence of a master's degree from a regionally accredited institution
- two letters of recommendation from professional colleagues or supervisors familiar with the candidate's current position;
- a statement indicating willingness to make a two-year commitment to the program and a statement of personal goals after completing the school administration program.

Candidates will be interviewed by the program coordinator, who will make admission recommendations to Graduate Admissions. Admission to the program will be made only for the fall semester. Therefore, all application materials should be received by Graduate Admissions no later than July 1.

Degree requirements

The Education Specialist degree in school administration requires 36 credits beyond the master's degree. One required course will be offered during the evening or late afternoon of each term (fall, winter and spring) and three required courses will be offered during the first summer. The action research project required by the program will be started during the first semester and will be scheduled for completion by the end of the last semester of the program.

Program Courses

EA 701	Internship Experience I	1
EA 702	Internship Experience II	1
EA 740	School as a Formal Organization	4
EA 741	School Business Management	4
EA 742	Education Law	4
EA 743	Professional Seminar	2
EA 744	Long-Range Planning	2
EA 746	Curriculum & Staff Development	4
EA 747	Program Assessment	2
EA 748	School/Community Development	2
EA 750	Action Research I	2
EA 751	Action Research II	2
EA 752	Action Research III	2
EA 754	Human Resource Management & Supervision	4

Field experiences and mentoring

All program participants will be paired with a mentor who is currently a practicing administrator. The purpose of the mentorship is to provide opportunities for field experiences in schools and specific activities with mentors, including reflective interviewing, shadowing, obtaining feedback and assistance, accessing professional craft knowledge and career planning. These field experiences will relate class discussions and assignments to actual practice in school and district settings.

■ The Master of Education in Educational Leadership

Coordinator: Eric J. Follo

Admission

Applicants to the M.Ed. program apply to Oakland University and the Department of Educational Leadership through Graduate Admissions. Application forms for the university and for the department are available from that office. Admission is a selective process; meeting minimum criteria does not guarantee acceptance into the program. Students are notified of their admission status by Graduate Admissions.

Admission requirements

Applicants must submit the following:

- 1 . An undergraduate GPA of at least 3.00
- 2 . a teaching certificate;
- 3 . for the leadership M.Ed. leading to Oakland University's Administrative Certificate applicant must have taught for three years
- 4 . two letters of recommendation from individuals in a supervisory relationship to the applicant
- 5 . a goal statement. Students who are conditionally admitted to the program because of a lower GPA or lack of recommendations must complete a minimum of 8 credit hours (EL 500 and one other core class) with a grade of at least 3.0 in each course and an overall average of 3.2.

Applications for special graduate status are available from and processed through Graduate Admissions.

Program requirements

The program requires a minimum of 36 credits. Upon admission, a plan of study is prepared jointly by the student and the faculty adviser. No grade below 2.8 may be applied to the degree and an overall GPA of 3.00 must be maintained.

Graduate Certificate in Educational Administration

Candidates successfully completing the Education Specialist program in school administration and possessing a valid Michigan teaching certificate with three years of successful teaching experience will be eligible to receive an administrator certificate issued by the university.

Course of Study:

EL 500	Introduction to Educational Leadership (formerly CIL 510)	4
EL 520	Schools, Students and Educational Equity (formerly CIL 509)	4
EL 530	Theories and Techniques of Leadership (formerly CIL 580)	4
EL 540	Educational Administration (formerly CIL 658)	4
EL 550	School Finance and Business Administration	4
EL 560	Staff and Curriculum Development for School Improvement (formerly CIL 685)	4
EL 620	Law for Teachers and Administrators (formerly CIL 585)	4
EL 630	Internship for School Leaders I (formerly CIL 691)	2
EL 640	Internship for School Leaders II (formerly CIL 692)	2
EL 690	Culminating Master's Practicum in Educational Leadership (formerly CIL 695)	4

Additional Courses:

EL 570	Issues in Educational Leadership (formerly CIL 611)	1-6
EL 590	Special Studies in Educational Leadership (formerly CIL 590)	1-4
EL 697	Master's Project in Educational Leadership (formerly CIL 697)	4
EL 699	Master's Thesis in Educational Leadership (formerly CIL 699)	8

Michigan professional certification

Teachers may be recommended for professional certification upon completion of a planned program in educational leadership consisting of EL 500, EL 520, EL 540 or EL 620, and 6 elective credits.

Graduate Certificate in Educational Administration

A minimum of three years teaching experience and a master's degree are required. The department offers a planned program leading to an administrator certificate. Admission requirements to the program are:

- 1 . a master's degree or admission to a master's degree program at Oakland University
- 2 . a current teaching certificate
- 3 . an undergraduate GPA of at least 3.00, or a GPA of at least 3.00 in a minimum of 12 graduate credits
- 4 . compliance with regulations established by the Michigan Department of Education regarding criminal convictions

An administrator certificate is also available for students enrolled in the MAT in reading and language arts. Applicants must first be admitted to the MAT in reading and language arts and must subsequently be approved and meet all criteria for admission to this program by the Educational Leadership Department.

Program requirements

EL 530, 620, 540, 550, 560, 630, 640

A minimum of 12 credits must be completed at Oakland University, and course work must be completed within 6 years of applying for each endorsement.

COURSE OFFERINGS

DOCTOR OF PHILOSOPHY IN EDUCATION

ED 730

Professional Seminar I (2)

Provides a forum for advanced level inquiry, discussion and analysis of leadership issues in human services and education from a multi-disciplinary perspective. The seminar will examine issues such as human development, knowledge base of education, multiculturalism and diversity, as well as the implication and applications of technology to the study of these topics.

Prerequisite: Admission to Ph.D. program.

ED 731

Professional Seminar II (2)

Provides a forum for additional advanced level inquiry, discussion and analysis of leadership issues in human services and education from multi-disciplinary perspective. The seminar will examine issues such as human development, knowledge base of education, multi-culturalism and diversity, as well as the implication and applications of technology to the study of these topics.

Prerequisite: Admission to Ph.D. program.

ED 732

Research Methodology (4)

Considers various modes of human science inquiry appropriate to the fields of education and human services. Examines a range of conceptions and strategies in light of students' emerging research interests. Studies tools of research, research planning and design, research methodologies and communication of results of research.

Prerequisite: Admission to Ph.D. program.

ED 733

Analytical Methods (4)

Offers a variety of research methods for analyzing empirical data. Considers the appropriateness of fit between various analytical procedures and diverse sets of data drawn from a range of settings in education and human services. Examines assumptions underlying different methods of analysis, different statistical designs and procedures, and different ways of interpreting data.

Prerequisite: Admission to Ph.D. program.

ED 801

Philosophical and Ethical Issues in Educational Leadership (4)

Investigates classical and contemporary philosophical theories and ethical issues and their influence on educational beliefs and practices. The course offers a special focus on the issue of trust in government.

Prerequisite: Admission to Ph.D. program.

ED 802

Advanced Education Politics and Policy (4)

Examines critical policy issues facing contemporary education and the political forces that drive or impede their resolution. A special focus is given to the political and policy issues that surround the improvement of urban education. Students are introduced to techniques for generating, evaluating and revising policy initiatives.

Prerequisite: Admission to Ph.D. program.

ED 804

Learning Theories and Psychological Issues in Education (4)

Provides an overview of classical learning theories associated with behavioral, developmental and cognitive schools of thought. Students will explore the application of such theories to issues of leadership, school and community culture, curriculum and staff development.

Prerequisite: Admission to Ph.D. program.

ED 901

Field-Based Mentorship Issues I (2)

Provides students an opportunity to reflect on their experience in working with a field-based mentor and to apply theory and research in the mentor's environment. Students will also work to refine a dissertation research proposal, possibly based on a problem identified with the help of the mentor.

Prerequisite: Admission to Ph.D. program.

ED 902

Field-Based Mentorship Issues II (2)

Provides students an opportunity to reflect on their experience in working with a field-based mentor and to apply theory and research in the mentor's environment. Students will also work to refine a dissertation research proposal, possibly based on a problem identified with the help of the mentor.

Prerequisite: Admission to Ph.D. program.

ED 903

Leadership Research Issues and Proposal Development (4)

Provides students with the opportunity to apply research methodology to selected issues in educational leadership. The major focus of the course will be the preparation of dissertation proposal.

Prerequisite: Admission to Ph.D. program.

ED 911

Contemporary American Higher Education (4)

Provides students with a broad understanding of contemporary American higher education through an examination of its current status and emerging future. Includes an examination of

how higher education is organized, financed and governed at national, state and local levels. Students will also examine the contemporary issues, policy debates, core values, political forces, and national trends impacting higher education.

Prerequisite: Admission to Ph.D. program or by permission of instructor.

ED 912

Administering the College or University (4)

Provides students with in-depth knowledge of the various divisions within a college or university and of the management and leadership responsibilities of division administrators. The class will visit various university/college programs and services and learn from their respective administrators.

Prerequisite: Admission to Ph.D. program or by permission of instructor.

ED 913

Executive Processes of Leadership and Management (4)

Provides students with the knowledge and skill needed to understand and implement the processes of positive organizational change. The course will focus on successful models and exemplary practices in the use of leadership, management, and power at senior levels of higher education organizations.

Prerequisite: Admission to Ph.D. program or by permission of instructor.

ED 914

Internship in Higher Education I (3)

Supervised internship in higher education administration designed to give students a working knowledge of higher education practice and the opportunity to develop administrative skills and leadership capacity.

Prerequisites: Admission into the Ph.D. and approval for the cognate in higher education. Coordinator approval of the internship site(s) and site preceptor is also required prior to the start of the internship. Completion of at least 4 credit hours of cognate course work prior to beginning the internship is strongly recommended. Concurrent registration for ED 918 is also required, unless exempted by the cognate coordinator.

ED 915

Internship in Higher Education II (3)

Supervised second internship in higher education administration designed to give students a working knowledge of higher education practice and the opportunity to develop administrative skills and leadership capacity.

Prerequisites: Admission into the Ph.D. and approval for the cognate in higher education. Coordinator approval of the internship site(s) and site preceptor is also required prior to the start of the internship. Completion of at least 4 credit hours of cognate course work prior to beginning the internship is strongly recommended. Concurrent registration for ED 918 is also required, unless exempted by the cognate coordinator.

ED 916**Internship Seminar in Higher Education I (1)**

Monthly, evening seminars to provide student interns with an opportunity for sharing and learning from each other's experiences. The seminars will provide an opportunity for students to reflect upon their experiences within a larger context of higher education issues.

Prerequisites: Admission into the Ph.D. and approval for the cognate in higher education. Concurrent registration for ED 914 is also required.

ED 917**Internship Seminar in Higher Education II (1)**

Monthly, evening seminars to provide student interns with an opportunity for sharing and learning from each other's experiences. The seminars will provide an opportunity for students to reflect upon their experiences in this second seminar within a larger context of higher education issues.

Prerequisites: Admission into the Ph.D. and approval for the cognate in higher education. Concurrent registration for ED 915 is also required.

ED 918**Internship Project in Higher Education (4)**

Students will complete an administrative or leadership project of their choosing designed to solve a problem or make a lasting contribution to their higher education internship setting. Students will complete all phases of the project including research, planning and implementation, as well as collaboration and leadership with others in the internship setting to ensure that the project is appropriate to the setting.

Prerequisite: Admission into the Ph.D. and approval for the cognate in higher education. Completed or concurrent enrollment in ED 914 or ED 915.

ED 999**Dissertation Research (1, 2, 4 or 8)**

The student will register for course credits consistent with pace of research and writing.

Prerequisite: Admission to Ph.D. program.

■ EDUCATION SPECIALIST

Prerequisite to all courses: admission to Ed.S. program.

EA 701**Internship Experience I (1)**

Analyzes students' personal goals and objectives through a leadership project or activity under the mentor's guidance.

EA 702**Internship Experience II (1)**

Analyzes students' personal goals and objectives through a leadership project or activity under the mentor's guidance.

EA 740**School as a Formal Organization (4)**

An introduction to organizational theory and analysis and its application to educational organizations. Students will be expected to complete written case studies.

EA 741**School Business Management (4)**

In-depth analysis of financial and business operations of schools, including external and local funding sources, resource allocation issues, school budget, accounting and auditing systems.

EA 742**Education Law (4)**

Analysis of school law through examination of landmark legal cases and legislative statutes. Emphasis on investigation of rights and responsibilities of students, teachers, administrators and parents; school liability issues; current court and legislative trends.

EA 743**Professional Seminar (2)**

Examines and synthesizes strategies for leadership and administration through the analysis of real problems facing practicing administrators.

EA 744**Long-Range Planning (2)**

Analysis of components of long-range planning including environmental scanning, identification of key stakeholders, development of district mission plan, goals and objectives, design and implementation of action plan.

EA 746**Curriculum & Staff Development (4)**

Examines administrative roles and responsibilities for the development of effective instructional programs. Emphasizes methods of staff development, curriculum theory, and design.

EA 747**Program Assessment (2)**

Presents the basic theories, techniques and issues in program assessment and planning are presented through lectures and seminars of specific topics related to the field. Students will be expected to participate in individual/group projects.

EA 748

School/Community Development (2)

Topics will be selected from a range of school/community relations issues. Major stakeholders will be identified and their roles and potential impact on the school analyzed.

EA 750

Action Research I (2)

Reviews differences between quantitative and qualitative research and practices techniques of action research. Explores action research methodology and selects topic for group research project.

EA 751

Action Research II (2)

Explores action research methodology and selects topic for group research project.

EA 752

Action Research III (2)

Completes group action research project.

EA 754

Human Resource Management & Supervision (4)

Provides students with the knowledge and skills needed for the implementation of effective and ethical human resources management and personnel supervision.

■ MASTERS OF EDUCATION

EL 500

Introduction to Educational Leadership (4) (Formerly CIL 510)

An introduction to educational leadership and preparation for the principalship. Examines current educational research and its use to improve instruction and leadership practices. Explores the role of federal, state, and local governments at elementary, middle, and secondary school settings.

EL 520

Schools, Students and Educational Equity (4) (Formerly CIL 509)

Examines curricular, organizational, and resource strategies for achieving educational equity for a wide range of student variability in a variety of school settings.

EL 530

Theories and Techniques of Leadership (4) (Formerly CIL 580)

Examines leadership theories and techniques. Identifies and critiques several theories of leadership and their application to various school environments. Explores major historical, philosophical, ethical, social, and economic influences affecting education in a democratic society.

EL 540

Educational Administration (4) (Formerly CIL 658)

Emphasizes processes and procedures in the management of educational systems, including personnel development. Examines a common core of knowledge gained through study in selected areas of school administration. Prepares students to assume responsibility for school administration with appropriate skill in communication and management skills, evaluation and supervision of staff, respect and value of human diversity.

EL 550

School Finance and Business Administration (4)

Examines the major principles that govern the design and implementation of school funding formulas in relation to concepts of equity and adequacy for all students. Issues related to general business operations such as transportation, maintenance, operations and food service will also be explored.

EL 560

Staff and Curriculum Development for School Improvement (4) (Formerly CIL 685)

Examines the current areas of curriculum development and research as they relate to local school district planning and implementation. Focuses attention on various indices and paradigms of effective staff training and development from the literature and research as related to practical applications for school improvement.

EI 570

Issues in Educational leadership (1–6) (Formerly CIL 611)

(Not part of the Course of Study)

Studies current issues impacting organization, administration, and environment of schools. May be taken more than once, but for no more than 6 credits.

Prerequisite: Adviser's permission.

EL 590
Special Studies in Educational Leadership (1–4)
(Formerly CIL 590)

(Not part of the Course of Study)

Directed readings or independent study of topics related to leadership. May be taken more than once, but for no more than a total of 4 credits.

Prerequisite: Adviser's permission.

EL 620
Law for Teachers and Administrators (4)
(Formerly CIL 585)

Introduces school law, with a unique opportunity to study crucial areas in public/private education that affect all educators. Investigates landmark cases and legislative statutes concerning the rights and responsibilities of teachers, students and parents.

EL 630
Internship for School Leaders I (2)
(Formerly CIL 691)

Internship for school leaders I is designed to apply the learnings from graduate leadership courses to the school setting. Students explore leadership issues and work under the supervision of a mentor and university field instructor to develop budgets, construct schedules, and interact with parents, community members, social agencies, and the media. Students spend approximately 40 hours a semester in field internship activities, attend seminars, prepare logs, and finalize portfolio sections for a culminating presentation.

Prerequisite: Students must enroll in consecutive semester for the two 2 credit hour courses.

EL 640
Internship for School Leaders II (2)
(Formerly CIL 692)

Internship for school leaders II continues to apply the learnings from graduate leadership courses to the school setting. Students explore leadership issues and work under the supervision of a mentor and university field instructor to develop budgets, construct schedules, and interact with parents, community members, social agencies, and the media. Students spend approximately 40 hours a semester in field internship activities, attend seminars, prepare logs, and finalize portfolio sections for a culminating presentation.

Prerequisite: Students must enroll in consecutive semester for the two 2 credit hour courses.

EL 690
Culminating Master's Practicum
in Educational Leadership (2)
(Formerly CIL 695)

Synthesizes and applies knowledge and skills gained in the M.Ed. in educational leadership to professional activities in the field. . Students prepare professional development workshops, engage in an eight week peer coaching activity in the field, analyze their own professional and personal progress during their master's program and complete a professional portfolio as a final assessment of the master's program.

EL 697
Master's Project in Educational Leadership (4)
(Formerly CIL 697)

(Not part of the Course of Study)

Plan and execute a significant project designed with the student's adviser. Students must request approval from the adviser early in the semester prior to enrollment for the project. Completed projects must be submitted at least two weeks before the end of classes in the semester of graduation.

Prerequisite: Admission to M.Ed. program and adviser permission.

EL 699
Master's Thesis in Educational Leadership (8)
(Formerly CIL 699)

(Not part of the Course of Study)

Plan and execute a significant research thesis with an advisory committee. Students must request approval from the adviser early in the semester prior to enrollment. Completed thesis must be submitted at least two weeks before the end of classes in the semester of graduation.

DEPARTMENT OF HUMAN DEVELOPMENT AND CHILD STUDIES

405B Education and Human Services Building • (248) 370-3077 • Fax (248) 370-4242 • <http://www.oakland.edu/sehs>

Chair:

Carol A. Swift

Professor emeritus:

Edward A. Bantel, Ed.D., Columbia University

Professors:

Gerald G. Freeman, Ph.D., University of Michigan

Donald M. Miller, Ph.D., University of Wisconsin

Ronald M. Swartz, Ph.D., New York University

Associate professors:

Sandra M. Alber, Ed.D., Wayne State University

Marc E. Briod, Ph.D., Northwestern University

Andrew S. Gunsberg, Ph.D., University of Illinois

M. Shannan McNair, Ed.D., University of Michigan

Sherri L. Oden, Ph.D., University of Illinois

Richard C. Pipan, Ed.D., University of North Carolina

Carol A. Swift, Ph.D., University of Arizona

Assistant professors:

Ambika P. Bhargava, Ph.D., University of Texas

James M. Javorsky, Ph.D., Purdue University

Erica A. Ruegg, Ed.D., Texas Technological University

Olivia A. Williams, Ph.D., Michigan State University

Degree Programs

Ph.D. Doctor of Philosophy in

Education with a major in early childhood education

M.Ed. Master of Education in Early Childhood Education

M.Ed. Master of Education in Special Education

Endorsement Programs

Early Childhood Education

Special Education

Autism

Learning Disabilities

Emotional Impairment

Dual Endorsement: Learning Disabilities/Emotional Impairment

The Department of Human Development and Child Studies offers programs leading to a Doctor of Philosophy in education with a major in early childhood education, degrees of Master of Education (M.Ed.) in early childhood and in special education, teaching endorsements, and professional certification. The M.Ed. in early childhood education includes the professional

certification and/or EC endorsement. Endorsements in learning disabilities (LD), emotionally impaired (EI) and autism are offered along with an M.Ed. in special education. All special education programs are currently under revision, as is the M.Ed. in Early Childhood Education. Please check with your adviser for potential changes in program requirements.

The Doctor of Philosophy in Education: major in early childhood education

Coordinator: Sherri Oden

Description

The Ph.D. in education with a major in early childhood education is designed to prepare leaders for the field. The goal of the program is to promote leadership and research that informs and supports education for young children. Major areas of focus include early development, multiple approaches to learning, literacy, cultural diversity, and transition from homes to preschools and from informal preschools to formal primary classrooms.

The program allows students to select a cognate across areas including special education, reading, administration, curriculum, or other academic areas.

Admission Terms and Deadlines

Students are admitted in the fall semester only. Applications will be accepted until May 1 for the following fall semester.

Application Requirements

The application materials and steps to be completed are:

1. Application for Admission to Graduate Study and \$30 application fee
2. official transcripts of all previous undergraduate and graduate level academic work
3. three letters of recommendation, at least one from a graduate academic source and one from a professional in the field

- 4 . official scores for the Graduate Record Examination (GRE)
- 5 . official scores for the Test of English as a Foreign Language (TOEFL) from applicants who are graduates of programs taught in a language other than English
- 6 . professional curriculum vitae
- 7 . personal essay statement, describing professional goals, experiences and philosophy
- 8 . two writing samples related to early childhood education, which may include professional reports, academic course papers, publications or presentations
- 9 . An interview (to be scheduled by the program coordinator) with the program coordinator and other faculty members, and a written assignment to be completed as part of the interview.

Admission Requirements

Finalists will be selected based upon a review of the following criteria as well as the personal statement, samples of writing, letters of recommendation, and the interview and written assignment.

- 1 . Completion of a master's degree or equivalent in early childhood education or an allied field
- 2 . Minimum graduate grade point average of 3.60
- 3 . Three years of professional experience in early childhood education or an allied field.

Academic Advising

Upon acceptance into the program, students are advised initially by the early childhood Ph.D. program coordinator. Toward the end of the first year of study, each student, in consultation with the program coordinator and faculty members, selects a faculty adviser who assists the student in planning a program of study, including establishment of a portfolio, design of a cognate, and resolution of issues related to the achievement of candidacy status.

Degree Requirements

The program requires a minimum of 80 credit hours beyond the master's degree: 12 credits in the foundation core, 32 credits in the department core, 20 credits in the cognate, and a minimum of 16 credits for the dissertation. Previously earned graduate credits may apply if they did not count towards the qualifying master's degree, and if they are equivalent to a required course for the program or are part of an approved cognate.

The cognate courses should complement the core foundation and department courses. The cognate area of study may include courses within or outside the department upon advisement by the program coordinator.

EC 730	Doctoral Professional Seminar I	2
EC 731	Doctoral Professional Seminar II	2
EC 732	Research Methodology	4
EC 733	Analytical Methods	4

Department Core (32 credits)

EC 809	Development and Early Learning: Theories and Research Studies	4
EC 844	Paradigms of Early Education and Curriculum Design	4
EC 851	Field Project I	4
EC 852	Field Project II (4)	
EC 862	Curriculum Investigation: Practice and Theory	4
FE 802	Ecology of Early Learning	4
FE 873	Policy Studies in Early Education: Culture, Economics and Politics	4
SE 861	Special Education: Early Childhood Seminar	4

Dissertation (16 minimum credit hours)

FE 994	Dissertation Proposal Planning	4
EC 995	Dissertation Development Seminar	4
EC 999	Dissertation Implementation and Writing	4, 6, or 8
FE 996	Dissertation Data Analysis Lab	2

Residency

Students must complete at least 16 hours of graduate credit (excluding dissertation credits) during one of the academic (or calendar) years of the student's program of doctoral study. Further, students are required to register for course credit every fall and winter after their admission to the program.

Qualifying Comprehensive Examinations

To prepare for exams, the student and the Doctoral Advisory Committee review the student's portfolio—a major source for determining the student's interests, strengths, and areas for further development. When the student elects to take the exams, the committee either grants approval or proposes a plan for further study, coursework, or other appropriate preparation necessary for taking the exams. Exam questions assess the student's knowledge with respect to challenging issues in the field, e.g., comparing and contrasting major theories, approaches, and policies in early childhood education and care; implications of the knowledge base for child care and education, preschool, and primary school early childhood curricula/programs; and for designing early childhood curricula and program approaches, evaluations, research studies, and policy initiatives.

Foundation Core (12 credit hours)

To pass qualifying exams, the student must demonstrate competence in the following four segments:

1. Comprehensive knowledge of the foundational core and early childhood education. This exam segment assesses the student's knowledge of the foundational and early childhood core coursework areas, including the major theories, research methods and findings, educational practices, and public policies. This segment of the exam is conducted on a "take-home" basis, with a limited time frame.
2. In-depth knowledge of a specific area in early childhood education. This segment of the exam is a qualifying paper that demonstrates an in-depth knowledge of a particular area of focus. The topic must be approved by the chair of the Doctoral Advisory committee, who also sets a minimum page requirement and a style format. The paper must be completed by a date set by the committee as a part of the exam process.
3. Comprehensive knowledge of a cognate area. This exam segment assesses the student's knowledge in a cognate area (a complementary area of study). This segment of the exam is conducted on a "take-home" basis, with a limited time frame.
4. The oral examination. Upon successful completion of the written segments of the qualifying comprehensive exam (parts 1, 2, and 3) explained above, the student proceeds to take the oral segment of the exams. This exam segment provides an opportunity for the student to make a presentation in an area of special interest and to demonstrate the ability to respond to questions from the faculty about the presentation and related issues.

The Advisory Committee assesses the student's performance on the written and oral parts of the exam to determine if the student is adequately prepared to proceed as a candidate for dissertation preparation. If the student's qualifying exam performance is determined to be inadequate, the Advisory Committee may recommend further preparation, e.g., coursework, writing, or study.

Dissertation

The dissertation is an original contribution to the field of study through disciplined inquiry. Conducting, writing, and defending a dissertation should be accomplished in accordance with the highest professional standards. The student's dissertation committee advises the student on the formation of a dissertation proposal. The written format for the proposal is specified by the committee, and the student orally presents and defends the dissertation proposal. The committee assesses the student's written and oral presentation of the proposal and determines if modifications in the proposal are needed prior to the student's conducting the research. The committee members, led by the dissertation advisor, continue to advise the student throughout the research and the preparation of the dissertation manuscript. Students must obtain a copy of the dissertation format requirements of the Office of Graduate Study so that the dissertation manuscript conforms to university standards.

Final Oral Examination and Dissertation Defense

The oral defense of the dissertation may be held after it is completed and approved by the committee. The purpose of the oral defense is to enable the dissertation committee to judge the quality of the investigation and the student's ability to defend and communicate the work. A copy of the dissertation is made available for review in the Office of The Dean of the School of Education and Human Services, and the announcement of the date, time, and location of the defense, along with a one-page abstract, is distributed to the faculty. The oral defense must be attended by no fewer than four members of the Dissertation Committee and is open to all School of Education and Human Services faculty, invited guests, and the university community. Final approval and acceptance of the doctoral dissertation requires a favorable vote of the Dissertation Committee with no more than one dissenting vote. The Dissertation Committee determines the adequacy of the student's oral defense and if there are to be modifications for the dissertation manuscript, which is then subject to final approval by the committee. The committee may permit reexamination, if the initial dissertation defense is deemed inadequate.

Time Limits

If more than six years have passed since the student has been admitted to the doctoral program, and all requirements (including an approved dissertation) have not been completed, the student must petition the program coordinator and the Office of Graduate Study for an extension. Students who are deemed inactive may be dropped from the program, although they may petition for reinstatement.

Graduation

Three copies of the approved dissertation manuscript must be delivered to the Office of Graduate Study by the date published in the Schedule of Classes for the term in which the student expects to graduate.

■ The Master of Education in Early Childhood Education

Coordinator: Andrew Gunsberg

Description

The program prepares professionals to work with children from birth through age eight in public and private schools and agency settings. It also provides training for the direction and evaluation of early childhood programs and the coordination of community resources for young children and families. The program combines theory with observation and participation in clinical, community and school practicum settings.

The program emphasizes a broad interdisciplinary view of early childhood education and child development. Also emphasized are multicultural issues concerning young children and their families, and the need for educational programs to respect and respond to children's developmental variabilities and exceptionalities.

Admission Terms and Deadlines

June 1 for fall admission, October 1 for winter admission, April 1 for summer admission.

Application Requirements

Applicants for admission must submit the following:

1. Application for Admission to Graduate Study and \$30 application fee
2. official transcripts from all colleges and universities attended
3. two letters of recommendation from individuals who are in a supervisory relationship to the applicant
4. goal statement which includes the reasons for application, the intended focus of graduate study, professional and career goals, and a description of experiences and accomplishments in working with children and their families.

Admission Requirements

Minimum criteria for acceptance into the program are: 1) an undergraduate degree from a regionally accredited institution, with a minimum GPA of 3.00 (applicants who do not meet this standard may be considered for conditional admit, but will be required to achieve a grade of 3.0 or above for the first 12 credit hours); 2) completion of a minimum of 24 semester credit hours at the undergraduate or graduate level in education, humanities, social sciences, health or an appropriate related field (this requirement is carefully weighed by the department's faculty admissions committees). Admission is selective. Meeting minimum criteria does not guarantee acceptance.

Degree Requirements

To fulfill the degree requirements, the student must complete the planned program of 36 credits, with a GPA of 3.0 or above within the six-year period allowed for the degree. Students must apply for graduation with the Office of the Registrar by the deadlines imposed by the university to be eligible for graduation.

Level I (20 credits):

EC 540	Theories of Child Development and Education	(4)
EC 542	Applied Developmental Principles	(4)
EC 543	Teacher as Child Advocate and Adult Educator	(4)
EC 544	Adult-Child Interaction: Play and Mediation of Learning	(4)
EC 645	Observation and Assessment of the Young Child	(4)

Level II (12 credits):

Prerequisite is completion of all courses in Level I

FE 509	Family, Child and Learning in Cultural Context	4
FE 593	Research Project in Early Childhood Education: Phase I	4
EC 546	Workshop in Early Childhood Curriculum (or equivalent)	4 or 8

Possible EC 546 equivalent courses:

EC 545	Administration and Direction of Early Childhood Programs	4
EC 547	Infants: Normal and Exceptional Development and Programming	4
EC 548	Toddlers: Normal and Exceptional Child Development and Programming	4
EC 550	Special Problems in Education — Early Childhood	2, 4 or 8
EC 549	Development of the Young Exceptional Child	4
EC 644	Play and Development of the Hospitalized Child	4
EC 651	Gifted and Talented Young Children	4

Level III (4 credits)

Prerequisite: Completion of all courses in Level II

EC 650	Research Project in Early Childhood Education: Phase II	4
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This is the final requirement of the program and consists of class meetings, seminars and the completion of an action project and a project report.

■ The Master of Education in Special Education

Coordinator: Carol Swift

Description

The master's program in special education is a degree focusing on (1) the broader concepts of exceptionality - learning, instruction and development and (2) an in depth preparation for one area of exceptionality. Exploration of theory and research and advanced application in instruction and assessment with selected populations are integrated throughout the program. The degree incorporates an endorsement in either learning disabilities, emotional impairment, or autism.

Admission Terms and Deadlines

July 1 for Fall admission, November 1 for Winter admission, March 1 for Spring admission, May 1 for summer admission.

Application Requirements

Applicants for admission must submit the following:

1. Application for Admission to Graduate Study and \$30 application fee
2. official transcripts from all undergraduate and graduate work
3. two recommendations from those who can attest to the applicant's potential for successful graduate study
4. copy of current (or most recent) teaching certificate
5. goal statement, which includes the reason for application, the intended focus of graduate study, a description of professional experiences and accomplishments, and professional and career goals.

Admission Requirements

Applicants for admission must:

1. hold a Bachelor's degree from a regionally accredited institution
2. demonstrate an undergraduate or graduate GPA of 3.0 or above
3. hold, or be eligible for, a valid Michigan teacher's certificate
4. have completed SE 501 and FE 506, or the equivalents

Degree requirements

Students must complete the 48 credits required for the degree with a GPA of 3.00 or higher within the six year period required by the university. Students must apply for graduation by the deadlines set by the university, in order to be eligible for graduation.

Requirements for the M.Ed. in special education with an endorsement in learning disabilities

Prerequisites (8 credits):

SE 501	Introduction to the Student with Special Needs	(or equivalent) 4
FE 506	Child Development, Variability and Learning	(or equivalent) 4

Block 1 (28 credits):

SE 518	Organization and Management of Instructional Behaviors and Environments	4
SE 517	Language and Exceptional Children and Youth	4
SE 502	Legal Issues in Special Education	4
RDG 536	Teaching Reading to the Student with Special Needs	4
EST 532	Diagnosis and Remediation in Children's Mathematics	4
SE 601	Issues and Trends in Special Education	4
Elective	Must have adviser approval	4

Block 2 (8 credits):

SE 524 or SE 624	Assessment in Special Education	4
SE 523	Advanced Diagnostics	4
	Educational Procedures for Students with Learning Disabilities	4

Block 3 (8 credits):

SE 619	Theory, Research and Practice in Special Education	4
SE 592	Practicum: Learning Disabilities - K-12	4

Block 4 (4 credits):

SE 699	Final Project in Special Education	4
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Requirements for the M.Ed. in special education with an endorsement in emotionally impaired

Prerequisites (8 credits):

SE 501	Introduction to the Student with Special Needs	(or equivalent) 4
FE 506	Child Development, Variability and Learning	(or equivalent) 4

Block 1 (16 credits):

SE 518	Organization and Management of Instructional Behaviors and Environments	4
SE 517	Language and Exceptional Children and Youth	4
SE 502	Legal Issues in Special Education	4
SE 601	Issues and Trends in Special Education	4

Block 2 (20 credits):

SE 510	Students with Behavioral and/or Emotional Impairments	4
SE 520	Educational Procedures for Students with Emotional Impairments	4
SE 620	Advanced Interventions and Resources for Students with Emotional Impairments	4
SE 524 or SE 624	Assessment in Special Education Advanced Diagnostics	4
Elective	Must have adviser approval	4

Block 3 (8 credits):

SE 619	Theory, Research and Practice in Special Education	4
SE 594	Practicum: Emotional Impairment - K-12	4

Block 4 (4 credits):

SE 699	Final Project in Special Education	4
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Requirements for the M.Ed. in special education with an endorsement in autism
Prerequisite:

A prior endorsement in special education. Although state rules have been amended to allow autism as a first special education endorsement, approval for Oakland University's program under that status is still in progress.

Block 1 (24 credits):

SE 559	Characteristics of Children and Youth with Autism	4
SE 527	Educational Procedures for Students with Autism	4
SE 578	Language Problems in the Student with Autism	4
SE 579	Classroom and Behavior Management for the Student with Autism	4
SE 596	Consultation Skills for Teachers of Students with Autism	4
SE 591	Practicum: Autism- K-12	4

Note: Endorsement may be recommended after completion of Block 1 coursework

Block 2 (16 credits):

SE 502	Legal Issues in Special Education	4
SE 601	Issues and Trends in Special Education	4
SE 524 or SE 624	Assessment in Special Education Advanced Diagnostics	4
Elective	Must have adviser approval	4

Note: Block 2 courses may be taken concurrently with Block 1 courses

Block 3 (8 credits):

SE 619	Theory, Research and Practice in Special Education	4
SE 699	Final Project in Special Education	4

Requirements for the M.Ed. in special education dual endorsement: learning disabilities and emotionally impaired
Prerequisite:

SE 501 or SE 355	Introduction to the Student with Special Needs approved equivalent	4
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Corequisite:

FE 506 or FE 215	Child Development, Variability and Learning approved equivalent	4
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Block 1

SE 518	Organization and Management of Instructional Behaviors and Environments	4
SE 517	Language and Exceptional Children and Youth	4
SE 502	Legal Issues in Special Education	4
RDG 536	Teaching Reading to the Student with Special Needs	4
CIL 615	Diagnosis and Remediation in Mathematics	4
SE 510 (Prerequisite: SE 518)	Social and Emotional Impairments	4
SE 520 (Prerequisite: SE 518)	Educational Procedures for Students with Emotional Impairments	4
SE 601	Issues and Trends in Special Education	4

Block 2

Prerequisite: Completion of Block 1 courses, with exception of elective and SE 601, which can be taken at any time during the program.

SE 524 or SE 624 (Prerequisite SE 524 or approved equivalent)	Assessment in Special Education	4
SE 523	Educational Procedures for Students with Learning Disabilities	4
SE 620	Advanced Interventions and Resources for Students with Emotional Impairments	4

Block 3

Prerequisite: Completion of Blocks 1 and 2

SE 619	Theory, Research, and Practice in Special Education	4
SE 592	Practicum: Learning Disabilities (K-12)	2 or 4
SE 594 (Prerequisite: All course work; may take concurrently with SE 619)	Practicum: Emotional Impairment (K-12)	2 or 4
Total:		52-56

■ Endorsement Programs in Early Childhood Education and Special Education

Endorsements generally refer to any content areas or specializations that are added to a teaching certificate and can be used as planned programs for professional certification. Only those individuals who hold a teaching certificate are eligible for an endorsement. Both course work and a practicum experience are required. The credit hour requirement for the endorsement program in Early Childhood Education is currently under review.

Early Childhood Education Endorsement

Description

This program consists of the of the five courses in Level 1 of the M.Ed. and may be applied for as an endorsement only program. Credits vary from 20-24, depending upon the student's background and the need to fulfill practicum requirements. The students in the M.Ed. program may apply for the endorsement upon completion of Block 1 requirements and successful completion of the state competency exam.

Application Requirements

Same as for the M.Ed. program.

Admission Requirements

Same as for the M.Ed. program

Relationship to the Master of Education in Early Childhood Education

The endorsement is attained through completion of Block 1 courses, for those students who are eligible (hold a teaching certificate). Courses taken prior to admission to the degree may count toward the degree if completed within the six year time frame allowed for the degree.

Special Education Endorsements

Description

Endorsements are available in three categorical areas: Learning Disabilities, Emotional Impairment, and Autism. The endorsements are contained within the degree program, and completion of the degree (with the exception of the elective and SE 699) is required prior to application. The exception is the endorsement

in autism, which is offered as a stand-alone program for those who already hold a prior endorsement in at least one other area of special education. Those who hold a prior master's degree in special education or a related field may be able to complete an endorsement in fewer credits than required by the degree. Interested applicants should contact the program coordinator for a review of transcripts. Completion of a practicum is required. Students should contact the program coordinator to confirm application procedures and deadlines.

Application Requirements

Same as for the M.Ed. program.

Admission Requirements

Same as for the M.Ed. program

Relationship to the Master of Education in Special Education

Requirements for the endorsement are contained within the degree programs. Courses taken in an endorsement only program may apply to the M.Ed. if taken within the six year time frame allowed for the degree.

COURSE OFFERINGS

EARLY CHILDHOOD

EC 540

Theories of Child Development and Education (4)

Views of education discussed from social, physical and cognitive perspectives. Analyzes diverse contemporary theories of early childhood and broader contemporary issues related to child development.

EC 541

The Family and Preschool as Educational Settings (4)

An investigation of the sociology of parent-child relationships and the influence of the relationships upon the preparation of children for preschool programs. Also, some consideration of the ways relations between parents and early childhood educators are affected by professionalism.

EC 542

Applied Developmental Principles(4)

An application of principles of child development in preschool and elementary classroom settings. This course focuses on the development of a project-based integrated curriculum, investigates the idea of developmentally appropriate assessment, and reviews curriculum models.

Prerequisite: EC 540

EC 543

Teacher as Child Advocate and Adult Educator (4)

Exploration of parental and community forces in meeting needs of young children and of teachers in child advocacy issues. Includes methods for working with parents, para-professionals, volunteers in the classroom, home, diverse community team members and referral resources.

Prerequisite: EC 540, 542, or instructor permission.

EC 544

Adult-Child Interaction: Play and Mediation of Learning (4)

The course explores play as enculturation and the adult's role in mediating learning through play. The changing role of play in the transition from infancy to representational thinking is investigated. Includes the relationship between play formats and the acquisition of skills, concepts and information.

Prerequisite: EC 540

EC 545

Administration and Direction of Early Childhood Programs (4)

Administrative aspects such as budgeting, legislation, rules and employee concerns. Includes procedures for developing programs, writing proposals and identifying funding sources. Examination of agencies -involved in early childhood programs, child-care trends in the community and problems in direction of centers.

Prerequisite: EC 540, 542, or instructor permission.

EC 546

Workshop in Early Childhood Curriculum (4 or 8)

Special areas of curriculum — mathematics, science, language, music, art and sensory-motor — are emphasized, and methods for development of workshops and learning centers in these areas are stressed. Includes the use of technology into learning centers and in workshop presentation.

EC 547

Infants: Normal and Exceptional Development and Programming (4)

Research on infants to 15 months, including exceptional infants; analysis of appropriate play environments and learning experiences. Students work with infants in small groups and interact with infants and parents for at least 32 hours at a program site approved by the course instructor.

Prerequisite: EC 542 or PSY 510 or equivalent.

EC 548
Toddlers: Normal and Exceptional Development and Programming (4)

Developmental/intellectual aspects unique to toddlers (15 to 36 months), including attention to variabilities and exceptionalities. Evaluate research on toddlers and analyze appropriate play environments and learning experiences. Students work with toddlers and their parents at least 32 hours per semester and evaluate toddler and parent development and behavior.

Prerequisite: EC 542 or PSY 510 or equivalent.

EC 549
Development of the Young Exceptional Child (4)

Overview of child development research applied to exceptional children in early childhood classrooms. Views the child from a developmental perspective and includes, along with study of normal behaviors in all preprimary children, curriculum strategies for mainstreamed and special education settings.

EC 550
Special Problems in Education — Early Childhood (2, 4 or 8)

Special problems in early childhood, applied development or parent education. Specific topics will be based on student and/or community needs. May be taken more than once for a total of no more than 8 credits. May be elected for independent study. Seminars and class sessions may be required.

Prerequisite: Instructor permission.

EC 644
Play and Development of the Hospitalized Child (4)

The hospitalized child's developmental problems and methods of utilizing play in a pediatric program. Addresses children's developmental needs and the relationship of illness to development; the procedures and routines in hospital care; and the effects of hospitalization. Includes practicum in hospital pediatric setting.

Prerequisites: EC 542 or PSY 510 or equivalent and EC 544.

EC 645
Observation and Assessment of the Young Child (4)

Assessment of young exceptional children, with training in interpreting formal and informal assessments and tests for young children. Critical evaluation and actual use of these tests are included. Emphasizes examining and using appropriate developmental tests and alternative assessment procedures.

EC 650
Research Project in Early Childhood Education: Phase II (4)

Culmination of the research project following completion of the action phase. Appropriate ways to analyses and report results are investigated. Reflection on the significance and implications of the results, especially for improving early childhood practice and better understanding its social and educational contexts. Submission of the final research report is accomplished.

Prerequisites: EC 540, 542, 543, 544, 546, 645; FE 509, 593.

EC 651
Gifted and Talented Young Children (4)

Compares an overview of average development in young children with the characteristics of young, gifted children. Examines environmental factors which influence gifted children and educational programs which can influence their development. Includes site visits.

EC 730
Doctoral Professional Seminar I (2)

A forum for advanced level inquiry, discussion and analysis of leadership issues in human services and education from a multi-disciplinary perspective. Examines issues such as human development, knowledge base of education, multiculturalism and diversity as well as implications and applications of technology.

Prerequisite: Admission to Ph.D program or instructor permission.

EC 731
Doctoral Professional Seminar II (2)

Provides a forum for additional advanced level inquiry, discussion and analysis of leadership issues in human services and education from a multi-disciplinary perspective. The seminar will examine issues such as human development, knowledge base of education, multi-culturalism and diversity, as well as the implication and applications of technology to the study of these topics.

Prerequisite: Admission to Ph.D program or instructor permission.

EC 732
Research Methodology (4)

Considers various modes of research inquiry appropriate to the fields of education and human services. Examines a range of conceptions and strategies in light of students' emerging research interests. Studies tools of research, research planning and design, research methodologies and communication of results of research.

Prerequisite: Admission to Ph.D program or instructor permission.

EC 733
Analytical Methods (4)

Offers a variety of research methods for analyzing empirical data. Considers the appropriateness of fit between various analytical procedures and diverse sets of data drawn from a range of settings in education and human services. Examines assumptions underlying different research questions, methods of analysis, statistical designs and procedures, and ways of interpreting data.

Prerequisite: Admission to Ph.D program or instructor permission.

EC 809

Development and Early Learning: Theories and Research Studies (4)

Examines selected theories and research studies of early development and learning, with implications for early childhood education practices. Investigates the distinction and interplay between physical, logico mathematical and social forms of knowledge. Studies cultural and individual differences that may affect early development and learning.

Prerequisite: Admission to Ph.D program or instructor permission.

EC 844

Paradigms of Early Education and Curriculum Design (4)

Compares and contrasts selected paradigms of learning, with implications for curriculum design. Examines the construction of early childhood curriculum forms, values and objectives, classes of content, and scope and sequence in selected curriculum areas. Evaluates early childhood curricula in light of developmentally appropriate practice.

Prerequisite: Admission to Ph.D program or instructor permission.

EC 851

Field-Based Project I (4)

Provides doctoral students with the opportunity to demonstrate leadership in planning, implementing and evaluating curricula and other program improvements in early childhood education. Field experiences are available in a variety of educational settings with culturally diverse constituents.

Prerequisite: Admission to Ph.D program or instructor permission.

EC 852

Field-Based Project II (4)

Provides doctoral students with the opportunity to demonstrate leadership in planning, implementing and evaluating a collaborative effort in program improvement or policy change for early childhood education. Field experiences are available in a variety of educational settings with culturally diverse constituents.

Prerequisite: Admission to Ph.D program or instructor permission.

EC 862

Curriculum Investigation: Practice and Theory (4)

Examines and analyzes curriculum practices in a variety of educational settings. Reviews theories about developmentally appropriate curricula that enhance the young child's constructive process. Emphasizes integrated curricula and cultural diversity.

Prerequisite: Admission to Ph.D program or instructor permission.

EC 995

Dissertation Development Seminar (4)

Students carry out the dissertation proposal put forth in FE 994, and implement the actions set forth in the initial proposal. Project plans and progress reports are reviewed and critiqued by seminar participants and instructors.

Prerequisite: Admission to Ph.D program or instructor permission.

EC 999

Dissertation Implementation and Writing (4, 6 or 8)

Students independently pursue their own dissertation research projects and writing, with an open invitation to reenter EC 995, Dissertation Development Seminar, in order to join the collaborative process of reviewing and critiquing dissertation projects, problems and progress, including their own.

Prerequisite: Admission to Ph.D program or instructor permission.

■ FOUNDATIONS OF EDUCATION

FE 503

Major Theorists in Education (4)

Intensive study of the works of one or more major figures in the development of educational theories.

FE 506

Child Development, Variability and Learning (4)

Development and stage theories of cognition and learning behavior, examined through research accounts of physical and mental variability, cultural background, social circumstances, lived experience, learning style and mode of educational interactivity.

FE 509

Family, Child and Learning in Cultural Context (4)

An interdisciplinary examination of selected social issues about children and early education in culturally diverse America: changing family patterns, socioeconomic and language issues, home-school transitions, media influence, child-parent-teacher relations, developing awareness of self and world.

FE 520

Applied Developmental Principles: Middle Childhood (4)

Study of the physical, social, emotional and intellectual development of the 10- to 14-year-old child. Examines changes in body structure and function, self concept and peer group identity and sexual awareness.

FE 590
Special Problems in Professional
Issues and Practices (2, 4, 6 or 8)

Problems concerning learners' needs and capacities, in formal or informal settings, are selected for study according to each student's professional experience and advancement goals. Preference is given to problems that call for understanding foundational and multi-disciplinary approaches to practices and programs. May be taken more than once for a total of 8 credits, or may be elected for independent study. Seminars may be required.

Prerequisite: Permission of instructor.

FE 591
Ecology of the Classroom (4)

Deals with the ecological context for learning in classroom, school and community. The primary task will be to describe, to analyze and to make inferences about the structure of the ecological environment. These findings will then be related to pupil learning.

FE 592
Foundations of Research and Evaluation Methods,
Techniques and Designs (4)

Examination of assumptions, concepts and premises underlying various methodologies, qualitative and quantitative techniques and strategies, types of evidence and relations between goals and methods. Applications will be undertaken in relation to students' professional experience and plans for study.

Prerequisite: Permission of instructor.

FE 593
Research Project in Early Childhood Education:
Phase I (4)

Preparation and first phase of a research project in early education. Identification of a significant problem or question, search for prior knowledge in research literature and the field, determination of an appropriate research methodology and a plan of action to carry out the project, including a plan for gathering and analyzing the data.

FE 599
Workshop in Professional
Problems and Practices (1 to 8)

Provides an opportunity for professional staff in education to develop competency in new practices or to adapt certain teaching skills to different subjects or age groups. Is offered under different topics based upon current needs identified or requested by professional educators. May be taken more than once for a maximum of 8 credits. May be applied toward degree program only with permission of adviser. (Graded S/U).

Prerequisite: Experience as a professional educator.

FE 601
History in Education (4)

Study of the historical development of educational institutions in Western society, emphasizing one or more of the following themes: teaching as a profession; changing conceptions of the student-teacher relationship; the learning process.

FE 602
Philosophy in Education (4)

Study of philosophical issues in education and their relevance to the personal and professional lives of teachers, emphasizing one or more of the following themes: knowledge and values; human nature and teaching; moral education; nature of the child.

FE 603
Cross-Cultural Studies in Education (4)

Explorations into the problems created by ethnocentricity within education and the effects of cultural currents on educational development, emphasizing one or more of the following themes: learning; cognition; development; school-community relations; school policy and cultural pluralism; international education policies; current issues.

FE 604
Sociology in Education (4)

Study of schools as social systems, the environmental effect of schools on students and teachers, and the impact of schooling on American society, emphasizing one or more of the following themes: sociological implications of work; social norms and schooling; cultural pluralism; educational alternatives and social change.

FE 605
Politics in Education (4)

Study of political issues in education and the theory and practice of politics in schools, emphasizing one or more of the following themes: legal, human and civil rights in education; equal educational opportunity; national educational policy; justice and education.

FE 606
Psychology in Education (4)

Study of the developing person throughout the life cycle. Topics include self, mind, intelligence, cognition, meaning awareness, feeling, competence and creativity. The person is studied in the context of social and cultural processes.

FE 608
Philosophy for Children (2 or 4)

Development of basic reasoning skills within a coherent, tested curriculum. Appropriate for social studies, language arts, science or gifted instruction in grades 5-8. Requires permission of school principal to purchase student books and teach curriculum two hours/week for 30 weeks.

FE 611

Issues in Social Foundations (4)

Study of enduring issues that reflect social values and controversies with historical roots. Examination of cultural assumptions and implications for formal and informal education processes.

FE 660

Change Models in Education (4)

Examines one or more key perspectives on evaluation and change within schools and other educational settings. Theories of change, educational reform movements and approaches to educational innovation are studied.

FE 680

Learning Models (4)

An overview of theories of learning including cognitive, social, ecological and phenomenological approaches as they relate to learning in a variety of settings and at several developmental levels. The student will examine applications of these theories in various strategic learning environments and educational programs.

Prerequisite: FE 606 or instructor permission.

FE 699

Terminal Project (4)

Planning and execution of significant research or project in accordance with student's advisory committee.

Prerequisite: Admission to a graduate program and written approval of the student's advisory committee. Students should request such approval from their advisers early in the fall semester for registration in the winter semester and early in the winter semester for registration in spring, summer or fall. Students must present the completed project at least two weeks before the end of classes in the semester of graduation.

FE 802

**Ecology of Early Learning:
Health, Care and Education (4)**

Investigation of the interrelated effects of health, care and education on the development of young children. Review of scientific studies that show a link between early learning and intelligence, on one hand, and key elements of health and care, on the other.

Prerequisite: Admission to Ph.D program or instructor permission.

FE 873

**Policy Studies in Early Education:
Culture, Economics and Politics (4)**

Study of social and educational policy issues and policy making actions taken on behalf of the education, health and well-being of children. Policies are studied through case material from legislation, administrative agencies and regulations, budget processes and court decisions.

Prerequisite: Admission to Ph.D program or instructor permission.

FE 994

Dissertation Proposal Planning (4)

Drawing upon the field-based projects and seminars in curriculum and policy, as well as earlier courses in development, learning, and research studies and methods, the student prepares a dissertation proposal. The proposal is formulated as a well-articulated problem with a rationale and action plan, including a commitment to specific research methods.

Prerequisite: Admission to Ph.D program or instructor permission.

FE 996

Dissertation Data Analysis Lab (2)

Using statistical software, students set up and maintain data files, carry out file management, perform graphic and display procedures, and apply various analysis methods in connection with their dissertation research projects.

Prerequisite: Admission to Ph.D program or instructor permission.

■ SPECIAL EDUCATION

SE 500

The Exceptional Student (2)

Introduction to the characteristics, etiologies and instructional and programmatic implications for students with special needs.

SE 501

Introduction to the Student with Special Needs (4)

Introduction to special education that presents the characteristics, etiologies and problems of each of the different clusters of atypical children. Individual differences — interindividual and intraindividual — are stressed. The environment of the learner and curricular and instructional adaptations are discussed along with an overview of issues and current research.

Prerequisite: Graduate standing or instructor permission.

SE 502

Legal Issues in Special Education (4)

Intensive study of federal legislation and the Michigan Special Education Rules and their implications for educating students with exceptionalities. Evaluation, IEP's, related services, free and appropriate education, placement -options, adequate referral and evaluation, investigation and due process hearings highlighted.

Prerequisite: Admission to program.

SE 510

Students with Behavioral and/or Emotional Impairments (4)

Familiarizes students with definitions, incidence, characteristics, etiology, treatment methods, educational and clinical intervention programs, and outcomes of children and adolescents exhibiting behavioral and emotional disorders.

Prerequisite: Admission to program.

SE 517

Language and Exceptional Children and Youth (4)

Research in the area of language disabilities is covered, with emphasis on assessment and intervention strategies. Both oral and written languages are considered, preschool through adult.

Prerequisite: Admission to program.

SE 518

Organization and Management of Instructional Behaviors and Environments (4)

Covers behavioral organization and management techniques; including classroom structure, applied behavior analysis, scheduling and evaluation. Other topics will include education strategies for effective teaching, self-management, issues of diversity and behavior, and management of problem behaviors.

Prerequisite: Admission to program.

SE 520

Educational Procedures for Students with Emotional Impairments (4)

Focuses on the implementation of effective strategies for academic instruction and classroom management for youth classified with emotional impairments. Various service delivery models, home/community collaborative practices, medication/clinical treatments, prevocational issues, and design and implementation of individual education plans will be discussed.

Prerequisite: Admission to program.

SE 521

Serving Students with Special Needs in General Education Classroom (4)

Assists regular classroom teachers to better serve children with mild to moderate learning and behavioral problems. Identifying needs through informal assessment, modifying instructional techniques and materials, and documenting and evaluating progress are emphasized in the context of cooperative teaching, regular education initiative and inclusion.

Prerequisite: Graduate standing.

SE 523

Educational Procedures for Students with Learning Disabilities (4)

Addresses the seven legally defined areas of learning disability in terms of informal assessment, appropriate instructional materials and curricular modification. Remedial techniques and their application are reviewed.

Prerequisite: Admission to program and Block 1 courses.

SE 524

Assessment in Special Education (4)

Provides an overview of the assessment process, including legal, ethical and diversity issues, in school and clinical settings. Students are introduced to a variety of procedures and instruments, role responsibilities, and relevant resources. Students administer, score and interpret information from selected norm-referenced achievement measures.

Prerequisite: Block 1 courses.

SE 527

Educational Procedures for Students with Autism (4)

Evaluation and instruction of students with autism. Relates informal assessment to instructional planning in the cognitive, motor and affective domains. Attention is paid to communicative skills, prevocational and vocational needs, recreational and life skills.

Prerequisite: Admission to autism endorsement program or permission of S.E. coordinator, and SE 559, SE 550, or equivalent.

SE 550

Introduction to Autism Spectrum Disorders (3)

Covers definitions, characteristics and etiologies of autism spectrum disorders, including Aspergers, throughout the life span. An overview of instructional methodologies, legal issues and collaboration with families and other professionals are introduced.

SE 551

**Autism Spectrum Disorders:
Communication and Language (3)**

Provides an overview of communication, normal and atypical language development, and difficulties associated with autism spectrum disorders. Interventions to assist in language development and communication.

Prerequisites: SE 550, SE 559 or approved equivalent.

SE 552

**Behavioral Issues in Students with
Autism Spectrum Disorders (3)**

Background in behavioral principles, purposes of behavior and historical treatments, along with interventions appropriate for students with autism spectrum disorders addressed.

Prerequisites: SE 550, SE 559 or approved equivalent.

**SE 553 Autism Spectrum Disorders:
Assessment and Intervention (3)**

Informal assessment and instructional techniques representing researched “best practice” for students with autism spectrum disorders are addressed.

Prerequisites: SE 550, SE 559 or approved equivalent.

SE 554

Collaboration and Consultation (3)

Designed to develop collaboration and consultation skills of special education professionals. Includes home-school interactions, family and community support services and resources.

Prerequisites: SE 550, SE 559 or approved equivalent

SE 559

**Characteristics of Children and Youth
with Autism (4)**

Addresses the characteristics of autism through a review of historical perspectives, theories and current research. Emphasis is placed on the effects of autism on communication, cognition and learning throughout the life span.

Prerequisite: Admission to autism endorsement program or permission of the S.E. coordinator

SE 578

Language Problems in the Student with Autism (4)

Provides an overview of normal language acquisition as the foundation for understanding language and communication problems of the student with autism. Differential diagnosis

and techniques for facilitating language and communication are emphasized.

Prerequisite: Admission to autism endorsement program or permission of S.E. coordinator, and SE 559, SE 550, or equivalent.

SE 579

**Classroom and Behavior Management for the
Student with Autism (4)**

Focuses on constructive management plans with students with autism. Individual plans as well as group and environmental management are covered, along with legal, ethical and theoretical issues.

Prerequisite: Admission to autism endorsement program or permission of S.E. coordinator, and SE 559, SE 550, or equivalent.

SE 590

Selected Topics in Special Education (1-4)

Special issues related to contemporary practice in special education. May be elected as an independent study.

Prerequisite: Instructor permission.

SE 591

Practicum: Autism K-12 (3 or 4)

Final experience required for K-12 endorsement in Autistically Impaired. Instructional experiences with students with autism required. The specific nature of the experience will be individually determined at the time of the practicum. (Formerly SE 584/SE585).

Prerequisite: Instructor permission. Application must be made prior to the semester intended for practicum completion.

SE 592

Practicum: Learning Disabilities K-12 (4)

Final experience required for K-12 endorsement in the area of Learning Disabilities. Instruction and assessment experiences with students with learning disabilities required.

Prerequisites: Blocks 1 and 2 completed. Application must be made prior to the semester intended for practicum completion.

SE 594

Practicum: Emotional Impairment K-12 (4)

Final experience required for K-12 endorsement in the area of emotional impairments. Instructional and assessment experiences with students with emotional impairments.

Prerequisites: Blocks 1 and 2 completed. Application must be made prior to the semester intended for practicum completion.

SE 596

**Consultation Skills for Teachers of
Students with Autism (4)**

Designed to develop consultation skills of teachers who work with autistic students. Includes home-school interactions, family and community support services.

Prerequisite: Admission to the autism endorsement program or permission of the S.E. coordinator, and SE 559, SE 550, or equivalent.

SE 601
Issues and Trends in Special Education (4)

Study of current major issues in special education. Emphasis is placed on the historical, political, empirical, societal, and educational perspectives of the controversial issues in the field. Issues will span the K-12 continuum

Prerequisite: Admission to M.Ed. or instructor permission.

SE 616
Consultation Skills for Special Educators (4)

Designed to develop the consultation skills used by special education teachers with members of allied professions and classroom teachers concerning evaluation, remediation and program planning for students with exceptionalities to translate consultations into educational programs.

Prerequisite: Admission to M.Ed. or instructor permission.

SE 619
Theory, Research and Practice in Special Education (4)

Introduces students to the theoretical and empirical foundations of the field of special education and its research methodologies. They will examine elements of experimental and non-experimental research designs with a strong emphasis on single-subject research designs.

Prerequisites: Blocks 1 and 2 of M.Ed. sequence.

SE 620
Advanced Interventions and Resources for Students with Emotional Impairments (4)

Focuses on the implementation of advanced methodologies and resources available for intervention with students with emotional impairments. These practices involve non-school related resources, including but not limited to hospitals, community agencies, detention centers, courts, and support groups. The effects of medication within the school setting will be discussed, as well as crisis interventions, brief therapy, and physical management. Various service delivery models that focus on home/community collaborative and consultative practices will be demonstrated.

Prerequisite: Admission to EI M.Ed. program and completion of SE 510 and SE 520.

SE 624
Advanced Diagnostics (4)

Assumes that students have basic understanding of measurement concepts, have some familiarity with special education assessment in the school setting, and are competent in the administration of at least one norm-referenced achievement measure. Students have the opportunity to explore new instruments and procedures while conducting a comprehensive educational/behavioral assessment with special needs students. Integration of assessment information is emphasized.

Prerequisite: SE 524 or equivalent and Block 1 courses.

SE 628
Advanced Practicum in Special Education (4)

Geared to the education, background and training of the student; designed to provide in-depth experience other than at a classroom level.

Prerequisite: Instructor permission.

SE 699
Final Project in Special Education (1-8)

Planning and execution of significant research or project. The result should be suitable for conference presentation and/or journal submission.

Prerequisite: Completion of course work and instructor permission.

SE 861
Special Education: Early Childhood Seminar (4)

A study of developmental delays, at-risk children and the effects of handicapping conditions. Emphasis is on ecological and curricular modifications required to promote cognitive, language, motor, personal and social development based on children's individual needs. Family-centered intervention models are stressed.

Prerequisite: Admission to Ph.D. program or instructor permission.

■ DEPARTMENT OF HUMAN RESOURCE DEVELOPMENT

435A Education and Human Services Building • (248) 370-4109 • Fax (248) 370-4095 • <http://www2.oakland.edu/sehs/hrd>

Chair:

Billy Joe Minor

Professors emeriti:

David P. Meyer, Ph.D., University of Arizona

William F. Moorhouse, Ed.D., University of Wyoming

Robert G. Payne, Ph.D., University of Michigan

Associate professors:

Susan M. Awbrey, Ph.D., Michigan State University

William C. Fish, Ed.D., Columbia University

Michael P. Long, J.D., Detroit College of Law

Billy Joe Minor, Ph.D., Indiana University

James Quinn, Ph.D., University of Iowa

Assistant professors:

Celina Byers, Ph.D., University of North Texas

Maria Cseh, Ph.D., University of Georgia

Tomas R. Giberson, Ph.D., Wayne State University

Constantine I. Kontoghiorghe, Ph.D., Georgia State University

Monica W. Tracey, Ph.D., Wayne State University

Instructor:

Chaunda L. Scott, Ed.M., Harvard University

Technology consultant:

George Preisinger

■ Master of Training and Development

Description

The program is designed to develop practitioners with the knowledge and skills required to enhance individual and organizational development and performance. Graduates of the program will be able to lead and support interventions and processes associated with diagnosing problems and opportunities, and evaluating and implementing solutions. Graduates of the program will be qualified to work as human resource professionals, including directors of training centers, organizational development consultants, instructional designers, and performance technologists.

The MTD program is offered as an off-campus program delivered at the Seaholm High School facility in Birmingham, Michigan. Students are admitted on a full-time and part-time basis and must complete the program in six years. Full-time students can complete the program in two and a half years.

Admission Terms

Students are admitted for the fall and winter semesters. Application to the MTD program is initiated through Graduate Admissions. All application materials must be received by Graduate Admissions at least five weeks prior to the beginning of the semester in which the applicant wishes to enroll. Completed applications are reviewed by the graduate admissions committee in the Department of Human Resource Development four weeks prior to the beginning of each semester.

Application Requirements

Applicants for the degree of Master of Training and Development must submit the following:

- 1 . Official transcripts for undergraduate and graduate course work, showing a bachelor's degree from a regionally accredited institution with a cumulative grade point average of 3.00 or better. Applicants who do not meet this standard may be conditionally admitted and must complete the first 12 credits of the graduate program with a grade of 3.2 or above before conditional status is removed.
- 2 . Official scores for the Graduate Record Examination taken within the previous five years.
- 3 . Applicants need to have a minimum of one year of work experience. A formal statement detailing work and life

experiences that have led to the desire to pursue the Master of Training and Development degree program. The statement must be between 1000 and 1500 words. The formal statement is evaluated on the basis of quality of writing, organization of ideas, clarity of expression, and compatibility with program goals.

- 4 . Three recommendations that attest to the quality and scope of the applicant's academic and professional ability.

An interview may be required. Admission to the MTD program is competitive and meeting the minimum requirements does not guarantee admission into the program.

Academic Advising

Upon admission, each student is assigned an academic adviser who is a faculty member in the Department of Human Resource Development. Together the student and the academic advisor establish a program plan, and meet each term prior to course enrollment to ensure successful completion of the plan.

Degree Requirements

Successful completion of the program requires:

- 1 . Completion of 44 approved credits with an overall grade point average of 3.00 or better. Credit toward the degree will not be given for courses with grades under 2.80.
- 2 . Completion of six core courses: HRD 502, HRD 503, HRD 504, HRD 507, HRD 605, and HRD 640. Students will select the remaining four courses, with the approval of the academic advisor, either from departmental offerings or from graduate level courses in other departments.
- 3 . Completion of a capstone project (HRD 699). Students are encouraged to consider ideas for the project throughout their program and to develop a proposal as part of the research course (HRD 640).

MTD Project Advising

Students work under the guidance of a project advisor who is an MTD faculty member. Students are responsible for identifying a project advisor based on the match between their proposed project and faculty interests and availability.

COURSE OFFERINGS

HRD 502

Introduction to Human Resource Development (4)

Introduces students to key aspects of the Human Resource Development (HRD) field. These include a definition of the concept of HRD; the history, current state and projected future of the HRD field; the major roles of HRD practitioners; and an overview of managing the HRD function.

Prerequisite: Admission to the Master of Training and Development program

HRD 503

Instructional Design (4)

Provides students with introductory graduate level competence in applying systematic instructional design principles and theories to the development of an instructional project. Students will investigate the philosophy and practices underlying the design and development of effective instruction, critically examine components of an instructional design model, and apply its principles to the production of instruction.

Prerequisite: Admission to the Master of Training and Development program

HRD 504

Organization Development (4)

Provides an overview of theory, research and practice in the implementation of change in organizations. Students will apply organization development and change theories and principles in the selection and implementation of appropriate interventions to

address specific organizational situations. The roles played by human resource development professionals in planned organizational change are explored during this course.

Prerequisite: Admission to the Master of Training and Development program

HRD 507

Needs Assessment (4)

Emphasizes the critical importance of identifying the needs of an organization, group, or individual prior to the decision to employ appropriate interventions. Students will learn about the theories and methods of needs assessment and develop knowledge and skills to effectively plan and conduct a comprehensive needs assessment.

Prerequisite: Admission to the Master of Training and Development program

HRD 510

Program Administration (4)

Develops understanding and skill in the philosophies and techniques required to successfully design and support HRD programs. Topics such as policy formation, process development, and alignment of training, career, succession planning, and other HRD programs will be presented. Students will obtain practice in developing requests for, and in evaluating proposals, and in administering, implementing, and evaluating programs.

Prerequisite: Admission to the Master of Training and Development program

HRD 520

HRD in a Global Context (4)

Introduces students to the concept of culture and globalization. Theories, practices, problems, and interventions will be discussed to illustrate the visible and invisible ways cultural differences and globalization impact the human resource development field. Students will have the opportunity to identify, examine, and apply effective HR strategies in a global context.

Prerequisite: Admission to the Master of Training and Development program

HRD 530

Team Development (4)

Develops students as sponsors, leaders and members of teams in the workplace. Students will understand the rationale for teams, their strengths and limitations, and become familiar with various techniques for enabling teams to work effectively.

Prerequisite: Admission to the Master of Training and Development program

HRD 540

Career Development and Succession Planning (4)

Develops the knowledge and skills required to provide career development systems and succession planning programs in an organization. The course will feature a balance between these two perspectives, and will emphasize aligning these systems with individual and organizational needs.

Prerequisite: Admission to the Master of Training and Development program

HRD 550

Trends and Issues in Technology-based Training (4)

Prepares students to apply instructional design principles to the effective analysis, design, development, implementation, and evaluation of technology-based instructional solutions. Students will learn current and emerging technological options and criteria for judging among alternatives.

Prerequisite: HRD503 or permission of instructor.

HRD 603

Advanced Instructional Design (4)

Facilitates an advanced level of professional competence in instructional design for individuals who aspire to leadership positions in the field of training and development. Students will explore various approaches to analysis, design, development, and evaluation of instruction.

Prerequisite: HRD 503 or permission of instructor

HRD 605

Program Evaluation (4)

Introduces students to current theory and practice in the evaluation of program impact. The course emphasizes four levels of evaluation: learner reactions to programs, learner knowledge acquisition and performance, learner behavior on the job, and

return on investment to the organization. Students are taught how to select and apply appropriate tools to evaluate all four levels of program impact.

Prerequisite: Admission to the Master of Training and Development program

HRD 610

Ethics in HRD (4)

Introduces students to the influences and concepts that shape ethical behaviors in the workplace. Students will investigate the code of ethics and integrity for HRD research and practice, the importance of social responsibility, strategies for promoting ethical behavior in the workplace, and ethical approaches for resolving workplace situations and problems.

Prerequisite: Admission to the Master of Training and Development program

HRD 615

Organization Development in Action (4)

Facilitates an advanced level of competence in the application of the OD process for students who aspire to practice OD in the field. Students will explore various approaches to designing, developing, and implementing an OD intervention.

Prerequisite: HRD 504 or permission of instructor

HRD 620

Quality Performance Through Systems (4)

Introduces the philosophies and concepts promoting quality performance in organizations including quality systems thinking, learning organizations, systematic problem solving, and total quality management. Students are taught how to select and apply the tools used in quality management.

Prerequisite: HRD 504 or permission of instructor

HRD 625

Theory to Practice (4)

Introduces students to current and historical theories that impact the field of training and development including systems, communications, adult learning, education and instructional theories. Students will apply these theories to practical applications in the field.

Prerequisites: HRD 502 or permission of instructor.

HRD 630

Current Trends (4)

Analyzes current topics related to Human Resource Development. Topics may include: the learning organization, linking human resource development to organizational strategy, systems thinking, informal and incidental learning in the workplace, diversity issues in human resource development, legal and ethical issues in HRD, spirituality in the workplace, action learning, utilizing technology in human resource development, performance technology, interactive distance learning. See Schedule of Classes for current offering.

Prerequisite: Permission of instructor.

HRD 640

Research in Training and Development (4)

Introduces students to the elements and dynamics of the research process and the critical review of existing research. Students will be prepared to conduct research in organizations and to complete the MTD project. The course requires the development of a research proposal using the process presented in the course.

Prerequisite: Permission of instructor and academic advisor

HRD 650

Independent Study (1 to 4)

Independent study in a topic in training and development under the guidance of a faculty member.

Prerequisite: Permission of instructor.

HRD 699

MTD Project (4)

Students will design, implement, and document a project in an organizational setting, under the guidance of a faculty member

Prerequisite: Permission of instructor

■ DEPARTMENT OF READING AND LANGUAGE ARTS

485K Education and Human Services Building • (248) 370-3065 • Fax (248) 370-4367 • <http://literacy.oakland.edu>

Chair:

Robert M. Schwartz

Professors emeriti:

Jane M. Bingham

Gloria T. Blatt

Harold C. Cafone

Robert J. Christina

George E. Coon

Distinguished Professor:

Ronald L. Cramer

Professors:

Robert M. Schwartz

Toni S. Walters

Associate professors:

Richard F. Barron

James F. Cipielewski

John E. McEneaney

Linda M. Pavonetti

Anne E. Porter

B. Joyce Wiencek

Assistant professor:

Jennifer I. Berne

Kathleen F. Clark

LeDong Li

Mary K. Lose

Gwendolyn M. McMillon

The Department of Reading and Language Arts offers:

Ph.D. Doctor of Philosophy in reading education

M.A.T. Master of Arts in Teaching in reading and language arts

M.A.T. with endorsement in early childhood (ZA)

M.A.T. with administrator certificate

Michigan professional certification planned program in
reading and language arts

Microcomputer Applications Certificate Program

Advanced Microcomputer Applications Certificate Program

Post-Master's Certificate in reading and language arts

Post-Master's Advanced Certificate in reading and language arts

■ The Doctor of Philosophy in Reading Education

Coordinator: Toni S. Walters

Reading and language arts education is predicated upon an understanding of such diverse domains of knowledge as linguistics, psychology, psychometrics and educational psychology, to mention just a few. A well-prepared reading and language arts professional must have a solid foundation in: learning theory, language development, literature, composition, comprehension, word recognition diagnosis and correction of reading performance, theoretical models of reading, as well as an historical perspective on reading and language arts as it has developed over the past century. Well-versed reading and language arts experts must possess a solid theoretical background, as well as the practical knowledge required to teach reading and the related language arts in classrooms, clinical settings, or in university programs.

The Reading and Language Arts Department is committed to offering a program of study that prepares students to conduct and evaluate research, to master the art of teaching children and adults to read and write, and to understand and appreciate the wealth of knowledge that related disciplines can contribute to literacy instruction.

Admission

Admission to the Ph.D. program is a two-step process. First, the screening committee evaluates candidates in four areas: letters of recommendation, prior course work at the undergraduate and graduate levels, writing ability as revealed through a personal essay and scores on the Miller Analogies Test.

Second, applicants who score highest on the screening steps are interviewed by the faculty. Final admission recommendations are then made by the reading and language arts faculty working as a committee of the whole. Applications for fall admission are reviewed during the previous winter semester. All application materials must be received by Graduate Admissions by March 1.

Residence

Students must complete two semesters during which they earn at least 8 credits each semester. The combined spring/summer sessions may constitute one semester toward residency. During residency, students may be assigned experiences not ordinarily available through course work. Examples of such experiences may include tutoring children and adults in the

reading clinic, assisting faculty in the conduct of research, and teaching undergraduate or graduate courses under departmental supervision. Graduate assistantships, which include a stipend, tuition and fees, are available on a competitive basis to students pursuing full-time study. Assistantships can not be granted to students who are employed full time.

Academic advising

Upon acceptance into the program, students are advised by the Ph.D. program coordinators. During the first semester of study, students are assigned a permanent academic adviser. The permanent academic adviser provides academic counseling throughout the course of study and assists the student in developing a plan of study. The plan of study specifies major and minor course work.

Course of study

The Ph.D. program consists of three parts: the reading and language arts core and research component, the minor specialization component and the dissertation component. Required course credits include 48 credits in the reading and language arts core and research components, 24 credits in the minor specialization and 20 dissertation credits. When appropriate, up to 36 graduate credits earned in a master's degree at Oakland University or other accredited universities may be applied toward the Ph.D. degree upon approval of the faculty and the Office of Graduate Study. In practice, however, transfer credit is seldom granted.

The reading and language arts core and research component consists of 12 advanced courses conducted in seminar fashion. These seminars cover such topics as statistics, research design, cognitive psychology, comprehension, theoretical models of reading, historical perspectives on reading, children's literature, the composing process, instructional systems technology, advanced diagnosis and correction, dissertation preparation, applied research and other selected topics. There are 48 credits in the reading and language arts core and research components combined. Depending on previous professional experiences and training, doctoral students may be asked to take a limited number of courses prior to the 700-level courses of the core program. The following courses make up the reading core and the research component:

- RDG 700 Introduction to Educational Statistics and Research Design in Reading and Language Arts
- RDG 701 Introduction to Research in Reading
- RDG 702 Applied Research in Reading and Language Arts
- RDG 703 Advanced Diagnostic and Corrective Reading
- RDG 704 Perspectives in Literature
- RDG 705 Perspectives in Writing
- IST 706 Perspectives in Instructional Systems Technology
- RDG 707 Theoretical Models and Historical Perspectives
- RDG 708* The Psychology of Reading
- RDG 709 Doctoral Seminar in Reading

The minor specialization component consists of 24 semester hours of study in a related discipline such as linguistics, psychology, English, learning disabilities, early childhood, instructional systems technology, children's literature, composition, school administration, guidance and counseling or business.

The dissertation component consists of course work in statistics, research design and applied research and culminates in a dissertation. The dissertation requirement consists of 20 credits. Dissertations may investigate any faculty-approved theoretical or practical issue in reading and language arts.

Qualifying examination

Before admission to candidacy, each student must pass a written and oral qualifying examination. The examination is taken after the bulk of course work is completed. The examination is prepared by the faculty under the supervision of the Ph.D. coordinator. The coordinator appoints a faculty committee to evaluate each candidate's qualifying examination. This committee consists of at least two faculty members from the Department of Reading and Language Arts and one faculty member from the candidate's area of minor concentration.

The qualifying examination is administered twice each academic year, in the fall and spring semesters. Normally, students will have passed their qualifying examinations before final approval of the dissertation proposal is given. However, the dissertation adviser can make an exception to this norm, when appropriate.

The qualifying examination consists of two written examinations and a qualifying paper presented at the time the examination is scheduled. The examination is administered over three days and covers reading and language arts content on days one and two and minor concentration content on the third day. The paper covers a special interest area selected by the student and approved by the Ph.D. coordinator and the student's academic adviser. The Ph.D. coordinator, in consultation with the faculty, assembles the examination questions. The oral examination, administered by the evaluation committee, can be taken only after successfully completing the written examination.

The committee may permit a student to repeat the qualifying examination. An unacceptable performance on the qualifying examination may result in educational requirements and experiences in addition to those specified in the regular course of study. Passing evaluations on either the written or oral portions of the examination do not preclude the faculty from requiring additional courses or learning experiences if the evaluating committee deems such action warranted.

Dissertation

Each candidate must complete a dissertation that makes a worthwhile contribution to the major field of study. When a student is ready to initiate a dissertation proposal, he or she should nominate a dissertation committee chairperson. The dissertation committee is then formed in consultation with the student's dissertation chairperson. The dissertation committee consists of four Oakland University faculty members, including

at least three members from the Department of Reading and Language Arts and at least one member from the student's area of minor concentration. An Oakland faculty member at large or a faculty member from another university may be asked to serve on the committee if approved by the committee chair and the Ph.D. coordinator. The student's nominees are subject to availability and other constraints. The coordinator of the doctoral program must approve the selection of the dissertation committee.

The dissertation committee chairperson advises the candidate through the stages of dissertation preparation. When the dissertation committee chairperson and the student have agreed on a dissertation topic, the student must prepare a written dissertation proposal. Content of the dissertation proposal shall be specified by the dissertation chairperson in consultation with the dissertation committee. The student shall present and orally defend the proposal before the dissertation committee, interested faculty and invited guests, insuring that all relevant issues pertaining to the dissertation are considered. Once the dissertation committee approves the proposal, the student may initiate the study.

A penultimate draft of the dissertation must be submitted to the committee for modification and approval before the final copy is prepared and approved by the dissertation committee. The completed dissertation must be filed with UMI Dissertation Publishing. Eleven bound copies of the dissertation are required and are distributed as follows: 1 to the Office of Graduate Study, 2 to Kresge Library, 3 to the Ph.D. coordinator of the Department of Reading and Language Arts, and 1 for each member of the dissertation committee.

Twenty credits in RDG 799 are required of all doctoral students. Merely amassing dissertation credits does not indicate satisfactory progress toward, or completion of, the dissertation. The dissertation is deemed completed only after a successful oral defense and after final approval of the completed dissertation by the dissertation committee.

Oral final examination

Each candidate must orally defend the dissertation before the dissertation committee. The examination is scheduled after the dissertation committee has approved the dissertation. While interested faculty and outside observers may make comments and ask questions, only the dissertation committee certifies approval of the dissertation. The dissertation committee may permit reexamination if the initial dissertation defense is deemed inadequate.

Time limits

All requirements, including the dissertation, must be completed within eight years after admission to the program. An extension may be granted with the approval of the Ph.D. coordinator and the Office of Graduate Study.

If six consecutive semesters elapse where no credits are accumulated toward the degree, the student will be considered inactive and may be dropped from the program. Students who are deemed inactive or dropped from the program may be reinstated upon approval of the Ph.D. coordinator and the Office of Graduate Study.

Graduation

Students expecting to graduate in a given semester must be registered and file an Application for Degree form at the Academic Records Office and pay the graduation service fee. Failure to do so on time will preclude graduation in that semester.

■ The Master of Arts in Teaching in Reading and Language Arts

Most MAT students are classroom teachers whose daily work requires them to deal with the literacy needs of young children, adolescents or adults. Consequently, the thrust of instruction in the MAT program is to prepare classroom teachers to work effectively and efficiently in settings where class sizes may range from 5 to 40 or more learners. While the emphasis is on classroom instruction, the MAT program does provide a K-12 state of Michigan reading endorsement and qualifies certified teachers to serve as reading consultants, reading specialists or remedial and corrective reading teachers. Endorsement candidates must also pass a State of Michigan certification test before a reading endorsement can be issued.

Admission

Applicants to the MAT degree in reading and language arts apply to the department through Graduate Admissions. Applications are accepted at any time. Applicants are notified of their status after submitting all required documents.

The department considers only those applicants who hold baccalaureate degrees from regionally accredited institutions. While an undergraduate grade point average of at least 3.00 is the minimum standard for admission, other factors bearing on potential academic success are given due consideration. An application for admission, an application fee, two letters of recommendation and official transcripts of previous academic work must be submitted to Graduate Admissions before the application can be reviewed by the department.

Requirements

The requirement for the MAT in reading and language arts is 36 credits; if the two-course option, in lieu of RDG 699 Terminal Project is selected, the program requires 40 credits.

Required courses (24 or 28 credits)

- RDG 500 Foundations of Reading Instruction
- RDG 571 Foundations of Literature for Children and Young Adults
- RDG 575 Teaching Writing in the Elementary and Secondary Schools
- RDG 632 Diagnosis of Reading Disabilities
- RDG 633 Correction of Reading Disabilities
- RDG 699* Master's Project

*Students may elect a two-course option in lieu of RDG 699. This option necessitates 40 credits for graduation. Recommended substitute courses in lieu of RDG 699 are: RDG 501, 534, 570 and IST 594. Other courses may be

substituted for these four but only with adviser permission.

Elective courses (12 credits)

Twelve credits may be elected from the reading and language arts course offerings. Any 500- or 600-level course with a RDG or IST designation preceding the course number constitutes an acceptable elective. In addition, RDG or IST 700-level courses may serve as electives, but only with adviser and course instructor permission.

Candidates for the Michigan Elementary Professional Certificate (formerly Continuing Certificate) must elect RDG 534 if they have not previously met this requirement.

Candidates for the Michigan Secondary Professional Certificate must elect RDG 538 if they have not previously completed an equivalent course. It is the student's responsibility to confirm with the School of Education and Human Services' advising office whether or not prior course work fulfills state requirements for the professional certificate.

■ MAT in Reading and Language Arts with Endorsement in Early Childhood Education (ZA)

Coordinator: B. Joyce Wiencek

A limited number of reading and language arts students will be admitted to the early childhood endorsement sequence. Candidates for admission to the certificate endorsement sequence in early childhood must first be admitted to the MAT in reading and language arts program and then apply to the early childhood program by the June 1 deadline for fall admission (see graduate catalog for the early childhood area). Students admitted to this sequence must schedule an advising appointment with the program coordinator before taking courses. Course requirements are as follows:

Block 1: Reading and Language Arts

RDG 500	4 credits
RDG 571 or RDG 574	4 credits
RDG 575	4 credits
RDG 632	4 credits
RDG 633	4 credits
RDG 560	4 credits
RDG 699	
or an adviser approved two course substitute of 4 or 8 credits	

Block 2: Early Childhood

EC 540	4 credits
EC 544	4 credits
EC 542	4 credits
EC 543	4 credits
EC 645	4 credits

■ MAT in Reading and Language Arts with Administrator Certificate in Elementary or Secondary Administration

Coordinator: Richard Barron

The Department of Reading and Language Arts and the Department of Educational Leadership offer a combined program leading to the MAT in reading and language arts with an Administrator Certificate. Candidates for this program must first be admitted to the MAT reading and language arts degree program and must meet all Educational Leadership requirements for admission to the Administrator Certificate program (see catalog section for the Department of Educational Leadership). Students admitted to this program must schedule an advising appointment with the program coordinator before scheduling courses. Course requirements are as follows:

Block 1: Reading and Language Arts

RDG 500 or RDG 538	4 credits
RDG 571	4 credits
RDG 575	4 credits
RDG 632	4 credits
RDG 633	4 credits
Reading Elective	4 credits
RDG 699 or an adviser-approved two-course substitute of 4 or 8 credits	

Block 2: Curriculum, Instruction and Leadership

Elementary/Middle School or Secondary/Middle School
Principal Certification

EL 530	4 credits
EL 620	4 credits
EL 540	4 credits
EL 550	4 credits
EL 560	4 credits

■ Microcomputer Applications Certificate Program

Coordinator: Anne Porter

The Reading and Language Arts Department offers a 16-credit certificate indicating focused training in educational applications of microcomputers and related technologies. This program is intended for teachers, administrators and professional staff representing a variety of educational and training levels. The certificate program meets the needs of educators in the challenging and rapidly changing field of technology in education as it relates to literacy, learning and the school curriculum.

Admission to this program requires basic computer literacy skills. Prior to entering the program students should be comfortable using computer applications such as word processing and curriculum related software to meet their general personal and professional needs.

Students enrolled in the MAT program in reading and language arts may earn the certificate as part of the master's degree program. Under this option, students will complete the elective portion of the MAT by enrolling in IST 594, 595 and 679. IST 699 will be substituted for RDG 699. Note: 4 credits of IST 630 may be substituted for IST 595 only.

■ Advanced Microcomputer Applications Certificate Program

Coordinator: Anne Porter

For holders of the Certificate of Microcomputer Applications in Education (or the equivalent), the Department of Reading and Language Arts offers a 16-credit certificate of advanced study in the theory and application of instructional systems technology in the enhancement of learning environments. This program provides an opportunity for focused inquiry in specific areas of interest relating to the impact of advanced technologies on teaching, learning and literacy in a variety of settings.

Doctoral students may pursue this certificate as part of their minor concentration. Students enrolled in the MAT in reading and language arts program may use these courses as part of their elective sequence with permission from their adviser. Students may also enroll in the certificate program without pursuing a graduate degree. Students will receive the certificate upon the successful completion of IST 630, 703, 706 and 780.

■ Certificate Endorsement in Reading

The Department of Reading and Language Arts offers a 24-credit, K-12 Michigan Certificate Endorsement in Reading for students who have successfully completed a master's degree in an allied or related field of study. Required courses are RDG 500, 571, 575, 632, 633 and one elective. Endorsement seekers must also pass a State of Michigan reading endorsement certification examination. Students considering pursuing this endorsement must schedule an advising interview prior to making application to the program. Failure to do so may result in loss of completed credits and/or dismissal from the program.

■ Post-Master's Certificate Programs in Reading, Language Arts and Literature: 16 credits and 32 credits

Coordinator: James Cipielewski

The 16- and 32-credit certificate programs in reading, language arts and literature are intended for two different groups of students: 1) students with little background in reading and, 2) students who have completed a MAT in reading and language arts. If you have little or no reading, language arts or children's literature background, the options available will enable you to gain a basic understanding of literacy instruction and provide invaluable information on current trends and issues in the field.

Since some school districts now require planned 15- and 30-hour programs, the Post Master's Certificate Programs in reading, language arts and literature will meet the need for a planned program. Students wishing to pursue this program option should schedule an advising appointment with the program coordinator.

16 credits

The 16-credit certificate consists of three courses from among the courses listed below plus an adviser-approved elective. A concentration in children's literature, writing or secondary reading can be arranged with an adviser.

RDG 501	Language, Literacy and Thought
RDG 530	Workshop in Reading
RDG 560	Emerging Literacy: Early Reading and Writing

RDG 561	Phonics in Proper Perspective
RDG 562	Whole Language: From Premise to Practice
RDG 563	The Reading-Writing Connection
RDG 566	ESL: Literacy for Second Language Learners
RDG 573	Adolescent Literature in Middle Schools, Junior and Senior High Schools
RDG 574	Literature for the Young Child
RDG 576	Poetry: Reading and Writing
RDG 577	Narrative: Reading and Writing
RDG 578	Non-fiction: Reading and Writing
RDG 631	Problems in Reading Instruction

32 credits

The 32-credit certificate requires that the 16-hour certificate first be completed. Thereafter, the following requirements apply:

RDG 565	Teaching Apprenticeship: Reading and Language Arts
RDG 780	Independent Investigations in Reading and Language Arts
Elective:	Two adviser-approved electives totaling 8 credits

■ COURSE OFFERINGS

■ READING AND LANGUAGE ARTS

RDG 500**Foundations of Reading Instruction (4)**

Provides an overview of the reading process including reading readiness, comprehension, word recognition diagnosis, methods of instruction, and related language acquisition processes.

RDG 501**Language, Literacy and Thought (4)**

Examines the role of oral and literate language practices in the development of human thought, emotion and action. Special emphasis is placed upon the role of cultural and social contexts in fostering literacy learning, development and instruction.

RDG 530**Workshop in Reading (2, 4, or 8)**

Emphasizes the development of materials and resources for reading and language arts instruction based on an open education philosophy. Includes workshops on drawing, painting, photography and other arts and crafts areas. Teaching strategies are stressed.

RDG 532**Teaching Reading in the Primary Grades (2, 4, or 6)**

Examines principles, practices and research related to early reading instruction. Includes analysis of the relationships of the various language arts to reading and emphasizes the developmental literacy skills of children, starting with kindergarten.

RDG 533**Oral Discourse: Talking and Listening (4)**

Focuses on the central role oral discourse (talking and listening) assumes as a primary means of making meaning in the learning of other language and thought processes, i.e., reading and writing, and in the learning of other content domains such as mathematics, science and art. The social and cultural dynamics of oral discourse will be explored.

RDG 534**Reading-Language Arts Instruction in the Elementary School (4)**

Emphasizes the teaching of writing, reading, listening, speaking and spelling. Develops a coordinated approach to teaching all language arts skills.

RDG 536**Teaching Reading to the Special Child (4)**

Focuses on the diagnostic teaching of reading with special education students, particularly: learning disabled, educable mentally impaired, emotionally impaired and autistic children. Students appraise reading competency and plan instruction using a variety of formal and informal assessment processes. *Prerequisite: Admission to the learning disabilities certificate endorsement program or instructor permission.*

RDG 537**Content Reading in the Elementary School (4)**

Designed for content subject learning in the elementary classroom. The course bridges learning to read and reading to learn practices relevant to the curriculum of elementary school children.

RDG 538**Guiding Reading-Learning in Content Subjects (4)**

Stresses the reading processes and skills students need to independently acquire and apply content understandings. Intended for middle-grade, junior high and senior high school teachers who work primarily in subject areas of the curriculum.

RDG 539**Clinical Issues in Early Literacy Instruction: Reading Recovery™ Teacher Training (2, 4, 6, 8, or 10)**

A three-semester sequence to prepare teachers to implement specialized reading methods with young children most at risk for reading difficulty in the classroom context. Teachers observe, record, analyze and modify the reading and writing behavior of children and develop understandings of reading acquisition. May be repeated for a maximum of 10 credits.

Prerequisites: Students must be nominated by a participating school district and accepted into the Reading Recovery™ program or receive permission from program director.

RDG 540**Leadership in Literacy Instruction (4)**

Focuses on the organization and administration of reading and language arts programs in the elementary, middle and secondary levels. Emphasis on how Literacy philosophy is related to policy at the national, state and local levels, staff and program development, text selection, and interpretation of student assessment for reading and language arts.

Prerequisites: RDG 500, 571 and 575

RDG 560**Emerging Literacy: Early Reading and Writing (2 or 4)**

Examines principles, strategies and research related to early literacy development among children from preschool through primary grades. Emphasizes the developmental nature of early learning and literacy.

RDG 561**Phonics in Proper Perspective (2 or 4)**

Addresses the role of phonics in the reading process of emergent and mature readers. Different theoretical views of phonics are examined and compared. Explores phonemic awareness and related concepts. Strategies for teaching phonics are presented. Special emphasis placed on the appropriate uses of phonics in a whole language curriculum.

RDG 562**Whole Language: From Premise to Practice (2 or 4)**

A course designed to explore modern integrated approaches to teaching language arts. Included are the study of language development, literature, oral and written language instruction, spelling and grammar. Whole language philosophy, premises and practices are stressed.

RDG 563**The Reading-Writing Connection (2 or 4)**

Develops understanding of the nature of the writing and reading processes, the influence of reading on writing, the influence of writing on reading, the uses of literature in the reading-writing connection and the nature of the learner in the reading-writing process.

RDG 564**Teacher as Researcher: Classroom Inquiry (4)**

Focus is on the role of the teacher as researcher exploring problems and/or questions of interest within her classroom and/or school. Students will be exposed to and engaged in qualitative approaches to research and the process of conducting classroom and community-based research.

RDG 565**Teaching Apprenticeship: Reading and Language Arts (4)**

Students work in a mentoring relationship with a faculty member. Specific experiences determined by each student's interests and needs. Apprentice teachers participate through observation, supervising group activities, counseling and guiding individual students, organizing and presenting lectures and demonstrations.

RDG 566**ESL: Literacy for Second Language Learners (2 or 4)**

Examines significant issues involved in teaching literacy to children and adults who are second language learners of English (ESL: English as a Second Language). Provides background for ESL teachers and suggests methods, practices and procedures for working with ESL learners.

RDG 570**The Author's and Illustrator's Art and Craft (4)**

Selected authors' and illustrators' works are read and criticized in light of psychological, sociological, historical, literary and curricular factors. Examines ways to encourage young people in elementary and secondary schools to read critically and appreciatively a variety of literary works representing multicultural perspectives and works in translation. May be repeated for credit.

RDG 571**Foundations of Literature for Children and Young Adults (4)**

Presents criteria for selecting and evaluating literature for children and young adults from a historical perspective. Examines important research in the field and ways to incorporate literature, specifically multicultural and international literature, into the curriculum via books, tapes and films.

RDG 572**Storytelling and Creative Dramatics (4)**

Focuses on methods of encouraging children to use imaginative and dramatic skills to interpret literature. Helps teachers use creative drama techniques. Provides opportunities to select, learn and tell stories and lead drama activities, storytelling and creative drama programs.

RDG 573
Adolescent Literature in Middle Schools, Junior and Senior High Schools (4)

Introduces literature written for and of interest to adolescents. Topics include trends in literature and publishing, methods of presenting books, how to stimulate reluctant readers and the use of trade books, tapes and films in content areas.

RDG 574
Literature for the Young Child (4)

Emphasizes the careful selection and sensitive use of developmentally appropriate and enriching literature, including multicultural literature, with preschool and early elementary school children.

RDG 575
Teaching Writing in the Elementary and Secondary Schools (4)

Emphasizes writing and teaching the writing process. Topics include prewriting, drafting, revising, publishing, conferencing, writing workshops, poetry, evaluation, writing across the curriculum, invented spelling, reading-writing connection and issues related to learning to write.

RDG 576
Poetry: Reading and Writing (2 or 4)

Examines children's response to poetry, the writing of poetry, approaches writers use in poems and the strategies teachers can use when teaching poetry writing. Emphasis will be on learning how to read and write poetry, professional teaching and assessment.

RDG 577
Narrative: Reading and Writing (2 or 4)

Examines children's responses to narrative writing, how they write fiction and the relationship between fiction writing and reading comprehension. Also examines how writers write fiction, how reading fiction improves writing, and methods of assessing responses to narrative writing.

RDG 578
Non-Fiction: Reading and Writing (2 or 4)

Examines language, cognitive development and non-fiction reading and writing. Students work on their own writing and explore teaching methods and research related to expository writing. Students read non-fiction as models for writing and consider ways to teach non-fiction writing.

RDG 590
Independent Study: Reading and Language Arts (2, 4, 6 or 8)

Topics differ depending on student interests. Students pursue a topic independently but with instructor guidance. A written proposal is prepared and must be approved by faculty sponsor.

RDG 630
Seminar in Reading (2 or 4)

Analyzes the validity, reliability, methodology, results, conclusions and implications of research and seminal literature in selected areas of reading and language arts.

RDG 631
Problems in Reading Instruction (4 or 8)

Analyzes diagnostic, methodological, organizational and administrative issues in reading and language arts. Topics vary depending on student and instructor interests.

RDG 632
Diagnosis of Reading Disabilities (4)

A laboratory course focusing on diagnosis of children's reading and language arts disabilities. Students develop, administer, interpret and score formal and informal tests, write case reports, and analyze reading and language arts problems.

Prerequisite: Admission to MAT, RDG 500 and/or instructor permission. Must have completed 20-24 credits in MAT program.

RDG 633
Correction of Reading Disabilities (4)

A laboratory course focusing on instructional strategies for teaching reading and language arts to children with reading difficulties. Students work directly with children. Students plan and conduct developmental, remedial and corrective instruction under supervision of the instructor.

Prerequisite: Admission to MAT program, RDG 632 and/or instructor permission.

RDG 639
Clinical Issues in Early Literacy Instruction: Reading Recovery™ Teacher Leader Training (2, 4, 6, 8, 10 or 12)

A three-semester sequence designed to prepare teachers to implement reading methods for use with young children most at risk for reading difficulty. Teachers observe, record, analyze and modify the reading and writing behavior of children. Teachers develop understandings of the theoretical underpinnings of reading acquisition. May be repeated for a maximum of 12 credits.

Prerequisites: Students must be nominated by a participating school district and accepted into the Reading Recovery™ program, or by program director permission.

RDG 699
Master's Project (4)

Planning and executing a research study or an educational project focused on reading and the language arts. A written research or project proposal must be prepared and approved by a faculty adviser before work is initiated. Work must be completed at least two weeks before the end of classes in the semester of graduation.

Prerequisite: Admission to MAT in Reading and Language Arts.

RDG 700

Introduction to Educational Statistics and Research Design in Reading and Language Arts (4 or 8)

Two-semester sequence focusing on the design and analysis of educational research in reading and language arts. Topics include: scientific reasoning, descriptive and inferential statistics, experimental design, research methods, measurement concepts and computer analysis of multivariate procedures.

Prerequisite: Admission to Ph.D. program or instructor permission.

RDG 701

Introduction to Research in Reading (4 or 8)

This course is designed as the first course in the program leading to the Ph.D. in reading and language arts. The content of the course will focus on a general overview of educational research with special emphasis on orienting students to the nature of reading and language arts research, searching reading and language arts literature, and initiating individual doctoral research.

Prerequisite: Admission to Ph.D. program or instructor permission.

RDG 702

Applied Research in Reading and Language Arts (4)

Assists students in the process of successfully completing a thesis for the doctoral degree. Focuses on preparation of a proposal leading to a thesis project.

Prerequisite: Admission to Ph.D. program, RDG 700 or instructor permission.

RDG 703

Advanced Diagnostic and Corrective Reading (4)

Two-semester course wherein doctoral student serves as an instructional assistant to a faculty member who is teaching the master's level diagnosis and correction sequence.

Prerequisite: Admission to Ph.D. program, RDG 632 and 633, or instructor permission.

RDG 704

Perspectives in Literature (4)

Examines perspectives of literature for children and young adults. Research and critical essays on literary theory, the teaching and use of literature in classrooms, and other pertinent topics will be studied.

Prerequisite: Admission to Ph.D. program or instructor permission.

RDG 705

Perspectives in Writing (4)

Examines research in writing, composition theory, philosophy of writing, the teaching of composition, relationship of composition and comprehension, and other pertinent topics.

Opportunities to write poems, stories and expository pieces.

Prerequisite: Admission to Ph.D. program or instructor permission.

RDG 707

Theoretical Models and Historical Perspectives (4)

Examines contemporary models of reading, including automaticity, attention-capacity, interactive-compensatory, psycholinguistic and other prominent models of reading. Traces the history and pertinent influences on the teaching of reading and reading practices from colonial to contemporary times.

Prerequisite: Admission to Ph.D. program or instructor permission.

RDG 708

The Psychology of Reading (4)

Explores the acquisition and operation of reading processes. Focuses on basic research on reading in cognitive and developmental psychology. Students will gain an understanding of the influences of psychology on reading theory, as well as in-depth knowledge of specific topics in the psychology of reading.

Prerequisite: Admission to Ph.D. program or instructor permission.

RDG 709

Doctoral Seminar in Reading (4)

Advanced topics in reading and language arts selected by the instructor in consideration of the needs and interests of doctoral students. Research and seminal works are analyzed and interpreted. Research designs, procedures and findings are discussed.

Prerequisite: Admission to Ph.D. program or instructor permission.

RDG 780

Independent Investigations in Reading and Language Arts (2, 4, 6, or 8)

Students investigate topics under faculty guidance. Student needs and interests determine topics chosen. Examination of diagnostic, methodological, organizational and administrative issues in reading are encouraged.

Prerequisite: Admission to Ph.D. program or instructor permission.

RDG 790

Independent Study (2, 4, or 8)

Directed readings for doctoral students on a topic that is not available through regular course offerings. May be taken for a total of 8 credits.

Prerequisite: Admission to Ph.D. program or instructor permission.

RDG 799

Dissertation Research (1 to 24)

Preparation of a research project culminating in the doctoral dissertation.

Prerequisites: Admission to Ph.D. program.

■ INSTRUCTIONAL SYSTEMS TECHNOLOGY

IST 520

Topics in Instructional Systems Technology (1 to 4)

The content of IST 520 may focus on a range of theoretical or applied topics which are of current interest in instructional systems technology and are not addressed in other IST courses.

IST 590

Special Problems in Instructional Systems Technology (2, 4, 6 or 8)

Course content depends on student and staff needs and interests. Topics may differ each semester. This course may be elected for independent study and may be taken for a maximum of 8 credits.

Prerequisite: Instructor permission.

IST 594

Introduction to Technology Applications in the Classroom (4)

An introduction to the integration of audio, video, computing and telecommunications technologies in classroom teaching. A theoretical and practical foundation for the instructional use of integrated technologies is provided.

IST 595

Instructional Systems Technology Applications (4)

A practical examination of the applications software and telecommunications technologies. Emphasis is on using technology to support classroom learning experiences with a focus on assessing, comprehending and communicating information. Students acquire proficiency in the use of these instructional tools.

Prerequisite: IST 594 or instructor permission.

IST 630

Workshop in Educational Software and Related Technologies (2 or 4)

Emphasizes the examination of current software and the development of materials, resources and processes for incorporating software into various curriculum areas with an emphasis on cross-curricular, multicultural and whole language issues. Includes workshops in digital literacy, comprehension issues related to hypermedia navigation and other topics.

IST 679

Software Design (4)

An introduction to software design applied through a variety of integrated technologies. The student will become familiar with the procedures used in the development and evaluation of software based learning environments. The student will apply design skills to the development of a technology supported learning experience.

Prerequisite: IST 595.

IST 699

Terminal Project: Instruction Systems Technology (4)

A project which incorporates the skills and principles covered in IST 594, 595 and 679. Students design, carry out and evaluate a comprehensive technology related learning experience.

Prerequisite: IST 679.

IST 703

Advanced Instructional Systems Technology Applications (4)

Extensive application of a variety of technologies in a learning environment. The student's work in the Teacher Explorer Center will be determined by both the center's needs and student interest.

Prerequisite: Admission to Ph.D. program, completion of IST 594/595 or instructor permission.

IST 706

Perspectives in Instructional Systems Technology (4)

Examines topics in Instructional Systems Technology in relation to literacy issues. Research in software design, roles of technology in support of learning, literacy needs of the future, new media authoring and other pertinent topics will be studied.

Prerequisite: Admission to Ph.D. program or instructor permission.

IST 780

Independent Investigations in Instructional Systems Technology (2, 4, 6, or 8)

Students investigate topics under the direction of a faculty member. Student needs determine the topics. Design, methodological, organizational, administrative and theoretical issues in Instructional Systems Technology are encouraged.

Prerequisite: Admission to Ph.D. program or instructor permission.

■ DEPARTMENT OF TEACHER DEVELOPMENT AND EDUCATIONAL STUDIES

485B Education and Human Services Building • (248) 370-2613 • Fax (248) 370-4605 • <http://www.oakland.edu/sehs>

Chair:

Dyanne M. Tracy

Professor emeriti:

James W. Hughes

Patrick J. Johnson

M. Sharon P. Muir

Professor:

Dyanne M. Tracy

Associate professors:

Dawn M. Pickard

Mary T. Stein

Robert A. Wiggins

Assistant professors:

Karen Bolak

Michael G. MacDonald

Carolyn J. O'Mahony

Richard W. Pontius

Visiting instructors:

Babette M. Benken

Nancy A. Melamed-Brown

Special instructor:

Mary F. Zeppelin

The Department of Teacher

Development and Educational Studies offers:

M.Ed. Master of Education in Educational Studies

M.A.T. Master of Arts in Teaching (secondary education)

■ The Master of Education in Educational Studies

Coordinator: Michael G. MacDonald

Admission

Applicants to the M.Ed. program apply to Oakland University and the Department of Teacher Development and Educational Studies through Graduate Admissions. Application forms for the university and for the department are available from that office. Admission is a selective process. Meeting minimum criteria does not guarantee acceptance into the program. Students are notified of their admission status by Graduate Admissions.

Admission requirements

- 1 . an undergraduate GPA of at least 3.00
- 2 . a teaching certificate
- 3 . ready access to K-12 classrooms
- 4 . K-12 teaching experience
- 5 . two letters of recommendation from individuals in a supervisory relationship to the applicant
- 6 . a statement of professional goals
- 7 . communication skills commensurate with graduate-level scholarship. Students who are conditionally admitted to the program because of a lower GPA or lack of recommendations must complete a minimum of 8 credit hours (EST 601 and one other core course) with a grade of at least 3.0 in each course.

Applications for special graduate status are available from and processed through Graduate Admissions.

Program requirements

The program requires a minimum of 35 credits. Upon admission, a plan of study is prepared jointly by the student and the faculty adviser. No grade below 3.00 may be applied to the degree. The program consists of a 16-credit core a minimum of 15 elective credits approved by student's faculty adviser, and a 4-credit exit of EST 609. Four Oakland University credits may be applied from outside the listed electives; exceptions to this policy require approval of a Petition of Exception by department faculty and the Office of Graduate Study.

Required core (16 credits):

EST 601	Introduction to Educational Studies (must be taken as first course in M.Ed. program)	4
EST 602	Diverse Learners and the Curriculum	4
EST 603	Teachers and the Curriculum	4
EST 604	Advanced Instructional Design	4

Educational Studies Electives (choose 15 credits from the following):

EST 500	Art for the Classroom Teacher	4
EST 530	Teaching Mathematics in the Middle School	1 to 4
EST 532	Diagnosis and Remediation in Mathematics	1 to 4
EST 560	Science and Children	4
EST 561	Outdoor and Environmental Education	4
EST 570	The International Experience	2 to 4
EST 571	Social Studies in the Schools	4
EST 572	Global Education in the Schools	4
EST 573	Multicultural Education in the Schools	4
EST 590	Trends and Practices in Middle Level Education	4
EST 591	Middle Level Schools	2 or 4
EST 630	Gender Socialization in the Schools	1 to 4
EST 640	Integrating Disciplines in the Curriculum	4
EST 641	Applied Curriculum Studies	4
EST 642	Practicum: Schoolwide Community-Building	4

EST 650 Special Studies in Teacher Development and Educational Studies (1 to 4)

EST 651	Issues in Education	1 to 6
EST 660	Teacher Leadership in Mathematics and Science	1 to 4
EST 661	Supervisory Skills for Teachers and Administrators	2 or 4
CNS 561	Introduction to School Counseling	2
CNS 571	Consultation Theory and Practice	2
EC 540	Theories of Child Development and Education	4
EL 560	Staff and Curriculum Development for School Improvement	4
EL 620	Law for Teachers and Administrators	4
HRD 625	Theory To Practice	
IST 594	Introduction to Technology Applications in the Classroom	4
RDG 500 or RDG 575	Foundations of Reading Instruction Teaching Writing in the Elementary and Secondary Schools	4 4
SE 510	Students with Behavioral and/or Emotional Impairments	4

Exit (4 credits):

EST 609	Collaborative Action Research	4
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The exit plan is to be completed within the last calendar year of the program with the M.Ed. adviser's and supervising instructor's approval.

Michigan professional certification

Teachers may be recommended for professional certification upon completion of a planned program in Teacher Development and Educational Studies consisting of EST 601; EST 602; EST 603; and 6 elective credits.

COURSE OFFERINGS

EDUCATIONAL STUDIES

EST 500

Art for the Classroom Teacher (4) (formerly CIL 577)

Provides teachers with opportunities to learn about and use various art media and procedures to enhance classroom teaching. Students write a unit plan that shows integration of various media into their curriculum.

EST 530

Teaching Mathematics in the Middle School (1 to 4) (formerly CIL 503)

Assists prospective and practicing teachers in developing sound pedagogical strategies and instructional techniques for teaching mathematics in the middle school.

Prerequisite: EED 302 or SED 428 or EST 601.

EST 532

Diagnosis and Remediation in Children's Mathematics (1 to 4) (formerly CIL 615)

Guides elementary teachers to acquiring skills for determining children's basic mathematics instructional levels, diagnosing learning difficulties and designing instruction for remediation and follow-up procedures.

EST 560

Science and Children (4) (formerly CIL 505)

This course is designed to develop research-based philosophies, rationale, and methods for teaching elementary and middle school science. Participants will have an opportunity to enhance their knowledge, skills and conceptual understanding relative to curriculum and instructional planning, instructional models, curriculum integration, use of instructional resources/materials, classroom management and assessment.

EST 561

Outdoor and Environmental Education (4) (formerly CIL 506)

Studies methods, materials, and sites for education in, for and about the outdoors. Topics may include field ecology studies (K-12), bringing the outdoors indoors, planning outdoor/environmental education programs, backpacking, and family camping. Field trips are included. Additional fees are possible.

EST 570

The International Experience (2 to 4) (formerly CIL 551)

Involves educators in a field experience team-teaching with

a classroom teacher or interning with a building principal. Compares educational systems through pre- and post-seminars, independent readings, and reflective journal entries. Requires a follow-up action project in the local school setting. This is a minimum two-term course currently offered only in New Zealand; enrollment typically is in summer; completion is in fall or winter semester.

Prerequisite: Must be an M.Ed. student in Teacher Development and Educational Studies.

EST 571

Social Studies in the Schools (4) (formerly CIL 587)

Intensive study of current trends, challenges, characteristics, and content of effective social studies programs, with emphasis on the relationships among social studies discipline areas.

EST 572

Global Education in the Schools (4) (formerly CIL 687)

Examines the role of global education in grades K-12. Identifies ways that teachers can meet objectives of global education by transforming the existing curriculum. Develops competence in using content, materials, methods and evaluation techniques unique to the objectives of a global society.

EST 573

Multicultural Education in the Schools (1 to 4) (formerly CIL 689)

Explores multicultural components of culture, race, gender, ethnicity, religion, exceptionalities and socioeconomic status in the American educational process. Examines ways that teachers and administrators in grades K-12 can transform the existing curriculum.

Prerequisite: EST 602

EST 590

Trends and Practices in Middle Level Education (4) (formerly CIL 553)

Provides an understanding of organizational structures and instructional strategies appropriate for middle level schools. Examines and provides practical application for interdisciplinary teaming, scheduling, advisory, integrated instruction and grouping strategies that are developmentally appropriate for early adolescents.

Prerequisite: EST 603.

EST 591

Middle Level Schools (2 or 4) (formerly CIL 583)

Studies all aspects of the emerging middle school, including organizational patterns, curriculum, psychological factors, philosophical bases and methodologies. Provides in-depth analysis of the relationship to contemporary education, social and student needs.

Prerequisites: EST 601 and 602.

EST 601

**Introduction to Educational Studies (4)
(formerly CIL 510)**

Investigates current education research, technology and instructional techniques and methods of implementing them in effective teaching and leadership practices. Must be taken as first course in M.Ed. in Educational Studies program.

Prerequisite: Admission to the M.Ed. in Educational Studies.

EST 602

**Diverse Learners and the Curriculum (4)
(formerly CIL 509)**

Examines the social and cultural context of schooling; focuses upon school organization and policies; curricular and instructional issues related to educational opportunity and equity for a wide range of diverse learners. Encourages graduate students to self-reflect and examine topics related to education, cultural diversity, curriculum and teaching.

Prerequisite: EST 601

EST 603

**Teachers and the Curriculum (4)
(formerly CIL 512)**

Provides a broad introduction to curriculum as a special area of study and the issues and problems of practice that engage curriculum scholars, teachers and teacher educators. Critical questions and issues that extend across K-12 grade levels, subject areas, and educational settings are examined.

Prerequisite: ES 601

EST 604

Advanced Instructional Design (4)

Studies the basic elements of curriculum design and ways of planning, organizing and implementing new curricula at the elementary, middle and secondary school levels.

Prerequisites: EST 601 and EST 603.

EST 609

**Collaborative Action Research (2, 4 or 6)
(formerly CIL 610)**

Informs practitioners and develops their skills in the use of qualitative and quantitative research to identify best practices and improve their practice at the classroom and school levels. Collaborative, systemic inquiry using the basic principles of research will be used to empower professionals as teachers and leaders. Must be taken for at least four credits if enrolled in the M.Ed. Program.

Prerequisites: EST 601, 602, 603, 604.

EST 630

**Gender Socialization in the Schools (1 to 4)
(formerly CIL 561)**

Provides an understanding of the role that gender plays in teaching and learning, with emphasis on the gender socialization of students in learning environments from pre-school to graduate school. Assists prospective teachers, parents and others in designing programs that reduce gender bias in the educational system.

Prerequisites: Admission to Elementary Education program, Women's Studies program or EST 601.

EST 640

**Integrating Disciplines in the Curriculum (4)
(formerly CIL 589)**

Explores methods and materials for integrating the curriculum. Emphasis is on thematic unit planning.

Prerequisite: EST 601.

EST 641

**Applied Curriculum Studies (4)
(formerly CIL 612)**

Examines practices and research in curriculum in modern public school settings. Investigates the total experiences of young people in school and challenges existing practices on the basis of recent curriculum developments.

Prerequisite: EST 603.

EST 642

Practicum: School-wide Community-Building (4)

Provides a one-semester practicum under the guidance of a university instructor and a participating school district, with emphasis upon the relationship between the school and its surrounding community. Graduate students will participate in an ongoing community-building project that will be implemented throughout a school building or district.

Prerequisites: EST 601, 602, 603.

EST 650

**Special Studies in Teacher Development and Educational Studies (1 to 4)
(formerly CIL 590)**

Pursues directed readings or independent study of topics related to curriculum, instruction or educational studies. May be taken more than once, but for no more than a total of 4 credits.

Prerequisite: Admission to M.Ed. in educational studies or permission of the Chair of the Department of Teacher Development and Educational Studies.

EST 651

**Issues in Education (1 to 6)
(formerly CIL 611)**

Studies current issues impacting on the organization, administration and environment of schools. May be taken more than once, but for no more than a total of 6 credits.

Prerequisite: Adviser permission.

EST 660**Teacher Leadership in
Mathematics and Science (1 to 4)
(formerly CIL 631)**

This course assists teachers in developing instructional leadership skills in the field of mathematics and science by obtaining greater expertise and collegial/administrative support. Strategies for securing essential resources and public support for enhancing the teaching of science and mathematics will be explored.

Prerequisites: EST 601 and one of EST 530, 532, 560 or 561.

EST 661**Supervisory Skills for Teachers
and Administrators (2 or 4)
(formerly CIL 588)**

Strengthens and develops the supervisory skills of teachers and administrators. Emphasizes assessment using observation, feedback and evaluative techniques.

■ TEACHER DEVELOPMENT

TD 500**Introduction to the School and Society (2)
(formerly CIL 500)**

Provides an introduction to educational issues including: purposes of schooling, choice, diversity, urban education, accountability, uses of technology, ways of learning, and roles and conditions of teaching.

Prerequisite: admission to alternative teacher certification program.

TD 511**Learning Theory (2)
(formerly CIL 511)**

This is a co-requisite course in the sequence leading to recommendation for teacher certification in Michigan. The course will survey twentieth century theories which are the basis for learning, memory and application of knowledge. Historical and current theories will be explored as they relate to teaching and schools.

Prerequisite: Admission to the Alternative Certification program.

TD 519**Issues of Equity in the Schools (3)
(formerly CIL 519)**

Engages prospective teachers in the process of understanding and exploring the issues of equity in the classroom and the school community and developing a proficiency in meeting the diverse needs of learners in that environment. The focus will be on exploring effective teaching practices as well as establishing an effective classroom environment that is appropriate for a wide range of diverse students.

Prerequisite: Admission to the MAT program.

TD 520**Instructional Interaction and
Classroom Management (3)
(formerly CIL 520)**

Acquaints prospective teachers with the importance of human interactive skills and classroom management. Provides understanding of the flexible line separating personal and professional behavior. Includes student involvement in role-playing and action-oriented problem solving. Includes a required field experience.

Prerequisite: Admission to MAT Program.

Co-requisite: TD521.

TD 521**Instructional Design and Assessment (3)
(formerly CIL 521)**

Prepares teacher candidates to plan and evaluate instruction through the design of lessons and the development and use of formal, informal, and teacher-created assessment techniques.

Prerequisite: Admission to the MAT.

Co-requisite: TD520.

TD 527**Methods of Teaching Secondary Students (2)
(formerly CIL 527)**

Emphasizes the development of teaching strategies and human interaction techniques unique to secondary students and classrooms. Topics include discipline, motivation, instructional technology, skill assessment, evaluation and affective learning.

Prerequisite: Admission to secondary alternative certification program.

Corequisite: TD 528.

TD 528**Secondary Teaching of the
Major and Minor Fields (3)
(formerly CIL 528)**

Develops specific knowledge, competencies and skills required for effective teaching in the student's major and minor fields.

Prerequisite: TD 554 and TD 520.

Corequisite: SE521.

TD 554

**Advanced Interaction Laboratory for
Teacher Development (4)
(formerly CIL 554)**

Strengthens and refines teacher's communication skills, instructional strategies, models of teaching and delivery systems to improve the learning climate for all students. Newly acquired skills are implemented, practiced and assessed in authentic settings. Teachers participate in peer coaching, group problem solving and qualitative research.

TD 555

**Practicum: Teaching Urban Students (8)
(formerly CIL 555)**

Open to graduate students enrolled in special projects. Designed to prepare graduate students for teaching in urban settings as well as fulfilling supervised internship requirements for Michigan certification for elementary teachers.
Corequisite: Enrolled in special project.

TD 556

**Seminar/Minor Methods (2)
(formerly CIL 556)**

Focuses on interactive dialogue and the study of effective teaching practices. This course is taken in conjunction with the student teaching experience.

Prerequisite: Complete course work in MAT secondary education.

Corequisite: TD 559.

TD 559

**Internship in Secondary Education (10)
(formerly CIL 559)**

Provides a one-semester internship under the guidance of a clinical instructor and a university field supervisor. Enrollment for 10 hours is required for completion of the internship. Emphasis will be placed on the development and application of effective instructional methods and classroom management techniques. Prerequisite: Complete course work in MAT secondary education.

Corequisite: TD 556.

SCHOOL OF ENGINEERING AND COMPUTER SCIENCE

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associate dean: Bhushan L. Bhatt • **assistant to the dean:** James L. Hargett

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Ka C. Cheok, interim, electrical and systems engineering

Ishwar K. Sethi, computer science and engineering

Professors emeriti:

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Andrzej Rusek, Ph.D., Technical University of Warsaw (Poland)

Ishwar K. Sethi, Ph.D.,

Indian Institute of Technology (Kharagpur)

Robert P. Van Til, Ph.D., Northwestern University

Sarma R. Vishnubhotla, Sc.D.,

Washington University (St. Louis)

Mohamed A. Zohdy, Ph.D., University of Waterloo

Associate professors:

Hoda S. Abdel-Aty-Zohdy, Ph.D., University of Waterloo

Patrick Dessert, Ph.D., Oakland University

Ching L. Ko, Ph.D., University of Oklahoma

Michael A. Latcha, Ph.D., Wayne State University

Kay Keyu Li, Ph.D., Johns Hopkins University

Zissimios Mourelatos, Ph.D., University of Michigan

Sayed Nassar, Ph.D., University of Cincinnati

Brian P. Sangeorzan, Ph.D., University of Wisconsin (Madison)

Sankar Sengupta, Ph.D., Clemson University

Gautam Singh, Ph.D., Wayne State University

Ronald J. Srodawa, Ph.D., University of Michigan

Christian C. Wagner, Ph.D., Michigan State University

Lianxiang Yang, Ph.D., University of Kassel (Germany)

Assistant professors:

Daniel Aloï, Ph.D., Ohio University

Djamel Bouchaffra, Ph.D., Université Des Sciences Sociales,
DeGrenoble II, France

Yin-Ping Chang, Ph.D., Penn State University

Debatash Debnath, Ph.D.,

Kyushu Institute of Technology (Japan)

Imad Elhajj, Ph.D., Michigan State University

Laila Guessous, Ph.D., University of Michigan

Darrin Hanna, Ph.D., Oakland University

Christopher Kobus, Ph.D., Oakland University

Jia Li, Ph.D., University of Michigan

Q. John Liu, Ph.D., University of Southern California

Lunjin Lu, Ph.D., University of Birmingham (England)

Barbara Oakley, Ph.D., Oakland University

Viviana Sandor, Ph.D., College of William and Mary

Lorenzo Smith, Ph.D., Michigan State University

Donggang Yao, Ph.D., University of Massachusetts (Amherst)

Qian Zou, Ph.D., Tsinghua University (China)

Special instructor:

Jerry E. Marsh, M.S., Oakland University

Special lecturer:

Laura Dinsmoor, M.S., Oakland University

Adjunct professors:

Alex Alkidas, Ph.D., Georgia Institute of Technology
Ronald R. Beck, Ph.D., University of Iowa
Robert F. Bordley, Ph.D., University of California (Berkeley)
Francis H.K. Chen, Ph.D., University of Illinois
Donald R. Falkenburg, Ph.D., Case Western Reserve University
Grant R. Gerhart, Ph.D., Wayne State University

Adjunct associate professors:

Yung Chiang, Ph.D., University of Wisconsin, Madison
Francis B. Hoogterp, Ph.D., Oakland University
Gerard Jozwiak, Ph.D., Wayne State University
Yung-Li Lee, Ph.D., University of Wisconsin (Madison)
Rohit Paranjpe, Ph.D., Columbia University
Peter Peng, Ph.D., McMaster University (Canada)
Ravi Rao, Ph.D., University of London
Mutasim Salman, Ph.D., University of Illinois (Champaign)
Phil Szuba, Ph.D., Oakland University
Simon C. Y. Tung, Ph.D., Rensselaer Polytechnic Insititute

Adjunct assistant professors:

Suresh Ramalingham, Ph.D., Texas A&M
Saeed Siavoshani, Ph.D., Oakland University
Gert Edzko Smid, Ph.D., Oakland University

Advisory board

The Advisory Board for the School of Engineering and Computer Science is composed of leaders in industry. They assist the school in developing educational and research programs to meet the rapidly expanding requirements in the technical world. The Board is available as a body or individually for consultation on such matters as curriculum, research, facilities, equipment requirements, special subjects and long-range planning. Board members are:

Robert T. Lentz, Ph.D., Chairperson, Advisory Board; Director,
Advanced Programs, General Dynamics
Land Systems Division
William G. Agnew, Ph.D., Director (Retired),
General Motors Research Labs
Hadi A. Akeel, Ph.D., Former Senior Vice President and
Chief Engineer, FANUC Robotics Corporation
Jerry R. Blevins, Division Manager, Engineering,
Eaton Actuators and Sensors
Samuel L. Cole, III, Chief Engineer, Chassis Engineering,
Lincoln Mercury Product Development
Juan DeLaRiva, Senior Vice President, ArvinMeritor, Inc.
Herbert H. Dobbs, Ph.D., Consultant, Rochester, Michigan
Grant R. Gerhart, Ph.D., Senior Research Scientist,
U.S. Army Tank-Automotive, RDE Center (TARDEC)
Philip M. Headley, Chief Engineer, Brake Systems,
Continental Teves
Sidney D. Jeffe, Vice President (Retired), Chrysler Corporation
Anna Kretz, Vehicle Line Executive, FWD Truck Products,
General Motors Corporation
Joseph D. Long, Chief Engineer, Door Systems,
Delphi Interior Systems
Ron A. May, Sr., Vice President of Energy Distribution,
DTE Energy. Vice Chair, Advisory Board
William T. Mihalic, Vice President,
Alliance Development Collin and Aikman
Yogen N. Rahangdale, Group Vice President, Chief Technical
Officer, American Axle and Manufacturing
Bernard I. Robertson, Senior Vice President - Engineering
Technologies, General Manager Truck Operations,
DaimlerChrysler Corporation
Gary W. Rogers, President and CEO,
FEV Engine Technology, Inc.
Gerhard Schmidt, Ph.D., Vice President, Research,
Ford Motor Company
Stephan Sharf, President, SICA
Jeffery Van Dorn, Director, Engineering Services, (Retired),
Compuware Corporation

General information

The School of Engineering and Computer Science offers programs leading to the Master of Science degree in electrical and computer engineering, mechanical engineering, systems engineering, computer science and engineering, embedded systems, information systems engineering and software engineering and the Doctor of Philosophy degrees in mechanical engineering, and systems engineering. It also offers a Master of Science program in engineering management in cooperation with the School of Business Administration.

The school is housed in Dodge Hall of Engineering, Hannah Hall and the Science and Engineering building, a modern facility with extensive laboratories for research and design studies. Laboratories cover automotive mechatronic systems, robotics, machine vision, experimental stress analysis, heat transfer, fluid flow, system simulation, circuits and communications, control, mechanical and electrical properties of materials, solid-state devices and microelectronics, microprocessors, mini-computers, computer graphics and computer-aided design. Students have access to the various computing facilities of the school and the university's computer services, consisting of a Distributed Computing Environment integrating DEC, Sun work stations, Silicon Graphics and Windows. The school also has a large number of personal computers. Fully-equipped and staffed electronics, computer and machine shops complement these facilities.

The Center for Robotics and Advanced Automation within the School of Engineering and Computer Science is an active center of research excellence. The main goals of the center are to contribute to the demand for high technology and industrial productivity in the United States.

The school has also established a Product Development and Manufacturing Center (PDMC) in collaboration with local industry. The focus of PDMC is to improve competitiveness of industry through the application of new and existing technology, modified business practices, and new educational and training paradigms.

Graduate assistantships/fellowships

A number of graduate assistantships and a limited number of fellowships are awarded each year on a competitive basis. They carry both stipend and tuition remuneration. Graduate assistants render 20 hours per week of teaching and/or research service to the university. No such service is required of graduate fellows. Graduate assistants or fellows at the master's level who plan to enter either the area of research and development in industry or a doctoral program are strongly encouraged to include a master's project or thesis as part of their program.

■ General Regulations for Doctoral Degree Programs

Admission

The Ph.D. programs are designed for students with academic backgrounds in engineering. Students with backgrounds in computer science, mathematics or the physical sciences may also be admitted to the program, but they will be required to build up basic engineering knowledge through remedial course work. Normally a master's degree from an accredited institution is required for admission; however, students with outstanding undergraduate records may apply directly for admission to the doctoral programs. Admission is highly selective; applicants should present transcripts of all previous academic work and recommendations from three faculty members of their most recent study program who can evaluate their scholarly achievement and potential. Applicants must submit scores from the Graduate Record Examination (GRE) if they graduated from an institution not accredited by a regional accrediting agency. The Test of English as a Foreign Language (TOEFL) must be submitted by applicants who are graduates of programs taught in a language other than English.

Entrance classification

All students who have been accepted for admission to doctoral study are classified as regular Ph.D. students and are subject to all of the general degree requirements listed below. Applicants with a master's degree who do not intend to pursue a degree program but wish merely to attend one or two courses are classified as professional development students. Credits earned as a professional development student are not applicable toward a doctoral degree, unless the student subsequently transfers to regular status and the courses are accepted as part of the Ph.D. program.

Post-master's students who have demonstrated outstanding achievement and who later wish to pursue a Ph.D. degree may apply for admission to the doctoral program. The applicant must complete a new application form, available from Graduate Admissions, and submit official transcripts and letters of reference if these were not included with the original application for admission. When considering changes of status, the applicant's performance at Oakland University will receive strong consideration.

Advisory committee

As soon as possible after admission, but prior to earning 16 credits of course work, students must form an advisory committee which will direct and guide the progress of their program. Such a committee is composed of four faculty members, specified as follows:

1. Three faculty members nominated by the student (one designated as chair and one selected from a department outside the School of Engineering and Computer Science).
2. One member appointed by the dean of the School of Engineering and Computer Science.
3. Upon recommendation of the advisory committee, following successful completion of the Ph.D. comprehensive examination, one member from within or outside the university community may either be added to the committee or replace a member for the dissertation proposal and review.

The entire committee must have the approval of the Dean of the School of Engineering and Computer Science and the Office of Graduate Study.

Initial advising

During the first semester after admission to the Ph.D. program, a student will be given a preliminary evaluation by a committee of two faculty members appointed by the dean. The purpose of the preliminary evaluation is to examine the student's background and preparation to do independent research. The committee will formulate an initial Plan of Study for use until the student forms his/her advisory committee, thereby ensuring the benefit of faculty counsel throughout the Ph.D. program. The student's advisory committee can at any time update the Plan of Study.

■ Doctoral degree requirements

Students must meet the following doctoral degree requirements:

Course work credits

At least 56 credits must be earned for course work beyond the bachelor's degree (exclusive of dissertation). The normal full-time load is 8 to 12 credits per semester. Students who have earned a master's degree may petition to have a maximum of 32 credits applied toward the 56. The advisory committee will evaluate the student's prior master's degree work and allow Ph.D. credits for courses relevant to the proposed Ph.D. course of study. All candidates must complete at least 24 credits of additional course work exclusively at Oakland University. In the Ph.D. program, credit will not be awarded for courses in which a grade less than 3.0 is earned. All numerical grades earned are used in computing a student's grade point average.

Comprehensive examination

Each student is required to take a comprehensive examination after the student has completed all of his/her course work, but before completing no more than 8 credits of dissertation research. The examination is designed to assess the student's analytical reasoning, theoretical understanding and preparedness to do independent research. The examination is composed of a written component and an oral component. The written examination includes at least two discipline-specific areas relevant to the student's course work and research interest. The student's advisory committee, based on the student's preparation, selects the areas for the examination. The oral examination follows within a month of the written examination. The written examination is commonly split into no more than three parts to be taken over a reasonable period of time (usually not to exceed one month). A student may repeat the comprehensive examination once.

Dissertation proposal

As soon as a candidate and the advisory committee chair agree on a specific research topic, the candidate must write a dissertation proposal. This document contains a formulation of the problem, the background work leading to the formulation and a plan for the subsequent research. Candidates must orally present the proposal to their advisory committees and any other interested faculty, at which time the committee may question the preparedness of the student to carry out the research.

Research credits

Students who have advisory committee approval of their dissertation proposals and are conducting research should register for EGR 790 or ME 790. At least 24 research credits are required of all doctoral candidates. However, merely amassing credits does not indicate satisfactory progress toward or completion of the dissertation. These judgments are made by the advisory committee. The dissertation is judged completed upon successful completion of the final examination and acceptance of the dissertation by the Office of Graduate Study.

Dissertation

Each candidate will submit a dissertation to the advisory committee. The dissertation must be the candidate's own work and must constitute a contribution to knowledge in his/her field of endeavor. All dissertations must conform to university standards (see "Master's thesis/doctoral dissertation" in the Policies and Procedures section of this catalog).

Residence

Writing a doctoral dissertation requires a full commitment to research. Such research cannot be effectively pursued in an environment which places research in a secondary role. Doctoral students are required to be full-time students for at least one year of their active dissertation research. The doctoral student should arrange such a period of residency by (1) registering for at least 8 credits of doctoral dissertation research for two consecutive semesters, and (2) making a commitment, in a statement addressed to his/her advisory committee, to a program of

full-time (at least 20 hours per week) research.

The above represents the normal residency requirement. However, if the present occupation of the candidate (e.g., industrial research or teaching) is conducive to the intended research, there is an alternative method to fulfilling the residency requirement. To arrange for that kind of residency, the candidate must apply in writing to his/her advisory committee at the time of the dissertation proposal review. The committee must be furnished with a written statement by the candidate's employer confirming that the dissertation research constitutes a major portion of the job assignment. If the advisory committee grants permission to pursue this option, the student must enroll in doctoral dissertation research (8 credits maximum) for at least two consecutive semesters.

The work of Ph.D. students described in the above paragraph will be documented by term reports, reviewed and accepted by the chair of the advisory committee. A copy of every report will be kept in the student's file. The advisory committee will review these reports. If the progress is unsatisfactory or the student and the employer are unable to fulfill the terms of the residency agreement, the advisory committee can declare the residency requirements unfulfilled.

Final examination

Each Ph.D. candidate must satisfactorily defend the dissertation in a final oral examination administered by the advisory committee. The examination is taken after the advisory committee certifies that the dissertation is ready for final review. At the committee's option, one re-examination may be permitted if a candidate fails to pass the final examination.

Time limit

Students have a seven-year time limit to complete all requirements for the Ph.D., beginning with the first term of enrollment in the program. Credits earned prior to entry into the program will be evaluated by the advisory committee for their currency before completion of 24 credits of doctoral course work at Oakland University by the student. Course work that is determined to be outdated will not be applicable toward the degree.

Graduation

Students expecting to graduate in a given semester must file an application for degree at the Academic Records Office and pay the graduation service fee. Failure to do so on time will preclude graduation in that semester.

■ The Doctor of Philosophy in Systems Engineering

The field of engineering has evolved into a blending of disciplines that is well suited for dealing with such concerns as robotics and machine vision, electronic and communication systems, mechanics, material and manufacturing systems, fluid and thermal systems, dynamic systems and control, computer and microprocessor systems, and artificial intelligence and expert systems. The School of Engineering and Computer Science is concentrating its efforts in these areas at the Ph.D. level.

The Ph.D. program in systems engineering is for students who plan careers in industrial or governmental research and development laboratories or problem-oriented agencies, as well as in the academic field. Students can begin doctoral study on a part-time basis, availing themselves of late afternoon or evening courses while working full time in local industry. However, later phases of study and research will require full-time devotion to the program. Students must also fulfill a residency requirement.

Ph.D. discipline specializations

In keeping with the programs of study that are currently available through the Computer Science and Engineering Department, Electrical and Systems Engineering Department, and Mechanical Engineering Department, the student can follow any one of the following discipline specializations, depending upon his or her previous background and training.

- **Computer Systems:** The work in this discipline may be focused on hardware and software system design, artificial intelligence and expert systems, computer communication systems including parallel and distributed computing, computer graphic systems, computer vision and multimedia systems, pattern recognition and data mining, and software engineering systems.
- **Control Engineering and Dynamic Systems:** The work in this discipline may be focused on adaptive, intelligent, digital and optimal control systems, modeling and estimation of dynamic systems, robotic systems, fuzzy logic and neural network-based control systems.
- **Electrical Engineering Systems:** The work in this discipline may be focused on digital image and signal processing, microelectronic circuits and systems including VLSI, instrumentation and measurement systems, electromagnetic systems, and analog and digital communication systems.
- **Manufacturing Processes and Systems:** The work in this discipline may be focused on manufacturing processes including machining, metal forming, materials, automated inspection and evaluation systems, integrated manufacturing systems, flexible manufacturing systems, artificial intelligence in manufacturing systems, scheduling and systems integration.
- **Mechanical Engineering Systems:** The work in this discipline may be focused on engineering mechanics systems involving

acoustics, vibrations, classical/experimental mechanics and non-destructive testing; fluid and thermal energy systems involving phase change, combustion, and energy transfer and conversion; tribology systems involving friction, lubrication and wear; and general manufacturing processes systems.

Systems approach

The field of systems engineering recognizes the inter-disciplinary nature of engineering, particularly in the areas of robotics, electronics, communications, mechanics, manufacturing systems, fluid and thermal systems, dynamic systems and control, computer hardware and software systems, software engineering, artificial intelligence and expert systems. The successful analysis and design of complex engineering systems in each of these areas involve two major perspectives. The first perspective, characterized by viewing individual elements of any phenomenon, process or system as being inter-related, with the form of the relationship influencing the behavior of the whole, requires that a systems approach be taken in the analysis, modeling or synthesis of the phenomenon, process or system under consideration. The second perspective is discipline-specific and requires a detailed understanding of the fundamental physical principles or concepts associated with the particular system under study.

A direct benefit of the above approach to problem solving is that it ties the contributions made to the fundamental knowledge in the field with the nuances and constraints imposed by the environment on the specific problem under investigation. In other words, it makes the engineering research sensitive and relevant to practical applications. For example, consider the problem of computer vision. Research in this area will involve the fundamental principles of pattern recognition, digital signal processing, image enhancement, data communication, etc. However, a computer vision system that is associated with robotics in a classical or flexible assembly line manufacturing environment would be subjected to very different environmental conditions and constraints than would a computer vision system on an all-terrain, ground-based vehicle. Integration of such fundamental research, while recognizing the interaction with the environment, lends itself to a systems approach to problem solving.

It is this broad definition of engineering systems that forms the corner-stone of the Ph.D. program in systems engineering at Oakland University. The program is multi-disciplinary, drawing its strength and resources from the entire faculty of the School of Engineering and Computer Science.

Academic program

Because of the importance of the two perspectives outlined above, the Ph.D. program in systems engineering has two major components: systems concepts and discipline-specific options. The courses in the first component provide the necessary knowledge to apply a systems approach to problem solving.

The systems concepts required for the analysis and design of continuous systems are different from those required of discrete systems. Therefore, two tracks of courses have been identified to address the systems approach to these two different classes of systems. The two sets of courses are:

Continuous Systems (12 credits)

SYS 520 Signal and Linear Systems Analysis or ME 610
Continuum Mechanics

APM 541-542 Mathematical Analysis for Engineers, I and II

Discrete Systems (12 credits)

SYS 569 Computer Simulation in Engineering

APM 563 Discrete Mathematics I

APM 564 Discrete Mathematics II
or

APM 581 Theory of Computation

Every student in the systems engineering Ph.D. program is required to elect one of these two tracks.

Once the systems approach to problem solving has been established, a student will study several specific depth areas which relate to his/her research interest. These courses provide the discipline-specific component of the Ph.D. program. The student will concentrate on at least two of these areas, the selection of which will be the concerted effort of the student and the advisory committee. Although a student is expected to specialize in either continuous systems or discrete systems, he/she may select courses from other areas as deemed appropriate.

The current discipline-specific options offered by the School of Engineering and Computer Science include:

Continuous Systems

Optimal Control

Numerical Techniques

Manufacturing Processes

Dynamic Systems

Robotics

Quality and Reliability

Advanced Systems Theory

Tribology

Optimization and Decision Theory

Microelectronics, VLSI

Analog and Digital Communications

Energy Systems

Thermal Energy Transport

Signal and Image Processing

Fluid Transport

Instrumentation and Measurement

Experimental Stress Analysis

Electromagnetics

Solid Mechanics and Materials

Intelligent and Adaptive Control
 Dynamics, Vibrations and Noise
 Digital Control
 Automotive Mechatronics

Discrete Systems

Manufacturing Systems
 Computer Communications
 Computer Integrated Manufacturing
 Artificial Intelligence
 Flexible Manufacturing Systems
 Software Engineering
 Graphics and CAD/CAM
 Theory of Computing Systems
 Computer Hardware Design
 Microprocessor Systems
 Software Systems
 Parallel Processing
 Pattern Recognition
 Data Mining
 Computer Vision
 Multimedia Systems

For example, a student interested in robotics would be required to take the continuous systems track and may elect the following three discipline-specific options: robotics, dynamic systems and microprocessors. These three options not only cross the boundaries of the two classes of systems but also include courses from all three departments within the School of Engineering and Computer Science, yet they form a cohesive and intensive research program. This multidisciplinary approach is one of the unique features of the systems engineering Ph.D. program at Oakland University.

The requirement for the Ph.D. is completion of a unified program of formal course work, as specified above, and independent research, directed and approved by the advisory committee. While the courses and examinations for a particular student are specified by the advisory committee, all programs are subject to the following general regulations.

■ The Doctor of Philosophy in Mechanical Engineering

The field of mechanical engineering includes areas such as dynamics, vibrations and noise, energy systems, automotive engineering design, thermal energy transport, fluid transport, experimental stress analysis, solid mechanics, manufacturing processes and materials, tribology, numerical techniques, optical inspection, mechanics of metal forming, and fasteners and bolted joints. The Department of Mechanical Engineering is concentrating its efforts in these areas at the Ph.D. level.

The Ph.D. program in mechanical engineering is for students who plan careers in industrial or governmental research and development laboratories or problem-oriented agencies, as well as in the academic field. Alternatively, students can choose Ph.D. program in Systems Engineering, listed above. Students can begin doctoral study on a part-time basis, availing themselves of late afternoon or evening courses while working full time in local industry. However, later phases of study and research will require full-time devotion to the program. Students must also fulfill a residency requirement.

Academic Program

To fulfill the requirements of a Ph.D. in Mechanical Engineering, a student must satisfy the following coursework:

Mathematics

APM 541 Mathematical Analysis for Engineers I (4)
 APM 542 Mathematical Analysis for Engineers II (4)

Depth areas

Select at least two depth areas from the following:

Manufacturing Processes and Materials
 Experimental Stress Analysis
 Dynamics, Vibrations and Noise
 Automotive Engineering Design
 Energy Systems
 Thermal Energy Transport
 Fluid Transport
 Solid Mechanics
 Tribology
 Numerical Techniques
 Optical Inspection
 Mechanics of Metal Forming
 Fasteners and Bolted Joints.

A listing of the courses within each depth area is available from the ME department.

The depth areas should be selected in consultation with the Advisory Committee and related to student's research interests. Students can also select graduate electives from computer science and engineering, electrical engineering, systems engineering, mathematics, chemistry and physics, after consultation with the Advisory Committee. In addition to the 56 hours of coursework, students must also complete a minimum of 24 hours of research credits. Thus, a minimum of 80 graduate credits is required for the Ph.D. in Mechanical Engineering Program.

■ General Regulations for Master's Degree Programs

Admission

The engineering programs leading to a Master of Science degree build upon the preparation acquired in a baccalaureate engineering curriculum. A bachelor's degree in physics, mathematics or other field of science may be acceptable, but a student presenting such a degree should plan to spend additional time in residence to gain proficiency in the fundamentals of engineering.

A suitable background for the program leading to the Master of Science in computer science and engineering embedded systems, information systems engineering or software engineering is a baccalaureate in computer science, mathematics or engineering. A degree in another field may be acceptable but remedial course work may be required to overcome deficiencies.

Admission to the Master of Science program in engineering management requires a bachelor's degree in engineering or computer science.

Admission to master's study is selective; applicants should have an undergraduate GPA of 3.00 or better in their major area of study and in their mathematics and science courses.

Applicants should present official academic transcripts from all institutions attended and recommendations from two members of the undergraduate major department who are familiar with their accomplishments and promise. These recommendations form an important part of the admission credentials. Graduate Record Examination (GRE) scores are required for a) graduates from institutions not accredited by a regional accrediting agency, b) graduates of programs not accredited by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology (ABET), and encouraged for c) other applicants whose credentials do not meet regular admission criteria. The TOEFL score must be submitted by applicants who are graduates of programs taught in a language other than English. Additional entrance requirements for each engineering program are listed in the appropriate department section.

Entrance classification

A graduate student is classified in one of three categories:

Regular status: For students who meet normal entrance requirements and who are seeking the Master of Science degree.

Conditional status: For students whose credentials do not meet criteria for regular admission and who are seeking the Master of Science degree; this category is not used to admit students who present substantially weak credentials for graduate study. Conditional status may be granted for one or more semesters; the minimum requirement for continuation in the program is a GPA of 3.00.

Special graduate status: To be admitted to special graduate status, students must submit an application for admission, submit a transcript that provides evidence of a bachelor's degree awarded, and obtain approval from the chairperson of the department which offers the classes the student plans to attend. Credits earned as a special graduate student do not apply toward the Master of Science from Oakland University unless the student is admitted to regular status and the courses are accepted as part of the Master of Science program. In addition, no more than 12 credits earned in this status can be applied toward the degree.

Special graduates desiring regular status must submit official transcripts and letters of recommendation if these were not with the original application for admission. When considering changes of status, the faculty will weigh heavily the applicant's performance at Oakland University. A 3.00 cumulative average in graduate courses is a minimal requirement.

Post-baccalaureate status: For students who have a bachelor's degree from a regionally accredited college or university and wish to enroll in undergraduate courses to prepare for an advanced degree program. Application for this type of admission should be made through the undergraduate admissions office.

Master's adviser

The progress of each regular student toward the Master of Science degree is directed by the student's adviser, who is a faculty member of the School of Engineering and Computer Science, and is assigned at time of admission. Incoming students seeking the degree are urged to discuss their proposed concentration area with their adviser or faculty members in that area. Students who wish to change their adviser can do so with the approval of the chair of their department.

Master's project or thesis

Although the master's degree requirements may be satisfied by taking only course work, either a graduate engineering project (690) or a directed master's thesis research (691) may be included as part of the program in place of elective courses. Students choosing the thesis option (691) must select an advisory committee which is composed of at least two faculty members

from the School of Engineering and Computer Science. The selection of the committee and the plan of study must be approved by the department chair. The chair (major professor) of the advisory committee will direct and guide the research. The student must propose a research topic to the committee for approval; however, a formal presentation of the proposal is not necessary. The completed thesis must conform to university standards (see “Master’s thesis/ doctoral dissertation” in the Policies and Procedures section of this catalog). At the completion of the research and its documentation, the content of the thesis must be publicly presented and defended. Successful defense of the thesis is a prerequisite for earning the research credits.

Course credit

Normally, graduate credit is awarded only for courses numbered 500 or higher. However, up to 4 credits of Oakland University senior-level (400-499) courses in the major can be approved for graduate credit by the student’s adviser. With the added approval of the graduate committee of the school, an additional 4 credits of senior-level courses can also be counted toward the required 32 credits. Course credit will not be awarded for work applied toward another degree. Students who have received credit for the 400-level version of a cross-listed senior/graduate course cannot receive credit toward a graduate degree for the 500-level version of that course.

Work load and scheduling

Full-time students must register for 8 to 12 credits per semester. Graduate assistants must be full-time students and commit 20 hours per week toward their research or teaching assistantship assignment. Graduate assistants normally register for only 8 credits per semester; however, a 12-credit load can be taken with the approval of the chair of their department.

For the convenience of part-time students employed in industry, courses are arranged in late afternoon and early evening. However, these students should be aware of the very real demands of graduate studies and should keep outside work commitments and their academic load in balance.

Academic progress

The minimum satisfactory grade for graduate work is 3.0. Credit for completion of a course in a Master of Science program will be given for grades of 2.5 or above but not more than two grades may be in the range of 2.5 to 2.9. Graduate credit will not be awarded for grades below 2.5. To repeat a course, a student must have the permission of the graduate committee of the school.

All grades received as a graduate student are used in computing the GPA except that, if a course has been repeated, the most recent grade is used in the calculation of the GPA. A graduate student is placed on academic probation if the student’s overall GPA drops below 3.00 or if the student receives more than one grade below 3.0, including the original grade(s) of any repeated course(s). A graduate student receiving a grade less than 3.0 while on probation is subject to dismissal. A graduate student receiving more than two grades below 3.0 is subject to dismissal

whether or not the student was put on probation previously.

In all programs the minimum grade point requirement is an average of at least 3.00. If a student’s GPA is less than 3.00 after having attempted 16 credits, the student will be recommended for dismissal from the program.

■ The Master of Science Degrees in

- Electrical and Computer Engineering
- Mechanical Engineering
- Systems Engineering

Students may earn the Master of Science in electrical and computer engineering, mechanical engineering or systems engineering. The degree requirements may be satisfied by taking only course work. However, a graduate engineering project (690) or master’s thesis research (691) provides a unique and valuable learning experience in which an individual student works with a faculty member in an area of mutual interest. Therefore, students are encouraged to include such an experience, as their program permits.

General degree requirements

To fulfill the requirements for a Master of Science degree in electrical and computer engineering, mechanical engineering or systems engineering programs, a student must:

- 1 . Complete at least 32 credits of graduate-level work, of which at least 24 credits must be in approved courses offered by the School of Engineering and Computer Science.
- 2 . Earn a cumulative GPA of at least 3.00 in courses applied toward the degree.
- 3 . Complete the requirements specified for the program in electrical and computer engineering, mechanical engineering or systems engineering.

Approval by the master’s degree adviser and the department chair is required for independent study, engineering projects, master’s thesis or special topics courses that are used toward the degree. In addition, approval of the faculty administering the independent study, advising the thesis or project, or teaching the special topics course must be obtained before registering for these credits. No more than 8 thesis or project credits may be used toward the degree requirements. The completed thesis must conform to university standards (see “Master’s thesis/ doctoral dissertation” in the Policies and Procedures section of this catalog).

• Electrical and computer engineering requirements:

In addition to the general degree requirements, a student must fulfill the following program requirements to be awarded the Master of Science in electrical and computer engineering:

Theory courses (4-8 credits):

APM 541	Mathematical Analysis	
APM 542	for Engineers I and II	(each) 4
APM 563	Applied Mathematics: Discrete Methods	4
MTH 555	Complex Analysis	4
SYS 520	Signal and Linear Systems Analysis	4
EE 533	Random Signals and Processes	4

Required courses (16 credits):

Select three from the following:

SYS 520	Signal and Linear Systems Analysis	4
EE 525	Instrumentation and Measurements	4
EE 534	Principles of Digital Communications	4
EE 545	Electromagnetic Engineering	4
EE 585	VLSIC Design of Digital Chips	4
EE 637	Digital Signal Processing	4

and one of the following:

CSE 564*	Computer Organization and Architecture	4
CSE 570*	Microprocessor-based Systems Design	4
CSE 571	Design of Embedded Software Computer Systems	4

Electives** (8-12 credits):

Students with specialized interests should consider choosing 8-12 credits of electives within one of the depth areas listed below:

Communications

EE 533	Random Signals and Processes	4
EE 534	Principles of Digital Communications	4
EE 545	Electromagnetic Engineering	4
EE 626	High-Frequency Electronics	4
EE 632	Wireless Communications	4
EE 633	Signal Detection and Estimation Theory	4
EE 635	Modulation and Coding	4
EE 637	Digital Signal Processing	4
EE 638	Digital Image Processing	4

Computers

EE 570*	Microprocessor-based Systems Design	4
EE 572	Microcomputer-based Control Systems	4
EE 581	Integrated Circuits and Devices	4
EE 585	VLSIC Design of Digital Chips	4
CSE 564*	Computer Organization and Architecture	4
CSE 571*	Design of Embedded Software Computer Systems	4
SYS 569*	Computer Simulation in Engineering	4
SYS 674	Digital Control Systems	4

Controls

EE 525	Instrumentation and Measurements	4
EE 572*	Microcomputer-based Control Systems	4
EE 575*	Automotive Mechatronics I	4
EE 675	Automotive Mechatronics II	4
SYS 520	Signal and Linear Systems Analysis	4
SYS 630	Optimal Control Theory	4
SYS 631	Estimation and Control Theory	4
SYS 632	Analysis of Nonlinear Control Systems	4
SYS 674	Digital Control Systems	4

Electronics

EE 575*	Automotive Mechatronics	4
EE 581	Integrated Circuits and Devices	4
EE 585*	VLSIC Design of Digital Chips	4
EE 587*	Integrated Electronics	4
EE 625	Applications of Analog Integrated Circuits	4
EE 626	High-Frequency Electronics	4
EE 675	Automotive Mechatronics II	4
EE 682	Field-Effect Devices	4
EE 683	Advanced VLSI Analog/Digital Systems Design	4

Energy

EE 525	Instrumentation and Measurements	4
SYS 520	Signal and Linear Systems Analysis	4
SYS 557	Energy Conservation Systems	4
SYS 558*	Electrical Energy Systems	4
SYS 721	Large-Scale Dynamic Systems	4

Students not interested in any one of the above depth areas are expected to consult with their adviser in selection of 8-12 credits of electives either from those listed under required courses or depth areas above and/or from the following:

EE	567, 620, 725,
SYS	510*, 563*, 623, 664, 722, 731,
CSE	513*, 547*, 571*
PHY	562, 574, 583, 632, 673
EE	594, 595, 690, 691, 795

TOTAL CREDITS REQUIRED FOR DEGREE 32

* These courses are cross-listed as advanced undergraduate and graduate courses. If completed as a 400-level course or equivalent as part of baccalaureate degree, the course may be used to offset graduate program requirements. However, credit will not then be awarded and must be earned by completion of an approved substitute course.

** Other electives that are appropriate to the student's plan of study require prior approval of the faculty adviser and the department chair.

Thesis Option

Students electing this option must accumulate a minimum of 8 credits of EE 691. Successful completion and defense of a thesis is a prerequisite for earning thesis credits. All theses must conform to university standards (see "Master's thesis/doctoral dissertation" in the Policies and Procedures section of this catalog).

• Mechanical engineering requirements:

In addition to the general degree requirements, a student must fulfill the following program requirements to be awarded the Master of Science in mechanical engineering:

Theory Courses (4 credits):

Select one of the following:

APM 541	Mathematical Analysis for Engineers I	4
APM 542	Mathematical Analysis for Engineers II	4
ME 539	Computational Fluid Dynamics	4
ME 549	Numerical Techniques in Heat Transfer and Fluid Flow	4
ME 569	Finite Elements	4

Students must take the theory course before completing 12 credits of their MS coursework.

Plus select one of the five options described below.

1. Engineering Mechanics Option

Required course (4 credits):

ME 521	Dynamics	4
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Depth areas (16 credits):

Select two courses from each of the following depth areas:

Solid Mechanics

ME 563	Applied Elasticity	4
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and one of the following:

ME 523*	Acoustics and Noise Control	4
ME 524	Vibration Analysis	4
ME 562	Fatigue Analysis and Design	4
ME 564	Mechanics of composite Materials	4
ME 569	Finite Elements	4
ME 571	Theory of Plasticity	4
ME 578	Mechanics of Metal Forming	4
ME 669	Advanced Finite Elements	4

Experimental Mechanics

ME 565	Experimental Stress Analysis	4
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and one of the following:

ME 567*	Optical Measurement and Quality Inspection	4
ME 665	Optical Methods in Experimental Mechanics	4

Electives** (4-8 credits):

Select 4 to 8 credits from:

ME	561*, 572*, 574*, 575* or any other ME courses with level 500 and above;
SYS	422, 510, 520, 630, 684.

With approval:

ME	594, 595, 690, 691, 795
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TOTAL CREDITS REQUIRED FOR DEGREE 32

2. Fluid and Thermal Systems Option**Required course (4 credits):**

ME 582*	Fluid and Thermal Energy Systems	4
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Depth areas (16 credits):

Select two courses each from any two of the following depth areas:

Energy Systems

ME 554*	Solar and Alternate Energy Systems	4
ME 555	Combustion Processes	4

Thermal Energy Transport

ME 548 *	Thermal Energy Transport	4
ME 549*	Numerical Techniques in Heat Transfer and Fluid Flow	4
ME 648	Thermal Transport Phenomena	4

Fluid Transport

ME 538*	Fluid Transport	4
ME 539*	Computational Fluid Dynamics	4
ME 638	Convective Transport Phenomena	4

Electives (4-8 credits):**

Select 4 to 8 credits from:

ME	550*, 557*, 639, 657; courses from remaining depth area above, or any other ME courses with level 500 and above;	
SYS	422, 510, 520, 630, 684;	
With approval:		
ME	594, 595, 690, 691, 795	
TOTAL CREDITS REQUIRED FOR DEGREE		32

3. Manufacturing Processes Option**Required course (4 credits):**

ME 572*	Material Properties and Processes	4
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Depth areas (16 credits):

Select two courses from any two of the following depth areas:

Materials and Manufacturing Processes

ME 564	Mechanics of Composite Materials	4
ME 571	Theory of Plasticity	4
ME 574*	Manufacturing Processes	4
ME 575*	Lubrication, Friction and Wear	4
ME 578	Mechanics of Metal Forming	4
ME 674	Machining Processes	4
ME 675	Advanced Tribology	4
ME 678	Advanced Metal Forming	4

Computer-Aided Engineering/Inspection

ME 567*	Optical Measurement and Quality Inspection	4
ME 569	Finite Elements	4
ME 576*	Product and Process Development	4
ME 577*	Concurrent Engineering	4
ME 587*	Mechanical Computer-Aided Engineering	4
ME 588	Mechanical Computer-Aided Manufacturing	4
ME 669	Advanced Finite Elements	4

Plastics and Composites Manufacturing Engineering

ME 543*	Polymeric Materials	4
ME 544*	Plastics Processing Engineering	4
ME 545*	Plastics Product Design	4

Electives (4- to 8 credits):**

Select 4 to 8 credits from:

ME	521, 524, 561*, 563, 565, 569, 610, 665, or any other ME courses with level 500 and above	
SYS	422, 510, 517, 520, 583*, 585*, 630, 684	
With approval:		
ME	594, 595, 690, 691, 795	
TOTAL CREDITS REQUIRED FOR DEGREE		32

4. Automotive Engineering Option

Required course (4 credits):

Select one of the following:

ME 521	Dynamics	4
ME 572*	Material Properties and Processes	4
ME 557*	Internal Combustion Engines I	4

Depth areas (16 credits):

Select at least two courses from each of the following depth areas.

Automotive Engineering Design

ME 584*	Automotive Engineering Design I	4
and one of the following:		
ME 523*	Acoustics and Noise Control	4
ME 524	Vibration Analysis	4
ME 539*	Computational Fluid Dynamics	4
ME 562	Fatigue Analysis and Design	4
ME 565	Experimental Stress Analysis	4
ME 567	Optical Measurement and Quality Inspection	4
ME 684	Automotive Engineering Design II	4

Internal Combustion Engines

ME 557*	Internal Combustion Engines I (Mandatory if not taken as required course)	4
ME 548*	Thermal Energy Transport	4
ME 555	Combustion Processes	4
ME 559	Advanced Automotive Propulsion Systems	4
ME 575*	Lubrication, Friction and Wear	4
ME 657	Internal Combustion Engines II	4

Electives** (4 to 8 credits):

Select 4 to 8 credits from :

ME	Any courses with level 500 and above,
EE	473, CSE 571, SYS 520
With approval:	
ME	594, 595, 690, 691, 795

TOTAL CREDITS REQUIRED FOR DEGREE 32

5. General Mechanical Engineering Option

Required course (4 credits):

Select one of:

ME 521	Dynamics	4
ME 572*	Material Properties and Processes	4
ME 582*	Fluid and Thermal Energy Systems	4

Depth areas (16 credits):

Select two courses each from any two of the depth areas listed under options 1, 2, 3 or 4 above.

Electives** (4 to 8 credits):

Remaining 4 to 8 credits from:

ME	Any courses with level 500 and above,
EE/SYS/CSE	Any elective courses listed under options 1, 2, 3 or 4 above
With approval:	
ME	594, 595, 690, 691, 795

TOTAL CREDITS REQUIRED FOR DEGREE 32

Thesis Option

Students electing this option must accumulate a minimum of 8 credits of ME 691. Successful completion and defense of a thesis is a prerequisite for earning thesis credits. Four of the thesis credits may be used to fulfill one of the courses in a depth area requirement. All theses must conform to university standards (see "Master's thesis/doctoral dissertation" in the Policies and Procedures section of this catalog).

*These courses are cross listed as advanced undergraduate and graduate courses. If completed as a 400-level course or equivalent as part of baccalaureate degree, the course may be used to offset graduate program requirements. However, credit will not then be awarded and must be earned by completion of an approved substitute course.

**Other electives in engineering, mathematics, physics or chemistry that are appropriate to the student's plan of study require prior approval of the faculty adviser and the department chair.

• Systems engineering requirements:

A student in the Master of Science in systems engineering program is required to select one of five options, as well as one of its associated depth areas. The five options are:

- 1 . Dynamic systems and control
- 2 . Manufacturing systems
- 3 . Robotic systems
- 4 . System modeling and computer simulation
- 5 . General systems engineering

In addition to the general degree requirements, a student must fulfill the program requirements for one of the options to be awarded the Master of Science in systems engineering.

1. Dynamic Systems and Control Option

Theory courses (4 to 8 credits):

APM 541-542	Mathematical Analysis for Engineers I and II	(each) 4
APM 553	Advanced Ordinary Differential Equations	4
MTH 555	Complex Analysis	4
SYS 520	Signal and Linear Systems Analysis	4
EE 533	Random Signals and Processes	4

Required courses (12 to 16 credits):

Students are required to select at least three courses from:

SYS 520	Signal and Linear Systems Analysis	4
SYS 630	Optimal Control Theory	4
SYS 631	Estimation and Control Theory	4
SYS 674	Digital Control Systems	4

Associated depth areas (8 to 16 credits):

A student is required to take at least two courses from one of the following depth areas.

(Depth area courses are listed below)

Advanced Control Systems

Robotic Systems

Intelligent Systems

Dynamic Systems

Nonlinear Systems

Microprocessor Control Systems

Optimization of Systems

Electives** (0 to 8 credits):

Additional credits may be taken from the following electives or the student may select

the M.S. thesis option (See listing below).

SYS	Any course with level 500 and above
CSE	512*, 513*, 516*, 545*, 550*, 571*
EE	525, 533, 567, 570*, 572*, 585*, 625, 637, 638, 683
ME	521, 569, 572*, 574*
PHY	56

TOTAL CREDITS REQUIRED FOR DEGREE 32

2. Manufacturing Systems Option

Theory courses: (4 to 8 credits):

APM 541-542	Mathematical Analysis for Engineers I and II	(each) 4
APM 563	Applied Mathematics: Discrete Methods I	4
MOR 554	Mathematical Programming	4
SYS 510	Systems Optimization and Design	4
SYS 517	Probability and its Engineering Applications	4

Required courses (12 to 16 credits):

Students are required to select at least three courses from:

SYS 563*	Foundation of Computer-aided Design	4
SYS 583*	Production Systems	4
SYS 585*	Statistical Quality Control	4
SYS 684	Computer-Integrated Manufacturing Systems	4

Associated depth areas (8 to 16 credits):

A student is required to take at least two courses from one of the following depth areas.

(Depth area courses are listed below)

Industrial Systems

Intelligent Systems

Manufacturing Process Systems

Manufacturing Systems

Modeling of Manufacturing Systems

Optimization of Systems

Robotic Systems

Stochastic Systems

Electives** (0 to 8 credits):

Additional credits may be taken from the following electives or the student may select the

M.S. thesis option (see listing below).

SYS	Any course with level 500 or above
CSE	512*, 513*, 516*, 545*, 550*, 571*
EE	525, 533, 567, 570*, 572*, 585*, 625, 637, 638, 683
ME	521, 569, 572*, 574*
PHY	562

TOTAL CREDITS REQUIRED FOR DEGREE 32

3. Robotics Systems Option

Theory courses: (4 to 8 credits):

APM 541	Mathematical Analysis	
APM 542	for Engineers I and II	(each) 4
APM 553	Advanced Ordinary	
	Differential Equations	4
APM 565	Differential Geometry	4
SYS 510	Systems Optimization and Design	4
SYS 520	Signal and Linear Systems Analysis	4

Required courses (12 to 16 credits):

Students are required to select at least three courses from:

SYS 520	Signal and Linear System Analysis	4
SYS 575*	Automotive Mechatronics I	4
SYS 623	Dynamics and Control	
	of Robot Manipulators	4
SYS 632	Analysis of Nonlinear	
	Control Systems	4

Associated depth areas (8 to 16 credits):

A student is required to take at least two courses from one of the following depth areas.

(Depth area courses are listed below)

Computer Systems
Dynamic Systems
Intelligent Systems
Linear Control Systems
Manufacturing Systems
Microprocessor Control Systems
Nonlinear Systems
Optimization of Systems

Electives** (0 to 8 credits):

Additional credits may be taken from the following electives or the student may select the M.S. thesis option (see listing below).

SYS	Any course with level 500 and above
CSE	512*, 513*, 516*, 545*, 550*, 571*
EE	526, 533, 567, 570*, 572*, 585*, 625, 637, 638, 683
ME	521, 569, 572*, 574*
PHY	562
TOTAL CREDITS REQUIRED FOR DEGREE	
32	

4. Systems Modeling and Computer Simulation Option

Theory courses (4 to 8 credits):

APM 541	Mathematical Analysis	
APM 542	for Engineers I and II	(each) 4
APM 553	Advanced Ordinary	
	Differential Equations	4
APM 565	Differential Geometry	4
SYS 510	Systems Optimization and Design	4
SYS 517	Probability and Its	
	Engineering Applications	4
SYS 520	Signal and Linear Systems Analysis	4

Required courses (12 to 16 credits):

Students are required to select at least three courses from:

SYS 520	Signal and Linear Systems Analysis	4
SYS 563*	Foundation of	
	Computer-aided Design	4
SYS 569*	Computer Simulation in Engineering	4
SYS 587*	Foundations of Systems Engineering	4

Associated depth areas (8 to 16 credits):

A student is required to take at least two courses from one of the following depth areas.

(Depth area courses are listed below)

Dynamic Systems
Industrial Systems
Linear Systems
Manufacturing Systems
Mechanical Systems
Modeling of Manufacturing Systems
Nonlinear Systems
Optimization of Systems
Robotic Systems
Stochastic Systems

Electives** (0 to 8 credits):

Additional credits may be taken from the following electives or the student may select the M.S. thesis option (see listing below):

SYS	Any course with level 500 and above
CSE	512*, 513*, 516*, 545*, 550*, 571*
EE	526, 533, 567, 570*, 572*, 585*, 625, 637, 638, 683
ME	521, 569, 572*, 574*
PHY	562
TOTAL CREDITS REQUIRED FOR DEGREE	
32	

5. General Systems Engineering Option**Mathematics (4 to 8 credits):**

APM 541	Mathematical Analysis	(each) 4
APM 542	for Engineers I and II	
APM 553	Advanced Ordinary Differential Equations	4
APM 563	Applied Mathematics: Discrete Models I	4
APM 565	Differential Geometry	4
MOR 554	Mathematical Programming	4
MTH 555	Complex Analysis	4

Required courses (12 to 16 credits):

Students are required to select at least three courses from:

SYS 510*	Systems Optimization and Design	4
SYS 569*	Computer Simulation in Engineering	4
SYS 587*	Foundations of Systems Engineering	4
SYS 680	Engineering Decision Analysis	4

Associated depth areas (8 to 16 credits):

A student is required to take at least two courses from one of the following depth areas.

(Depth area courses are listed below)

Computer Systems
Dynamic Systems
Electrical Systems
Industrial Systems
Intelligent Systems
Linear Control Systems
Manufacturing Process Systems
Manufacturing Systems
Mechanical Systems
Modeling of Manufacturing Systems
Nonlinear Systems
Optimization of Systems
Robotic Systems
Stochastic Systems

Electives (0 to 8 credits):**

Additional credits may be taken from the following electives or the student may select the M.S. thesis option.

(See listing below)

SYS	Any course with level 500 and above
CSE	512*, 513*, 516*, 545*, 550*, 565*, 571*, 578*
EE	525, 533, 567, 570*, 572*, 585*, 625, 637, 638, 683
ME	521, 569, 572*, 574*
PHY	562

TOTAL CREDITS REQUIRED FOR DEGREE 32

Systems Engineering Depth Areas.

The student must select at least two courses from one of the following depth areas associated with their option, above.

Advanced Control Systems:	SYS 632, SYS 635, SYS 735
Computer Systems:	SYS 563*, EE 567, EE 570*, EE 572*, EE 585*
Dynamic Systems:	SYS 520, SYS 575*, SYS 675, EE 525, ME 521
Electrical Systems:	EE 525, EE 570*, EE 572*, EE 585*, EE 637, EE 638, EE 683
Industrial Systems:	SYS 517, SYS 577*, SYS 583*, SYS 585*, SYS 680
Intelligent Systems:	SYS 635, SYS 735, CSE 512*, CSE 516*
Linear Control Systems:	SYS 433, SYS 520, SYS 575*, SYS 630, SYS 675
Manufacturing Process Systems:	SYS 484, SYS 563*, EE 526, ME 574*
Manufacturing Systems:	SYS 484, SYS 577*, SYS 587*, SYS 684, CSE 512*
Mechanical Systems:	SYS 422, SYS 575*, SYS 623, SYS 675, ME 521
Microprocessor Control Systems:	SYS 674, EE 525, EE 570*, EE 572*
Modeling of Manufacturing Systems:	SYS 517, SYS 569*, SYS 587*, CSE 512*
Nonlinear Systems:	SYS 510*, SYS 623, SYS 632, SYS 635
Optimization of Systems:	SYS 510*, SYS 630, SYS 631, CSE 513*
Robotic Systems:	SYS 422, SYS 575*, SYS 623, SYS 675, EE 525
Stochastic Systems:	SYS 517, SYS 585*, SYS 631, EE 533

*These courses are cross listed as advanced undergraduate and graduate courses. If completed as a 400-level course or equivalent as part of a baccalaureate degree, the course may be used to offset graduate program requirements. However, credit will not then be awarded and must be earned by completion of an

approved substitute course.

**Other electives that are appropriate to the student's plan of study require prior approval of the faculty adviser and department chair.

Thesis Option.

Students electing this option must accumulate a minimum of 8 credits of SYS 691. Successful completion and defense of a thesis is a prerequisite for earning thesis credits. All theses must conform to university standards (see "Master's thesis/doctoral dissertation" in the Policies and Procedures section of this catalog).

■ The Master of Science Degrees in

- **Computer Science and Engineering**
- **Software Engineering**
- **Embedded Systems**
- **Information Systems Engineering**

The Master of Science programs in computer science and engineering, software engineering, embedded systems and information systems engineering are designed to prepare students for significant computer-related careers in business and industry and simultaneously for further graduate study. The Master of Science program in computer science and engineering offers a natural continuation of studies for students who have received a baccalaureate in computer engineering or computer science. Similarly, the Master of Science program in software engineering offers a natural continuation of studies for students who have received a baccalaureate degree in computer science. It is designed to enhance the skills of students already engaged in software engineering careers in business and industry. Consequently, the students concentrate almost exclusively on mastering and applying the theories and methodologies of software engineering with a high level of skill. The advanced level prerequisite courses CSE 501-504 afford an opportunity for students with strong academic or professional records in related fields to prepare for graduate studies in the above graduate programs in minimal time.

The Master of Science program in information systems engineering is primarily aimed at individuals who want to focus on building or managing information systems. It strives to provide a more practice-oriented course setting. The Master of Science program in embedded systems is a specialized program with focus on gaining specialized knowledge related to the design and development of embedded systems.

Admission requirements

- B.S. in Computer Science (CS) or Computer Engineering (CE). Applicants from other disciplines would be considered after successfully completing appropriate prerequisite courses.
- Grade point average of 3.00 or better
- Official GRE scores are required of applicants having the qualifying degree from an institution not regionally accredited
- Official TOEFL scores are required of graduates of programs taught in a language other than English.

Additionally, the applicants seeking admission in Software Engineering should have two years of software development experience.

• **Computer Science and Engineering requirements:**

A total of 32 credits of graduate coursework are required which must satisfy the core, depth and breadth requirements as given below.

- Core requirement: Must complete three courses from common core. One of the courses must be from theory core consisting of CSE 510, CSE 511, APM 577 and APM 581. (12 credits)
- Depth requirement: Must complete master's thesis or two courses, one of which must be at 600/700 level, from one of the specialty groups. (8 credits)
- Breadth requirement: Must complete one course each from at least two specialty groups (other than the depth group). (8 credit hours)
- Elective: Select any CSE course numbered 510 and above. (4 credits)

Total: 32 credits

Thesis Option

Students electing this option must accumulate a minimum of 8 credits of CSE 691. Successful completion and defense of a thesis is a prerequisite for earning these credits. All theses must conform to university standards (see "Master's thesis/doctoral dissertation" in the Policies and Procedures section of this catalog).

• **Software Engineering requirements:**

A total of 32 credits of graduate coursework are required which must satisfy the core and depth requirements as given below.

- Core requirement: Must complete CSE 510, CSE 539 and CSE 522 from the common core. Students having the knowledge equivalent to these courses may substitute other courses from the common core. (12 credit hours)
- Breadth requirement: Must do a course from one of the non-software engineering specialty groups. (4 credit hours)
- Depth requirement: Must complete remaining courses from the software engineering group. (16 credit hours)

Total: 32 credits

Thesis Option

Students electing this option must accumulate a minimum of 8 credits of CSE 691. Successful completion and defense of a thesis is a prerequisite for earning these credits. All theses must conform to university standards (see "Master's thesis/doctoral dissertation" in the Policies and Procedures section of this catalog).

• Embedded Systems requirements:

- Core requirement: Must complete CSE 547, CSE 550 and CSE 564 from the common core. (12 credits)
- Breadth requirement: Must do a course from one of the non-embedded system specialty groups. (4 credits)
- Depth requirement: Must complete remaining courses from the embedded system group. (16 credits)

Total: 32 credits

• Information Systems requirements:

- Core requirement: Must complete CSE 547 or CSE 550, CSE 545 and CSE 551 from the common core. (12 credits)
- Breadth requirement: Must do a course from one of the non-information systems engineering specialty groups. (4 credits)
- Depth requirement: Must complete remaining courses from the information systems engineering group. (16 credits)

Total: 32 credits

500-700 Level courses

The following is the complete list of 500-700 level courses offered by the department. The prerequisite courses do not give any graduate credit. These are meant for students lacking sufficient background in computer science and engineering. Please consult the degree requirements to see how best to choose courses for your program of study.

Note: Courses listed under miscellaneous do not form a specialty group.

PREREQUISITE COURSES:

CSE 501	Programming and Data Structures	4
CSE 502	Microprocessors, Computer Organization and Assembly Language Programming	4
CSE 504	Discrete Structures and Foundations of Computer Science	4

CORE COURSES:

CSE 510	Fundamentals of SE Modeling	4
CSE 511	Design & Analysis of Algorithms	4
CSE 522	Object Oriented Analysis & Design	4
CSE 535	Topics in Programming Languages	4
CSE 539	Software Engineering	4

CSE 545	Database Systems I	4
CSE 547	Computer Communications	4
CSE 550	Operating Systems	4
CSE 551	Web Design and Applications	4
CSE 564	Computer Organization and Architecture	4

SPECIALITY GROUP COURSES:

Networking and Systems Group

CSE 549	Multimedia and Networks	4
CSE 647	Advanced Computer Communications	4
CSE 650	Distributed Systems	4
CSE 664	Parallel and Distributed Processing	4
CSE 666	Real-time Computer Systems	4

Embedded Systems Group

CSE 570	Microprocessor-based System Design	4
CSE 571	Design of Embedded Software Computer Systems	4
CSE 666	Real-time Computer Systems	4
CSE 670	Embedded Systems Design Using FPGAs	4
CSE 671	DSP in Embedded Systems	4
CSE 672	Hardware/Software Co-Design in Embedded Systems	4

Information System Engineering Group

CSE 542	Rapid Prototyping & Component Software	4
CSE 581	Data Mining and Knowledge Discovery	4
CSE 582	Information Retrieval	4
CSE 583	E-Commerce and ERP	4
CSE 645	Database Systems II	4
CSE 681	Information Security	4

Software Engineering Group

CSE 521	Software Requirements Engineering	4
CSE 537	Systematic Software Development	4
CSE 538	Software Verification & Testing	4
CSE 540	Software Quality Assurance	4
CSE 541	Software Project Planning and Management	4
CSE 639	Software Maintenance & Reuse	4
CSE 640	Software Architecture	4

Intelligent Computing Group

CSE 512	Artificial Intelligence in Manufacturing	4
CSE 513	Soft Computing	4
CSE 516	Artificial Intelligence	4
CSE 517	Agent-Based Systems	4
CSE 555	Computer Graphics I	4
CSE 556	Computer Graphics II	4
CSE 616	Applied Pattern Recognition	4
CSE 618	Visual Computing	4
CSE 718	Advanced Visual Computing	4

MISCELLANEOUS

CSE 594	Independent Study	2-4
CSE 595	Special Topics	2-4
CSE 690	Graduate Project	2-4
CSE 691	Master's Thesis Research	2-8
CSE 794	Independent Study	2-4
CSE 795	Special Topics	2-4

■ The Master of Science in Engineering Management

The Master of Science program in engineering management is offered by the School of Engineering and Computer Science in cooperation with the School of Business Administration. Intended for students with a bachelor's degree in engineering or computer science, the program has as its goal the provision of the tools and skills necessary for making sound management decisions in industry and business while retaining one's commitment to a specialized field of endeavor. Applicants with a computer science background may be required to take remedial courses in engineering.

To be awarded the Master of Science degree in engineering management the student must:

1. Successfully complete a minimum of 42-43 credits of graduate level work as specified below.
2. Earn a grade point average of at least 3.00 in courses applied toward the degree.

Theory courses: (select 4 credits)

MOR 554	Mathematical Programming	4
STA 501	Statistical Methods in Research and Production	4
STA 503	Design and Analysis of Industrial Experiments	4

Required core: (select 12 credits)

SYS 510*	Systems Optimization and Design	4
SYS 569*	Computer Simulation in Engineering	4
SYS 585*	Statistical Quality Control	4
SYS 680	Engineering Decision Analysis	4
SYS 684	Computer-Integrated Manufacturing Systems	4

Group A: (select 8 credits)

Choose two 500- and/or 600-level courses, in one discipline only, from SYS, EE, ME or CSE (excluding CSE 501, 502 and 504)

Group B: (select 15 credits)

ACC 512	Managerial Accounting Systems	3
ECN 521	Managerial Economics	3
FIN 533	Financial Management	3
MIS 524	Management Information Systems	3
MKT 560	Marketing	3
ORG 631	Human Resources Management	3
POM 521	Operations Management	3

Group C: (select 3 to 4 credits)**

ACC 511	Financial Accounting	3
ECN 522	Macroeconomic Analysis	3
MGT 550	Legal Environment of Business	3
MIS 525	Management of Information Resources	3
ORG 530	Organizational Behavior	3
CSE 545*	Database Systems	4
SYS 583*	Production Systems	4
SYS 587	Foundation of Systems Engineering	4

TOTAL CREDITS REQUIRED FOR DEGREE 42-43

* These courses are cross listed as advanced undergraduate and graduate courses. If completed as a 400-level course or equivalent as part of baccalaureate degree, the course may be used to offset graduation program requirements. However, credit will not then be awarded and must be earned by completion of an approved substitute course.

** Some of the courses in this group may serve as prerequisites for above courses.

COURSE OFFERINGS

Courses offered through the School of Engineering and Computer Science carry the following designations: computer science and engineering courses (CSE), electrical engineering courses (EE), systems engineering courses (SYS), mechanical engineering courses (ME). Courses offered under the general title of engineering are listed under EGR. For some of the courses, the semester(s) in which they are usually offered is indicated at the end of the course description. However, this is subject to change.

ENGINEERING

EGR 500

Engineering Seminar (1)

Lectures and discussions conducted by faculty, graduate students and speakers from industry and other universities. Emphasis is on current research interests of the school.

EGR 790

Doctoral Dissertation Research (2 to 12)

Directed research toward the doctoral dissertation.

COMPUTER SCIENCE AND ENGINEERING

CSE 501

Programming and Data Structures (4)

Introduction to the C++ programming language, iteration and recursion, functions, strings, structures, pointers, concepts of abstract data type and object-oriented programming. Data structures including lists, stacks, queues, binary trees and their traversal, and searching and sorting. Applications including stackbased algorithms, binary search trees, expression trees and heaps. An accelerated course intended to provide working knowledge in programming using data structures. Credit not applicable toward an M. S. degree in the CSE department. *Prerequisites: MTH 155 and knowledge of at least one high-level programming language.*

CSE 502

Microprocessors, Computer Organization and Assembly Language Programming (4)

An accelerated course in computer organization, hardware design and low-level programming. Assembly level machine organization, representation of data, memory organization and mapping, instruction set and programming, concepts of RISC and CISC machines, Boolean functions and circuits, minimization and design, flip-flops, excitation tables, design of synchronous sequential circuits, shift registers, study of single processor architectures, interfacing and communication. Credit not applicable toward an M. S. degree in the CSE department. *Prerequisite: CSE 501 or equivalent.*

CSE 504**Discrete Structures and Foundations of Computer Science (4)**

An accelerated course presenting fundamental mathematical background for computer science. Propositions, truth tables, implication, equivalence, logical proofs, quantifiers, mathematical induction. Sets, relations, functions, orderings, equivalences. Cardinality, counting, combinations, permutations, binomial coefficients, inclusion and exclusion principles. Digraphs, isomorphism, paths, cycles, adjacency matrices. Time orders of algorithms, NP-completeness, iteration versus recursion. Finite automaton acceptors and regular sets, context-free grammars and languages, pushdown automata, Turing machines, unsolvable problems. Credit not applicable toward an M. S. degree in the CSE department.

Prerequisite: CSE 501 or equivalent.

CSE 510**Fundamentals of SE Modeling (4)**

A graduate level presentation of basic mathematical background for the study of computer science, computer engineering, and software engineering. Boolean expressions; propositional calculus; proofs; formal logic; quantification; predicate calculus; predicates and programming; sets, relations, functions, orderings and equivalence relations; mathematical induction; integers and sequences; graph theory.

Prerequisite: CSE 504 or equivalent.

CSE 511**Design and Analysis of Algorithms (4)**

This course covers computer algorithms, their design, and their analysis. Different strategies for constructing algorithmic solutions, including Divide-and-Conquer, Dynamic Programming and Greedy Algorithms, are discussed and illustrated using graph and artificial intelligence problems. The development of algorithms for parallel and distributed architectures is also discussed. Computational complexity, as it pertains to time and space, is used to evaluate algorithms. Amortized analysis (aggregate and accounting methods) is introduced and used to evaluate data structures implementations. A general overview of complexity classes is given. The course emphasizes algorithm design rather than implementation.

Prerequisites: CSE 501 and 504 or equivalent.

CSE 512**Artificial Intelligence in Manufacturing (4)**

This course focuses on the integration of the techniques and methodologies from artificial intelligence and manufacturing engineering. On the manufacturing side, issues of design, manufacturability, process planning and cost analysis are cast around feature-based CAD/ CAM technologies. The artificial intelligence techniques include standard transparent representation schemes of rule bases and semantic networks as well as the most up-to-date opaque representations of neural networks and genetic algorithms, both areas integrated with issues of fuzzy logic and control. Involves a large class project.

Prerequisite: Background in artificial intelligence, manufacturing, or business.

CSE 513**Soft Computing (4)**

This course studies algorithms that can be used to add humanlike intelligence to computer systems. Topics covered include fuzzy logic, artificial neural networks, genetic algorithms, and classification and regression trees. Applications to machine learning, pattern recognition and intelligent automation.

Prerequisites: CSE 501 and 504 or equivalent.

CSE 516**Artificial Intelligence (4)**

Introduction to artificial intelligence techniques including knowledge representation using semantic networks, scripts, frames, predicate calculus, production and expert systems, and procedures; learning via symbolic and adaptive algorithms; natural language understanding; and game playing and other searching problems.

Prerequisite: CSE 335 or equivalent.

CSE 517**Agent-Based Systems (4)**

Introduction to intelligent agents and multiagent systems; distributed problem solving and planning; search algorithms for agents; interaction and cooperation; action and behavior modeling of agents; learning and knowledge acquisition; applications.

Prerequisites: CSE 501 and 504 or equivalent.

CSE 521**Software Requirements Engineering (4)**

This course studies the mechanisms underlying programming decisions and presents systematic procedures for making these decisions. The procedures studied cover the design of iterative loops and sequence statements, along with general heuristics that represent problem-solving strategies. The course uses the formalism of relational algebra. The relational algebra is covered in class.

Prerequisites: CSE 501 and 504 or equivalent.

CSE 522**Object Oriented Analysis and Design (4)**

This course covers the methodologies of object oriented (OO) modeling during the planning, analysis and design stages of software systems development. Predominant methodologies and techniques such as the Unified Modeling Language (UML) will be surveyed. OO programming using an OO language such as C++ or Java is not covered in this course. Topics include both process oriented issues, such as the application of use case modeling during OO requirements analysis, and product-oriented issues, such as the definition of an OO design using class diagrams.

Prerequisites: CSE 501 and 504 or equivalent.

CSE 535

Topics in Programming Languages (4)

Modern topics in programming languages such as: object-oriented languages, functional programming logic programming, parallel programming, concurrent programming in a distributed environment, formal syntax and semantics, exception handling, client-server programming.

Prerequisites: CSE 231, 335 and 343.

CSE 537

Systematic Software Development (4)

A project-driven, language-independent, top-down software development method based on specifications and refinement of every step of design. It involves user-defined Abstract Operations and Abstract Data types. A variant of the Vienna Development Method (VDM) is used. Specification techniques are introduced gradually, in step with a nontrivial term project. An emphasis is placed on practical applications of the method.

Prerequisites: Fluency in programming and a good command of data structures; APM 563 a plus.

CSE 538

Software Verification and Testing (4)

Systematic methods of software verification, testing and analysis and the supporting CASE tools. Topics: principles of formal verification, static program analysis and dynamic program analysis (testing and debugging). A significant part of the course is its lab component.

Prerequisite: CSE 501 or equivalent.

CSE 539

Software Engineering (4)

An overview of software development processes, tools and techniques from the perspective of learning what they can and cannot do; deciding when, how and why to apply them; and selecting among the available alternatives. Requirements analysis and specification techniques; life-cycle models; process modeling; software design methods; project planning and management; quality assurance; configuration management; program and system testing.

Prerequisite: CSE 501 or equivalent.

CSE 540

Software Quality Assurance (4)

Intended for students who have mastered fundamental design and programming skills. The impact of software design and construction techniques on structural quality for both object-oriented and traditional decomposition. The relationship between software structure and software maintainability (modifiability and readability) and reusability is emphasized. Topics include software design, object-oriented design and its impact on reuse and modifiability, information hiding, layers of abstraction, coupling and cohesion, polymorphism and inheritance hierarchies for reuse, designing reusable components and libraries, structuring code for maintenance, coding for readability, modularity, abstraction mechanisms in design, software complexity.

Prerequisite: CSE 501 or equivalent.

CSE 541

Software Project Planning and Management (4)

Software project planning and management topics include uncertainty and risk analysis; planning a software project; project modeling, scheduling and milestones; resource allocation; software cost estimation; mechanisms for monitoring and controlling schedule, budget, quality and productivity; staffing, leadership, motivation, and team building; communication management and project documentation.

Prerequisite: CSE 539 or equivalent.

CSE 542

Rapid Prototyping and Component Software (4)

Methodologies for rapid prototyping and component software use. Topics include: platforms for rapid prototyping and object-oriented software development; available software components; object request brokers (COM/CORBA/OLE); data modeling, transaction processing and federated database; client and server web technologies. A theory and project oriented course.

Prerequisite: CSE 501 or equivalent.

CSE 545

Database Systems I (4)

Study of the design and implementation of relational, hierarchical and network database systems. Query/ update languages; conceptual data models; physical storage methods; database system architecture; database security and integrity. Includes the study of existing systems.

Prerequisites: CSE 501 and CSE 504 or equivalent.

CSE 547

Computer Communications (4)

A study of data communications and computer networks with emphasis on the functional characteristics of communications hardware and the design of communications control software. Standard protocols and interfaces. Case studies of local area networks and wide area networks. Communications software is designed and implemented as student projects.

Prerequisite: CSE 550 or permission of the instructor.

CSE 549

Multimedia and Networks (4)

Multimedia system requirements, data representation and compression, input/output and devices, network load implications, Multimedia authoring, web design and presentation of multimedia, collaborative multimedia sessions, graphical user interface design using Tcl/Tk and Java.

Prerequisite: CSE 547

CSE 550

Operating Systems (4)

Introduction to the concepts and design of multi-programmed operating systems. Typical topics include: historical perspectives; sequential processes; concurrent processes; processor management; store management; scheduling; file management; resource protection; a case study.

Prerequisites: CSE 501 and 502 or equivalent.

CSE 551**Web Design and Applications (4)**

Advanced concepts in web design, creation and use of web development tools, simple and advance application design will be covered. The students will do a design project during the second half of the semester. This course assumes prior knowledge of web programming.

Prerequisite: CSE 501

CSE 555**Computer Graphics I (4)**

Introduction to the concepts underlying two- and three-dimensional computer graphics. Topics include an overview of graphics hardware and software; capabilities and algorithms of a two-dimensional raster graphics package; basics of three-dimensional raster graphics; algorithms for simple three-dimensional raster graphics; introduction to computer animation.

Prerequisites: MTH 256 and CSE 231 or permission of instructor.

CSE 556**Computer Graphics II (4)**

Continuation of CSE 555. Topics covered include realistic rendering techniques (hidden line/ surface, lighting, shading, texture mapping); mathematics and data structures for curve, surface and solid representation (including B-spline and Bezier techniques), advanced animation techniques (key-frame animation, morphing).

Prerequisites: CSE 555 or permission of instructor.

CSE 564**Computer Organization and Architecture (4)**

Stored program computers, theory and design of arithmetic-logic and control units, hardwired design and microprogrammed design, performance metrics and scalability, pipelined computer design, interfacing input/ output units with processors, parallel processing. Emphasis of this course is on hardware design and organization.

Prerequisite: CSE 502 or equivalent.

CSE 570**Microprocessor-based Systems Design (4)**

Application of microprocessors and microcomputers to the solution of typical problems; interfacing microprocessors with external systems such as sensors, displays and keyboards; programming considerations, microcomputer system and memory system design. A laboratory design course; several short design projects and one large design project. This course integrates concepts learned in required courses and provides a design experience. The large design project includes cost/ trade-off analysis, submitting a detailed written report and oral presentation of the project. Credit cannot be earned for more than one of CSE 470/ 570 and EE 470/ 570. Offered fall, winter.

Prerequisite: CSE/ EE 378 or CSE 502 or equivalent.

CSE 571**Design of Embedded Software Computer Systems (4)**

Design of real-time systems with microcontrollers such as the 68HC11 and 68332. Object-oriented software development using both assembly language and high-level languages. Use of interrupts. Project-oriented course. Offered winter.

Prerequisite: CSE 570 or equivalent.

CSE 581**Data Mining and Knowledge Discovery (4)**

This course provides a background in data warehousing technologies, and their applications in knowledge discovery using data mining algorithms. Data preparation, reduction, and transformation concepts are presented as integral component of the discovery life cycle. Data mining algorithms, including association rules, decision trees, link analysis, clustering, regression and neural models are covered. The theoretical concepts presented are supplemented with adequate hands-on experience with software tools for data mining.

CSE 582**Information Retrieval (4)**

Introduction; information retrieval models; retrieval evaluation; query languages; query operations; text and multimedia documents; indexing and searching; visualization; web search engines.

CSE 583**E-Commerce and ERP (4)**

This course focuses on the evolving technologies on the world wide web that support new models of business. These models include 1) electronic commerce with concerns of fault tolerance, security, and 24x7 availability and 2) ERP with concerns of financial, human resource and manufacturing systems integrating together into inter-company supply chain systems.

CSE 594**Independent Study (2 to 4)**

Independent study in a special area of computer science and engineering. Topic must be approved prior to registration.

CSE 595**Special Topics (2 to 4)**

Study of special topics in computer science and engineering. May be taken more than once.

CSE 616**Applied Pattern Recognition (4)**

Pattern recognition system model; feature extraction; taxonomy of classification methods; parametric and nonparametric classifiers; clustering techniques; performance evaluation; applications in image and speech recognition.

CSE 618

Visual Computing (4)

Introduction; image representation, image formats and image coding; manipulating image appearance; computation of image properties such as shape, color and texture; image segmentation.

CSE 639

Software Maintenance & Reuse (4)

This course discusses issues related to the reuse and maintenance of software, including techniques and processes to comprehend the purpose, utilization and interdependencies of software components. Topics include software development paradigms as they relate to reuse and maintenance; methodologies and tools for building for and with reuse; methods for the reengineering and evolution of existing software; and methods and tools for assessing and measuring products and processes.

CSE 640

Software Architecture (4)

Software architecture captures the fundamental high-level structure and behavior of software systems. Topics covered in this course include role of the architecture in the software life cycle; different architectural styles for single as well as distributed processes; and architecture description languages for various architectural viewpoints. Topics include architectural styles for both single process and distributed systems, such as pipe/filter, data flow, data centered, client-server and distributed objects.

CSE 645

Database Systems II (4)

Continuation of CSE 545. Concurrency control, recovery and query optimization for database systems; distributed database systems; object-oriented database systems; knowledge-base systems; optimization of conjunctive queries and linear recursions; experimental knowledge-base systems; the universal relation as a user interface. Students will create and conduct studies of standard relational databases as a laboratory component of this course.

Prerequisite: CSE 545 or equivalent.

CSE 647

Advanced Computer Communications (4)

Data communications networking technology; protocols and architecture; protocol specification and verification; network performance measurement and predication-analysis, simulation, and modeling.

Prerequisite: CSE 547 or equivalent.

CSE 650

Advanced Operating Systems (4)

This course focuses on distributed operating systems. Communication protocols such as message systems and RPC; synchronization of distributed systems; processes and processors; distributed file systems; distributed shared memory.

Prerequisite: CSE 550 or equivalent.

CSE 664

Parallel and Distributed Processing (4)

Classes of computer systems, SIMD parallel and MIMD computers, interconnection networks and parallel memories, parallel algorithms; performance evaluation of parallel systems; parallel computers such as Illiac IV, PEPE and STARAN; pipelined computers; multiprocessing by tight and loose coupling; distributed systems; data flow machines; architecture and software considerations.

Prerequisite: CSE 564.

CSE 666

Real-Time Computer Systems (4)

This course emphasizes hard and soft real-time computer system design for uniprocessor embedded system applications and distributed real-time systems. Topics covered include characterizing real-time systems, performance measure, task assigning, scheduling, fault-tolerant scheduling, run-time error handling, run-time support, compiler, linker, debugger, kernel, real-time databases, real-time communication, software development techniques; practical applications.

Prerequisite: CSE 570 or 571

CSE 670

Embedded Systems Design Using FPGAs (4)

The use of hardware description languages such as VHDL in the design of embedded systems containing both an FPGA and a microprocessor; high-level design tools to specify, simulate and synthesize designs to FPGAs; design examples.

CSE 671

DSP in Embedded Systems (4)

This course emphasizes design of embedded systems using Digital Signal Processing microprocessors, and special DSP FPGA chips. Topics covered include, DSP microprocessor architecture, advanced instructions, addressing modes, interrupt, system design considerations, interfacing serial and parallel I/O, memory structure, arithmetic manipulations, software development tools, multiple DSP processor system design, and embedded system applications. Applications include automotive, multimedia and wireless communications. Performance measurement, benchmarking and DSP system simulation, testing and debugging. Design of DSP embedded system using Synopsys COSSAP tools. The students will do a set of lab projects and a large embedded system design project.

CSE 672

Hardware/Software Co-Design in Embedded Systems (4)

This research-oriented course will study hardware/software co-design issues and explore the use of FPGAs in the design of low-cost, high-performance embedded systems.

Prerequisite: CSE 670 and CSE 571.

CSE 681 **Information Security (4)**

Introduction to cryptography; message authentication; digital signatures and authentication protocols; e-mail security; IP security; web security; intruders, viruses and worms; firewalls

CSE 690 **Graduate Computer Science and Engineering Project (2 to 12)**

Independent work on an advanced computer science and engineering project. Topic must be approved prior to registration.

CSE 691 **Master's Thesis Research (2 to 8)**

Directed research leading to a master's thesis. Topic must be approved prior to registration.

CSE 718 **Advanced Visual Computing (4)**

2-D and 3-D object recognition; stuff detectors; video representation, video formats and coding; motion; image and video analysis for content-based retrieval.

Prerequisite: CSE 618

CSE 794 **Independent Study (2 to 4)**

Advanced independent study in a special area of computer science and engineering. Topic must be approved prior to registration.

CSE 795 **Special Topics (2 to 4)**

Advanced study of special topics in computer science and engineering. May be taken more than once.

■ ELECTRICAL ENGINEERING

For additional related courses students should refer to the course offerings in systems engineering (SYS) and computer science and engineering (CSE).

EE 473 **Automotive Electronics (4)**

Review of basic automotive devices and circuits. Characteristics, models and interfacing of sensors and actuators. Basic electronic and electromechanical controllers; engines, transmission, brake, suspension and traction. Battery system supply. Ancillary system components: safety, auto theft, diagnostics, collision avoidance. Laboratory and design projects.
Prerequisites: Introductory courses in electrical circuits and linear systems.

EE 525 **Instrumentation and Measurements (4)**

Errors in measurements, error corrections and minimization; transducers and their applications; signal conditioning and interfacing; electromagnetic compatibility and interference problems in instrumentation; measurement instruments and their characteristics. Measurement systems, signal analyzers and data acquisition systems; signal conversion; computer and microprocessor-based instrumentation. With project.
(Previously EE 526). Offered fall.
Prerequisite: Permission of instructor.

EE 533 **Random Signals and Processes (4)**

Provides the foundation needed to work with the random signals which are encountered in engineering. Concept of a random variable. Properties of one- and multi-dimensional random variables. Concept of a stochastic process. Characterization of random waveforms using power spectral density and the correlation function. Random signals in linear systems. Applications to engineering systems. Offered winter.
Prerequisite: Basic knowledge of linear systems.

EE 534 **Principles of Digital Communications (4)**

Source coding, signal design, modulation and demodulation. The optimal receiver principle, synchronization, communications over narrow band channels, fading channels and error correction codes. Offered fall.
Prerequisite: A previous course in communications systems or instructor permission.

EE 545 **Electromagnetic Engineering (4)**

Electromagnetic theory with applications. Diffraction, radiation, propagation, guided waves, optical transmission and resonant cavities. Offered winter.
Prerequisite: Background in vector calculus and basic electromagnetic theory.

EE 567 **Computer Networks (4)**

Resource-sharing principles; communications and networks; packet switching; the ARPANET; network performance using principles of queueing theory; network design principles, capacity assignment; flow assignment; topological design. Other related topics.

EE 570

Microprocessor-based System Design (4)

Application of microprocessors and microcomputers to the solution of typical problems; interfacing microprocessors with external systems such as sensors, displays and keyboards; programming considerations, microcomputer system and memory system design. A laboratory design course; several short design projects and one large design project. This course integrates concepts learned in required courses and provides a design experience. The large design project includes cost/trade-off analysis, submitting a detailed written report and oral presentation of the project. Credit cannot be earned for more than one of CSE 470/570 and EE 470/570. Offered fall, winter.

Prerequisite: CSE/EE 378 or CSE 502 or equivalent.

EE 572

Microcomputer-based Control Systems (4)

Microcomputer-aided control system design and implementation techniques; board-level microcomputer and digital signal processor technology; design and realization of digital controllers, estimators and filters; hardware development of stand-alone, on-line microcomputer/processor-based control systems; real-time applications and multi-processor systems. A laboratory and project oriented course. Offered fall, winter.

Prerequisite: EE 570 or CSE 570.

EE 575

Automotive Mechatronics I (4)

Overview of mechatronics; modeling, identification and simulation of electro-mechanical devices; introduction to computer-aided software; basic automotive sensors; basic actuators and power train devices; principles of automotive and industrial electronic circuits and control systems (analog and digital); principles of product design; mechatronics case studies. Credit can not be received for both EE 575 and SYS 575.

EE 581

Integrated Circuits and Devices (4)

Fundamentals of semiconductor electronics. Theory and operation of PN junctions and junction devices. MOS devices. Integrated circuits functional blocks, fabrication techniques, processing steps and equivalent circuits. Device modeling and simulation techniques. Offered winter.

EE 585

VLSIC Design of Digital Chips (4)

Design techniques for rapid implementation and evaluation of Very Large Scale Integrated Circuits (VLSIC), including behavioral, functional, logic, circuit, device, physical IC fabrication, and layout issues. CMOS and pseudo NMOS technology, inverters, logic and transmission gates switching characteristics and processing. Reliability, yield and performance estimation. The course is project oriented. Students start with concepts and finish with actual Application Specific Integrated Circuits (ASICs) using modern CAD tool suites. Offered winter.

EE 587

Integrated Electronics (4)

Modern microelectronics processes and fabrication of integrated circuits. Crystal growth and wafer preparation, photolithography, dielectric and polysilicon film deposition, epitaxial growth, oxidation, diffusion, ion implantation, etching, metalization and integrated circuits layout principles. Introduction to MOS-based and bipolar junction transistor-based microcircuits design and fabrication. Fabrication processing simulation using SUPREM, with projects. Offered winter, even years.

EE 594

Independent Study (2 to 4)

Independent study in a special area of electrical engineering. Topic must be approved prior to registration.

EE 595

Special Topics (2 to 4)

Study of special topics in electrical engineering. May be taken more than once.

EE 620

Multi-dimensional Signal Theory (4)

Random vector analysis. Generalized harmonic analysis. Correlation and spectrum analysis of stochastic fields. Multi-dimensional linear systems. Transformations of random fields in multidimensional systems. Elements of generalized functions and Hilbert spaces. Applications to signal field processing, image processing and antenna and sensor array design.

Prerequisite: SYS 520.

EE 625

Applications of Analog Integrated Circuits (4)

Building blocks of analog integrated circuits and their limitations; characteristics, analysis and applications of analog integrated circuits; principles of circuit and system design with analog integrated circuits. Offered winter.

Prerequisite: Permission of instructor.

EE 626

High-Frequency Electronics (4)

Transmission lines with sinusoidal and pulse excitation. Passive and active circuit components at high frequency. High frequency amplifiers, communication circuits, waveform generators and digital circuits. Introduction to high frequency measurements. (Previously EE 726.)

Prerequisite: Permission of instructor.

EE 632

Wireless Communications (4)

Introduction to wireless communication principles and systems. Wireless channel models, TDMA, FDMA, spread spectrum, CDMA, equalization, detection, estimation, coding, security, quality assessment of service and personal communications. The 2nd generation and 3rd generation wireless standards are also discussed. Offered fall, odd years.

Prerequisite: EE 534 or instructor permission.

EE 633
Signal Detection and Estimation Theory (4)

Noise analysis concept review, binary decision theory, multiple decision, sequential decision theory, nonparametric decision theory, fundamentals of estimation, sequential estimation theory, detection of coded information and error control.

Prerequisite: EE 533.

EE 634
Statistical Communication System Theory (4)

Harmonic analysis, sampling theory, stochastic process and correlation functions, linear systems response to random inputs, optimum linear systems (matched filters, Wiener filters) coherent and noncoherent filtering, nonlinear systems with random input (zero memory, square law, nth law devices), modulation theory, interference considerations.

Prerequisites: EE 533 or SYS 517.

EE 635
Modulation and Coding (4)

Phase shift keying (PSK), quadrature amplitude modulation (QAM), continuous phase modulation (CPM), constant envelope modulation, power spectral density, bandwidth efficiency, block codes, convolutional codes and turbo codes.

Offered winter, even years.

Prerequisites: EE 534.

EE 637
Digital Signal Processing (4)

Analysis of discrete signals and systems. Introduction to digital filters including finite and infinite impulse response filter. Discrete and Fast Fourier Transformations. Application of digital signal processing. Offered winter.

Prerequisite: Basic knowledge of linear systems.

EE 638
Digital Image Processing (4)

Fundamentals of digital image processing; review of one-dimensional signal processing techniques; introduction to two-dimensional signals and systems; two-dimensional digital filtering; image enhancement techniques; statistical model based methods and algebraic techniques for image restoration; image data compression; image analysis and computer vision. Selected applications. Offered fall, odd years.

Prerequisites: Knowledge of linear systems, and probability and statistics.

EE 675
Automotive Mechatronics II (4)

Extensive review of software and modeling fundamentals, sensors, actuators, power train characteristics, automotive and industrial control systems; selected topics include engine and exhaust gas sensors; sensor interfaces; injection electronic circuits, engine and transmission controllers, pneumatic servos and active suspension; electromagnetic compatibility and issues related to system design, compatibility requirements, filtering, shielding/grounding, testing; emerging technologies in

automotive mechatronics systems. Student projects. Credit cannot be received for both EE 675 and SYS 675.

Prerequisite: EE 575.

EE 682
Field-Effect Devices (4)

Electronic structure of semiconductor surfaces. Concepts of surface states and surface change. Metal-Semiconductor (MS) contacts: ohmic and rectifying. Conductivity modulation and the theory of JFET and MESFET transistors. Integrated device technology, including Silicon on Sapphire (SOS) and Silicon on Insulator (SOI) structures and their application.

Prerequisite: EE 581.

EE 683
Advanced VLSIC Analog/Digital Systems Design (4)

Full-custom design and analysis techniques of ASICs. Metal-Oxide-Semiconductor (MOS) devices, circuits and future trends. MOS processing and design rules. Extensive circuit simulation. Analog VLSIC basic functions. Graphical model representation. Amplifiers. Current mirrors. Computer Aided Design (CAD) of analog integrated circuits. Layout and design for testability considerations. Implementing integrated system design from circuit topology to patterning geometry to wafer fabrication. The course is project oriented. Students start with concepts and finish with testing and evaluating ASIC prototypes. Offered fall or winter.

Prerequisite: Permission of instructor.

EE 690
Graduate Engineering Project (2 to 4)

Independent work on an advanced project in electrical engineering. Topic must be approved prior to registration.

EE 691
Master's Thesis Research (2 to 8)

Directed research leading to a master's thesis. Topic must be approved prior to registration.

EE 725
Theory of Networks (4)

Network models of linear dynamic systems; network graphs and topological constraints, generalized equilibrium equations, time-frequency duality, energy and stability constraints, network passivity or activity, input-output representations, and state-transition matrices.

Prerequisite: SYS 520.

EE 741
Coherent Optics (4)

Current developments in coherent optics and holography; two-dimensional Fourier analysis, diffraction theory, Fourier transforming and imaging properties of lenses, holographic interferometry, optical data processing. With laboratory.

Prerequisite: SYS 520.

EE 794

Independent Study (2 to 4)

Advanced independent study in a special area in electrical engineering. Topic must be approved prior to registration.

EE 795

Special Topics (2 to 4)

Advanced study of special topics in electrical engineering. May be taken more than once.

■ MECHANICAL ENGINEERING

ME 521

Dynamics (4)

Generalized coordinates and matrix methods of analysis of the motion of particles and rigid bodies. Energy and momentum methods applied to mechanical systems. Euler and Lagrange methods applied to forces and motion. An introduction to mechanical vibrating systems. Keplerian motion and kinematics. Offered winter.

ME 523

Acoustics and Noise Control (4)

Introduction to vibrations and waves; plane and spherical acoustic waves; sound generation, transmission and propagation; sound intensity and power; principles and definitions of noise control; sound and hearing; hearing conservation; community, building and industrial noise control; measurement of sound. Offered spring.

ME 524

Vibration Analysis (4)

Analysis of lumped mechanical systems by application of D'Alembert's principle, Lagrange's equations, Hamilton's principle, and integral transforms. Matrix formulation of general n-degree-of-freedom systems with and without damping. Methods of approximation for continuous systems. Offered winter.

ME 538

Fluid Transport (4)

Continued study of the fundamentals of fluid mechanics and their applications; angular momentum principle, generalized study of various turbomachines, potential flow of inviscid fluids; laminar and turbulent boundary layer theory; dimensional analysis and similitude; compressible flow. With laboratory emphasizing engineering design. Offered fall.

ME 539

Computational Fluid Dynamics (4)

Overview of the physical and mathematical foundations of computational fluid dynamics (CFD). Practical numerical solution techniques for the Navier-Stokes equations; Finite difference and finite volume methods, including discretization, stability analysis, time stepping and multigrid methods are covered. Discussion of grid generation and complex geometries. Introduction to commercial CFD software (Fluent/Gambit). Offered fall.

Corequisites: ME 538, or approval of instructor; knowledge of a programming language.

ME 543

Polymeric Materials (4)

Fundamentals of plastic materials. Terminology and nomenclature for plastics. General topics dealing with plastics, such as structure, morphology, properties, etc. Focus on mechanical and physical properties and mechanical behaviors of plastics. Plastics processing, testing, design, and recycling is introduced. Project required.

ME 544

Plastics Processing Engineering (4)

Polymeric materials and their manufacturing related properties. Principles and design of extrusion, post extrusion processes, molding and forming processes. Rheological behavior of polymers, melt-flow characteristics, modeling and simulation. With project and laboratory.

ME 545

Plastics Product Design (4)

Design of plastic/composite products based on strength, stiffness, creep, impact, chemical and environmental attack. Effect of processing on part quality and performance. Design of plastic parts for manufacturability. Prototyping plastic parts. Design of plastic parts for joining and assembly. Use of CAD/CAM/CAE software for structural analysis and design optimization. Project required.

ME 548

Thermal Energy Transport (4)

Continued study of properties and descriptions of conduction, convection and thermal radiation heat transfer; thermal boundary layer theory; forced and natural convection, heat transfer correlations. Thermodynamics of thermal radiation, radiation intensity, surface properties and energy exchange. Laboratory emphasizes experimental design and development of empirical relationships. Offered winter.

ME 549 **Numerical Techniques in Heat Transfer and Fluid Flow (4)**

Overview of practical numerical solution techniques. Major emphasis is on concepts, methodology and physics associated with the formulation of the discretization equations appropriate for the representation and solution of linear and nonlinear partial differential equations governing heat transfer and fluid flow. Personal and mainframe computers will be used for the solution of a variety of engineering and design problems. Offered winter, odd years.

ME 550 **Computer-Aided Data Acquisition Analysis and Control (2)**

Introduction to and "hands-on" experience with computer-aided data acquisition, analysis and control as it relates to fluid and thermal experimentation and measurements. Topics include computer hardware and software, a variety of measurement and control instrumentation, communication between instrumentation and computer. ASYST programming language, instrument operation and calibration, data acquisition and analysis. Design-oriented laboratory projects.
Corequisite: ME 582, or permission of instructor.

ME 554 **Solar and Alternate Energy Systems (4)**

The analysis and design of energy conversion systems. Principles of optimum power transfer and efficiency. Availability analysis of systems for heating, chemical conversion and electrical generation. Emphasis on solar applications and alternative energy technology. Includes design project(s). With laboratory.

ME 555 **Combustion Processes (4)**

Thermodynamics of state, mixtures, Gibbs free energy; chemical equilibrium, stoichiometry; chemical reaction kinetics, reaction rate, mixing, catalyst action; fluid vaporization, condensation, atomization; applications, spark and compression ignition, continuous combustion.
Prerequisite: ME 456 or equivalent.

ME 557 **Internal Combustion Engines I (4)**

An introduction to the thermodynamics, fluid mechanics and performance of internal combustion engines, including an introduction to engine types and their operation, engine design and operating parameters, ideal thermodynamics cycles, the thermodynamics of actual working fluids and the actual cycles, gas exchange processes, heat losses, performance, exhaust gas analysis and air pollution. With laboratory. Offered fall.

ME 559 **Advanced Automotive Propulsion Systems (4)**

An overview of prime movers suitable for vehicle propulsion. Topics include: a morphological description of various internal combustion engines, current and future passenger car engines

and powertrains, energy alternatives, legislative issues, vehicle integration, and suitable advanced technologies. The course typically will be taught by a team of industry experts. Offered Winter.

Prerequisite: ME 557, or equivalent experience in I.C. engines.

ME 561 **Analysis and Design of Mechanical Structures (4)**

Use and methods of advanced mechanics of materials to design mechanical structures to meet elastic strength criteria. Topics include plates and shells, torsion of noncircular cross-sections, beams on elastic foundation, curved and composite beams, rotating disks, thick-walled cylinders, and energy methods. Offered fall.

ME 562 **Fatigue Analysis and Design (4)**

Emphasis is placed on analytical and predictive methods that are useful to design engineers in avoiding fatigue failure. The most current fatigue analysis methods, techniques and applications are introduced, which include the following: guidance for choosing and applying the analysis methods most appropriate to a fatigue situation; variable amplitude loading and statistical fatigue properties; engineering case studies involving the development of both fundamental and advanced analytical skills.

ME 563 **Applied Elasticity (4)**

Fundamentals of solid mechanics, stress-strain and equilibrium and compatibility equations, generalized Hook's law, boundary conditions. Plane strain and generalized plane stress, plane elasticity. Airy stress function, torsion and bending, St. Venant principle, introduction to thermoelasticity, and numerical methods. Offered winter.

ME 564 **Mechanics of Composite Materials (4)**

Introduction to composite materials. Forming procedures and manufacturing. Basic principles of fiber-reinforced composite materials. Introduction to micromechanics of a lamina. Macromechanical behavior of a laminate. Bending of laminated plates. Stress analysis of viscoelastic composite materials. Characterization and design of composite materials. Structural synthesis. Offered fall, even years.

ME 565 **Experimental Stress Analysis (4)**

Experimental determination of stress and strain in loaded members. Use of capacitance strain gage, resistance strain gages and rosettes and Wheatstone bridges, optical strain gages and rosette, and two-dimensional photoelasticity and photoelastic coatings. Design of experiments and portable transducers which measure force, moment and displacement and deformations etc. With laboratory. Offered fall, winter.

ME 567

Optical Measurement and Quality Inspection (4)

Topics include the state-of-the-art optical methods such as holography, shearography, moire, three-dimensional computer vision, electronic speckle pattern interferometry and laser triangulation; with applications to measurement of displacement, vibrational mode shapes, material properties, residual stresses, three-dimensional shapes, quality inspection and nondestructive testing. Offered fall, winter.

ME 569

Finite Elements (4)

Structural analysis through matrix formulation using direct and variational methods; stiffness and flexibility matrices for triangular, quadrilateral and isoparametric elements in two and three dimensions. Finite element programs and available graphics hardware for data preparation. Offered fall.

ME 571

Theory of Plasticity (4)

Details of the fundamental mechanics of plastic deformation are explored. Yield criteria, hardening laws, constitutive relations, ductile fracture criteria and instability models are covered. An emphasis on theoretical concepts is made in order to prepare the student for metal forming problem solutions.

ME 572

Material Properties and Processes (4)

Study of mechanical behavior of real engineering materials and how they influence mechanical design. True stress/strain properties of materials, plastic deformation and fracture of materials, failure theories, fatigue damage under cyclic loading, creep and high temperature applications. Material properties of engineering metals, ceramics and composites. Behavior of materials during and after manufacturing processes such as stamping, drawing, extrusion, etc. Offered winter, summer.

ME 574

Manufacturing Processes (4)

Fundamentals and technology of machining, forming, casting and welding. Mechanics of cutting. Molding of polymers. Tolerancing and surface topography. Manufacturing considerations in design. Economics of manufacturing. Process assembly and product engineering. With laboratory. Offered fall, winter.

ME 575

Lubrication, Friction and Wear (4)

Study of fundamental wear mechanisms including: adhesive, abrasive, corrosive and surface fatigue. Boundary and hydrodynamic lubrication. Friction theories. Surface topography characterization. Applications: journal and ball bearings, gears and engine components. Offered spring, fall.

ME 576

Product and Process Development (4)

Topics include traditional and nontraditional approaches in product and process development and optimization, including conventional experimental mechanics and acoustic test methods. The Taguchi approach and other methods for design of experiments are used to study the interaction of variables and to attain optimization. Offered fall.

ME 577

Concurrent Engineering (4)

Principles of concurrent engineering including: manufacturing competitiveness, performance indicators, life-cycle management, strategic technology insertions, process re-engineering, cooperative work teams, supplier organization, information modeling and product realization taxonomy. Credit can not be received for both ME 577 and SYS 577. Offered winter.

ME 578

Mechanics of Metal Forming (4)

Study of mechanics, metallurgy and basic analytical and numerical methods needed to understand the analysis of metal forming processes. Topics include: introduction to plasticity, yield criteria, work hardening and plastic anisotropy; ideal work method, slab and upper-bound analyses; formability, springback and forming limit diagrams. Overview of using commercial finite element packages to simulate bulk and sheet metal forming. Offered fall.

ME 582

Fluid and Thermal Energy Systems (4)

Study of systems involving fluid and thermal phenomena. Includes conventional and unconventional energy conversion, fluid and thermal energy transport. Analysis, design and optimization of systems are emphasized using basic integral, differential and lumped parameter modeling techniques. The course bridges conventional engineering design disciplines with design-oriented laboratory projects. Offered fall.

ME 584

Automotive Engineering Design I (4)

Tire forces and moments, rolling resistance of tires, tractive effort and longitudinal slip, tires on wet surfaces, ride properties of tires; equation of motion and maximum tractive effort, aerodynamic forces and moments, power plant and transmission characteristics, prediction of vehicle performance, operating fuel economy, engine and transmission matching, braking performance. Offered fall.

ME 587

Mechanical Computer-Aided Engineering (4)

Introduction to the use of state-of-the-art finite element technology in mechanical engineering analysis. Fundamentals of computer graphics, solid modeling, finite element modeling and interactive design. Analysis and evaluation of linear static and dynamic mechanical systems. Includes design project(s) in various topics. Offered fall, summer.

ME 588**Mechanical Computer-Aided Manufacturing (4)**

Use of CATIA in various aspects of manufacturing processes. GD&T and tolerance analysis; surface design, managing cloud points and reverse engineering; simulation of kinematics of machine tools; 3-axis surface machining; mold tooling design; CMM and measurement data analysis; assembly simulation and structural analysis, rapid-prototyping. Includes design projects in various topics. Offered winter.

Prerequisite: CATIA fundamentals or permission from instructor.

ME 594**Independent Study (2 to 4)**

Independent Study in a special area in mechanical engineering. Topic must be approved prior to registration.

ME 595**Special Topics (2 to 4)**

Study of special topics in mechanical engineering. May be taken more than once.

ME 610**Continuum Mechanics (4)**

Foundations in vector and tensor fields, kinematics of deformation, measures of strain and analysis of stress, equations of motion, compatibility conditions, constitutive equations, thermodynamics of deformation. Study of infinitesimal elasticity, ideal fluids, ideal elastoplasticity, processing, and material capabilities are studied in a systems context.

(Previously ME 510). Offered winter, odd years.

ME 638**Convective Transport Phenomena (4)**

Development of the fundamental equations expressing conservation of mass and momentum principle. Navier-Stokes equations. Approximation techniques. Boundary layer theory. Introduction to turbulent transport processes. Hydrodynamics of two-phase flows. Offered winter, even years.

ME 639**Gas Dynamics (4)**

Fundamental theories and applications of high-speed aerodynamics are the major subjects of the course. One-dimensional gas dynamics and wave motion. Shock waves in supersonic flow. Flow in ducts and wind tunnels. The equations of three-dimensional frictionless flow. Small-perturbation theory. Slender body theory. The similarity rules of high-speed flow and methods of measurement. Transonic flow. The method of characteristics. Offered fall, odd years.

Prerequisite: ME 538

ME 648**Thermal Transport Phenomena (4)**

Development of the fundamental continuum equation expressing conservation of energy. Radiation and conduction heat transfer, extended surfaces, multi-dimensional conduction problems, and one-dimensional unsteady conduction problems.

Convective heat transfer, thermal boundary layer theory, forced and natural convection, and two-phase flow phenomena. Offered fall.

ME 657**Internal Combustion Engines II (4)**

Combustion characteristics, fuels, materials and design of internal combustion engines including: combustion in spark and compression ignition engines; engine heat transfer; fuels and fuel systems; engine balance and vibration; friction, lubrication and wear; valves and valve train; superchargers, turbochargers and auxiliary systems; variables affecting engine performance; engine design. With laboratory. (Previously ME 558). Offered winter.

Prerequisite: ME 557.

ME 665**Optical Methods in Experimental Mechanics (4)**

Modern contemporary optical methods in experimental stress analysis, including digital speckle methods, correlation methods, x-rays and optical diffraction methods, digital holography, digital shearography and other digital optical methods. Emphasis on full field, non-contacting measurement and analysis of 3D-deformations, 3D-strains/stresses and vibration. With laboratory. Offered winter.

Prerequisite: ME 567 or equivalent.

ME 669**Advanced Finite Elements (4)**

Nonlinear finite element formulation for large deformation, plasticity and creep; incremental and iterative solution technique; design optimization; use of a finite element code in engineering applications such as stamping, metal forming, contact mechanics, buckling analysis, mechanics of composites and nonlinear transient dynamics. Offered winter, even years.

Prerequisite: ME 569

ME 674**Machining Processes (4)**

Fundamentals of various machining processes including turning, milling, drilling and grinding. Fixturing and geometric errors produced by machine tools. Friction and wear of cutting tools. Influence of cutting fluids, tool design and tool material on cutting temperatures, work piece surface roughness and tool wear. Description of alternative machines and smart machine tools. Offered spring.

Prerequisite: ME 574

ME 675**Advanced Tribology (4)**

In depth study of selected topics in tribology. Examples include: friction and wear theories, temperature rise due to frictional sliding, oil film thickness calculations, contact mechanics, friction and wear, mechanisms of metals, polymers and ceramics, engine and bearing tribology. Offered winter, odd years.

Prerequisite: ME 575.

ME 678

Advanced Metal Forming (4)

The finite element simulation of metal forming processes using commercially available software. Focus on sheet metal stamping, tubular hydroforming and bulk metal forging. Mesh refinement, mass scaling, velocity scaling, element formulations, contact models, material models, CPU efficiency and post-process solution interpretation are discussed. Project presentation typically required. Offered winter. Odd Years.

Prerequisite: ME 578, ME 569 or equivalent

ME 684

Automotive Engineering Design II (4)

Continuation of Automotive Engineering Design I including: mechanics of handling, suspension, roll and ride; design of steering systems including: universal joints, vibration isolators, rack and pinion gears and tie rods. Design of doors, liftgates, hatchbacks and occupant environment. (Previously ME 585.) Offered winter.

Prerequisite: ME 584 or permission of instructor.

ME 690

Graduate Engineering Project (2 to 4)

Independent work on an advanced project in mechanical engineering. Topic must be approved prior to registration. May be taken more than once.

ME 691

Master's Thesis Research (2 to 8)

Directed research leading to a master's thesis. Topic must be approved prior to registration.

ME 790

Doctoral Dissertation Research (2-12)

Directed research toward the doctoral dissertation in mechanical engineering

ME 794

Independent Study (2 to 4)

Advanced independent study in a special area in mechanical engineering. Topic must be approved prior to registration.

ME 795

Special Topics (2 to 4)

Advanced study of special topics in mechanical engineering. May be taken more than once.

■ SYSTEMS ENGINEERING

For related courses students should refer to course offerings in electrical engineering (EE) and computer science and engineering (CSE).

SYS 422

Robotic Systems (4)

Overview of industrial robots, their components and typical applications. Kinematics of robots and solution of kinematic equations. Path planning. Vision and pattern recognition. Robot and vision programming languages. Laboratory experience in the development and implementation of a robot language environment using minirobots. Demonstrations and applications using industrial robots. Offered fall.

SYS 433

Modern Control System Design (4)

Design methodology for control systems via state space approach; modeling and transformation. Physical systems, time response, stability, transition matrix, state feedback control. Integrated system design, state observers. Analytical and computer simulations. Course includes a project to model, design, implement and evaluate a controller for a practical system. With laboratory. Offered fall.

Prerequisite: SYS 431

SYS 484

Flexible Manufacturing Systems (4)

The components of flexible manufacturing systems (FMS): CNC machining centers, automated assembly, automated warehousing (AS/RS), inspection, material transport, programmable logic controllers and coordination; integration of CAD/CAM to the FMS; production planning and control; factory simulation; implementation strategies. With laboratory. Offered winter.

Prerequisite: Major standing.

SYS 510

Systems Optimization and Design (4)

Classical optimization techniques including Lagrange multipliers and Kuhn-Tucker conditions. Computer techniques for system optimization including linear programming, constrained and unconstrained nonlinear programming. System design-case studies. The course emphasizes a capstone design experience involving system modeling, simulation and optimal design. Offered winter.

SYS 517

Probability and Its Engineering Applications (4)

Techniques and topics from probability of use to engineers, particularly those interested in manufacturing. Includes topics from statistics, control charts, propagation of error and tolerancing, analysis of queuing systems using birth and death processes and Markov chains, reliability, decision trees, etc.

Offered winter, odd years.

Prerequisite: Course in probability.

SYS 520
Signal and Linear Systems Analysis (4)

Modeling and analysis of both continuous-time and discrete-time systems and signals. Time-domain and frequency-domain representation methods and transformations applied to electric circuits, mechanical systems and other dynamic systems. Fundamental theories of systems stability, controllability, observability and state-feedback control design. Computer simulation studies. Offered fall.

SYS 557
Energy Conservation Systems (4)

Techniques for improving energy use in industrial and commercial applications. Topics include: energy accounting; energy auditing; energy conservation management; net energy analysis; second law methods of analysis; combined use energy systems; new technology for energy conservation; assessment of alternative technology.

SYS 558
Electrical Energy Systems (4)

Generation, transmission and distribution of electrical energy. Analysis and design of three-phase circuits, per unit normalization, system design evaluation and load-flow, symmetrical components and stability. Offered winter.

SYS 563
Foundation of Computer-Aided Design (4)

Computer-aided design as the cornerstone of computer integrated manufacturing. Presentation and exploration of "generic" CAD architecture. Mathematical representations of CAD primitives, surfaces and solids and manipulation. Comparison of wire-frame, surface, 2-1/2 D and solid models. IGES, STEP, CALS and DXF standards. Description of "feature-based CAD" and the CAD manufacturing link. Offered fall.

SYS 569
Computer Simulation in Engineering (4)

Simulation as modeling tool for discrete-event and continuous systems; general principles of simulation; statistical models; input modeling; random variable generation; model building using a commercial simulation language; model verification and validation; determination of run length; output analysis; variance reduction techniques. Design and optimization of production service systems. Offered winter.

SYS 575
Automotive Mechatronics I (4)

Overview of mechatronics; modeling, identification and simulation of electro-mechanical devices; introduction to computer-aided software; basic automotive sensors; basic actuators and power train devices; principles of automotive and industrial electronic circuits and control systems (analog and digital); principles of product design; mechatronics case studies. Credit can not be received for both SYS 575 and EE 575.

SYS 577
Concurrent Engineering (4)

Principles of concurrent engineering including: manufacturing competitiveness, performance indicators, life-cycle management, strategic technology insertions, process re-engineering, cooperative work teams, supplier organization, information modeling and product realization taxonomy. Credit can not be received for both SYS 577 and ME 577.

SYS 583
Production Systems (4)

Design issues to control the flow of material in manufacturing systems from forecast to finished product. Topics include characterization of production systems, aggregate planning and disaggregation to a master schedule, inventory control, MRP, JIT systems, scheduling and sequencing, project planning and resource balancing. Offered fall.

Prerequisite: A course in probability.

SYS 585
Statistical Quality Control (4)

Fundamentals of statistical quality control and their use in system design. Control charts for variables, control charts for attributes, cusum charts and other process quality monitoring topics. Sampling inspection plans. Fundamentals of design of experiments and their application to product/process design and improvement. Taguchi's approach to robust design and related topics. Offered winter.

Prerequisite: A course in probability.

SYS 587
Foundations of Systems Engineering (4)

Techniques for generation, analysis and verification of traceable product design requirements. System performance and structural modeling using object, behavioral and other models. Techniques for analysis of system for serviceability, reliability, maintainability and testability. System alternative trade-off study techniques. System life cycle and other tools for implementation of systems engineering techniques.

SYS 594
Independent Study (2 to 4)

Independent study in a special area in systems engineering. Topic must be approved prior to registration.

SYS 595
Special Topics (2 to 4)

Study of special topics in systems engineering. May be taken more than once.

SYS 623

Dynamics and Control of Robot Manipulators (4)

Cartesian and joint space representations and transformations. The Denavit-Hartenberg (D-H) convention and parameter tables. Robotic forward and inverse kinematics and task planning. Newton-Euler and Lagrangian dynamic models and formulations. Robotic joint servo control, position control, force control, compliant motion and many industrial application aspects. Computer numerical and graphical simulations. Offered winter.

Prerequisite: SYS 520.

SYS 630

Optimal Control Theory (4)

Modern control theory applied to linear dynamical systems. Differential and difference equations; stability of optimal control systems; dynamic programming; calculus of variation and Pontryagin's minimum principle; optimally switched control systems, linear regulator problem; application of theory to practical control system design methodology; project involving the design of an optimal control system. Offered winter.

Prerequisite: SYS 520.

SYS 631

Estimation and Control Theory (4)

Stochastic differential and difference equations; Luenberger observer theory; Kalman-Bucy filtering theory; design of stochastic optimal and microprocessor-based control systems; duality between optimal estimation and control problems; the separation principle; simulation and laboratory implementation of observers and filters in stochastic control system. Offered fall.

Prerequisite: SYS 520.

SYS 632

Analysis of Nonlinear Control Systems (4)

Nonlinear systems modeling and analysis with various engineering applications. Special phenomena and nonlinear dynamics. Theory of nonlinear systems stability and stabilization. Controllability, observability, invertibility and linearizability of nonlinear control systems. Nonlinear feedback control, internal dynamics and nonlinear adaptive control. Advanced computer simulation studies. Offered fall.

Prerequisite: SYS 520.

SYS 635

Adaptive Control Systems (4)

Classifications of self-tuning and adaptive systems; parameter estimation techniques, self-tuning regulators and state estimators, stability and convergence analysis; model reference adaptive systems using Lyapunov and hyperstability models; applications of adaptive control systems; computer simulation and laboratory experiments. Offered fall.

Prerequisite: SYS 520.

SYS 664

Advanced Computer-Aided Design (4)

Three-dimensional graphics in computer-aided design systems. Hidden surface elimination, shading, algebraic surface drawing, solid modeling and 3-D animation. Project demonstrates the application of 3-D graphics to the analysis and design of engineering applications.

Prerequisite: SYS 563.

SYS 674

Digital Control Systems (4)

Theoretical foundation needed to implement the microprocessor in control applications. Effects of sampling, data conversion, quantization, finite word length and time delays on system response and stability are examined. Pole-placement and observer/estimator techniques. Actual construction of a micro-computer-based controller culminates the course. Offered winter.

Prerequisite: SYS 520.

SYS 675

Automotive Mechatronics II (4)

Extensive review of software and modeling fundamentals, sensors, actuators, power train characteristics, automotive and industrial control systems; selected topics include engine and exhaust gas sensors; sensor interfaces; injection electronic circuits, engine and transmission controllers, pneumatic servos and active suspension; electromagnetic compatibility and issues related to system design, compatibility requirements, filtering, shielding/grounding, testing; emerging technologies in automotive mechatronics systems. Student projects.

Credit cannot be received for both SYS 675 and EE 675.

Prerequisite: SYS 575.

SYS 680

Engineering Decision Analysis (4)

Consideration of risk and uncertainty in decision criteria for resource allocation. Mathematical programming in engineering applications for multi-attribute utility analysis. Offered fall.

SYS 684

Computer-Integrated Manufacturing Systems (4)

The integration of the computer in the manufacturing process from concept, through engineering design, production planning, materials handling and process quality control and inventory management. The course will utilize simulation and laboratory to study parts and information flow in a computer-integrated manufacturing facility with fixed and flexible automation. Offered fall.

SYS 690

Graduate Engineering Project (2 to 4)

Independent work on an advanced project in systems engineering. Topic must be approved prior to registration.

SYS 691**Master's Thesis Research (2 to 8)**

Directed research leading to a master's thesis. Topic must be approved prior to registration.

SYS 721**Large-Scale Dynamic Systems (4)**

Analysis using a systems methodology including state variable modeling and multilevel structure. Structural stability, dynamic reliability, aggregation and decomposition. Application to estimation and control of large systems.

Prerequisite: SYS 520.

SYS 722**Linear Multivariable Systems (4)**

Fundamental and state-of-the-art modeling, analysis and design of linear multivariable dynamic systems. The role of polynomial matrices and differential operators in the description and structural realization of multivariable systems. Concepts of multivariable poles, zeros, Nyquist arrays and generalized root loci. Algebraic design methods based on state feedback observers, and model-matching. Inverse Nyquist and characteristic locus techniques as extensions of classical control design.

Prerequisite: SYS 520.

SYS 731**Stochastic Optimal Control and Estimation Theory (4)**

Foundation of stochastic optimal control and estimation theory. Continuous-time and discrete-time stochastic linear and nonlinear systems; analysis and design of stochastic optimal control systems; nonlinear filtering smoothing and prediction theory; and adaptive control estimation. Offered fall, odd years.

Prerequisite: SYS 630.

SYS 735**Intelligent Control Systems (4)**

Definition and paradigm for intelligent control; self-learning and supervised learning; hierarchical decision architecture; fuzzy logic, neural network, heuristics, genetic algorithm, optimum strategy and related topics; examples of intelligent and autonomous systems; computer simulation and visualization of applications.

Prerequisite: Permission of instructor.

SYS 794**Independent Study (2 to 4)**

Advanced independent study in a special area in systems engineering. Topic must be approved prior to registration.

SYS 795**Special Topics (2 to 4)**

Advanced study of special topics in systems engineering. May be taken more than once.

■ ENGINEERING MANAGEMENT

For engineering component of this program see courses listed under computer science and engineering (CSE), electrical engineering (EE), mechanical engineering (ME) and systems engineering (SYS). For business component of the program, relevant course descriptions are as follows:

ACC 511**Financial Accounting (3)**

Focus is on financial accounting for external reporting: communications addressed to shareholders, government agencies, potential investors and the public.

ACC 512**Managerial Accounting Systems (3)**

Emphasizes recording, reporting and the use of data within the enterprise. Cost accounting, budgeting and internal control systems are covered.

Prerequisite: PC skills proficiency and a course in financial accounting.

ECN 521**Economics For Managers (3)**

Analysis of microeconomic decision makers in a market environment. Includes models of: consumer theory, the firm, production processes, costs, pricing, resource allocation, market and industry structure, decision making under certainty, and an introduction to decision making under uncertainty.

ECN 522**Macroeconomic Analysis (3)**

Construction, analysis and interpretation of models of national and international aggregate economic behavior, including policy implications of alternative models, with emphasis on current economic events. International economic interrelationships are explored.

FIN 533

Financial Management (3)

Introduction to the institutions, instruments, theories and analytical tools of financial management. Emphasis is placed on return versus risk valuation tradeoff. Topics include capital budgeting, cost of capital, capital structure, dividend policy, cash management, accounts receivable, short-term debt, financial statement analysis, international financial management and financial forecasting.

MGT 550

Legal Environment of Business (3)

Examination of the legal environment as it affects business, emphasizing the U.S. and international legal systems, ethical analysis of public policy and managerial decisions, functions and powers of regulatory agencies, and the laws relating to securities, business organizations, employment practices, antitrust and the environment.

MIS 524

Management Information Systems (3)

Development of information systems from the perspective of the manager as a user. Survey of the behavioral, organizational and systems theory foundations of MIS; the systems development process and alternative system development strategies; and the integration of data processing, decision support systems, office automation and telecommunications across functional areas.

MIS 525

Management of Information Resources (3)

Topics include organization of the MIS function; evaluation of information systems; acquisition of resources; support of end users; and the management of the system development process, telecommunications, multinational issues and the information systems staff.

MKT 560

Marketing (3)

Focuses on problems of product planning, market segmentation, demand analysis, consumer behavior, product distribution, pricing and promotion in both domestic and international markets. The approach to these problems considers both the normative or theoretical, and the empirical or marketing research orientations.

ORG 530

Organizational Behavior (3)

Organizational behavior is analyzed at individual, group and organizational levels. Individual and group processes such as perception, learning, motivation, communication and conflict are studied in depth. Organizational-level topics include size, structure, complexity and effectiveness. Where appropriate, cross-cultural issues will be discussed.

ORG 631

Human Resources Management (3)

Theoretical and empirical issues of the personnel function in modern organizations. Includes job analysis and design, employee recruiting, compensation policies and practices, research techniques, government policy, law, and social and environmental factors related to decision making.

POM 521

Operations Management (3)

Study of operations of manufacturing and service organizations. Introduction to operational design and control issues such as forecasting, capacity planning, facility location and layout, production control, material requirements planning, scheduling and quality assurance. Includes international, legal and ethical aspects, as well as computer exercises.

SCHOOL OF HEALTH SCIENCES

363 Hannah Hall • (248) 370-3562 • Fax (248) 370-4227 • <http://www.acs.oakland.edu/shs/programs/programs.htm>

Dean: Ronald E. Olson • **Interim associate dean:** Kenneth Hightower • **assistant dean:** Ronald M. Mattei

General Information

The School of Health Sciences offers degree and graduate certificate programs in health and medically-related fields. Master of Science degrees are offered in exercise science and physical therapy. An entry-level doctor of physical therapy degree (DPT) and a post-professional doctor of science in physical therapy degree (DSCT) for those who are already licensed physical therapists are also offered. Four non-degree graduate certificate programs are offered through the exercise science program, including graduate certificates in clinical exercise science, complementary medicine and wellness, corporate and worksite wellness and exercise science. Non-degree graduate certificates in orthopedic manual physical therapy, pediatric rehabilitation, orthopedics, teaching and learning for rehabilitation professionals and neurological rehabilitation are offered through the physical therapy program to physical therapists, occupational therapists and other rehabilitation professionals who have acquired clinical experience following their entry-level professional preparation. Finally, a number of graduate level courses

are offered through the school's program in industrial health and safety for students who wish to enroll on a non-degree basis or who may be able to apply these courses as electives to a graduate degree in a related field.

Continuing professional education is offered by the School of Health Sciences in order to meet the educational needs of health science professionals. Specialized contract programs are also provided to meet the unique professional staff development needs of employers in the health care setting, business and industry, government and other settings. Programs are individually tailored to meet the specific workplace needs of professionals and employers. Programs and courses are offered either for university credit or noncredit. When noncredit programs and courses are offered they carry the nationally recognized Continuing Education Unit (CEU).

Admission to any program offered by the School of Health Sciences may be considered on a competitive basis if the balance between applicants and available instructional resources requires such action to maintain the academic integrity of the program.

Exercise Science Program

<http://www.acs.oakland.edu/shs/programs/exs/index.htm>

Director:

Brian R. Goslin

Professor Emeritus:

Alfred W. Stransky, Ph.D., Florida State University

Associate professors:

Brian R. Goslin, Ph.D., Rhodes University (South Africa)

Robert W. Jarski, Ph.D., University of Iowa

Charles R.C. Marks, Ph.D., University of Michigan

Clinical professors:

Barry A. Franklin, Ph.D., Pennsylvania State University

Murray B. Levin, M.D., Wayne State University

Augustine L. Perrotta, D.O., Chicago College of Osteopathic Medicine

Clinical associate professors:

John F. Kazmierski, D.O., College of Osteopathic Medicine and Surgery, Des Moines, Iowa

Steven J. Keteyian, Ph.D., Wayne State University

Creagh E. Milford, D.O., Chicago College of Osteopathic Medicine

Rajendra Prasad, M.D., Prince of Wales Medical College (India)

Clinical assistant professors:

Patricia Brooks, M.D., Michigan State University

Roger Byrd, D.O., Chicago College of Osteopathic Medicine

Jeffrey H. Declaire, M.D., University of Michigan

Mario J. C. DeMeireles, M.D., University of Michigan

Albert A. DePolo, Jr., D.O., Philadelphia College of Osteopathic Medicine

Scott W. Eathorn, M.D., Wayne State University

Johnathon Ehrman, Ph.D., Ohio State University

Roland Gerhard, D.O., Chicago College of Osteopathic Medicine

William E. Hill, M.D., Howard University

Victoria Kimler, Ph.D., Wayne State University

Andrew J. Madak, D.O., Michigan State University

Chandra S. Reddy, M.D., Osmania Medical College (India)

Hans J. Stein, M.D., Wayne State University

Adjunct assistant professor:

Jack T. Wilson, Ph.D., University of Northern Colorado

Clinical instructors:

Mary Ann Cukr, M.S., Oakland University

Nancy S. Kennedy, M.S., Oakland University

Sheldon D. Levine, M.S.A., Central Michigan University

The Master of Science in Exercise Science

This interdisciplinary program emphasizes the role of exercise in health improvement and in the primary and secondary prevention of chronic degenerative disease. The curriculum addresses the inter-relationships among life-style, health and physical activity and optimization of human performance. Clinical experience is gained through cooperating internship sites. Graduates of the program are prepared for professional positions such as: cardiac stress testing specialists, exercise specialists in medical settings, sport scientists, and directors of adult fitness programs, cardiac rehabilitation programs, and health maintenance/health improvement programs in corporate, industrial and educational settings.

Full-time students complete the degree in 18 to 24 months. Part-time students usually require 3 to 4 years, depending on the number of credits taken per year. All courses are available in the evening and several are offered in a concentrated weekend "executive style" format.

Admission

An applicant for admission to the Master of Science in exercise science program should have: (a) a bachelor's degree from a regionally accredited school with an undergraduate cumulative grade point average of 3.00 or above, (b) a strong background in basic and applied health sciences, and (c) completed the following prerequisite courses: human anatomy, physiology, exercise physiology, kinesiology (human motion analysis), statistics, first aid and 4 semester hours of health enhancement (or physical education activity/theory).

While not required, additional course work in biochemistry, organic chemistry and mathematics through precalculus is highly recommended.

Applicants who are deficient in no more than two prerequisite courses can be considered for conditional admission status. Such applicants will be required to complete all prerequisite courses before conditional status is removed. Applicants with an undergraduate GPA less than 3.00 with the appropriate academic background and strong letters of recommendation may be considered for conditional admission. Students who qualify for this status must complete a minimum of 16 hours of graduate-level work with a GPA of 3.00 or above before conditional status is removed.

Admission to this program is competitive. All application materials should be submitted prior to the deadline published in the Admission Schedule in the catalog.

Thesis research or comprehensive examination option

Candidates for the Master of Science degree must choose either to carry out an independent research project culminating with the completion of a master's thesis, or to conduct in-depth study in a number of approved areas, followed by a comprehensive examination covering these areas.

Students who choose the thesis option select an adviser, who serves as the thesis committee chair, and two committee

members agreed upon by the student and chair. A thesis proposal is presented orally and in writing to the committee for approval. Research topics usually consist of experimental studies in the areas of biomechanics, cardiac rehabilitation, exercise physiology, measurement and evaluation, performance assessment, physical rehabilitation and studies of life-style behavior. The thesis is presented and defended by the candidate at a meeting open to all interested faculty members. All thesis requirements must adhere to university format standards and deadlines (see "Master's thesis and doctoral dissertation" in the Policies and Procedures section of this catalog).

The comprehensive examination option is designed to provide those students who do not wish to conduct thesis research an opportunity for in-depth study in several areas. Under this option, students, with their adviser's approval, select a minimum of three topics. Extensive reading lists for each topic are compiled from recommendations submitted by three or more faculty members who have expertise in the area. A comprehensive examination, consisting of selected questions for each topic area, is given in order to determine if the candidate has the in-depth knowledge expected of a master's degree candidate. The comprehensive examination can be arranged to be given in three parts, covering each of the topics studied.

Exercise science internship

The internship component of this program provides an opportunity for students to gain first-hand experience in the practice of exercise science. Internship placements will be the responsibility of the program and will include public and private health care settings and corporate and community wellness settings. At least one internship shall be taken at a health promotion/disease prevention facility. Students are expected to satisfy this requirement by completing one internship at Botsford Center for Health Improvement, Mount Clemens General Hospital non-invasive cardiology, or Henry Ford Heart and Vascular Institute. Students entering the program with significant previous clinical experience, comparable to the internship experiences offered through this program, may be exempted from one or both internship courses (EXS 601 and 602) by following the course competency procedure and/or the Graduate Petition of Exception procedure (see "Petition of exception" in the Policies and Procedures section of this catalog).

Code of Ethics

Along with scholarly preparation in the appropriate academic disciplines, high levels of ethical conduct are considered essential for those who are involved in health care. Students are expected to comply with the principles of the Code of Ethics and Professional Conduct of the American College of Sports Medicine. Violations will be brought before the faculty and could result in dismissal from the program.

Requirements for the degree

The average candidate entering the fall or winter semester will spend two full-time academic years to successfully complete this graduate program, which requires:

1. Completion of a minimum of 36 approved credits with a GPA of 3.00 or better. Credit toward the degree will not be given for courses with grades under 2.5.
2. Completion of the core courses: EXS 500, 520, 525, 530, 540, 601 and 602. Students will select six hours of elective course work, approved by their advisers, either from department offerings (400 level or above) or from advanced course work (300 level or above) in such areas as biology, chemistry, computer science, engineering, health science or psychology.
3. Completion of a research requirement involving a master's thesis or comprehensive examination. The research requirement involves the completion of a minimum of 6 credits in EXS 670.

Graduate Certificate in Clinical Exercise Science

The graduate certificate in clinical exercise science is designed to offer advanced, graduate-level courses in exercise science to individuals wishing to prepare for the rigors of clinical exercise science practice.

Admission

An applicant for admission to this certificate program should have: a) a bachelor's degree from a regionally accredited institution with an undergraduate cumulative GPA of 3.00 or above; b) a strong background in basic sciences and applied health sciences; and c) completed the following prerequisite courses: human anatomy, human physiology, exercise physiology, kinesiology (human motion analysis), statistics, first aid, and 4 semester hours of health enhancement (or physical education activity/theory). It is strongly recommended that applicants have suitable work experience in the field of exercise science.

An applicant who is deficient in no more than one prerequisite course can be considered for conditional admission status. Such an applicant will be required to complete the prerequisite course before conditional status is removed. Applicants with an undergraduate GPA less than 3.00 with the appropriate academic background and strong letters of recommendation may be considered for conditional admission. Students who qualify for this status must complete a minimum of 8 credits of graduate course work achieving a GPA of 3.00 or above in each course before conditional status is removed.

Requirements for the certificate

A candidate entering the fall or winter semester will spend one full-time academic year to successfully complete the certificate program, which requires:

1. Completion of the core courses: HS 501 and EXS 520, 525, 530, 540 and 625 with a GPA of 3.00 or better.

Credit toward the certificate will not be given for courses with grades under 2.5

2. Credit granted for successful completion of a course toward an undergraduate degree program may not be repeated for a graduate certificate. In such an instance, an equal number of program-approved graduate credits will be required.

Graduate Certificate in Complementary Medicine and Wellness

The graduate certificate in complementary medicine and wellness is a course of study emphasizing patient/client counseling, and education about health promotion, disease prevention, wellness and complementary therapies. Goals include helping patients/clients achieve a level of well-being that reaches beyond merely the absence of disease. Participants will learn to optimize the patient/client-practitioner relationship while promoting health across the identified wellness dimensions: physical, psychological, environmental, spiritual and social. Recent trends in health care delivery have challenged practitioners and educators to integrate alternative approaches that are complementary into traditional practice, and to teach methods for evaluating their safety and effectiveness.

It is intended that candidates will use the certificate to enhance or further their own professional practice, current licensure or formal education. The program augments the background of professionals in disciplines such as exercise science, counseling, physical therapy, medicine, physician assistant, nursing, dietetics, social work, psychology, education and theology. The program is offered as a full-time or part-time course of study accommodating the needs of working professionals. The certificate is awarded following completion of the specified 16 credit hours of study.

Admission

Applicants should hold a bachelor's degree with an undergraduate cumulative GPA of 3.00 or above from a regionally accredited institution. Applicants who have less than a 3.00 cumulative GPA may be considered for conditional admission status. Applicants are required to submit: 1) a completed Application for Admission to Graduate Study and the program's supplemental admissions form, 2) a two-page prospectus describing how the applicant intends to integrate or use the certificate program in practice or for furthering education, 3) an elective or directed study plan for HS 693 and 4) two satisfactory letters of recommendation from professionals qualified to comment on the applicant.

Requirements for the certificate

The graduate certificate program consists of 16 credits of course work: HS/CNS 651 or HS 451, HS/CNS 652, EXS 535, CNS 653, HS 630 and HS 693 or elective. The program must be completed with a GPA of 3.00 or better. Credit toward the certificate will not be given for courses with a grade under 2.5.

Graduate Certificate in Corporate and Worksite Wellness

The graduate certificate in corporate and worksite wellness is designed to offer advanced graduate courses to prepare exercise science practitioners for the demands of careers in corporate and worksite wellness.

Admission

Same as admission criteria for the Graduate Certificate in Clinical Exercise Science.

Requirements for the certificate

A candidate entering the fall or winter semester will spend one full-time academic year to successfully complete the certificate program, which requires:

1. Completion of the core courses HS 501 and EXS 520, 525, 530 and 565. Students will select two credit hours of elective course work from EXS 500, 505, 510, 521, 540, 545, 560, 580, 605, 610, 615, 620, 625, 630, 635 or 693. A GPA of 3.00 or better must be obtained. Credit toward the certificate will not be given for courses with grades under 2.5.
2. Credit granted for successful completion of a course toward an undergraduate degree program may not be repeated for a graduate certificate. In such an instance, an equal number of program-approved graduate credits will be required.

Graduate Certificate in Exercise Science

The graduate certificate in exercise science is designed to offer a logical, coherent, yet flexible program of study that will meet the needs of a select group of graduate students seeking to improve their skills in specialized areas of exercise science, such as ergonomics, human performance analysis, sports science and health promotion.

Admission

Same as admission criteria for the Graduate Certificate in Clinical Exercise Science

Requirements for the certificate

A candidate entering the fall or winter semester will spend one full-time academic year to successfully complete the certificate program, which requires:

1. Completion of the core courses EXS 520, 525, 530 and either HS 501 or EXS 500, plus four credit hours of elective course work from EXS 500, 505, 510, 521, 540, 545, 560, 580, 605, 610, 615, 620, 625, 630, 635 or 693. A GPA of 3.00 or better must be obtained. Credit toward the certificate will not be given for courses with grades under 2.5.
2. Credit granted for successful completion of a course toward an undergraduate degree program may not be repeated for a graduate certificate. In such an instance, an equal number of program-approved graduate credits will be required.

■ Physical Therapy Program

<http://www.oakland.edu/SHS/PT>

Director:

Beth C. Marcoux

Associate professor:

Beth C. Marcoux, Ph.D., University of Michigan

Assistant Professors

Kathleen M. Galloway, D.Sc., Rocky Mountain University

Cathy A. Larson, Ph.D., University of Michigan

Special instructors:

Christine Stiller, Ph.D., Michigan State University

Kristine A. Thompson, Ph.D., Michigan State University

Instructors:

John R. Krauss, M.S., Oakland University

Visiting instructors:

R. Elizabeth Black, M.S., McMaster University

Douglas S. Creighton, M.S., University of Detroit

Susan E. Saliga, M.H.S., University of Indianapolis

Clinical professor:

A. Charles Dorando, B.S., Adelphi College

Consulting professor:

Olaf Evjenth, Orthopedic Institute, Oslo, Norway

Clinical assistant professors:

Pamela A. Lemerand, Ph.D., University of Michigan

Gretchen D. Reeves, Ph.D., University of Michigan

Bjorn W. Svendsen, D.H.Sc., Loma Linda University

Consulting assistant professor:

Lasse Erik Thue, School of Physical Therapy of Berlin

Senior clinical instructors:

Mary S. Lundy, M.S., East Carolina University

Martha Schiller, M.S., Central Michigan University

David A. Tomsich, M.S., University of Kentucky

David Gilboe, B.S., Wayne State University

Clinical instructors:

Lezlie Adler, M.A., Wayne State University

Henry D. Boutros, M.Ed., Wayne State University

Paula Denison, B.S., Wayne State University

Linda F. Erickson, B.S., Georgia State University

Pamela S. Knickerbocker, M.S., Oakland University

Gregory Kopp, M.P.T., Oakland University

Kathleen Jakubiak Kovacek, B.S., Wayne State University

Peter R. Kovacek, M.S.A., Central Michigan University

Jeffrey Placzek, M.D., Wayne State University

Frederick D. Pociask, M.S., Oakland University

Marilyn J. Raymond, Ph.D., University of Michigan
 Helene M. Rosen, B.S., University of Michigan
 Janet Siedel, M.P.T., Oakland University
 Angela C. Strong, B.S., Spelman College
 James E. Traylor, B.S., Wayne State University
 Kenneth M. Woodward, C.P.O.

The Doctor of Physical Therapy

The Doctor of Physical Therapy is an entry-level graduate program, which prepares individuals for licensure in the physical therapy profession. As a graduate program, it includes advanced theoretical, clinical practice, and research courses and experiences to prepare graduates to function in a variety of settings in physical therapy.

Physical therapy is concerned with the prevention and treatment of acute and chronic conditions that cause disorders of movement. In order to provide appropriate treatment, physical therapists evaluate the musculoskeletal, neuromuscular, cardiopulmonary and associated systems, calling on the basic sciences and behavioral sciences in the interpretation of this evaluation. Patient programs are then developed to resolve movement dysfunctions. Physical therapists work in concert with all members of the health care team through a variety of referral relationships.

The Doctor of Physical Therapy at Oakland University is designed to prepare clinicians with the evaluation and examination skills necessary to make physical therapy differential diagnoses of movement related impairments affecting the neuromusculoskeletal system. In addition, this degree will prepare graduates to provide effective care in the areas of prevention, screening, rehabilitation and community reintegration for their clients. Finally, graduates will be able to interpret and conduct clinical research needed to demonstrate the reliability and validity of physical therapy evaluation tools and to determine the effectiveness of physical therapy interventions.

The program is accredited by the Commission on Accreditation in Physical Therapy Education.

Admission

Students must have completed a baccalaureate degree prior to admission to the program. The following minimum prerequisites will also be required:

Prerequisite	# of Courses	Lab Required
Biology	1	x
Chemistry	2	x
Physics	2	x
Anatomy	1	
Physiology	1	
Exercise Physiology	1	
Statistics	1	
Psychology	1	
Developmental Psychology	1	
Humanities	2	
Social Sciences	2	

Admissions Requirements

- Students will be considered for admission if they will be completing their baccalaureate degree and all prerequisite courses prior to the start of the program.
- An overall cumulative GPA of 3.00 or above is required. Applicants must have received a minimum grade of 2.0 in all prerequisite courses.
- Foreign-educated students must meet all university requirements for proficiency in English. In addition, they will be required to demonstrate an educational-level equivalent to a BS degree in the United States.
- All students will take the Graduate Record Examination (GRE) and GRE writing sample.
- Additional requirements include satisfactory letters of recommendation, personal statement, and proof of successful completion of first aid and CPR.
 An applicant who is deficient in no more than one prerequisite course can be considered for conditional admission status. Such an applicant will be required to complete the prerequisite course before conditional status is removed. Applicants with an undergraduate GPA less than 3.00 with the appropriate academic background and strong letters of recommendation may be considered for conditional admission. Students who qualify for this status must complete the first semester of graduate course work achieving a grade point of 3.0 or above in each course before the conditional status is removed.

Requirements for the degree

Students admitted to the DPT program are required to attend a full-time program of prescribed course work. A new class of students begins this program each fall semester. A minimum of 122-130 semester hours of credit are required for the degree, consisting of the following courses: HS 401 and HS 531, PT 514, 515, 516, 517, 519, 531, 540, 551, 552, 556, 597, 627, 628, 630, 631, 640, 641, 635, 652, 653, 655, 660, 661, 681,

682, 698, 728, 732, 734, 735, 742, 743, 751, 755, 762, 783, 799. With approval from the Program Director, students may graduate with fewer than 130 credits if they have completed a pharmacology and/or pathology course prior to entry into the professional program.

Grade point policy

The grading policy for graduate students at Oakland University (see the Policies and Procedures section of this catalog) will be followed for students in the DPT program. In addition, a 3.00 GPA for all course work taken is required for graduation and no grade below 2.0 may be applied toward this degree. The Physical Therapy Promotion and Graduation Committee will monitor student progress throughout the program. Students whose GPA falls below 3.00 shall be subject to probation and will be informed of their probationary status, including the grounds for the decision. Students receiving a GPA of less than 3.00 more than once are subject to suspension or dismissal from the program. Dismissal by the Vice Provost for Research and Graduate Study is based on a recommendation from the Physical Therapy Promotion and Graduation Committee. Students should consult the section of this catalog dealing with appeal procedures concerning academic dismissals.

Code of Ethics

Ethical conduct is critical to a profession. Students are required to abide by the Physical Therapy Code of Ethics and Guide to Professional Conduct, published by the American Physical Therapy Association. Violations will be reviewed by the Physical Therapy Promotion and Graduation Committee and could result in dismissal from the program.

The Master of Science in Physical Therapy

This degree is designed to provide practicing physical therapists with advanced knowledge in theoretical and clinical aspects of the profession. The clinical curriculum addresses orthopedic, pediatric and adult neurological aspects of physical therapy while the theoretical curriculum focuses on biomechanics and motor learning. Optional clinical experience, in a residency format, is gained through cooperating internship sites. Graduates of the program are prepared for autonomous specialty practice within their area of study.

Students can elect to complete specific subsets of courses leading to a graduate certificate in orthopedic manual physical therapy (described below) or a graduate certificate in pediatric rehabilitation (described below).

Admission

Applicants should hold a bachelor's degree or entry-level master's degree in physical therapy from a regionally accredited institution with a cumulative GPA of 3.00 or above. Admission requirements include transcripts of all college-level work, a curriculum vita which includes professional experiences, a personal statement on career experiences and goals, two letters of

recommendation, proof of licensure in physical therapy in the United States and eligibility for licensure in the state of Michigan and the Graduate Record Examination general test score. Two years of clinical experience is strongly recommended. Prerequisite preparation must include statistics and basic cardiopulmonary resuscitation (CPR). Applicants will be considered for admission in September or January of each year. However, entry into the graduate certificate in orthopedic manual physical therapy set of courses may not coincide with admission to the degree program since the certificate program currently admits new students every other year.

Applicants with an undergraduate GPA less than 3.00 with the appropriate academic background and strong letters of recommendation may be considered for conditional admission. Students who qualify for this status must complete a minimum of 8 credits of graduate course work achieving a grade point of 3.00 or above in each course before conditional status is removed.

Thesis research or comprehensive examination option

Candidates for the Master of Science degree must choose either to carry out an independent research project culminating with the completion of a master's thesis, or to conduct in-depth study in a number of approved areas, followed by a comprehensive examination covering these areas.

Students who choose the thesis option select an adviser who serves as the thesis committee chair, and two committee members agreed upon by the student and chair. A thesis proposal is presented orally and in writing to the committee for approval. The thesis is presented and defended by the candidate at a meeting open to the university community. All thesis requirements must conform to university standards (see "Master's thesis and doctoral dissertation" in the Policies and Procedures section of this catalog).

The comprehensive examination option is designed to provide those students who do not wish to conduct thesis research an opportunity for in-depth study in several areas. Under this option, students, with their adviser's approval, select a minimum of three topics. Extensive reading lists for each topic are compiled from recommendations submitted by three or more faculty members who have expertise in the area. A written examination, consisting of selected questions for each topic area, is given in order to determine if the candidate has the in-depth knowledge expected of a master's degree candidate. The written exam can be arranged to be given in three parts, covering each of the topics studied. This is followed by an oral examination covering all three topics.

Requirements for the degree

1. Completion of a minimum of 36 credits with a GPA of 3.00 or better. Credit toward the degree will not be given for courses with grades under 2.0.
2. Completion of the core courses: PT 550, 570, 590, 610, 631, 677 and either PT 536 or PT 611.
3. Completion of thirteen or more credits of electives as

approved by the student's faculty adviser. Elective options include: PT 500, 502, 503, 506, 507, 509, 510, 511, 520, 540, 598, 601, 602, 603, 604, 610, 611 and other adviser-approved courses.

4. Completion of a master's thesis or comprehensive examination. The master's thesis option requires the completion of a minimum of 4 credits in PT 690. The comprehensive examination option requires the completion of a minimum of 4 credits in PT 650.

Graduate Certificate in Orthopedic Manual Physical Therapy

The graduate certificate in orthopedic manual physical therapy is designed to offer advanced, graduate-level courses in orthopedics to physical therapists interested in developing clinical specialty skills. This educational program provides advanced theoretical and clinical training, emphasizing differential diagnosis and manual therapy procedures.

The certificate program is offered as a part-time course of study accommodating the needs of working professionals. Students enrolled in the program will participate in 17 credits of course work including orthopedic theory, techniques and clinical internship training. The length of study for this part-time program is three years, with courses being offered primarily on a weekend and evening basis. The clinical internship training entails 440 hours of supervised clinical training at an approved clinical site. All of the required courses that comprise this certificate can be applied to the Master of Science in physical therapy degree.

Admission

To be eligible for admission to this program, individuals must hold an entry-level physical therapy degree (i.e., Bachelor of Science or Master of Physical Therapy) from an APTA accredited program, or its equivalent, and be licensed as a physical therapist in the state of Michigan. Two years of clinical experience is highly recommended. Class size is limited due to the nature and sequencing of the manual therapy technique courses. A new group of students is accepted every even-numbered year.

Fees

Special course fees are assessed for the manual therapy theory and technique classes (PT 510, 511) required for the certificate.

Requirements for the certificate

To fulfill the certificate requirements the student must complete, with at least a 2.0 grade in each course and an overall GPA of 3.00, a program consisting of PT 510, 511, 520, 601, 602, 611 and 677.

Graduate Certificate in Pediatric Rehabilitation

The graduate certificate in pediatric rehabilitation is designed to offer advanced, graduate-level courses in pediatrics to physical therapists and occupational therapists interested in developing clinical specialty skills. The certificate program is offered as a part-time course of study accommodating the needs of working professionals. Students enrolled in the program will participate in 17 credits of course work including advanced theoretical and clinical training, emphasizing clinical decision making, case management skills, and therapeutic procedures. A clinical internship will entail supervised clinical training at an approved clinical site. For physical therapists, all of the required courses that comprise this certificate can be applied to the Master of Science in physical therapy degree.

Admission

To be eligible for admission to this program, individuals must hold an entry-level physical therapy or occupational therapy degree from an APTA or AOTA accredited program or its equivalency, and must be a licensed physical therapist or a registered occupational therapist, or eligible for licensure or registration, respectively. Two years of clinical experience in pediatrics is highly recommended.

Requirements for the certificate

To fulfill the certificate requirements the student must complete, with at least a 2.0 grade in each course and an overall GPA of 3.00, a program consisting of PT 500, 502, 506, 507, and 536 and 2 credits of electives.

Graduate Certificate in Teaching and Learning for Rehabilitation Professionals

The graduate certificate in teaching and learning for rehabilitation professionals is designed to provide an in-depth understanding of the theoretical background of the principles of teaching and learning used in all aspects of rehabilitation. In addition, it will provide students with advanced skill in teaching methodology and the development of educational materials. Students will complete a teaching practicum under the guidance of full-time faculty in the physical therapy program. All of the required courses that comprise the certificate can be applied to the post-professional MSPT degree or the DScPT.

Admission

To be eligible for admission to this program, individuals must hold an entry-level degree in a rehabilitation of other health profession, and must be licensed, registered or certified in their respective discipline (or eligible for such). Two years of clinical experience is highly recommended. All other admissions requirements for graduate application as determined by Graduate Admissions must also be met.

Requirements for the certificate

To fulfill the certificate requirements the student must complete with at least a 2.0 grade in each course and an overall GPA of 3.00, a program consisting of PT 502, PT 810, PT 592, PT 593 and PT 594

Graduate Certificate in Orthopedics

The graduate certificate in orthopedics is designed to give licensed physical therapists and final year DPT students advanced patient management skills with a broader area of focus than the current OMPT program. The GCO will offer additional flexibility and another point of entry for individuals interested in pursuing graduate education at Oakland University. Course work in this program may serve as a step toward the post entry-level Doctor of Science (DScPT), Masters of Science (MS), and provide a pathway of specialization for DPT students in their last year of entry-level education.

Admissions

To be eligible for admission to this program, individuals must hold an entry-level degree in physical therapy and be licensed (or eligible for licensure) in physical therapy. Two years of clinical experience is highly recommended. All other admissions requirements for graduate application as determined by Graduate Admissions must also be met.

Requirements for the certificate

To fulfill the certificate requirements the student must complete, with at least a 2.0 grade in each course and an overall GPA of 3.00, a program consisting of PT 502, PT 510, PT 511, PT 601, PT 611, PT 677 and 3 credits of electives.

Graduate Certificate in Neurological Rehabilitation

The graduate certificate in neurological rehabilitation (GCNR) is designed to provide advanced theoretical and clinical training for physical and occupational therapists interested in specializing in the areas of neurorehabilitation and geriatrics. The GCNR will allow practicing therapists to take graduate level courses aimed at developing the specialty skills of a master clinician in treating those individuals with a neurological injury such a stroke, multiple sclerosis, traumatic brain injury and Parkinson's disease. Physical therapists may apply the 17 GCNR credits towards completion of the post-professional DScPT degree or the post-professional MSPT degree. Occupational therapists who gain specialization in neurological rehabilitation, however, are not eligible for the DScPT

Admissions

To be eligible for admission to this program, individuals must hold an entry-level degree in physical therapy and occupational therapy and be licensed or registered in their respective disciplines (or eligible for such). Two years of clinical experience

is highly recommended. All other admissions requirements for graduate application as determined by the Graduate Admissions must also be met.

Requirements for the certificate

To fulfill the certificate requirements the student must complete, with at least a 2.0 grade in each course and an overall GPA of 3.00, a program consisting of PT 502, PT 536, PT 537, PT 538, PT 539 and PT 610

The Doctor of Science in Physical Therapy (DScPT)

The post-professional DScPT is designed for physical therapists who received an entry-level bachelor's or master's degree in physical therapy and are interested in obtaining an advanced clinical doctorate. Prerequisite requirements for the DScPT will be determined on an individual basis. Students will be required to complete a range of credits based on prior academic preparation. An admissions committee composed of senior faculty in the PT program will review all applications.

Admissions Requirements

Applicants for the DScPT must:

- be licensed as a physical therapist in the United States
- have completed a US equivalent BS/MPT or MSPT degree
- have completed the GRE
(required for students with a BS only)
- meet Oakland University requirements for English proficiency
- have worked a minimum of 2 years as a physical therapist

Applicants with an undergraduate GPA less than 3.00 with the appropriate academic background and strong letters of recommendation may be considered for conditional admission. Students who qualify for this course status must complete a minimum of 8 credits of graduate course work achieving a grade point of 3.0 or above in each course before conditional status is removed.

This degree will require completion of 90 credits beyond a BS degree with up to 36 credits that can be earned from a qualified masters degree counting toward the DScPT degree. The transfer credit policy outlined in the graduate catalog will be followed. Per this policy, students may be allowed to transfer up to 9 semester hour credits. Students will be required to take the professional core courses (PT 800, 810, 900, 901 and 950), and select a physical therapy concentration (this can include a certificate, an advanced research practicum or an approved set of related coursework for a total of 16-54 credits) and cognate (9-12 credits). Cognate courses should support or complement the concentration and may be non-PT rubric courses. All students will develop a plan of study that outlines course work in the concentration and cognate. The student's adviser must approve this plan of study. All students will complete an individual research project under the direction of a committee chaired by physical therapy faculty.

COURSE OFFERINGS

EXERCISE SCIENCE

(Scheduling of classes subject to change.)

EXS 500

Introduction to Research (4)

An introductory graduate-level course in research methods for students pursuing graduate degrees in the health sciences. Topics include: scientific method, ethics, research design, interpretation of existing research, statistical concepts, computer resources, conceptualization of research problems, instrumentation and proposal preparation and presentation. Offered fall semester.

Prerequisites: STA 225, graduate status.

EXS 505

Health and Disease (2)

This course familiarizes the student with the pathogenesis of representative diseases and the physical changes associated with varying states of health and disease. Information from the health and medical history focus upon factors that are lifestyle related. Offered winter semester.

Prerequisites: BIO 111 and 207, BIO 205 recommended, or instructor's permission.

EXS 506

The Brain and Disease (2)

Reviews current neurological research on the brain in health and in disease, including addiction, depression, stroke, viral infections, Alzheimer's and Parkinson's. Emphasis on multidisciplinary research studies on the role of exercise and nutritional antioxidants. Offered spring semester.

Prerequisite: EXS 304, HS 401 or instructor's permission.

EXS 510

Stress Management (2)

This course examines the causes of stress and the changes that occur as a result. The physiological and psychological results of stress are investigated. Practical solutions to improving stress management that include recognition of the most common symptoms are discussed. Offered spring semester in even-numbered years.

Prerequisite: EXS 304.

EXS 520

Advanced Exercise Physiology (4)

This course emphasizes the incorporation of recent advances in biological research with the study of exercise. Topics include: morphological, biochemical and physiological responses to both acute and chronic exercise; mechanisms in metabolic control; hormonal, renal and digestive factors in exercise; and the relationships between exercise and cardiovascular disease.

Offered fall semester.

Prerequisites: BIO 325 or CHM 201, EXS 304 or instructor's permission.

EXS 521

Basic Athletic Training (2)

Course directed to competitive sports and the recognition and immediate care of athletic injuries. Evaluation and treatment procedures and techniques are presented and practiced. Offered fall and winter semesters.

Prerequisites: BIO 205, BIO 207, EXS 350 or PT 300.

EXS 525

Biomechanics (3)

This course emphasizes the principles of mechanics applied to human movement. Students learn the principles of applied kinesiology for the analysis of exercise, gait and physical activity in recreational and occupational settings. Qualitative and quantitative techniques for human motion analysis are presented.

Offered fall semester.

Prerequisite: EXS 350.

EXS 530

Diagnostic Testing and Exercise Prescription (3)

Course content emphasizes stress testing procedures and techniques for exercise prescription, including basic concepts in electro-cardiography. Students completing this course should be able to make clinical assessments regarding ECG information and, under faculty supervision, will be responsible for implementing a program of exercise rehabilitation for cardiac patients. Offered winter semester.

Prerequisites: EXS 304, 520 or instructor's permission.

EXS 535

Health-Promoting Lifestyles Choices and Interventions (4)

Emphasizes physical aspects of health-promoting behaviors, and philosophies of primary and secondary prevention, health education and health interventions. Includes modules on health beliefs, theoretical models of health and disease behaviors, principles of behavior modification and relapse prevention, predictors and measures of intervention success, and strategies for improving adherence. Offered winter semester.

Prerequisite: Instructor's permission

EXS 540

Nutrition, Weight Management and Exercise (2)

This course emphasizes basic concepts in nutrition as applied to exercise, physical training, health improvement and cardiac rehabilitation. Topics are related to the importance of food nutrients in sustaining physical function during moderate to severe physical activity, the energy value of foods and the relationships between nutrition, fitness and health.

Offered winter semester.

Prerequisites: BIO 325 or CHM 201, EXS 304

or instructor's permission.

EXS 545

Physical Activity and Aging (2)

This course examines the effects of aging on physical work capacity, body composition, and cardiovascular, pulmonary, neuromuscular and musculoskeletal function. Retardation of the aging process through the use of physical conditioning programs is presented, and principles for prescribing and conducting exercise programs are included. Offered summer semester.

Prerequisites: EXS 304 and 350 or instructor's permission.

EXS 550

Children and Exercise (2)

Physical activity and the growth, maturation, motor development and motor learning of children from birth to adolescence. Skill and performance enhancement, exercise program design, biomechanics, and injury and disease prevention are discussed. Credit will not be granted for both EXS 450 and EXS 550.

Offered summer semester in odd-numbered years.

Prerequisites: EXS 304 and 350.

EXS 560

Healthy Lifestyle Choices (2)

This course takes a biopsychosocial approach to exercise and other healthy lifestyle choices. Focus is on the dimensions of wellness, factors influencing lifestyle choices, the theory and practice of behavior change, and health promotion concepts in clinical, community, worksite, and commercial settings.

Offered spring semester.

EXS 565

Corporate and Worksite Wellness Programs (2)

This course explores concepts underlying corporate and worksite health promotion programs. It examines administration of these programs including: health and exercise program planning; facility planning and design; program management; staffing; equipment selection; safety and legal issues; and marketing. Offered spring semester.

Prerequisites: EXS 304, instructor's permission.

EXS 580

Preventative Nutrition Through the Life Span (2)

This course emphasizes the preventative benefits of lifestyle changes in physical activity and nutrition through the life span as they apply to the chronic degenerative diseases including diabetes, cancer and cardiovascular diseases. Offered spring semester in even-numbered years.

Prerequisite: EXS 540.

EXS 601/602

Exercise Science Internship I/II (2 or 4 each)

Supervised internship experience in a wide variety of clinical and community settings including hospitals, clinics, corporate fitness and community sites. Offered every semester.

Prerequisites: Departmental permission and 20 credits of graduate study including EXS 520, 525 and 530.

EXS 605

Administration of a Cardiac Rehabilitation or Community Exercise Program (2)

This course emphasizes the administrative steps necessary to establish and operate a cardiac rehabilitation or community exercise program. Staffing, facilities, equipment, budgeting, scheduling, legal liabilities and contacts with physicians, support personnel and health care centers are discussed.

Offered spring semester.

Prerequisites: EXS 520 and 530 or instructor's permission.

EXS 610

Clinical Biomechanics (2)

This course focuses on the pathomechanics of the human musculoskeletal system. The use of exercise in rehabilitation, sports medicine and clinical settings is explored. Topics include static and dynamic properties of human tissue, mechanisms of injury, pathokinesiology in various anatomical regions, and principles of musculoskeletal exercise prescription. Offered fall semester in even-numbered years.

Prerequisite: EXS 350 or instructor's permission.

EXS 615

Laboratory Instrumentation (2)

This course involves both concepts and procedures regarding the measurement of human performance -using appropriate laboratory instruments and data collection systems in the disciplines of exercise physiology and biomechanics. Students will learn proper techniques for data acquisition, equipment calibration and data interpretation for instrumentation used in exercise science. Offered winter semester in odd-numbered years.

Prerequisites: EXS 304, 520 or instructor's permission.

EXS 620**Muscle Physiology (2)**

This course focuses on the basic principles and current knowledge pertaining to muscle structure and function. Topics include muscle tissue anatomy, contraction, muscle fiber types and their recruitment patterns, energy metabolism, substrate utilization, fatigue and mitochondrial adaptations. Offered winter semester in even-numbered years.

Prerequisites: EXS 304, 520 or instructor's permission.

EXS 625**Exercise Electrocardiography (2)**

Explores theoretical and applied concepts of electrocardiography. Students learn basic principles of obtaining and understanding resting and exercise electrocardiograms, effects on the normal electrocardiogram and factors contributing to abnormal electrocardiography. Students experience exercise test applications of the electrocardiogram and learn to recognize life-threatening arrhythmias. Offered spring semester.

Prerequisite: EXS 304 or instructor's permission.

EXS 630**Seminar in Exercise Science (2)**

In-depth study of often-cited, controversial or recent research articles on a topic in exercise science. Students will give oral critiques of articles and write one review paper. Offered spring semester in odd-numbered years.

Prerequisites: EXS 500 and 520.

EXS 635**Environment and Human Performance (2)**

A multi-perspective consideration of human adaptation to major factors which can significantly influence human movement in diverse micro- and macro-environments. Factors to be considered include temperature, altitude, precipitation, light, noise and sociocultural. Health/safety in locomotion, rehabilitation, sport/recreation and occupational contexts are emphasized. Offered fall semester in odd-numbered years.

Prerequisites: EXS 304, EXS 520 or instructor's permission.

EXS 670**Research in Exercise Science (1 to 6)**

Independent research approved by the student's faculty adviser and research committee. May be satisfied by completion of either 1) presentation of findings in a written master's thesis and oral thesis defense, or 2) written and oral comprehensive examinations to determine if the student has acquired knowledge of exercise science expected of a master's degree candidate.

Offered every semester.

Prerequisites: 20 credits of graduate study, including EXS 500.

EXS 693**Directed Study and Research (1 or 2)**

Special study areas and research in exercise science. May be repeated for additional credit. Offered every semester.

Prerequisite: Written departmental permission.

■ HEALTH SCIENCES

HS 501**Introductory Pathology (4)**

Basic principles of human pathology appropriate for students pursuing curricula in the health-related disciplines. Diseases of the major systems of the body are studied.

Prerequisite: BIO 111 and BIO 207 or 321

HS 531**Pharmacology (2)**

An introduction to the principles of pharmacology, including the principles of drug therapy and the actions of the basic classes of drugs.

Prerequisite: BIO 207 or BIO 321

HS 630**Complementary Medicine and Wellness Seminar (2)**

In-depth study of often-cited, controversial or recent publications relating to alternative and complementary medicine and wellness. Integrates the physical, psychological, environmental, spiritual and social dimensions of the Complementary Medicine and Wellness Program.

Prerequisite: HS/CNS 652 or instructor permission.

HS 651**Mind-Body Medicine (2)**

Through analysis of scientific literature, examines the role of stress, emotions and other psychological states that bring about physiological changes affecting health and disease. Topics include stress management, psychoneuroimmunology, biofeedback, nutrition, and humor and laughter. Theories of various alternative/complementary approaches discussed emphasizing their application to practice.

Prerequisite: Graduate status or instructor permission.

HS 652

Advanced Mind-Body Medicine (2)

Builds upon previous learning involving further synthesis and evaluation of mind-body phenomena. Includes analysis of case histories, advanced theory and practice of stress management techniques, and analysis of additional, current studies related to health, mind-body medicine and psychoneuroimmunology.

Prerequisite: HS/CNS 651 or HS 451, or instructor permission.

HS 693

Directed Study in Complementary Medicine and Wellness (1-4)

Advanced study of a complementary technique, method or discipline to enhance professional practice or an academic program. Must be consistent with the student's employment and current professional licensure. A study plan for this course is submitted as part of the Complementary Medicine and Wellness Program admissions process.

Prerequisite: Admission to the Complementary Medicine and Wellness Program, and written approval.

■ INDUSTRIAL HEALTH AND SAFETY

(The Industrial Health and Safety Program does not offer a graduate degree program. However, it has been authorized to offer the following graduate courses.)

IHS 503

Industrial Toxicology (3)

Concepts and techniques of toxicology with special attention to industrial work environments. Evaluation of the effects of toxic substances on the human body. Focus on responses of various systems within the body to selected toxic agents.

Prerequisites: BIO 207, CHM 204, IHS 302.

IHS 504

Ergonomics (2)

Ergonomics and related change management concepts; anthropometry, biomechanics, metabolic energy expenditure, capabilities and limitations of workers; design and analysis of the work place, hand tools, controls and products; application of the NIOSH Lifting Guidelines and other standards. Graduate students will be required to do a research project involving ergonomics.

IHS 510

Health Care Facility Safety (2)

Critical health care associated risks such as blood-borne diseases, radiation, medical waste handling and back injuries, as well as the general topics of ergonomics, construction, hazardous waste and fire safety as they relate to diverse health care facilities.

■ PHYSICAL THERAPY

PT 500

Foundations of Pediatric Practice (3)

Beginning with the origins of biological systems, the learner will review the impact of atypical physical development on independent performance and reexamine principles of sensorimotor, emotional and behavioral development for examination, evaluation, intervention and functional goal-setting within multiple contexts.

PT 502

Understanding Evidence-Based Practice (2)

An overview of evidence-based practice and its application to examination, evaluation, diagnosis, prognosis, and intervention in physical and occupational therapy. The course will also include a review of frameworks for clinical decision making, qualitative and quantitative research designs, and methods of assessing professional literature related to approaches used by healthcare professionals.

PT 503

Diagnostic Imaging (2)

Diagnostic imaging techniques (roentgenography, MRI, CT, etc.) as they apply to evaluation of the neuromusculoskeletal system are presented and discussed. Radiographic interpretation and imaging interpretation of various traumatic lesions and arthropathies that affect the musculoskeletal and associated systems will be conducted. Selected correlations with physical and laboratory findings will be discussed.

Prerequisites: PT 513 or equivalent or physical therapy license.

PT 506

Current Issues in Pediatric Practice (3)

An examination of current trends in physical and occupational therapy related to the role of therapists in working with other professionals, the family, the community and schools to facilitate growth and development in children with disabilities. Legislative and professional issues, current trends in health care, and changing models of service delivery will be examined.

PT 507**Developmental Aspects of Pediatric Rehabilitation (3)**

Developmental theories and their application to growth and development in children as it relates to physical and occupational therapy examination, evaluation and treatment. An exploration of how illness and disability affect cognitive, social-emotional and motor development. Emphasis will be placed on the interaction among various aspects of development, with particular attention to the effect of motoric and physiological dysfunction on cognitive and socio-emotional growth and development.

PT 509**Biomechanics of Growth and Development (2)**

Application of biomechanical principles in growth and development of children. In addition to analysis of selected functional tasks, skeletal, muscular and neural dynamics will be discussed.

PT 510**Advanced Orthopedics I (3)**

This course is designed to introduce basic orthopedic science, orthopedic practice principles, and treatment techniques required in the day to day management of patients with movement impairments, functional limitations, and disabilities due to musculoskeletal pathologies of the extremities.

Prerequisite: Two years of clinical experience recommended.

PT 511**Advanced Orthopedics II (3)**

Building upon the basic science practice principles and treatment techniques introduced in PT 510, this course will address the day-to-day management of patients with movement impairments, functional limitations, and disabilities due to musculoskeletal pathologies of the spinal column.

Prerequisite: PT 510.

PT 514**Pharmacology for Physical Therapy (1)**

Investigates the principles of pharmacology, including principles of drug therapy and the actions of the basic classes of drugs for physical therapists.

Prerequisite: PT major standing.

PT 515**Gross Human Anatomy for Physical Therapy (4)**

Lecture and dissection laboratory for the study of human body systems with an emphasis on the neuromusculoskeletal system. The clinical significance for understanding human anatomy for effective physical therapy practice will be discussed.

Prerequisite: PT major standing.

PT 516**Neuroanatomy (4)**

Lecture and laboratory related to the morphology, development, function and integration within the neurological system. The clinical significance of neurological lesions to physical therapy practice will be discussed.

Prerequisite: PT major standing.

PT 517**Functional Anatomy (4)**

Study of anatomical, structural and functional properties of human muscular, skeletal and connective tissue structure. Normal human movement is emphasized in order to develop a base of knowledge for clinical assessment and intervention. Laboratories focus on palpating surface structures used during evaluation and intervention. Elementary analysis of nonpathological gait is included.

Prerequisite: PT major standing.

PT 519**Clinical Medicine (4)**

Etiology, pathology, clinical presentation, diagnosis, prognosis and intervention of disorders of the cardiovascular, pulmonary, endocrine, gastrointestinal, genitourinary, integumentary and neuromusculoskeletal systems. The course format is a combination of lectures, case studies and group discussions.

Prerequisite: PT major standing.

PT 520**Advanced Orthopedics III (3)**

A lecture and laboratory course on differential diagnosis of musculoskeletal dysfunction and application of manual therapy treatment techniques in varying soft tissue lesions.

Prerequisites: PT 510, 511.

PT 523**Craniomandibular System (1)**

The course offers a comprehensive overview of temporomandibular anatomy, biomechanics, clinical examination, evaluation and intervention. Differential evaluation of other sources of head and facial pain are presented and discussed.

Prerequisites: Admission to post-entry level Physical Therapy Program.

PT 531**Professional Issues I (2)**

Orientation to the profession of physical therapy including concepts related to disability and rehabilitation. Characteristics and history of the profession and professional expectations for practitioners will be included.

Prerequisite: PT major standing.

PT 536**Motor Control and Motor Learning Theory and Application (4)**

This course integrates recent theories in neuroscience, motor learning, motor control, biomechanics and movement analysis in order to enhance and expedite patient recovery following neurological injury. Examination of motor control principles within functional activities will be analyzed with patient case examples.

PT 537**Foundations of Geriatric Neurological Practice (3)**

This course reviews the pertinent physiological changes that occur with aging and their impact on the therapeutic effects of intervention with those individuals who have sustained a neurological injury. Psychosocial and cognitive aspects of aging and their influence on the recovery of the geriatric adult will be discussed. Factors affecting the patient, family, and the patient/family relationship in the situation of chronic illness and loss will be examined. Learning formats will include lecture, web-based materials, case studies, and small group discussions.

Prerequisite: Admitted to a post-professional PT program.

PT 538**Assessment of Neurological Dysfunction (3)**

This course is designed to enhance the examination and evaluation skills of therapists working with individuals with neurological dysfunctions. Evidence supporting or questioning current and new neurological examination procedures will be scrutinized. A number of objective function outcome measures will be presented and appropriate utilization of these measures will be discussed. Utilization of current technology such as motion analysis systems, force plates, electromyography, electrogoniometry, etc., used to enhance and objectify the examination and evaluation of individuals with neurological dysfunction will be a significant part of this class. Lecture, lab experiences, web-based material, case studies, small group problem solving and discussion will enhance the learning and integration of course material.

Prerequisite: Admitted to a post-professional PT program.

PT 539**Developing Interventions for Patients with Neuralgic Dysfunction (3)**

This course integrates information from prerequisite classes in determining and developing interventions for patients with functional limitations and impairments due to neurological dysfunction. Evidence from a variety of sources supporting clinical interventions will be examined. Medical management of relevant symptoms displayed by persons with neurological dysfunction will be examined.

Prerequisites: Admitted to a post-professional PT program, PT 538.

PT 540**Movement Science I (Biomechanics) (3)**

The functions and interrelationships in movement of the human musculoskeletal system are presented. Principles of muscle torque, lever systems, muscle mechanics and function

are applied to movement analysis. Topics discussed include: kinematics, electromyography, postural control, ergonomics, biomechanics of selected joints, soft tissues and bone, and mechanisms of injury related to physical therapy.

Prerequisite: Admission to professional program.

PT 550**Clinical Anatomy and Neuroanatomy (3)**

This course includes cadaver dissection with emphasis on the spine. There will be a review of functional anatomy relative to surface palpation of bone, ligament/tendon and muscles. A detailed description of joints, their surfaces, the ligamentous relationships including functional relationships between the noncontractile and contractile structures and the peripheral nervous system are analyzed. Vascular and neural supplies to the musculoskeletal system are described.

Prerequisite: Human gross anatomy.

PT 551**Clinical Examination and Evaluation I (4)**

This foundational course focuses on the fundamentals of the patient history taking process, use of pain questionnaires and the general aspects of screening visceral pathology. Introductory clinical examination skills consisting of postural assessment, gait analysis, AROM/PROM testing, a neurologic screening assessment and the clinical palpatory assessment form the foundational patient assessment skills.

Prerequisite: PT major standing.

PT 552**Examination and Evaluation II (4)**

In this second course, all aspects of the patient history as the initial step in the clinical diagnostic process are analyzed in greater detail. Abdominal palpation is now added as an additional tool for screening visceral pathology. Advanced clinical analysis of all forms of motion for the purposes of biomechanical diagnosis of movement impairment is a principal focus, and an expanded neurologic examination is included in this course.

Prerequisite: PT major standing, PT 551.

PT 556**Patient Management (3)**

Principles of patient management including a patient management model, legal and risk management principles, patient rights, confidentiality, history taking, medical records and documentation. Therapeutic massage, passive range of motion, functional training in self-care, and home-management related to mobility, transfers and gait are covered. Case studies and patient problems focus on understanding the role of the physical therapist in acute care, lab values, tubes and lines, patient monitoring and emergency situations.

Prerequisite: PT major standing.

PT 570**Musculoskeletal Biomechanics (3)**

Current biomechanical literature on peripheral and spinal joint arthrokinematics is extensively analyzed. Musculoskeletal measurement techniques and methodology are studied and applied in a patient case study. Selected aspects of ergonomics are addressed.

PT 590**Advanced Clinical Research Design (4)**

Research study designs and methodologies most relevant to clinical practice are presented. Topics include: scientific method, ethics, conceptualization of research problems and interpretation of existing research. Research designs discussed include: experimental designs, single case design, meta analysis case study design, historical case design and qualitative designs.

PT 592**Methods of Teaching and Learning in Rehabilitation (3)**

The process of selecting, designing, implementing and evaluating teaching methodologies for rehabilitation professionals will be presented. Application of these methods to clinical, academic, and community settings will be discussed. A project demonstrating attainment of teaching methods and techniques will be required.

Prerequisite: Admitted to a post-professional PT program, PT 810 or permission of instructor.

PT 593**Professional Education in Rehabilitation (4)**

The roles and responsibilities of academic and clinical faculty in professional education will be discussed. An understanding of the processes related to education in post-secondary institutions, including accreditation, curriculum development, and assessment will be examined.

Prerequisite: Admitted to a post-professional P program, PT 810 or permission of instructor.

PT 594**Teaching Practicum for Rehabilitation Professionals (4)**

Students will participate in a variety of experiences which may include developing lesson plans, writing objectives, providing lectures, directing and developing laboratory experiences, developing and providing modules via the Internet, and/or developing and providing in-service education to clinical staff or the general public.

Prerequisite: Admitted to a post-professional PT program, PT 810, PT 592 or permission of instructor.

PT 597**Critical Inquiry I (3)**

This course will emphasize ethical principles in research, basic components of research with an emphasis on critiquing the literature and basic analytic techniques needed for interpreting professional literature. Students will critique clinical research

articles in physical therapy and related professions. Application of clinical research in physical therapy will be emphasized.

Prerequisite: PT major standing.

PT 598**Independent Study (1-4)**

Student initiated and problem-oriented independent study focusing on physical therapy issues. May be repeated for additional credit. Graded numerically or S/U.

Prerequisite: Departmental permission.

PT 601**Clinical Orthopedic Internship I (2)**

This course is designed to provide supervised clinical practice in an orthopedic physical therapy setting. Students will actively apply principles and techniques taught in PT 510 and 511 to manage patients with impairments, functional limitations and disabilities due to musculoskeletal pathologies. Additional instruction in aspects of orthopedic physical therapy intervention will include coordination, communication, documentation and patient/client-related instruction. The student will take an active role in the interpretation of and progression of selected patient cases.

Prerequisite: PT 510 and PT511.

PT 602**Clinical Orthopedic Internship II (2)**

This course is designed to provide supervised clinical practice in an orthopedic manual physical therapy setting. Students will actively apply principles and techniques taught in PT 520 to manage patients with impairments, functional limitations and disabilities due to musculoskeletal pathologies. Additional instruction in aspects of orthopedic physical therapy intervention will include coordination, communication, documentation, and patient/client-related instruction. The student will take an active role in the interpretation of and pregression of selected patient cases and will be responsible for developing and orally presenting a publishable case report.

Prerequisites: PT 510, 511, 601.

PT 603**Pediatric Clinical Internship I (2)**

Supervised clinical practice in a pediatric rehabilitation setting. Students must demonstrate an integration of examination, evaluation and intervention and assessment skills. Functional assessment and training are incorporated.

PT 604**Pediatric Clinical Internship II (1-2)**

Supervised clinical practice in an acute and post-acute trauma setting. Students must demonstrate application and integration of examination, evaluation and intervention skills in a diverse multi-disciplinary environment.

Prerequisite: PT 603.

PT 610

Clinical Neurophysiology (2)

Lecture and laboratory related to the morphology, development, function of and integration within the neurological system. The clinical significance of neurological lesions to physical therapy practice will be discussed.

Prerequisite: BIO 460 or equivalent and departmental permission.

PT 611

Applied Movement Sciences (2 or 3)

This course is designed to educate students in principles related to applied physiology and biomechanics. Course content will include topics relating to connective tissue and joint mechanics, motor skill development and tissue response to exercise.

PT 620

Health Care Economics (3)

Application of economic concepts to the health care sector. Demand and supply, elasticity, health insurance, regulation, competition and cost-effectiveness analysis for strategic planning. Analysis of the application of advanced economic theory to problems in the health services field. General discussion of the appropriate economic theory and a critical review of the relevant health economics literature.

PT 621

Marketing of Rehabilitation Services (3)

Introductory survey of marketing concepts as applied to rehabilitation services organizations. Consumer behavior, market segmentation, target marketing, marketing research, management, and control of marketing mix variables are discussed and applied to different types of providers, home care and long-term care.

PT 622

Federal and State Health Policy (2)

Relationship between the political process and health policy at the state and federal level is explored. Students will examine critically the United States health care system and the formulation and implementation of health policies. Emphasis will be on the influence of values, ideology and politics on the ongoing transformation of health care.

PT 623

Health Care and Employment Law (2)

The legal principles and processes influencing health care providers, including employment law, contract law and tort law. Focus on major health care liability producing areas and interface between law and ethics. Selected legal principles and their application to health field.

PT 624

Strategic Planning (1)

This course introduces the principles, methods and models of strategic management of organizations with an emphasis on how they apply to health care organizations. Students will increase their understanding of the theory and practice of strategic

thinking, planning and management for public managers and develop their managerial skills for implementation of plans.

PT 625

Management Internship or Independent Study (2)

Under the supervision of a faculty member, the student pursues research on a topic of interest not covered in other courses in the program curriculum. The student's independent project must be of significant scope and depth to permit the synthesis of prior learning and expansion of knowledge on the topic.

PT 627

Lifespan Development I (4)

An overview of developmental theories related to psychomotor, cognitive and social-emotional development across the lifespan. The application of developmental theories to understanding stages of normal growth and development in patients commonly treated by physical therapists.

Prerequisite: PT major standing.

PT 628

Pediatric Examination and Interventions (4)

Using lecture, discussion, case studies, laboratory experiences and field observations, students will become familiar with the types of diagnoses commonly treated by the pediatric physical therapist. The application of developmental and neurophysiological theories to the examination and evaluation of and intervention with children of all ages.

Prerequisite: PT major standing and PT 627.

PT 630

Administration and Practice Management (4)

Discussion and group experiences related to management theories, employee motivation, billing, patient care audits, policies and procedures, problem oriented medical records, quality assurance, public relations, health career economics, marketing and strategic planning. These topics will be applied to the practice of physical therapy.

Prerequisite: PT major standing.

PT 631

Clinical Pharmacology of the Musculoskeletal System (1)

Principles of pharmacology including drug nomenclature, classification, pharmacokinetics, approval and regulation are reviewed. Typical agents, their pharmacokinetics, adverse effects and specific physical therapy concerns are covered for the following: analgesic and anti-inflammatory drugs, skeletal muscle relaxants, cardiovascular drugs, anti-infectious agents, cancer treatments, anti-epileptic drugs, anesthetics, psychopharmacology and endocrine pharmacology.

PT 635**Educational Theory and Practice (3)**

The application of learning theories to teaching and learning interactions between physical therapists and patients and their families, colleagues, legislators and the community. Includes the importance of self-assessment and self-directed learning for continued professional development.

Prerequisite: PT major standing.

PT 640**Movement Science II
(Motor Control and Motor Learning) (2)**

The use of motor learning principles (e.g., feedback, knowledge of results, practice considerations and patient problem solving) to optimize patient's learning of motor tasks and promote carry-over of these skills to home and community environments will be discussed. Concepts in motor control and movement analysis will be applied to examination and evaluation of the intact and dysfunctioning nervous system and formulation of therapeutic intervention.

Prerequisite: PT major standing and PT 540.

PT 641**Clinical Neuroscience (3)**

Lecture and laboratory related to the morphology, development, function of and integration within the neurological system. The clinical significance of neurological lesions to physical therapy practice will be discussed.

Prerequisite: PT major standing.

PT 650**Comprehensive Examination (4)**

In-depth study of physical therapy topics approved by student's faculty adviser and comprehensive examination committee. Written and oral comprehensive examinations are given to determine if the student has acquired knowledge and ability to analyze and synthesize current literature in physical therapy expected of a master's degree candidate. Offered every semester.

Prerequisite: Departmental permission.

PT 651**Modalities and Electrotherapeutic Interventions (4)**

Principles and techniques of physical agents to include: the physiologic basis and the technical application of thermal agents, ultrasound, traction and electrotherapeutic agents. The focus will be on utilizing appropriate modalities in a patient situation and the decision-making process.

Prerequisite: PT major standing.

PT 652**Foundations of Therapeutic
Exercise Interventions (3)**

This foundational course focuses on the therapeutic effects of various forms of movement, and understanding rationale for therapeutic exercise prescription based on musculoskeletal injury, repair, and physiological time frames for healing of

tissue. A broad spectrum of exercises is shown which span the clinical continuum of acute to chronic conditions.

Prerequisite: PT major standing.

PT 653**Advanced Therapeutic Exercise Interventions (3)**

Evaluation procedures are introduced to assist in assessing and localizing symptomatic movement impairment for the purposes of accurate and correct therapeutic exercise prescription. Special topic sections on relaxation, balance and coordination exercise are included, and teaching techniques to facilitate patient understanding, exercise independence and follow through are described.

Prerequisite: PT major standing and PT 652.

PT 655**Integumentary Diagnosis and Interventions (2)**

The use of lecture, laboratory and case studies related to the role of the physical therapist in the treatment of patients with problems related to the integumentary system. Care of wounds, burns, diabetic ulcers and the lymphatic and vascular systems will be discussed.

Prerequisite: PT major standing.

PT 660**Prosthetic and Orthotic Interventions (2)**

Principles and techniques in the evaluation and management of clients requiring prosthetic and/or orthotic devices. Principles of prosthetic and/or orthotic prescription will be discussed. Therapeutic exercise for the prosthetic and/or orthotic user will be examined. Case studies and laboratories will be used.

Prerequisite: PT major standing.

PT 661**Foundations of Musculoskeletal
Diagnosis and Interventions (3)**

Lectures, demonstrations, and laboratory experiences coupled with dissection of the deep extremity joints prepare the student to design, develop and implement interventions for patients with common spinal and extremity orthopedic pathologies.

Prerequisite: PT major standing.

PT 677**Advanced Differential Diagnosis (2)**

This course is designed to facilitate the student's ability to synthesize evaluation skills in physical therapy with differential diagnostic skills; to refine the student's knowledge of other professionals to whom the physical therapist refers and from whom the physical therapist receives referrals; to develop prognostic skills using algorithms and clinical decision trees.

Prerequisite: Entry-level physical therapy degree.

PT 681

Physical Therapy Internship (3)

Seminar and clinical internship. The purpose of the seminar is to orient students to clinical and professional practice including professional behaviors, expectations, roles and development. Students develop skills in verbal and written communication and self-assessment and begin to develop a professional development portfolio. During the internship students are oriented to clinical practice and provide patient care with supervision by a licensed physical therapist in various clinical settings.

Prerequisite: PT major standing.

PT 682

Physical Therapy Internship II (3)

In this second clinical internship, students continue to refine their skills in examination, evaluation and intervention through the provision of patient care in clinical settings, under the supervision of a licensed physical therapist.

Prerequisite: PT major standing and PT 681.

PT 690

Thesis Research (4)

Independent research approved by the student's faculty adviser and thesis committee. The student will present the methodology and findings of his/her work in the form of a written master's thesis. In addition, an oral defense of the thesis will be scheduled following acceptance of the written thesis.

Offered every semester.

Prerequisite: Departmental permission.

PT 698

Critical Inquiry II (3)

This course will emphasize the process of research. Students will complete a review of the literature, develop a research proposal and complete an application for institutional review for use of human subjects in research, on a topic of their choice. This proposal may serve as the basis for the project to be completed in Research Practicum.

Prerequisite: PT major standing and PT 597.

PT 728

Lifespan Development II (2)

This course describes the normal age-related changes from adulthood into old age in terms of physiology, psychology, sociology and environmental resources. The focus of this course is to highlight how patient assessment and treatment need to be adapted in light of normal age-related changes. A case study format will allow for problem solving and develop clinical decision-making skills.

Prerequisite: PT major standing.

PT 732

Professional Issues II (3)

The purpose of this course is to prepare students for their professional roles as physical therapists in the areas of consultation, delegation to and supervision of support personnel, clinical instruction, pro bono service and professional development.

This seminar will address legislative, legal and ethical issues that are currently impacting physical therapy in order to increase awareness and facilitate advocacy for patients and the profession. Students complete a consultation project and a professional practice portfolio.

Prerequisite: PT major standing and PT 531.

PT 734

Psychosocial Aspects of Disability (3)

Study of the various factors affecting the patient, family or meaningful others, other health care team members, and the patient-therapist relationship. An understanding of the psychological and social factors that affect the ability of individuals with injuries, diseases or disabilities to function to the best of their ability on a personal and societal level.

Prerequisite: PT major standing.

PT 735

Health Promotion and Wellness in Physical Therapy (4)

The role of physical therapists in community health, health promotion, wellness and injury prevention will be addressed. Concepts related to health behavior, health education, community health, epidemiology, public health, cultural diversity, patient advocacy, compliance, ergonomics and disease and injury prevention are presented. Strategies for community assessment and the prevention of disability will be included.

Prerequisite: PT major standing.

PT 742

Neuromuscular Interventions I (4)

This course provides the student with intervention techniques based on neuroanatomy and neurophysiological principles. Analysis of normal movement patterns during functional activities will allow the student to determine client deficiencies and establish a plan of care. Clinical skills are developed through lecture, class discussions, laboratories and a case study problem-solving format.

Prerequisite: PT major standing.

PT 743

Neuromuscular Interventions II (4)

This course will prepare the physical therapy student to design intervention programs for patients with neuromusculoskeletal problems at an entry-level, based on a thorough examination and evaluation. Diagnoses will include spinal cord injury, traumatic brain injury, cerebral vascular accident and other select dysfunctions.

Prerequisite: PT major standing and PT 742.

PT 751**Differential Diagnosis and Referral Systems (4)**

This course synthesizes material learned earlier in the curriculum to enable students to examine and evaluate patients with a multitude of pathologies. Students will learn to identify pathology which requires medical intervention and to refer the patient to the appropriate provider when necessary. Familiarization with laboratory testing and diagnostic procedures is required.

Prerequisite: PT major standing.

PT 755**Cardiopulmonary Interventions (3)**

Physiology, pathophysiology, examination, evaluation and interventions for disorders of the pulmonary and cardiac systems. Lecture, laboratory and case studies with an emphasis on clinical problem-solving will be used to enhance student understanding of evaluation and intervention with patients with cardiopulmonary problems and the implications of a compromised cardiopulmonary system for patients with neuromuscular or musculoskeletal conditions.

Prerequisite: PT major standing.

PT 762**Advanced Musculoskeletal Diagnosis and Interventions (4)**

This course develops the student's clinical problem-solving skills for patients with complex spinal and extremity clinical presentations. Students will design, develop and implement examinations and interventions that demonstrate an integrated understanding of the neuromusculoskeletal system with further emphasis on prioritization, efficiency and outcome assessment.

Prerequisite: PT major standing and PT 661.

PT 783**Physical Therapy Internship III (8)**

In this final clinical internship, students further refine their skills in examination, evaluation and intervention through the provision of patient care in clinical settings, under the supervision of a licensed physical therapist. Through exposure to more complex patient cases, students develop critical thinking and advanced problem-solving skills in preparation for entry into professional practice.

Prerequisite: PT major standing and PT 681.

PT 799**Research Practicum (3)**

This course will involve the completion of a research project. Students will collect, analyze, and present data in both oral and written formats. There is an expectation that students will submit their findings from this terminal experience at a public forum and will submit final papers in publication format.

Prerequisite: PT major standing and PT 597.

PT 800**Professional Seminar (4)**

Students will be oriented to the process of doctoral education, current issues in the profession and current issues in research. Students will develop a plan of study, initiate research activities and determine professional goals. Students will critically review foundational documents of the profession and physical therapy theories of practice.

Prerequisite: PT major standing.

PT 810**Educational Principles for Rehabilitation Professionals (4)**

The role of rehabilitation professionals as educators of students, patients, the community and other health care providers will be examined. Theoretical principles related to the teaching and learning process, adult learning and a professional development will be presented. Current issues in academic, post-professional and clinical education will be critically reviewed.

Prerequisite: Admitted to a post-professional PT program or permission of instructor.

PT 820**Community Practicum in Physical Therapy (4)**

The role of the physical therapist as an advanced practitioner in health, wellness and injury and disease prevention are examined. Current concepts and models in community and public health related to the practice of physical therapy will be critically reviewed. Roles for physical therapists in wellness throughout the life span will be discussed.

Prerequisite: PT major standing.

PT 900**Advanced Scientific Inquiry (4)**

Concepts related to understanding and developing clinically relevant research will be examined. Topics include: research methodologies, ethics in research, critical review of existing research, and statistical analyses commonly used in physical therapy literature. Students will be expected to initiate a review of the literature and complete a research proposal.

Prerequisite: PT major standing.

PT 901**Analysis of Clinical Findings (2)**

This course will focus on the analysis and interpretation of data related to clinical findings in physical therapy. Evidence-based practice principles will be emphasized.

Prerequisite: PT 900 and basic statistics.

PT 950**Research Practicum (10)**

Students will complete and orally defend their individual research project. This will include development of a proposal and piloting of procedures and instruments to be used in the study. Students will present their proposal to their graduate committee for approval prior to implementation and submission for IRB approval.

Prerequisite: PT major standing.

SCHOOL OF NURSING

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Office of the dean:

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nursing laboratory manager: Patricia T. Ketcham • **administrative project coordinator:** Joann Burrington

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Wayne State University

Adjunct instructors:

Palemonita Jones, M.S.N, CRNA, Oakland University

Lisa Ann Mileto, M.S., CRNA, Mercy College of Detroit

objectives and curricular design, as well as clinical and research programs that meet the rapidly changing requirements of the health care field. Board members consult on such matters as facilities, equipment requirements, special topics and long-range planning.

Members of the Board of Visitors are:

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Board of Visitors

The Board of Visitors for the School of Nursing is composed of community leaders in the metropolitan Detroit area. The Board assists the School of Nursing in developing its goals,

■ The Master of Science in Nursing

The School of Nursing graduate degree program prepares professional nurses for advanced nursing practice, leadership in the nursing profession and future doctoral study. Four tracks are offered: Adult/Gerontological Nurse Practitioner, Family Nurse Practitioner, Nurse Anesthesia and Nursing Education. The master's program is accredited by the Commission on Collegiate Nursing Education. In addition, the Nurse Anesthesia program is accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs.

Graduate Program Objectives

In keeping with the philosophy of the School of Nursing, master's degree graduates achieve the following outcome competencies:

1. Incorporate concepts and theories from nursing and related disciplines into advanced nursing practice.
2. Provide advanced nursing care in a variety of settings in accordance with the American Nurses Association (ANA) Scope and Standards of Advanced Practice Registered Nursing and appropriate subspecialty standards.
3. Exemplify in practice the American Nurses Association Standards of Professional Performance as detailed in the Scope and Standards of Advanced Practice Registered Nursing as well as other appropriate advanced standards of care.

Adult/Gerontological Nurse Practitioner

The plan of study for the Adult/Gerontological Nurse Practitioner (Adult/GNP) program prepares the advanced practice nurse as a primary care provider for adult, older adult and frail elder clients in a variety of settings. The curriculum focuses on culturally sensitive care, incorporating health promotion and management of acute and chronic health problems. The graduate is prepared to apply nursing theory, principles of advanced practice nursing and the research process in the design and delivery of primary care. Knowledge for advanced nursing practice is synthesized from concepts in nursing as well as the biological and social sciences. Graduates of the Adult/GNP program are prepared to take an Adult Nurse Practitioner national certification examination and/or a Gerontological Nurse Practitioner national certification examination.

Family Nurse Practitioner

The plan of study for the Family Nurse Practitioner (FNP) program prepares the advanced practice nurse as a primary care provider for clients across ages in a variety of settings. The curriculum focuses on culturally sensitive care, incorporating health promotion and management of acute and chronic health problems. The graduate is prepared to apply nursing theory, principles of advanced practice nursing and the research process in the design and delivery of primary care. Knowledge for

advanced nursing practice is synthesized from concepts in nursing, as well as the biological and social sciences. Graduates of the Family Nurse Practitioner program are prepared to take a Family Nurse Practitioner national certification examination.

Nurse Anesthesia

The plan of study for the Nurse Anesthesia (NA) program prepares nurses as specialists in anesthesia care. Nursing courses and clinical internships provide the opportunity for students to gain experience in nurse anesthesia practice in all specialty areas. Students study physiology, pathophysiology, pharmacology and anatomy in cognate courses. The graduate applies nursing theory, principles of nurse anesthesia practice and research in the delivery of anesthesia care. After 28 months of full-time study, nurse anesthesia graduates are prepared to take the certification examination offered by the Council of Certification of Nurse Anesthetists leading to the designation CRNA.

Nursing Education

The Master of Science in Nursing Education (NE) program prepares nurses to teach in an academic setting. The curriculum focuses on curriculum and instruction, program and course design, development, and evaluation. Students study learning styles, teaching methods, and evaluation strategies. A field experience, which will occur in an academic setting, provides students with the opportunity to apply these skills in actual classroom and clinical environments under the guidance of expert School of Nursing faculty. Graduates of the Nursing Education program are prepared to teach in both classroom and clinical settings.

Admission

Applicants for admission to the Master of Science in Nursing program must have a Bachelor of Science degree in Nursing with an undergraduate cumulative grade point average of 3.00 or above from an institution accredited by the National League for Nursing or the Commission on Collegiate Nursing Education. Applicants must be able to demonstrate the competencies underpinning the ANA Standards of Care and Standards of Professional Performance, show satisfactory achievement on the Graduate Record Examination (GRE) (for applicants with undergraduate GPA's of 3.50 or above, the GRE is not required), and be eligible for a current Registered Nurse license in the state of Michigan. Applicants should have at least one year prior clinical experience and must have completed an undergraduate physical assessment course.

Applicants for the nurse anesthesia program must also have grades of 3.0 or above in each required science course in their undergraduate nursing programs. A minimum of one year of critical care experience as an RN is required during which time the applicant has functioned as an independent decision maker, demonstrated advanced psychomotor skills and used and interpreted advanced monitoring techniques.

The admission process begins with application for admission to graduate study at Oakland University, Graduate Admissions, 160 North Foundation Hall, (248) 370-3167. Concurrently, the applicant is advised to schedule an appoint-

ment with an academic adviser of the School of Nursing (248) 370-4068.

Admission to the programs is selective. Preference is given to applicants evaluated as best qualified to undertake the program of study. Regular admission to the program will be considered when the following materials have been received by the University: 1) an application for admission to graduate study and \$30 application fee, 2) official transcripts of all graduate and undergraduate course work, 3) two recommendations from professionals who are able to attest to the applicant's ability (nurse anesthesia program applicants must have one recommendation from their current nurse manager), and 4) official Graduate Record Examination (GRE) results for those applicants whose undergraduate GPA's are less than 3.50. If GRE results are necessary but not available, the applicant may be admitted under Special Graduate Status.

Applicants are required to submit a resume and a goal statement of 500 to 1,000 words, with attention given to the applicant's professional goals and experience, and contributions the applicant expects to make to the profession of nursing. Applicants for the nurse anesthesia program must submit proof of BLS and ACLS certification and attend an interview with the Admissions Committee that consists of a group interview and a brief quiz about critical care nursing. Individual interviews with faculty are required for family nurse practitioner, adult/gerontological nurse practitioner, and nursing education applicants.

Applications for admission are accepted at any time for the MSN program. Nurse anesthesia applications are accepted anytime, but the final deadline is October 15 for the class that begins full-time study the following fall semester.

Advising

Students are responsible for requirements and policies stated in the School of Nursing Graduate Student Handbook and each course's syllabus. Every student admitted to the MSN program is assigned both an academic adviser and a faculty adviser who has teaching responsibilities in the graduate program. These advisers are available to discuss course work, plans of study, concerns regarding progression in the program and student career goals.

Academic progress

Students are required to follow the University policies and procedures for graduate students, as described in the Oakland University graduate catalog. In addition to the University requirements, specific School of Nursing policies and procedures are outlined in the School of Nursing Graduate Handbook.

Students are expected to earn a grade of 3.0 or above in each course in the MSN program. In courses graded satisfactory/unsatisfactory (S/U), students are expected to earn a course grade of satisfactory. Students who are not making satisfactory progress in the program may be placed on probation with conditions imposed for retention in the program or may be recommended for dismissal from the program.

Degree requirements

The Adult/Gerontological and Family Nurse Practitioner tracks are 47 credits and 45 credits, respectively, including 630 clinical practice hours each. Both programs of study allow full-time students to complete the requirements in two academic years. Part-time students may complete the program in three to six academic years. The Nursing Education program is 36-37 credits, which includes 280 clinical practice hours and also can be completed in two years.

The program of study for Nurse Anesthesia is 55 credits and requires 28 months of full-time study, commencing in September. Extensive time is required in the clinical setting, beginning with 16 hours a week the first term and concluding with 40 or more hours a week during the final internship. Clinical requirements by the accrediting body require a minimum of 550 cases, in all specialty areas, with at least 800 hours of anesthesia time.

The Office of Graduate Study may accept a maximum of nine approved semester hours of transferred graduate nursing course work for equivalent course credit. However, once matriculated at Oakland University, all other required graduate courses are expected to be completed at Oakland University. A maximum of six years is allowed for completion of all degree requirements according to university policy. This policy includes all transfer credits.

Components of the MSN Curriculum

Foundation Courses

Foundation courses address critical content needed by all graduate nursing students. These courses include content on nursing theory, diversity, research, ethics, health policy and roles of advanced practice nursing. A total of 15 credits are required in the foundation courses.

Clinical Core Courses

The clinical core courses provide graduate students with advanced clinical knowledge and skills in pharmacology, assessment, anatomy and physiology, pathophysiology and advanced nursing interventions.

Specialty Courses

The specialty courses are comprised of didactic and clinical courses that prepare students for the advanced practice specialties of Family or Adult/Gerontological Nurse Practitioner, Nurse Anesthetist, or Nursing Education. The specialty courses build upon nursing knowledge and skills learned at the undergraduate level and during foundation and clinical core courses.

Adult/Gerontological Nurse Practitioner Program

Foundation courses

NRS 500	Theoretical Foundations of Advanced Nursing Practice	3
NRS 521	Diversity and Social Issues	2
NRS 531	Research in Advanced Nursing Practice	3
NRS 610	Health Policy and Finance	3
NRS 643	Professional Role Development and Ethics	3
NRS 687	Graduate Research: Project	1
		15

Clinical Core courses

NRS 611	Pathophysiology in Advanced Nursing	3
NRS 613	Advanced Health Assessment	4
NRS 616	Advanced Nursing Interventions	2
NRS 648	Pharmacology for Advanced Practice	4
		13

Specialty courses

NRS 598	Holistic Perspectives on Aging	2
NRS 631	Health Promotion Across the Lifespan	2
NRS 638	Advanced Nursing Care of Adults and Older Adults I	5
NRS 639	Advanced Nursing Care of Adults and Older Adults II	5
NRS 641	Advanced Nursing of Frail Elders	5
		19
	Total	47

Family Nurse Practitioner Program

Foundation courses

NRS 500	Theoretical Foundations of Advanced Nursing Practice	3
NRS 521	Diversity and Social Issues	2
NRS 531	Research in Advanced Nursing Practice	3
NRS 610	Health Policy and Finance	3
NRS 643	Professional Role Development and Ethics	3
NRS 687	Graduate Research: Project 1	15

Clinical Core courses

NRS 611	Pathophysiology in Advanced Nursing	3
NRS 613	Advanced Health Assessment	4
NRS 616	Advanced Nursing Interventions	2
NRS 648	Pharmacology for Advanced Practice	4
		13

Specialty courses

NRS 620	Pediatric Pathophysiology	2
NRS 653	Family Nursing: Wellness Care	5
NRS 654	Family Nursing: Acute Problems	5
NRS 655	Family Nursing: Chronic Problems	5
		17
	Total	45

Nurse Anesthesia Program

Foundation courses

NRS 500	Theoretical Foundations of Advanced Nursing Practice	3
NRS 521	Diversity and Social Issues	2
NRS 531	Research in Advanced Nursing Practice	3
NRS 610	Health Policy and Finance	3
NRS 643	Professional Role Development and Ethics	3
NRS 687	Graduate Research: Project	1
		15

Clinical Core courses

NRS 605	Introduction to Pharmacology for Nurse Anesthesia Practice	3
NRS 651	Pharmacology: Nurse Anesthesia I	3
NRS 652	Pharmacology: Nurse Anesthesia II	3
BIO 501	Physiology and Pathophysiology I	3
BIO 502	Physiology and Pathophysiology II	3
BIO 503	Gross Anatomical Dissection	3
		18

Specialty courses

NRS 607	Introduction to Nurse Anesthesia Practice and Clinical Internship I	3
NRS 615	Nurse Anesthesia Practice I	4
NRS 617	Nurse Anesthesia Clinical Internship II	1
NRS 618	Biophysics for Nurse Anesthesia	2
NRS 625	Nurse Anesthesia Practice II	4
NRS 627	Nurse Anesthesia Clinical Internship III	1
NRS 635	Regional Anesthesia and Pain Management	3
NRS 637	Nurse Anesthesia Clinical Internship IV	1
NRS 647	Nurse Anesthesia Clinical Internship V	1
NRS 657	Nurse Anesthesia Clinical Internship VI	1
NRS 667	Nurse Anesthesia Clinical Internship VII	1
		22
	Total	55

Nursing Education Program

Foundation courses

NRS 500	Theoretical Foundations of Advanced Nursing Practice	3
NRS 521	Diversity and Social Issues	2
NRS 531	Research in Advanced Nursing Practice	3
NRS 610	Health Policy and Finance	3
NRS 643	Professional Role Development and Ethics	3
NRS 687	Graduate Research: Project	1
		15

Clinical Core courses

NRS 616	Advanced Nursing Interventions	2
<i>Select one course from the following:</i>		
NRS 611	Pathophysiology in Advanced Nursing	3
NRS 613	Advanced Health Assessment	4
NRS 648	Pharmacology for Advanced Practice	4
		5-6

Specialty courses

NRS 632	Curriculum and Instruction in Nursing Education	4
NRS 634	Evaluation in Nursing Education	4
NRS 636	Field Experience in Nursing Education	4
Elective	Elective	4
		16
	Total	36-37

■ Post-Master's Certificate Programs

The School of Nursing offers two Post-Master's Certificate programs: Family Nurse Practitioner and Nurse Anesthesia. These programs are designed to provide students who have a Master of Science in Nursing degree with additional course work in a specific area of nursing.

Post-Master's Certificate: Family Nurse Practitioner

The Post-Master's Family Nurse Practitioner Certificate is a graduate program that prepares the advanced practice nurse as a primary care provider for clients across a variety of settings. The goals and focus of this certificate program are the same as the Family Nurse Practitioner master's program. Upon completion of the certification program, the advanced practice nurse is prepared to take a Family Nurse Practitioner national certification examination.

Admission

Post-Master's Certificate applicants must have a master's degree in nursing from an accredited institution (see admission standards for MSN programs). Students must meet the same admission requirements as those students entering the FNP-MSN program. Two letters of recommendation are required, including at least one from a faculty member familiar with the student's graduate work. Evidence of a graduate-level pathophysiology course must also be submitted. The GRE requirement is waived.

Plan of study

NRS 613	Advanced Health Assessment	4
NRS 620	Pediatric Pathophysiology	2
NRS 643	Professional Role Development and Ethics	3
NRS 648	Pharmacology for Advanced Practice	4
NRS 653	Family Nursing: Wellness Care	5
NRS 654	Family Nursing: Acute Problems	5
NRS 655	Family Nursing: Chronic Problems	5

There are 15 to 28 credits required in the post-master's specialization. All students are required to complete NRS 653, 654, 655 for 15 credits. For students who have not completed course work in Advanced Health Assessment, Pediatric Pathophysiology, Professional Role Development and Ethics, and Pharmacology for Advanced Practice, 28 credits are required.

Post-Master's Certificate: Nurse Anesthesia

The Post-Master's Certificate in Nurse Anesthesia is a graduate program of full-time study that prepares nurses as specialists in anesthesia care. Clinical core and specialty courses, including clinical internships, are the same as the MSN nurse anesthesia program. Upon completion of the 40-credit, 28-month post-master's certificate program, the nurse is prepared to take the certification exam offered by the Council of Certification of Nurse Anesthetists leading to the designation CRNA.

Admission

Post-master's certificate applicants must have a master's degree in nursing from an accredited institution (see admission standards for MSN programs). Students must meet the same admission requirements, process and deadlines as those students entering the MSN Nurse Anesthesia program. The requirement for the GRE is waived.

Plan of Study

Clinical Core courses

NRS 605	Introduction to Pharmacology for NA Practice	3
NRS 651	Pharmacology: Nurse Anesthesia I	3
NRS 652	Pharmacology: Nurse Anesthesia II	3
BIO 501	Physiology and Pathophysiology I	3
BIO 502	Physiology and Pathophysiology II	3
BIO 503	Gross Anatomical Dissection	3
		18

Specialty courses

NRS 607	Introduction to Nurse Anesthesia Practice and Clinical Internship I	3
NRS 615	Nurse Anesthesia Practice I	4
NRS 617	Nurse Anesthesia Clinical Internship II	1
NRS 618	Biophysics for Nurse Anesthesia	2
NRS 625	Nurse Anesthesia Practice II	4
NRS 627	Nurse Anesthesia Clinical Internship III	1
NRS 635	Regional Anesthesia and Pain Management	3
NRS 637	Nurse Anesthesia Clinical Internship IV	1
NRS 647	Nurse Anesthesia Clinical Internship V	1
NRS 657	Nurse Anesthesia Clinical Internship VI	1
NRS 667	Nurse Anesthesia Clinical Internship VII	1
		22
Total		40

■ Graduate Certificate in Nursing Education

This 15-credit certificate program prepares nurses for teaching positions in higher education and staff development. The program emphasizes instruction in curriculum, program and course design, development and evaluation. A field experience, which may occur in either an academic or service setting, provides students with the opportunity to apply these skills in actual classroom and clinical environments under the guidance of expert School of Nursing faculty. Content focuses on learning styles, teaching methods and evaluation strategies.

Admission

Students must meet the same admission requirements, process, and deadlines as those entering the MSN program.

Plan of Study

Courses

NRS 632	Curriculum and Instruction in Nursing Education	4
NRS 634	Evaluation in Nursing Education	4
NRS 636	Field Experience in Nursing Education	3
Elective	Elective	4
Total		15

■ COURSE OFFERINGS

NRS 500

Theoretical Foundations of Advanced Nursing Practice (3)

This course introduces the student to graduate nursing education. The focus of this course will be on theoretical foundations of advanced nursing practice including nursing, health promotion and family.

Prerequisite: Admission to MSN program or permission of instructor.

NRS 521

Diversity and Social Issues (2)

Understanding and appreciation of human diversity in health and illness to assure the delivery of appropriate or individualized health care. Health care problems resulting from social issues and lifestyle choices will be studied from the perspective of advanced practice nursing.

Prerequisite: Admission to MSN program or permission of instructor.

NRS 531

Research in Advanced Nursing Practice (3)

Preparation of students to evaluate research and implement changes in practice based on research data. Role of master's prepared nurse in research utilization explored.

Prerequisite or Corequisite: NRS 500.

NRS 598

Holistic Perspectives on Aging (2)

This course is designed to enable the student to synthesize theoretical knowledge of physiological, psychological, developmental, socio-cultural, environmental, and spiritual factors in aging.

NRS 599

Topical Seminar in Nursing (1 to 3)

Discussion of a selected topic relevant to the practice of a master's prepared nurse.

Prerequisite: Admission to MSN program or permission of instructor.

NRS 605

Introduction to Pharmacology for Nurse Anesthesia Practice (3)

The pharmacology of specific anesthetic agents and an introduction to basic pharmacologic principles applied to anesthesia administration.

Prerequisite or Corequisite: NRS 500.

NRS 607

Introduction to Nurse Anesthesia Practice and Clinical Internship I (3)

Clinical focus provides orientation to the operating room environment, anesthesia work site and various practice settings. Introduction to the various types of anesthesia and assessment techniques, anesthesia equipment, basic techniques of anesthesia administration, and principles of care for patients undergoing local, regional or general anesthesia are included.

Prerequisites or Corequisites: NRS 605, BIO 503.

NRS 610

Health Policy and Finance (3)

Examination of health care policy in the provision of cost-effective care, and in the design, implementation and evaluation of health care across settings; management of human, fiscal, and physical resources.

Prerequisite: Admission to MSN program or permission of instructor.

NRS 611**Pathophysiology in Advanced Nursing (3)**

Study of the human as a multidimensional being in dynamic interaction with the environment. Examination of the nursing approach to human physiological response in selected health, illness and disease states; analysis of the interaction of physiological response with selected psychosocial, situational and cultural stressors.

Prerequisite or Corequisite: NRS 500.

NRS 613**Advanced Health Assessment (4)**

Comprehensive assessment and clinical decision making in advanced nursing practice. Students develop and strengthen health assessment skills including physical, psychosocial, cultural and family dimensions of assessment.

Prerequisite or Corequisite: NRS 611.

NRS 615**Nurse Anesthesia Practice I (4)**

Coexisting disease states and their impact on anesthesia care are studied, as well as an introduction to specialty areas of anesthesia practice such as EENT, GU, thoracic and neurosurgery procedures.

Prerequisite: NRS 607.

NRS 616**Advanced Nursing Interventions (2)**

Theory and application of therapeutic nursing interventions in advanced nursing practice; theory and application of models for evaluation of nursing interventions.

Prerequisite: NRS 500.

NRS 617**Nurse Anesthesia Clinical Internship II (1)**

Clinical focus emphasizes patient safety and monitoring during administration of anesthesia. Students will have the opportunity to participate in the perioperative care for a wide variety of patients undergoing local, regional or general anesthesia. Daily anesthesia care plans will be developed.

Prerequisite: NRS 607

Prerequisite or Corequisite: BIO 503

NRS 618**Biophysics for Nurse Anesthesia (2)**

Classroom focus includes principles of chemistry and physics as they relate to anesthesia practice, as well as in depth examination of the anesthesia machine and monitoring devices.

Prerequisite: NRS 615.

NRS 620**Pediatric Pathophysiology (2)**

Physiologic and pathophysiologic development of the pediatric client. Examination of the response of pediatric clients in selected illness and disease states. Analysis of the interaction of pediatric physiological responses with selected psychosocial, developmental and cultural stressors.

Prerequisite: NRS 611.

NRS 625**Nurse Anesthesia Practice II (4)**

Principles of anesthetic management of complex cases including vascular, cardiovascular, pediatric and obstetric are studied.

Prerequisite: NRS 615.

NRS 627**Nurse Anesthesia Clinical Internship III (1)**

Clinical focus will include anesthesia administration for patients undergoing a wide variety of surgical or therapeutic procedures which require anesthesia care.

Prerequisite: NRS 617.

Prerequisite or Corequisite: NRS 651.

NRS 631**Health Promotion Across the Lifespan (2)**

Integrates concepts of health promotion, maintenance, and wellness teaching in advanced nursing practice across the lifespan.

NRS 632**Curriculum and Instruction in Nursing Education (4)**

This course focuses on the process of curriculum development in nursing education. Students learn how to analyze a written curricular plan and to develop an individual nursing course including instructional methods.

NRS 634**Evaluation in Nursing Education (4)**

This course focuses on evaluation concepts for use in nursing education. Students will develop examination items, clinical evaluation tool(s), and an evaluation plan for a hypothetical nursing program.

Prerequisite or Corequisite: NRS 632

NRS 635**Regional Anesthesia and Pain Management (3)**

Classroom focus will be on the administration and care of patients requiring regional anesthesia. Pain management issues will be explored, including techniques and administration for acute and chronic pain.

Prerequisite: NRS 625

NRS 636**Field Experience in Nursing Education (3-4)**

Students will be assigned to faculty who will be responsible for providing the student with opportunities to implement concepts and skills learned in NRS 632 and NRS 634. Field experiences will be in either academic or service settings.

Prerequisite or Corequisite: NRS 634.

NRS 637**Nurse Anesthesia Clinical Internship IV (1)**

Clinical focus is on providing anesthesia in clinical specialties. Clinical assignments will include rotations to affiliating agencies and areas of specialty practice such as neuro/ENT, cardiac, vascular, thoracic, obstetrics and pediatrics, as well as regional anesthesia administration.

Prerequisite: NRS 627

Prerequisite or Corequisite: NRS 652.

NRS 638**Advanced Nursing Care of Adults and Older Adults I (5)**

This course prepares students for specialty nurse practitioner roles and advanced nurse certification. The focus is on advanced, comprehensive assessment, theoretical, and research-based advanced nursing interventions to promote, maintain, and restore health of adults and older adults experiencing common acute health problems.

Prerequisite: NRS 611, 613, 648.

Prerequisite or Corequisite: NRS 616, 631.

NRS 639**Advanced Nursing Care of Adults and Older Adults II (5)**

This course prepares students for specialty nurse practitioner roles and advanced nurse certification. The focus is on advanced, comprehensive assessment, theoretical, and research-based advanced nursing interventions to promote, maintain, and restore health of adults and older adults experiencing common chronic health problems.

Prerequisite: NRS 638

NRS 641**Advanced Nursing Care of Frail Elders (5)**

Focuses on the concept of frailty of old age. Quality of life, end-of-life decision making and palliative care issues are included. Needs of caregivers and frail elders, and the resources available for meeting these needs, are addressed. The focus is on advanced, comprehensive assessment, theoretical, and research-based advanced nursing interventions to promote, maintain and restore health of frail elders.

Prerequisite: NRS 639

NRS 643**Professional Role Development and Ethics (3)**

Theoretical foundation in role theory, role development, and ethics related to the advanced practice role of the nurse. Advanced practice nursing roles and competencies, including

requirements for and regulation of these roles, will be analyzed in light of evolving trends effecting health care delivery.

Prerequisite or Corequisite: NRS 500.

NRS 647**Nurse Anesthesia Clinical Internship V (1)**

Clinical focus is on the perioperative care and administration of anesthesia to patients undergoing all types of surgery, utilizing all types of anesthetic techniques in a variety of clinical settings.

Prerequisite: NRS 637.

NRS 648**Pharmacology for Advanced Practice (4)**

Principles of pharmacokinetics and pharmacodynamics including physiologic responses, possible side effects and expected outcomes to various drugs. Emphasis on synthesizing knowledge of pharmacotherapeutics as a basis for clinical decision making in advanced nursing practice.

Prerequisite: Admission to M.S.N. program or permission of instructor.

NRS 650**Independent Study in Nursing (1 to 12)**

Advanced independent study in a specialty area.

Prerequisite: Prior approval of independent study option by instructor and associate dean.

NRS 651**Pharmacology: Nurse Anesthesia I (3)**

Classroom focus is on the general principles of pharmacology, including pharmacokinetics and pharmacodynamics, and specific classifications of drugs used in nurse anesthesia.

Prerequisite: NRS 605.

NRS 652**Pharmacology: Nurse Anesthesia II (3)**

Classroom focus is on drugs used to treat psychiatric, respiratory, GI and endocrine disorders. Discussion includes the use and implications of antibiotics, chemotherapeutic agents, nutraceuticals, drugs affecting coagulation, antiepileptics, diuretics, blood components and substitutes, antihyperlipidemics, antiarrhythmics and antimigraines.

Prerequisite: NRS 651.

NRS 653**Family Nursing: Wellness Care (5)**

Students integrate concepts of advanced nursing practice, theory and research into primary health care of family health and wellness. Primary care nursing management includes assessing, diagnosing, planning, implementing and evaluating health care of families in an effort to promote and maintain health and wellness.

Prerequisites: NRS 613, 648.

Prerequisites or Corequisites: NRS 616, 620.

NRS 654

Family Nursing: Acute Problems (5)

Integration of concepts of advanced nursing practice, theory and research applied to primary health care of families experiencing common acute health problems. In clinical practice, students exercise clinical judgment and use skilled communication and a variety of therapeutic nursing interventions to restore and promote health in families.

Prerequisite: NRS 653.

NRS 655

Family Nursing: Chronic Problems (5)

Integration of concepts of advanced nursing practice, theory and research applied to the primary health care of families experiencing chronic health problems across the life span. In clinical practice, students exercise clinical judgment in the primary care management of families and evaluate the clinical effectiveness of strategies derived from diverse theoretical perspectives.

Prerequisite: NRS 654.

NRS 657

Nurse Anesthesia Clinical Internship VI (1)

Clinical focus is on perioperative care and administration of anesthesia to patients undergoing all types of surgery, utilizing all types of anesthetic techniques in a variety of clinical settings. Specialty and affiliation rotations continue. Weekly seminars explore the history, practice standards, ethical considerations, employment, education and reimbursement issues that impact the professional nurse anesthetist.

Prerequisite: NRS 647.

NRS 667

Nurse Anesthesia Clinical Internship VII (1)

Clinical focus will be on developing the ability to work independently and to participate in the full range of perianesthetic care, including preanesthetic assessment and preparation, teaching, planning, administration, pain management, postanesthesia care and follow-up.

Prerequisite: NRS 657.

NRS 687

Graduate Research: Project (1)

Research project examining a nursing issue in a clinical setting. The outcome (e.g. manuscript preparation, poster presentation, quality improvement project) of the project is negotiable with the faculty research adviser. Seminars may be required.

Prerequisites: NRS 531 and prior approval of instructor.

NRS 690

Master's Thesis (1-2)

Scientific investigation of nursing phenomena using all steps of research process.

Prerequisites: NRS 531 and prior approval of instructor.

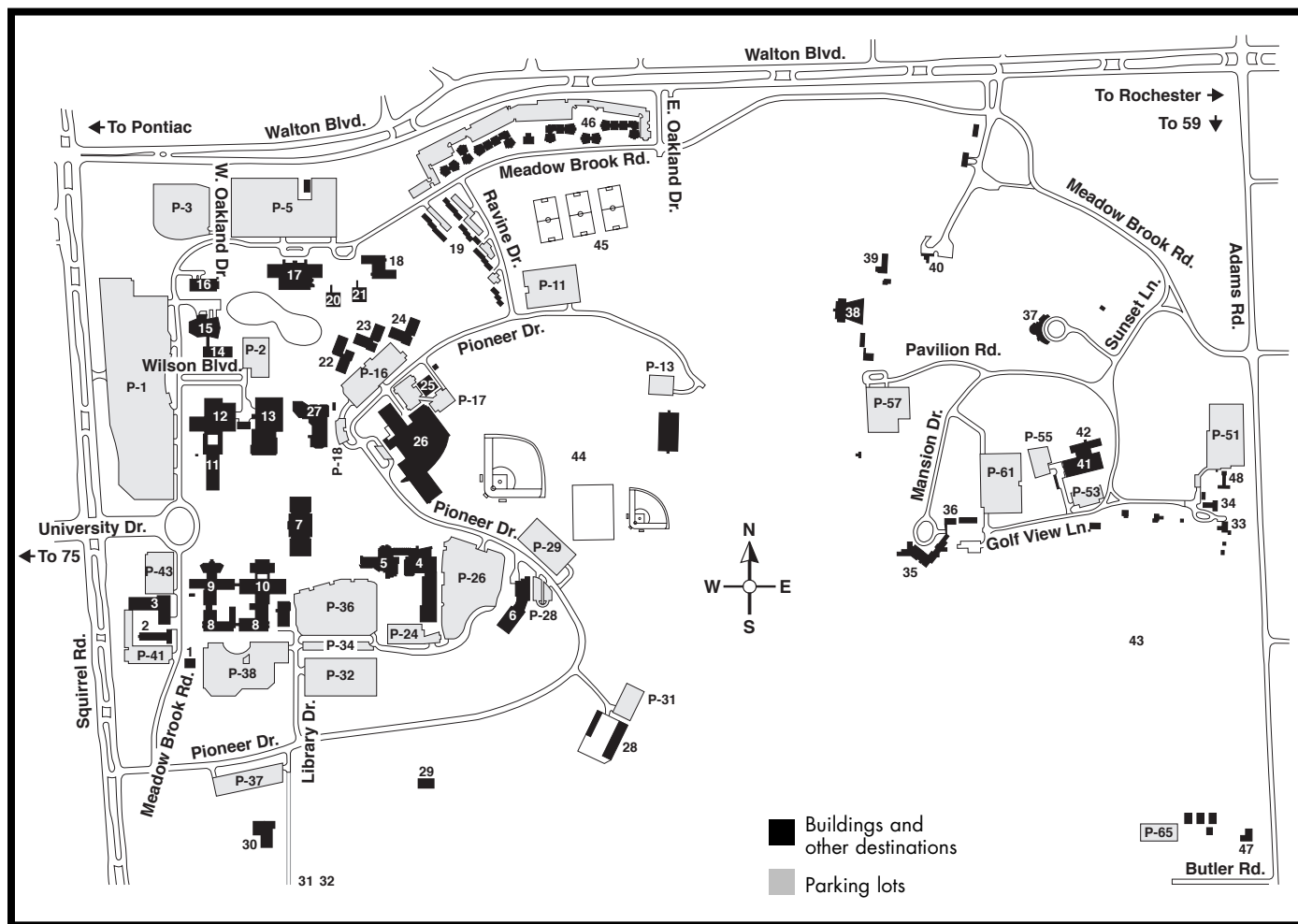
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Oakland University



Current Legend

1. Facilities Management	FM	15. Meadow Brook Theatre and Art Gallery		32. Observatory*	
2. Belgian Barns		16. Graham Health Center	GHC	33. Golf Course Clubhouse	
3. Police and Support Services Building	PSS	17. Vandenberg Hall	VBH	34. John Dodge House	JDH
4. Varner Hall	VAR	18. Hamlin Hall	HAM	35. Meadow Brook Hall	MBH
Recital Hall		19. George T. Matthews Apartments		36. Carriage House	
Studio Theatre		20. Hill House	HIL	37. Sunset Terrace	SST
5. Elliott Hall	EH	21. Van Wagoner House	VWH	38. Baldwin Pavilion	BP
6. Education and Human Services	ED	22. Fitzgerald House	FTZ	39. Trumbull Terrace	
Lowry Child Care Center		23. Anibal House	ANI	40. Meadow Brook Music Festival	
7. Kresge Library	KL	24. Pryale House	PRY	Ticket Office	
8. Science and Engineering Building	SEB	25. Central Heating Plant	CHP	41. Shotwell-Gustafson Pavilion	
9. Hannah Hall of Science	HHS	26. Recreation and Athletics Center	RAC	42. Meadow Brook Health	MBI
10. Dodge Hall of Engineering	DHE	27. O'Dowd Hall	ODH	Enhancement Institute	
11. South Foundation Hall	SFH	28. Grounds/Maintenance		43. Katke-Cousins and R&S Sharf Golf Courses	
12. North Foundation Hall	NFH	29. Storage Facility		44. Pioneer Field (lower)	
13. Oakland Center	OC	30. Electrical Substation		45. Pioneer Field (upper)	
14. Wilson Hall	WH	31. Kettering Magnetics Lab*	KML	46. Varner House	VAH
				47. Meadow Brook Greenhouse	

* Off Map

