

THE GRADUATE SCHOOL

The University of Toledo offers a wide array of master's and doctoral programs. This catalog provides you with the necessary information to make your academic choices regarding graduate courses and programs. It contains course descriptions and academic regulations. For more detailed information about specific policies or academic programs please consult the graduate adviser in your chosen discipline or the Graduate School.

Degrees Offered

College of Arts and Sciences

Master of arts or

Master of arts and education in

Economics

English

Foreign language

French

German

Spanish

Geography

History

Mathematics

Philosophy

Political science

Psychology

Sociology

Master of education in art education (see College of Education for details)

Master of music education (see College of Education for details)

Master of music performance

Master of science or

Master of science and education in

Biology

Chemistry

Geology

Mathematics

Physics

Master of liberal studies

Master of public administration

Doctor of philosophy in

Biology

Chemistry

History

Mathematics

Physics

Psychology

College of Business Administration

Master of business administration

Master of business administration/juris doctor (J.D.)

Master of science in accountancy

Doctor of philosophy in manufacturing management

College of Education

Master of education

Art education

Career and technical education

Curriculum and instruction

Early childhood education PreK-3

Educational administration and supervision

Educational psychology

Educational research and measurement

Educational technology

Educational theory and social foundations

Elementary and early childhood education

Health education

Higher education

Middle childhood education

Physical education

Secondary education

Special education

Master of arts and education

Education and anthropology

Education and classics

Education and economics

Education and English

Education and English as a second language (ESL)

Education and French

Education and German

Education and history

Education and mathematics

Education and political science

Education and sociology

Education and Spanish

Master of music

Music education

Master of science and education

Education and biology

Education and chemistry

Education and geology

Education and mathematics

Education and physics

Education specialist

Administration and supervision

Curriculum and instruction

Career and technical education

Early childhood education

Educational technology

Elementary education

Educational media

Secondary education

Special education

Doctor of education or doctor of philosophy in curriculum and instruction

Curriculum and instruction

Educational media

Elementary

Gifted and talented education (Ph.D. only)

Secondary

Special education

Doctor of education or doctor of philosophy in foundations of education

- Educational psychology
- Educational sociology
- Foundation of education
- History of education
- Philosophy of education
- Research and measurement

Doctor of education in administration and supervision

Doctor of philosophy in higher education

College of Engineering

Master of science

- Bioengineering
- Chemical engineering
- Civil engineering
- Computer science
- Electrical engineering
- Industrial engineering
- Mechanical engineering

Master of Science in Engineering

Master of science in engineering/juris doctor (J.D.)

Doctor of philosophy in engineering (except computer science)

College of Health and Human Services

Master of arts

- Counselor education
- Community counseling
- School counseling
- Criminal justice
- School psychology
- Speech-language pathology

Master of science in exercise science

- Applied biomechanics
- Athletic training
- Clinical kinesiology
- Clinical exercise physiology
- Applied exercise physiology

Master of public health*

Master of arts in recreation

- Leisure recreation administration
- Recreational therapy and therapeutic arts

Master of social work

- Child and family health
- Mental health

Education specialist

- School psychology

Doctor of philosophy

- Exercise science
- Health education
- Counselor education

*The master of public health degree is offered through the Northwest Ohio Consortium for Public Health.

College of Law

Juris doctor (J.D.)

Juris doctor (J.D.)/master of arts in criminal justice (M.A.C.J.)

Juris doctor (J.D.)/master of business administration (M.B.A.)

Juris doctor (J.D.)/master of science in engineering (M.S.E.)

Master of studies in law (M.L.W.)

College of Pharmacy

Master of science in medicinal chemistry

Master of science in pharmaceutical science

- Administrative pharmacy

- Industrial pharmacy

- Pharmacology/toxicology

Doctor of philosophy in medicinal chemistry

Doctor of pharmacy

Certificate Programs

Communication studies

Teaching of writing

Geographic information systems and applied geographics

Health-care policy and administration

Juvenile justice municipal administration

Severe behavioral spectrum

Toxicology

Admissions

Admission Application Forms

Application may be made on the form provided by the Graduate School or submitted electronically via the Internet at <http://gradschool.utoledo.edu>. Application forms and transcripts must be filed at least four weeks prior to registration in order to be considered. An application fee of \$45 (check or money order payable to The University of Toledo) must accompany each application for admission. This fee is nonrefundable. It should be noted some departments or programs have an online preapplication process intended to prescreen students for possible admission. Regardless of any prescreening process, all prospective students must go through the formal Graduate School application process.

Admission Requirements

An applicant is considered for admission to the Graduate School on the basis of the performance of the applicant in his or her undergraduate program, a well-formulated objective for graduate study and recommendations from college faculty members acquainted with the student's ability. In some instances, additional recommendations are required. The specific minimum requirements are:

1. A bachelor's or professional degree earned from a department of approved standing and granted by an accredited college or university.
2. A 2.70 or equivalent GPA for all previous academic work, or
 - a. If the GPA is less than a 2.70 or equivalent, applicants are required to forward results of the Graduate Record Examination (GRE) and/or other appropriate qualifying examinations to the Graduate School as specified by the department concerned.
 - b. Various departments may require the GRE or other qualifying examinations for all applicants.
3. Prerequisite academic work that indicates the applicant should be able to pursue effectively the graduate work in the department in which specialization is desired.
4. Acceptance by the college and/or department concerned.

5. All students from countries where English is not the primary language must achieve satisfactory scores on the Test of English as a Foreign Language (TOEFL) and the general test of the GRE.
6. All international students also must demonstrate they have adequate financial resources for their graduate education before they can be admitted.
7. All students are required to provide proof of health and accident insurance at time of registration.

Applicants must present proof of a bachelor's degree at the time of application or within the first semester of enrollment; without such proof, registration will be canceled.

Students not meeting requirements for admission to the Graduate School may apply to the appropriate baccalaureate college for admission as an undergraduate with degree (UWD) to make up deficiencies and to establish a basis for reconsideration of admission to the Graduate School. UWDs are not permitted to register for graduate credit courses. Admission to a master's program does not automatically admit a student to the doctoral program.

Financial Assistance

Assistantships are available for students studying for advanced degrees. Students holding assistantships receive a stipend for service as assistants and a tuition fee award. Contact department chairs or designated directors of graduate programs for application procedures.

A limited number of University and endowed fellowships are available in masters and doctoral areas for outstanding students. University of Toledo advisers and departmental chairs should make nominations. Fellowship students receive a stipend and a scholarship for tuition and fees.

Scholarships from foundations and societies are available to students who have maintained a high undergraduate and graduate scholastic record. Such scholarships usually permit full- or part-time study. Applications can be obtained from the Graduate School office; however, prospective students are advised to inquire directly to agencies that may provide scholarships or other financial support.

Classification of Students

Students may be admitted in five categories to take graduate studies.

1. **Regular** – An applicant is admitted as a regular graduate student if, after considering all of the required documents, the applicant is considered to meet all admission requirements.
2. **Provisional** – An applicant is admitted as a provisional student if, at the time of application, all of the requirements for admission have not been completed. All admission requirements must be completed during the first semester of attendance.
3. **Conditional** – Applicants who meet all qualifications for admission to a graduate program, except for the TOEFL requirement, will be considered for conditional admission. To be considered in this category, the applicant must have submitted a TOEFL score greater than 500 (paper-based, or equivalent), be self-supporting, and satisfy all other academic requirements. A student with conditional admission status may not register for any graduate-level course work until a TOEFL score of 550 (paper-based), 213 (computer-based), 80 (Internet-based) or higher is obtained. Students in this category will be required to enroll for English language training at the American Language Institute until the required minimum TOEFL score is achieved.

4. **Special student status** – Applicants interested in taking graduate courses for personal enrichment, professional development, certification, or who wish to explore graduate study prior to deciding on a degree program, may enroll under special student status. This status is not an admission to a Graduate School degree program. However, if subsequently accepted to a degree program, a student may, upon approval of the Graduate School, have a maximum of nine semester hours counted toward a degree. Since this status is not available in all academic areas, applicants should inquire with the Graduate School, the appropriate department or college before submitting an application.

5. **Guest admission** – A student enrolled in a graduate program at an accredited institution other than The University of Toledo may be admitted as a graduate guest student. A transcript of work completed at The University of Toledo will be sent to the student's home institution for the semester enrolled. This status is granted on a semester basis and is contingent on approval of the institution in which the student is pursuing a degree.

Concurrent Enrollment Program

The University of Toledo, Bowling Green State University and the Medical University of Ohio jointly sponsor this program, which allows graduate students at one institution to enroll and receive credit for classes offered at the other institution. The concurrent program provides graduate students the unique opportunity to enhance their academic experience by taking advantage of resources provided by the three institutions. Credit and grades earned count as resident credit at the home institution.

Students at any of these institutions must be admitted under the concurrent student status, and the approval of the graduate dean of the student's home institution is required before a student receives credit and a grade for the class in which he/she has enrolled. In addition, The University of Toledo graduate students who enroll at Bowling Green State University or the Medical University of Ohio are required to complete a minimum of 51 percent of their courses in their degree programs on the main campus of The University of Toledo. Part-time graduate students pay the instructional, general, and if applicable, the nonresident fees at the host institution on a per-hour basis. Full-time graduate students who have paid full-time instructional, general and nonresident fees at their home institution, or who are graduate assistants or teaching fellows at their home university, generally will not have additional charges associated with their concurrent registration.

Letter of Admission

A letter of admission will be issued to the student upon the satisfactory completion of all requirements. A copy of the letter of admission will be kept in the student's file in the Graduate School office. Only the Graduate School is authorized to provide admission into graduate programs.

Transcripts

Official transcripts showing all undergraduate credits and all degrees earned must be provided by the student to the Graduate School upon his or her enrollment. If previous graduate work has been undertaken, transcripts of these records also must be filed with the Graduate School. Receipt of the official copy will be acknowledged in the Registrar's office by the posting of the degree to the students academic record. Students who fail to provide official transcripts within the first semester of enrollment will not be permitted to register in subsequent semesters.

***Note:** An official transcript is defined as one that is **received directly from the issuing institution**. Transcripts marked "issued to student" are not considered official transcripts.

Academic Regulations

Responsibility of Graduate Students

The graduate student is advised and expected to become familiar with academic regulations of the University and the particular requirements of the specific educational program. The student is solely responsible for complying with all regulations of the University, the Graduate School and the department of instruction, and for meeting all requirements for the degree. The student should consult with the adviser in the event that there is any question concerning the requirements for the degree. The student should determine if proper prerequisites for each course have been met. Regulations of the graduate faculty require graduate students to maintain a GPA of 3.0 on a 12-point system for all courses completed and an average of 3.0 on a 12-point system for courses completed in the department of specialization. Students whose GPA falls below 3.0 on the 12-point scale are subject to dismissal from Graduate School. Grades of A, A-, B+, B, B-, C+, C, C-, D+, D, D- and F are used in determining GPAs. A grade less than C (2.0) in a graduate course is unsatisfactory and cannot be used to fulfill the academic requirements in a graduate program of study. Therefore, any graduate course in which a grade less than C was achieved will not be permitted on the plan of study. Grades below C will continue to be counted in determining the cumulative GPA.

For individual study, master and doctoral thesis, and/or dissertations and other projects at the graduate level, the grade of PR may be used for work in progress. The PR and IN grades will not be considered in the GPA. A limited number of special graduate courses will earn grades of S (satisfactory) or U (unsatisfactory) upon completion. A grade of S will allow for graduate credit to be earned, while a grade of U will be processed as an F.

Courses for Graduate Study

Credit toward a graduate degree is given for completion of courses designed for graduate students (5000-8000 level). If a student does not qualify for admission to the Graduate School, the student may take work in the undergraduate program as an Undergraduate with Degree (UWD) but will not be classified as a graduate student.

Advising

The Graduate School of The University of Toledo places a high priority on a program of faculty advising for students. After a student has been accepted for graduate study by the Graduate School, an adviser is appointed. The student should address questions concerning the program to the adviser and seek advice each semester prior to the time of registration.

Assurance of Compliance

All graduate students engaging in project, thesis or dissertation research are required to submit a completed "Assurances of Compliance with Applicable Federal and State Regulations Governing Research" form to the Graduate School. The form is available in the Graduate School and should be completed at the time the nature of the research project is determined. The student must demonstrate compliance before engaging in related research. Failure to obtain the proper approvals could prevent or significantly delay the awarding of the degree.

Students who work on projects sponsored by external entities are required to comply with all contractual terms, including the confidentiality of data or other information received from the sponsor or developed within the scope of the project by the university researchers.

Intellectual Properties and Patent Sign-off

All graduate students engaged in project, thesis or dissertation research are required to submit a completed "Intellectual Property and Patent Sign-Off" form prior to graduation. This form is designed to protect both the student and the University's legal rights in any invention resulting from the student's research efforts. If potential intellectual property is identified, this form allows for the publication delay of the dissertation, thesis or research project to provide time to file the necessary legal papers, but it will not interfere with the student's graduation schedule.

The form is available in the Graduate School and should be completed at the time the dissertation, thesis or research project report is submitted to the Graduate School. Failure to submit the form could prevent or significantly delay the awarding of the degree.

Minimum Enrollment

Graduate students who have completed their course work and are working on their project, thesis or dissertation, and/or using University facilities and services (i.e., the library, health services, computer services, laboratories, consulting with faculty, apply for graduation, etc.) must register for a minimum of one graduate credit hour each semester, excluding summer terms. However, students who apply for graduation during the summer term also must be registered for a minimum of one graduate credit hour. Access to certain other facilities and services, such as the Student Recreation Center and parking, will require additional user fees. Students who are not enrolled during any time over one calendar year (three consecutive semesters, including summer) will be considered to have stopped their graduate programs and will be required to apply for readmission in order to complete their programs.

Transfer of Credits

Graduate work completed in residence at other academically accredited institutions may be offered in partial fulfillment of the requirements, other than residence, for graduate degrees at The University of Toledo when the work is of acceptable quality and appropriate to the student's program and not part of an outside degree. Application for transfer of credit must be made to the student's adviser. The department/college will communicate its recommendation to the dean of the Graduate School. The student may obtain advance approval from the adviser to take work elsewhere while enrolled at The University of Toledo. All graduate credits requested for transfer must carry a grade of A, A-, B+ or B. Credit for an S grade may be transferred for grade only if the grading institution verifies that the S translates into a grade of B or higher. Application for transfer of credit must be completed as soon as the credits have been earned. Except in unusual situations, no more than one-third of the hours required for a degree will be accepted as transfer credit. Transfer credit must have been earned within the period of six years immediately preceding the time the degree is awarded.

A student may substitute an acceptable alternative for a required course in the case where a substantially similar course was completed as part of a previous degree. Such a substitution requires the approval of the program adviser, college dean and Graduate School and must not decrease the number of course hours required by The University of Toledo.

A student who has obtained one master's degree at The University of Toledo and elects to take a second master's degree at The University of Toledo may use up to 12 semester hours from the first master's degree if the course work is appropriate for the student's program.

Probation and Dismissal from Graduate Programs

A graduate student must maintain a minimum overall GPA of 3.0 for all graduate courses taken in order to be in good standing and to make adequate progress toward the degree. Whenever the student's GPA falls below 3.0, the student is placed on academic probation and must correct the GPA deficiency within the next semester of enrollment. Failure to do so may result in dismissal. Please consult with graduate advisers in the individual programs of study concerning other academic requirements necessary for graduation.

Foreign Language Requirement

The student is required to meet the foreign language requirement of the specific department or college. Applications for the examination are available in the Graduate School.

Master's Thesis

Certain departments specify the submission of a thesis as a requirement for the master's degree. If a thesis is required, the title must be reported to the department concerned, the college dean and the Graduate School. The title of the master's thesis must be filed not later than one semester prior to the expected date of graduation. The student's adviser must approve the title of the thesis. Two originals of the thesis (one original only if submitting electronically), signed by the adviser, must be in the Graduate School office one week prior to graduation. To assist students in the preparation of the thesis or project, a preparation handbook is available in the Graduate School.

A master's thesis committee must consist of a minimum of three members, all of whom must be members of the graduate faculty. An expert from outside the University also may serve as one of the three thesis committee members upon recommendation of the committee chair and approval by the department chair and the graduate dean. Full membership on the graduate faculty is a prerequisite to chairing a master's thesis committee.

Application to Candidacy for the Doctoral Degree

At the time a student applies for application to candidacy, the following requirements must be fulfilled: a GPA of 3.0 on a 12-point system for all courses completed and for courses completed in the department of specialization and satisfactory completion of the examination requirements of the specific college or department. Application forms are available at the Graduate School office. It is the student's responsibility to initiate the application to candidacy. Admission to candidacy shall be recorded on the student's permanent record. A student who fails to qualify for candidacy at the required time will not be permitted to continue.

Doctoral Dissertation

All departments require a dissertation in partial fulfillment of the doctoral degree. The dissertation should constitute an original work of a scholarly nature. It is the responsibility of the student to meet the requirements for the dissertation as stipulated by the department and college conferring the degree. Two originals of the dissertation and one copy (original only if submitting electronically), signed by the adviser(s) and/or appropriate committee members, must be in the Graduate School office one week prior to graduation. Copyrighting is available but not required. To assist students in the preparation of the dissertation, a handbook is available in the Graduate School.

Dissertation Committee

A doctoral dissertation committee must consist of a minimum of four members. One of the four members must be an external member whose primary appointment is outside the candidate's program or department or outside the University. The chair of the dissertation committee recommends the outside reader to the Graduate School for final approval. Requests for readers outside of The University of Toledo must be submitted in writing to the Graduate School at least one week before the dissertation defense is to occur. The request must be accompanied by a copy of the outside reader's curriculum vitae. Full membership on the graduate faculty is a prerequisite to chairing a doctoral dissertation committee.

Graduation Procedures

Students must apply for graduation on a formal "Application for Graduation" form filed with the Graduate School by the time of the published deadline. This deadline is in the beginning of the semester in which the student plans to graduate and is posted on the graduate school Web site at <http://gradschool.utoledo.edu>. The official diploma will be issued approximately four weeks after the commencement, following the semester in which the student completes the degree requirements. The University graduation exercises are conducted to honor those who have earned their degrees. The graduate is encouraged to attend the commencement exercises. Candidates shall wear academic dress with appropriate hoods. Arrangements for academic dress must be made through the University Bookstore well in advance of commencement. The student should contact the University Bookstore early in the semester of graduation.

Courses Reserved for Graduate Credit

A senior who does not require a full schedule for the completion of bachelor's degree requirements at The University of Toledo may enroll in courses for graduate credit. In such cases the total schedule is not to exceed 12 semester hours of work. An application for admission must be filed with the Graduate School before the beginning of the semester. This procedure is possible only where the academic record reveals unusual scholastic ability.

Residence Requirements for the Ph.D. and Ed.D. Degrees

Two consecutive semesters of full-time work must be completed at the University in order to fulfill requirements for the Ph. D. degree. For the Ed. D. degree, residence requirements are the same as those for the Ph.D. degree, or they may be fulfilled by the completion of two consecutive full-time summer semesters at the University.

Time Limitations for Degrees

The credit applied toward the master's degree must have been earned within the period of six years immediately preceding the time the degree is awarded. In the doctoral programs, a maximum study period of seven years is allowed prior to the time the degree is awarded. In the event the above requirements constitute a hardship on an individual student, a written petition may be presented to the Graduate School for consideration. Any course work that predates the initial time limit for the degree must be re-evaluated by an instructor in that field to determine if the material is still current and if the student is still knowledgeable in the state-of-the-art for that material.

Academic Grievance Procedure for Graduate Students

In the event that a graduate student has an academic grievance, he or she should attempt to resolve the problem by adhering to the following procedure:

1. Discuss the problem with the instructor involved.
2. If no resolution can be achieved, the student should present his or her grievance to the chair of the department.
3. If the problem is still not resolved, the student should see the dean of the college.
4. If a resolution has been unsuccessful at the college dean's level, the student may present the grievance to the Graduate School.
5. The final appeal can be made to the committee on academic standing of the Graduate Council, and its decision shall be binding on all parties involved in the grievance.

In steps 1 through 4 above, a resolution of the grievance is sought by achieving a consensus on the part of all involved in the grievance. If the process reaches step 5, the academic standing committee of the Graduate Council renders a final decision based upon all of the evidence presented. The committee's decision shall be binding on all parties involved in the grievance.

Note: Graduate students must file the initial grievance with the instructor and a copy to the department no later than one semester after the occurrence of the incident. If students desire to proceed to the next level of appeal, they must file within one month of the last rendered decision until final resolution of the grievance.

Other Policies and Information

Other policies and information pertaining to graduate education may be found in the General Section of the University catalog and the college and departmental catalog sections. Graduate students are encouraged to obtain a copy, or view on the graduate school Web site at <http://gradschool.utoledo.edu>, the *Graduate Student Handbook* prepared by the Graduate School and/or the individual college departments.

College of Arts and Sciences

Graduate Programs

Department of Biological Sciences

Patricia R. Komuniecki, chair

Douglas Leaman, graduate adviser

The department of biological sciences offers graduate degrees at master's and doctoral levels. Students entering the M.S. or Ph.D. programs are expected to have an adequate background in natural sciences and in mathematics. Usually, this will require knowledge of differential and integral calculus, college physics and organic chemistry. Students may be admitted on a provisional basis if they do not have an adequate academic background, but they will be expected to acquire it as rapidly as possible.

Requirements for the M.S. in Biology Program (Cell/Molecular Biology Concentration)

Option A (Thesis): For the degree of master of science in biology (cell/molecular biology concentration), a student must complete a minimum of 30 semester hours of graduate course work approved by an advisory committee, including BIOL 6000, 6010, 6090, 6100 and 6930 (two hours), CHEM 6500, and additional course and research credits for 13 to 17 hours. The student also must pass a comprehensive oral examination. In some cases, a written comprehensive examination also may be required. The student must complete six to 10 hours of BIOL 6960, write an original research thesis, and pass an oral examination on the thesis.

Option B (Non-thesis): For the degree of master of science in biology, a student must complete a minimum of 30 semester hours of graduate course work approved by an advisory committee, including BIOL 6000, BIOL 6010, 6090, 6100 and 6930 (two hours), CHEM 6500, and additional course and research credits for a total of 30 hours. A maximum of three hours in BIOL 6960, 6980 or 6990 may be included in the minimum 30 hours. The student must write an original research paper based on library research that meets the approval of the student's advisory committee and pass an oral examination defending the research hypothesis. Normally, students choosing Option B will not be encouraged to pursue graduate study beyond the M.S. degree.

Up to 10 hours of graduate credit may be transferred from another accredited institution, as recommended by the student's advisory committee.

Requirements for the Master of Science and Education

For the degree of master of science and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog. In addition, no more than 8 hours may be earned in 5000-level courses. Students doing their theses in biology rather than in education must fulfill the same thesis-related requirements as other biology M.S. candidates.

Requirements for the Ph.D. in Biology Program (Cell/Molecular Biology Concentration)

The doctoral degree in biology (cell/molecular biology concentration) is awarded to a student who has demonstrated mastery in the field of biology and a distinct and superior ability to make substantial contributions to the field. It is not awarded merely as a result of courses taken, nor for years spent in studying or research. The quality of work and the resourcefulness of the student must be such that the faculty can expect a continuing effort toward the advancement of knowledge and significant achievement in research and related activities.

In general, work for the Ph.D. takes five years of study beyond the bachelor's degree. A substantial portion of this time is spent in independent research leading to a dissertation. Up to 30 hours toward a master's degree may apply as part of the student's doctoral program. Normally 90 semester hours of study beyond the bachelor's degree are required for the Ph.D.

Each student must complete an individualized program of study in the area of cell/molecular biology approved by the student's advisory committee and the department. This course of study must include BIOL 8000, 8010,

8090, 8100 and 8930 (three hours), CHEM 8500, and additional course and research credits to attain the minimum number of semester hours. Ph.D. candidates must pass a written qualifying examination in the spring of their second year of the program, an oral comprehensive examination involving a defense of their research proposal after gaining admission to candidacy, and a final oral dissertation defense examination.

Courses numbered at the 5000 and 6000 levels are intended primarily for students at the master's level. Courses numbered at the 7000 and 8000 levels are intended primarily for students at the post-master's (students with a master's degree, or with more than 34 graduate credit hours) and doctoral levels. Courses carrying a dual listing (numbered at both 5000/7000 or 6000/8000 levels) are available to students at both levels. In these cases, there may be substantive differences in the course requirements for students registered at the advanced level.

The department considers experience in teaching to be a vital and significant component of graduate education. Therefore, all graduate students in the Ph.D. program are required to complete at least one semester of formal teaching experience. M.S. students also are expected to acquire teaching experience as part of their graduate programs.

Department of Chemistry

A. Alan Pinkerton, chair

Jon R. Kirchhoff, associate chair

Xiche Hu, director of graduate studies

The Master's Program

The master's program in chemistry increases the professional competence of the chemist beyond the bachelor's degree. Course work, independent research and small group discussions are emphasized to achieve this goal. The master of science degree can be viewed as an important professional goal or as preparation for study toward the doctoral degree.

Requirements for the Master's Program

For the degree of master of science or master of science and education, students must meet the following departmental requirements:

- The courses presented must total at least 30 hours of graduate credit, including at least four hours of credit in graduate research.
- Registration for research seminar is typically required each term the student is enrolled in graduate research.
- Each candidate must present a thesis.
- Registration for chemistry colloquium is typically required each term, but no more than four hours of credit may count within the required 30 hours.
- Each candidate must demonstrate satisfactory performance on a comprehensive oral examination, in addition to the public defense of the thesis at a colloquium presentation.
- Upon choosing a research director, an advisory committee will be appointed to supervise the research, to administer the comprehensive oral examination, and to approve the thesis. Each student, in conjunction with the graduate adviser, the research director, and the student's advisory committee, will prepare a plan of study listing the courses and other requirements for the degree. Upon approval, the plan of study becomes the list of course requirements for the degree. Students typically take six or more 6000-level courses as part of the plan of study.

- Each candidate must demonstrate satisfactory performance on a comprehensive oral examination on his or her dissertation research and a public defense of the dissertation at a colloquium presentation.

Master of Science and Education

For the degree of master of science and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog.

The Doctoral Program

The doctoral program in chemistry is designed to ensure that the student has the basic foundation of knowledge and is equipped with the tools necessary to do independent research. The emphasis on research recognizes the power of original research to arouse the scientific curiosity of the student, to develop and stimulate creativity, and to encourage further discovery through independent study.

The doctoral program is divided into three stages for the typical student. The first stage establishes, through a set of prescribed courses, the foundation for further training. During this stage, a research director is chosen. During the second stage, the student will pursue research toward the dissertation and undertake comprehensive examinations, including the preparation of the required original research proposals. After meeting the comprehensive examination requirements, the student is admitted to candidacy in the third stage of the program. This stage is devoted to research and completion of the doctoral dissertation. The departmental degree requirements are listed in the following section. Further details on examinations and admission to candidacy may be obtained from the department.

Requirements for the Doctoral Program in Chemistry

Candidates for the doctor of philosophy degree must meet the following requirements:

- Each student, in conjunction with the graduate adviser, the research director, and the student's advisory committee, will prepare a doctoral program proposal (plan of study) listing the courses and other requirements for the degree. Upon approval, the program proposal becomes the list of course and other requirements for the degree. Students typically take six or more 8000-level courses as part of the plan of study.
- Registration for chemistry colloquium is required each term.
- Registration for research seminar is required each term the student is enrolled in graduate research.
- Each student must satisfactorily complete two semesters in supervised, half-time teaching.
- After admission to candidacy, each student is required to spend a minimum of two consecutive semesters in full-time study at The University of Toledo.
- Dissertation research must be carried out primarily in laboratories of The University of Toledo.

Department of Communication

James Benjamin, chair and graduate adviser

Certificate in Communication Studies

The graduate certificate in communication studies is designed to provide advanced study in professional and organizational communication. The certificate of communication studies requires the successful completion of 15 credit hours in communication studies. The certificate can be earned separately or as a part of the master of liberal studies degree. See the master of liberal studies program for details on the master of liberal studies with a certificate in communication studies.

Application

Those applying to work on the certificate alone must be admitted to the Graduate School and submit an application form and letter of interest to the department of communication. Those applying to complete the certificate and the masters of liberal studies should also contact the director of the master of liberal studies program.

Requirements

The certificate consists of 15 credit hours of graduate courses in communication studies. Students may use the courses completed for the certificate in the electives portion of the master of liberal studies degree.

Department of Earth, Ecological and Environmental Sciences

Michael W. Phillips, chair

Johan F. Gottgens, graduate adviser (ecology)

James A. Harrell, graduate adviser (geology)

The department of earth, ecological and environmental sciences (EEES) offers graduate degrees in geology and biology (ecology track) at the master's level and in biology (ecology track) at the doctoral level. Students entering the M.S. or Ph.D. programs are expected to have an adequate background in the natural sciences and mathematics, but may be admitted on a provisional basis if they lack such a background.

Requirements for the Master of Science Programs

Master of Science in Geology

A student must take a minimum of 30 hours of approved graduate course work, including six hours of thesis research and 24 hours of formal lecture courses approved by the student's advisory committee. Up to eight of the required 24 hours of course work may be taken outside earth, ecology and environmental sciences, provided they are relevant to the student's research program. At least 12 of the earth, ecological and environmental sciences hours must be taken in geology. Students who do not have a baccalaureate in geology may be required to take remedial courses, none of which will count toward the 30 hours required for the master's degree. Candidates for the master's degree must prepare a written thesis, which is a report of original and independent research, and present and defend an oral summary of the thesis before a faculty advisory committee.

Master of Science in Biology (Ecology Track)

Option A (Thesis): A student must complete a minimum of 30 semester hours of graduate course work approved by the student's advisory committee. A minimum of 18 hours of this requirement must be earned in the major subject area. In addition, each plan of study must include EEES 6400, 6600 and 6930 (two hours) and a selection of at least nine credit hours of formal EEES courses at the 5000 level or above. The student must write and defend a research thesis consisting of a written report of original and independent research.

Option B (Non-thesis): A student must complete a minimum of 30 semester hours of graduate course work approved by the student's advisory committee. A minimum of 18 hours of this requirement must be earned in the major subject area. In addition, each plan of study must include EEES 6600, 6930 (two hours) and four additional EEES courses (5000 level or higher) or their equivalents from other departments that are approved by the student's advisory committee. Further, the plan of study may only include a maximum of three semester hours in EEES 6960 or 6990. The student also must write an original paper based on library research that meets the approval of the student's advisory committee. Normally, students choosing Option B will not be encouraged to pursue graduate study beyond the M.S. degree.

Master of Science and Education in Biology (Ecology Track)

Master of Science and Education in Geology

For the degree of master of science and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog. Within the minimum of 15 hours of course work to be taken in earth, ecological and environmental sciences and in the selection of the thesis or project topic, students may specialize in either ecology or geology. Students who do not have a baccalaureate in ecology or geology may be required to take remedial courses, which will not count toward the 36 hours required for the master's degree.

Requirements for the Doctoral Program in Biology (Ecology Track)

The doctoral degree in biology (ecology track) is awarded to a student who has demonstrated mastery in the field of biology and a distinct and superior ability to make substantial contributions to the field. It is not awarded merely as a result of courses taken or for years spent in studying or research. The quality of work and the resourcefulness of the student must be such that the faculty can expect a continuing effort toward the advancement of knowledge and significant achievement in research and related activities.

In general, work for the Ph.D. takes at least four years of study beyond the bachelor's degree. Normally, 90 semester hours of study beyond the bachelor's degree are required for the Ph.D. A substantial portion of this time is spent in independent research leading to a dissertation. Work done toward a master's degree may apply as part of the student's doctoral program.

Each student must complete an individualized program of study in an area of ecology that is approved by the student's advisory committee and the ecology faculty in the department. This program must include two semesters of statistics (EEES 8400 and an advanced multivariate statistics course such as EEES 6500), EEES 8600 and 8930 (three hours), a selection of at least 12 credit hours of formal EEES courses at the 5000 level or above, and additional courses and research credits to meet the minimum required number of semester hours. Ph.D. students must pass

a written qualifying examination during the first two years of study and an oral comprehensive examination involving a defense of their research proposal after gaining admission to candidacy.

Courses numbered at the 5000 and 6000 levels are intended primarily for students at the master's level. Courses numbered at the 7000 and 8000 levels are intended primarily for students at the post-master's (students with a master's degree or with over 34 graduate credit hours) and doctoral levels. Courses carrying a dual listing (numbered at both 5000/7000 or 6000/8000 levels) are available to students at both levels. In these cases, there may be substantive differences in the course requirements for students registered at different levels.

The department considers experience in teaching to be a vital and significant component of graduate education. Therefore, all graduate students in the Ph.D. program are required to complete at least one semester of formal teaching experience before graduation.

Department of Economics

Michael Dowd, chair

David Black, director of graduate studies

Requirements for the Master's Program

The economics department offers the master of arts in economics degree, the master of arts in economics degree with an applied econometrics specialization, and the master of arts in economics and education degree. In all cases, students must complete a minimum of 30 hours of graduate work that includes the following:

1. At least 21 hours of graduate credit in economics (excluding ECON 6930) must be included within the total of 30 hours presented for any graduate degree. The minimum of 21 hours in economics must include at least one course from each of two different fields, in addition to the following basic theory requirements (or their equivalents):
 - (a) ECON 5150 Advanced Macroeconomic Theory
 - (b) ECON 5200 Advanced Microeconomic Theory
 - (c) ECON 5300 Introduction to Mathematical Economics
 - (d) ECON 5810 Econometrics Models and Methods I

The graduate adviser may waive the ECON 5300 requirement for students who have an adequate background in mathematics.

2. Credits in excess of seven hours in economics courses numbered 6000 through 6990 will not ordinarily be applicable to the 30 hours.
3. Candidates for either degree are required to pass a comprehensive written examination in macroeconomics and microeconomics. In addition, the department may require an oral examination.
4. In addition to the 30 hours of course work, candidates must satisfy a writing requirement of either a thesis or a seminar paper.

A candidate who elects the thesis option must submit a thesis for review by a committee of at least three faculty members and satisfy Graduate School thesis requirements. Such a candidate may receive a maximum of seven credit hours following the successful defense of that thesis. A candidate who elects the non-thesis option must submit a seminar paper, or its equivalent, for review by at least two faculty members. No credit hours will be earned for the seminar paper.

Specialization in Econometrics

The master's program with an applied econometrics specialization is designed to afford interested, well-qualified candidates for the master's in economics an opportunity to study econometrics on a more intensive and applied basis. The applied econometrics specialization would enable candidates to develop applied econometric skills through hands-on research combined with textbook-lecture learning.

The specialization in applied econometrics is an option in the M.A. program in economics. Students who elect the specialization option will normally need two full years of study to complete the program. In the first year, an M.A. candidate in the specialization will complete the regular M.A. core requirements, an additional econometric course (ECON 5820), and field/related course work. Further, the M.A. candidate is required to pass a written comprehensive examination in econometrics, as well as the usual written comprehensive examinations required of all students. In the second year of the program, the candidate will enroll in a sequence of two applied econometrics seminars (ECON 6810 and ECON 6820) and engage in thesis work.

Internships

The department offers a public service internship, requiring seven credit hours of ECON 6940. In addition to ECON 6940, the intern is allowed to include up to three credit hours of either ECON 6900 or 6990 toward the 30 credit hours required for a master of arts degree.

Master of Arts and Education

For the degree of master of arts and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog.

Department of English Language and Literature

Sara Lundquist, chair

Matthew Wikander, director of graduate studies

Requirements for the Master's Program M.A. in English with a Concentration in Literature

The M.A. degree (literature concentration) requires 33 hours of course work. Graduate students who are accepted into the program as teaching assistants are further required to take ENGL 6010 Seminar in English Instruction: Composition, an additional three-hour course, for a total of 36 hours earned separately from the degree.

All students working toward the master of arts with a concentration in literature must satisfy the following requirements:

- (a) The course work shall include ENGL 5100 History of the English Language; **either** ENGL 5750 History of Literary Criticism **or** ENGL 5780 Contemporary Literary Theories and Criticism; ENGL 5790 Approaches to Research in English; and two seminars (excluding instructional seminars – see schedule of classes for seminar listings). Students who have completed any of these course requirements or their equivalents at the graduate level before admission to the Graduate School may petition the director of graduate studies in English for substitutions.
- (b) Of the remaining 18 hours of course work for the degree, students may take a maximum of two courses from other departments in the humanities, fine arts or social sciences, as approved by the director

of graduate studies. Students may count two creative writing courses and one independent study course toward the degree.

- (c) Students are required to demonstrate a reading knowledge of at least one foreign language. Passing a special examination administered by the department of foreign languages will satisfy this requirement. International students with a native language other than English will be considered to have satisfied the requirement, as will any student having achieved a grade of C or better in an upper-division or graduate literature course offered by the department of foreign languages (excluding courses where texts are read in English translation).
- (d) Candidates must submit a graduate-level course paper applying scholarly techniques to a literary topic of their choice.

Certificate in the Teaching of Writing

A certificate in the teaching of writing can be earned as part of the master's degree in English (literature concentration). The certificate also can be earned separately from the degree.

The certificate is designed to offer continuing education for regional high school teachers of English and composition; to offer specialized education in composition to those earning master's degrees who wish to pursue work as teachers of writing at regional community colleges and area universities; and to provide graduate students with the opportunity to earn job credentials in composition, as well as in literature.

Application

Those applying for both the M.A. in English and the certificate in the teaching of writing program should submit an application form for each to the Graduate School office, along with their other application materials.

Those applying to work on the certificate alone must hold an undergraduate degree in English and submit an application form, a letter of interest, all college and graduate school transcripts, and two letters of recommendation.

Requirements

Fifteen hours of course work are required for completion of the certificate:

Theory

ENGL 5780 Literary Theories and Criticism

ENGL 5090 Current Writing Theory

Praxis

ENGL 6010 Instruction in Composition

This course assumes experience in teaching. Those not presently teaching will be asked to work with a teacher to gain that experience.

Methods

ENGL 6180 Methods in Composition Course Design and Assessment

Research

ENGL 6890 Certificate Capstone

Those students working on the master's degree also must fulfill all requirements of that degree.

No transfer of credits from other institutions will be allowed, although those students who complete ENGL 4090 while undergraduates at The University of Toledo will not be required to take ENGL 5090 if they received a grade of B or higher.

M.A. in English with a Concentration in English as a Second Language (E.S.L.)

The M.A. in E.S.L. includes 33 to 35 hours of course work.

Students working toward the master of arts degree with a concentration in E.S.L. must satisfy these specific requirements:

- (a) The course work shall include ENGL 5100, 5150, 6060, 6150, 6160 and 6170, and one course to be prescribed by the adviser.
- (b) The remaining 12 hours required for the degree must include CI 5430, ENGL 5190 and an additional six hours (including no more than one additional course outside of English and linguistics) as approved by the graduate adviser. Students who have completed any of the above required courses or their equivalent before their admission to the Graduate School may petition the graduate adviser in the department of English language and literature for substitutions. Students may count up to one independent study course toward the degree.
- (c) Candidates must demonstrate proficiency in a foreign language by having earned a grade of C or better in a course at the 3000-level or above, or by passing an examination administered by the department of foreign languages.
- (d) Candidates must also complete a thesis (ENGL 6960, one to three hours).

Master of Arts and Education

For the degree of master of arts and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog.

M.A. and Ed. Degree in Literature

The master of arts and education in literature degree can include either 30 or 36 hours of course work.

The literature program has the following requirements: a minimum of 18 hours shall include ENGL 5100, either ENGL 5750 or 5780, and two seminars (**excluding instructional seminars**); and candidates must pass a written examination based on a list of 17 British and American literary works and submit either a paper applying scholarly and critical techniques to a literary work of their choice or a project in education. As an alternative to the examination and paper, they may choose to take six additional hours of literature courses, including at least one seminar (**excluding instructional seminars**). They also must satisfy the requirements specified by the College of Education.

M.A. and Ed. Degree in English as a Second Language (E.S.L.)

The M.A. and Ed. degree in E.S.L. includes from 33 to 35 hours of course work.

The English as a second language program requires the following: a minimum of 10 hours in linguistics, including ENGL 5150, 5190, 6150 and 6160 (If any of these were taken on the undergraduate level, appropriate courses may be substituted in consultation with the graduate studies adviser); a minimum of 10 hours in E.S.L. which must include ENGL

6170 and 6060 and CI 5430; a thesis or project (one to three hours); and reading proficiency in one foreign language as required by the master of arts degree. Students also must satisfy the requirements specified by the College of Education.

Students should obtain from the department of English language and literature the appropriate information pamphlet that describes in detail departmental regulations and procedures for the M.A. or the M.A. and Ed. degree, and includes the reading list.

Department of Foreign Languages

Antonio Varela, chair

Ruth Hottell, French graduate adviser

Joseph A. Feustle Jr., Spanish graduate adviser

Debra Stoudt, German graduate adviser

Requirements for the Master's Program in French, German and Spanish

A minimum of 30 semester credit hours are required for the master of arts and a minimum of 30 semester credit hours are necessary for the master of arts and education.

For the degree of master of arts or master of arts and education with a major in French, German or Spanish, students must meet the following departmental requirements: present an undergraduate major in the language of interest from an accredited college or university; satisfactorily complete at least 18 hours of graduate credit in the major language (including courses 5010 and 5020 in French and German, 5010 and 5110 in Spanish); satisfactorily complete an additional 12 hours in the major language or in approved, cognate courses; pass a comprehensive examination; and demonstrate a reading proficiency in a foreign language other than the major. This may be done either by earning a passing grade in a foreign language course at or above the 3000 level, or by passing an examination administered by the department of foreign languages. A thesis may be presented for an additional six hours of credit in lieu of the comprehensive examination.

Master of Arts and Education

For the degree of master of arts and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog.

Department of Geography and Planning

Peter S. Lindquist, chair

David J. Nemeth, graduate adviser

Daniel J. Hammel, internship director

Requirements for the Master's Program

For the master of arts degree, students must meet the following departmental requirements, including 30 credit hours of graduate work:

1. 15 of the 30 minimum hours must taken in the department at the 6000 level. Nine additional elective hours may be taken at the 5000 or 6000 level within the major. The 6100, 6150, 6910, and 6920 courses are mandatory. This 15-hour requirement may not include the following courses: 6700, 6910, 6940 and 6960.
2. A minimum of one graduate-level (at least three hours) course or seminar, approved by the adviser, must be taken in a related area outside the department. This may not include an independent study or research course.
3. The selection of geography and planning courses and related courses should comprise a unified program chosen in consultation with the graduate adviser.
4. At the end of the second semester of full-time work, the student takes a comprehensive written and oral exam upon completion of at least nine course credits, maintaining a B grade or better in 6100 and 6150, and a B average or better for all graduate work. Successful completion of the comprehensive exam entitles the student to become a formal candidate for the M.A. degree.
5. The student then seeks approval of a thesis topic, formulates a thesis committee, and submits the proposal for approval.
6. The student should research and write an approved thesis under the direction of a thesis committee composed of departmental faculty members. The student may select an applied or traditional thesis option.
7. Upon completion of the thesis, an oral examination on the student's research, as it relates to general professional competence, will be required.
8. A minimum enrollment to qualify for the master's degree is two hours of thesis credits, but there may be as many as six hours within the 30 semester hours of graduate work.

The master's program is designed to provide a quality multidisciplinary education, foster theoretical and applied research in geography and planning, promote multicultural understanding, complement interdisciplinary work, and support local community outreach programs and grass-roots organizations. Faculty interests and research facilities offer opportunities to pursue intensive programs in community and urban planning, economic geography, geographic information science, environmental geography and planning, or cultural and behavioral geography.

Master of Arts and Education

For the degree of master of arts and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog.

Department of History

Alfred Cave, interim chair

Michael Jakobson, director of graduate studies

Admission

All students seeking admission to graduate study are required to provide transcripts, GRE scores, three academic letters of recommendation, and a statement of purpose. In addition, students whose native language is not English must submit TOEFL scores. A description of the history program

is available from the departmental office or the Web site at www.history.utoledo.edu/GraduateAdmissions.html.

Requirements for the Master of Arts

Degree

The student may earn the M.A. degree by completing either 30 graduate credits, including a thesis, of which six credits may, with the approval of the student's committee, be taken outside the department; or 36 graduate credits with an examination in lieu of a thesis, of which 10 credits may, with the approval of the student's committee, be taken outside the department. The choice between the two options will lie with the student's committee and will be made at the time of the student's first advisory conference with the committee. The student must maintain a B average in all graduate work. Each candidate for the M.A. degree must include within the program one course in historiography and two seminars.

Requirements for the Master of Arts and Education Degree

For the degree of master of arts and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog. The master of arts and education degree in history requires at least 21 hours of graduate credit in history within the total of 36 hours presented for the degree, including American or European historiography and a seminar. A comprehensive written and oral examination covering all graduate courses also is required.

Requirements for the Ph.D. Degree

The doctor of philosophy degree in history requires a minimum of 62 hours beyond the master's degree, including 24 hours for the dissertation. Doctoral students must complete four seminars, a course in historiography and a teaching workshop.

General Field

The student must stand for examination, written and oral, over one general field, such as U.S. history or Europe since 1600. See *program handbook* for additional details.

Topical Major Area

The student must stand for examination in one major area of concentration. This normally will be the area in which the student will write the dissertation and in which the student has had course and seminar work.

Topical Minor Area

The student will be examined in a minor area outside the general field. Selection of this field will be made by the student and the director of graduate studies.

Additional Study Outside the Department

The student's committee may require additional course work or readings in a department other than history – for example, economics, political science, sociology, geography, English or philosophy. The student will not be examined in the related area, but must satisfy the committee on the quantity and quality of such work. A member of the associated department may participate in the general oral examination.

Foreign Language and Other Tools

Every student in U.S. history, before taking the general or qualifying

examinations, must pass an examination in a foreign language – for example, German, French, Spanish, Portuguese, Italian or Russian. The choice of the language required will lie with the student's advisory committee, which also may require a demonstration of competence in other foreign languages or in some appropriate skill, such as computer analysis or statistics. Students in non-U.S. history must demonstrate competence in at least two foreign languages.

Master of Liberal Studies Program

Lawrence Anderson-Huang, director

James Benjamin, adviser for Communication Studies

The master of liberal studies program offers personal enrichment and professional enhancement to individuals with bachelor's degrees who desire additional study in the liberal arts. The program is interdisciplinary in nature, allowing students to do research exploring relationships among traditional areas of study. After a series of core seminars, a student creates his or her own program of study under the guidance of a faculty adviser. The master of liberal studies program works cooperatively with the various departments and undergraduate interdisciplinary studies programs to arrange meaningful experiences for students. For further information, please see the master of liberal studies Web page at <http://mls.utoledo.edu> and/or contact the director.

A certificate in communication studies is available through the master of liberal studies program. See the department of communication for details.

Admission

All students seeking admission to the master of liberal studies program must file an application with the Graduate School. Application materials consist of a cover form, a statement of purpose, post-secondary transcripts (not necessary for applicants with a UT degree), and three letters of reference. Students with an undergraduate GPA of less than 2.70 must also submit GRE scores. Provisional admission that may be upgraded on completing the core seminar series with grades of B or better also is available. Applicants may request or may be requested to have an interview with the director.

Requirements for the Master of Liberal Studies Degree

For the master of liberal studies degree, students must complete the following requirements, totaling 33 hours of study:

1. Core seminars (12 hours):
 - MLS Seminar in the Humanities (MLS 6010).
 - MLS Seminar in the Social Sciences (MLS 6020).
 - MLS Seminar in the Natural Sciences (MLS 6030).
 - MLS Seminar in the Visual and Performing Arts (MLS 6040).
2. Electives, chosen in consultation with the director and an adviser (15-18 hours).
3. Thesis (3-6 hours): A thesis is an independent research project. Students are given considerable flexibility and freedom in choosing their thesis topics.

Elective requirements for the MLS / Communication Studies Certificate

The electives above must be chosen from designated courses offered by the department of communication (15 hours).

Department of Mathematics

Geofrey Martin, chair

Donald B. White, associate chair and graduate adviser in statistics

Martin Pettet, graduate adviser in pure math

H. Westcott Vayo, graduate adviser in applied math

A full description of programs and requirements, with syllabi for exams, is available from the department office or on its Web site at www.math.utoledo.edu. The paragraphs below represent a synopsis of the essential elements.

Requirements for the Master's Programs

Master of Arts

To obtain the master of arts degree in mathematics, students must complete a minimum of 30 semester hours of graduate credit and meet the following requirements:

1. Complete two-semester sequences in abstract algebra (5330, 5340), real analysis (5820, 5830), and topology (5450, 5460), and a semester course in complex analysis (5880).
2. Complete one, two-semester sequence at the 6000 level in algebra, topology, differential geometry, differential equations or analysis.
3. Complete one of the following courses: Classical Differential Geometry, Ordinary Differential Equations, Partial Differential Equations, Calculus of Variations and Optimal Control, or any course at the 6000 level listed under item 2.
4. The student must pass comprehensive examinations or write a master's thesis. If a thesis is elected, the student must take an oral examination on the general area of the thesis.

Master of Science

The degree of master of science can be obtained in one of two options.

Option A – Applied Mathematics: To obtain the degree of master of science in the applied mathematics option, the student must complete a minimum of 30 semester hours of graduate.

1. Complete two-semester sequences in numerical analysis (5710, 5720), real analysis (5820, 5830), and differential equations (6500, 6510), and a semester course in complex analysis (5880).
2. Remaining courses may be chosen from the following: Applied Functional Analysis, Linear and Nonlinear Programming, Infinite Dimensional Optimization, Differential Geometry, Differential Equations, Dynamical Systems, Methods of Mathematical Physics, Functional Analysis, Complex Analysis, Discrete Structures and Analysis of Algorithms, Probability, Statistics Probability and Statistics, Operational Mathematics or Calculus of Variations.
3. The student must pass a comprehensive examination or submit and defend a master's thesis.

Option B – Statistics: To obtain the degree of master of science in the statistics option, the student must complete a minimum of 35 semester hours of graduate and meet the following requirements:

1. Complete Applications of Statistics I, Applications of Statistics II, Linear Statistical Methods, Theory and Methods of Sample Surveys, Statistical Computing, Statistical Consulting I, Statistical Consulting II, Categorical Data Analysis, Distribution Free and Robust Statistical Methods, Statistical Inference, and Multivariate Statistics.
2. Complete one of the following: Applied Probability, Measure Theoretic Probability, Theory of Statistics, or Topics in Statistics.
3. Complete one of the following: Linear Algebra I, Applied Linear Algebra, Introduction to the Theory of Probability, Advanced Calculus.
4. Pass a two-part comprehensive examination, one part in probability and statistical theory and one part in applied statistics.

Master of Science and Education or Master of Arts and Education

For the degree of master of arts and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog.

For the degree of master of science and education, the following requirements must be met:

1. A minimum of 32 hours of graduate credit must be completed. Colloquium and proseminar do not count toward the 32 hours. At least 18 hours must be in mathematics and nine hours in education, with an additional six hours to be assigned in conference with the adviser. As part of the additional six hours, the student may elect to write a paper in mathematics education or one of expository character in mathematics.
2. The total graduate and undergraduate program must include the following: at least six hours of abstract algebra and/or linear algebra, six hours in geometry, statistics, probability and/or computer programming, three to six hours of analysis (beyond calculus), three hours of complex analysis, and one course in logic and foundations.
3. The student must pass comprehensive examinations in three of the areas of study of mathematics. The exact areas are to be arranged with the adviser.
4. For information on the education course requirements, see the program description provided by the College of Education.

Requirements for the Doctoral Program

The doctorate in mathematics is offered with concentrations in either mathematics or statistics. The broad requirements for these programs are as follows:

1. Each student must pass a qualifying examination within two years of entering the program. Mathematics students must pass two topics chosen from algebra, topology and analysis. For statistics students, the two topics must be analysis and probability and statistics.
2. A minimum of 90 hours of graduate credit must be completed. Colloquium and proseminar do not count in the 90 hours. Of the 90 hours, at least 18 but no more than 36 shall be allotted for the dissertation. Mathematics students must complete two-semester sequences at the 6000 level in algebra, topology, real analysis and complex analysis. Statistics students must complete probability and statistics, real analysis, statistical methods, data analysis and multivariate statistics.

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3. The student must pass an oral examination in the general area of the intended thesis research within one year of passing the qualifying examination.
4. The student must demonstrate the ability to read mathematical literature in one foreign language, ordinarily chosen from French, German or Russian. Another language may be substituted if it is necessary for the student's specific program. The language requirement must be met before beginning dissertation research.
5. All doctoral students are expected to participate in a seminar on undergraduate teaching methods and to spend two consecutive semesters in supervised teaching. This requirement should be met before beginning dissertation research.
6. The student must write a Ph.D. dissertation under the direction of a faculty member. Before completing the dissertation, the student must report on it in an open seminar. An outside examiner must approve the completed dissertation, and the student must defend it before a faculty committee appointed for that purpose.

Department of Music

Lee Heritage, chair

Master of Music in Performance Degree

For the master of music in performance degree, students must take a minimum of 30 hours of formal course work. Of the 30 hours, a minimum of 10 hours is required in applied study, leading to a graduate recital. In addition, students will be advised to select a balance of courses (minimum of 10 hours) among music theory, music history and literature, and pedagogy. The remaining 10 hours include the required Graduate Studies in Music course - MUS 5900 (three hours), ensembles (two hours), a document (two hours) and electives (three hours).

Applicants are required to audition for the applied faculty. A diagnostic music theory and history exam will be administered before the first semester of enrollment. Applicants should have the minimum undergraduate GPA (2.70) required by the Graduate School for admission to the program. Applicants who do not have a minimum undergraduate GPA of 2.70 are required to take the GRE and report the results to the Graduate School and the department.

Master of Music in Performance Degree Requirements

1. Required Music Course (3 hours)

MUS 5900 Graduate Studies in Music3

2. Music Electives (minimum of 10 hours)

Graduate courses in music theory, music history and literature and pedagogy. The choice of courses will be determined in consultation with the graduate adviser, acting on behalf of the departmental graduate committee. Courses usually selected include:

MUS 5610 Analytical Techniques 3
MUS 5630 Counterpoint: Comparison of Styles 3
MUS 5410 Music History & Literature - World Music 3
MUS 5490 Music History & Literature – 20th Century 3
MUS 5590 Piano Pedagogy 3

Plus special topics and seminars in music theory, history and pedagogy

3. Applied Music (minimum of 10 hours)

MUS 6800 Applied Music, two to five credit hours per semester. Students are required to give a graduate recital. Students must be registered for applied music during the semester in which the recital is given.

4. Ensembles (2 hours) Ensembles chosen in consultation with the graduate adviser.

5. Graduate Electives (3 hours)

Music or nonmusic courses chosen in consultation with the graduate adviser.

6. MUS 6990 Recital/Document [Independent Study] (2 hours) A paper of 15 to 20 pages, which covers a theoretical analysis and/or historical review of the music performed on the graduate recital and/or related topics.

7. Students will be required to pass comprehensive and written and oral examinations, normally given during the last semester of work.

Master of Music in Music Education

Degree

For requirements of the master of music education degree, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog.

Department of Philosophy

Eric Snider, chair

Benjamin Pryor, graduate adviser

Susan Purviance, graduate adviser

Requirements for the Master's Program

For the degree of master of arts, students must meet the following departmental requirements:

Thesis option: Completion of at least 27 semester hours of graduate credit in courses offered by the department of philosophy, excluding readings and research courses; a written thesis for 6 semester hours of credit; and an oral examination covering the field of the thesis and general competency in the major areas of philosophy.

Non-thesis option: Completion of 33 semester hours of graduate credit in courses offered by the department of philosophy, excluding readings and research courses; and completion of an examination on contemporary philosophy and on an area, topic or figure chosen by the student in consultation with the faculty.

For both options: Completion of PHIL 3000 or 6000 (or its equivalent or satisfied as an undergraduate); completion of PHIL 3210 and 3230 (or their equivalents or satisfied as an undergraduate); completion of an examination on the history of philosophy; and completion of at least 42 semester hours of graduate and undergraduate credit in philosophy.

Department of Physics and Astronomy

Alvin D. Compaan, chair

Brian G. Bagley, graduate adviser

Requirements for the Master's Degree

For the master of science or master of science and education, a student must complete 30 hours of graduate credit that includes the following:

- (a) PHYS 6140 and an additional 15 hours of graduate course credit in physics, with six of the 15 hours numbered above 6000. Credit in PHYS 5900, 6010 and/or 6020 will not count toward either degree.
- (b) The student must present a satisfactory thesis based on directed research, for no more than eight credit hours.
- (c) The remaining hours within the 30 total may be chosen from graduate courses approved by the student's committee. In some cases students working toward the Ph.D. may earn the M.S. or the M.S.E. degree without formal presentation of the M.S. thesis if they have passed the Ph.D. qualifying examination, satisfied the course requirements for the M.S., and completed a research project under the supervision of a research adviser. Students meeting these requirements may petition the department to grant the M.S. without formal presentation of a thesis.

M.S. in Physics with Materials Science Option

A master of science degree in physics with a materials science option is available. For this degree, a student must complete 30 hours of graduate credit, including the following:

- (a) PHYS 6140, 6540, 6550 and an additional 12 hours of graduate course credit in physics with six of the 12 hours numbered above 6000 (no degree credit for PHYS 5900, 6010 or 6020).
- (b) The student must present a satisfactory thesis based on directed research, for no more than eight credit hours.
- (c) The remaining hours within the 30 total may be chosen from any graduate courses approved by the student's committee.

Master of Science and Education

For the degree of master of science and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog.

Requirements for the Doctoral Program

For the doctor of philosophy degree, a student must complete a total of 90 hours of graduate credit including the following: MATH 6730; PHYS 7220, 7250, 7260, 7320, 7330 and 7450; at least 18 additional hours of credit in physics in courses numbered higher than 6100 approved by the student's committee; and 30 to 48 hours allowed for the dissertation research, depending on the nature of the research and the needs of the student. Credit in PHYS 5900, 6/8010, 6/8020, 6/7030 or 7910 will not count toward degree requirements.

The doctoral degree requirements include a Ph.D. qualifying examination, a comprehensive examination, and a final oral examination. Passing the qualifying examination is a prerequisite for status as a Ph.D. candidate in physics. After passing the qualifying examination, the doctoral student must select a field of specialization. A faculty committee is formed, chaired by the research adviser, to evaluate the student's progress and to establish an

appropriate program of course work. This committee administers the oral comprehensive examination, after which only the dissertation research requirement remains. The graduate program ends with the student presenting the dissertation and defending it satisfactorily in an oral examination.

Ph.D. in Physics with Concentration in Materials Science

The Ph.D. in physics with concentration in materials science satisfies all the requirements for the Ph.D. in physics while preparing students for a career in materials science.

In addition, the concentration requires:

- Two core courses in the fundamentals of materials science:
 - PHYS 8540 Structure, Defects and Diffusion
 - PHYS 8550 Thermodynamics and Phase Transformation in Condensed Systems;
- Two additional elective courses in materials science and engineering chosen from a list of courses approved by the faculty of the Center for Materials Science and Engineering; and
- A dissertation in a materials-related field with a supervisor who is a member of the Center for Materials Science and Engineering.

Ph.D. in Physics with Concentration in Medical Physics

The Ph.D. in physics with concentration in medical physics satisfies all of the requirements for a Ph.D. in physics degree while preparing students for a career in medical physics. The medical physics-related courses, which total at least 27 credit hours, are provided by the Medical University of Ohio (MUO). The student's faculty advisory committee will consist of faculty members from the department of physics and astronomy and the medical physics fields. The committee may also include other members appropriate for this degree. A dissertation research project is chosen that will have relevance to both physics and medical physics. The Ph.D. requirement of 18 additional credit hours outside the core courses will be satisfied by the specified additional graduate courses in physics (UT) and in medical physics (MUO).

Ph.D. in Physics with M.S. in Engineering

The University of Toledo has established a joint program leading to the Ph.D. degree in physics and the master of science degree in computer science and engineering (CSE) or in electrical engineering (EE). The program is designed for physics students who wish to obtain background in either of the engineering fields and for engineering and computer science students who wish further study in physics. It is designed so that the B.S. in computer science and engineering or electrical engineering is not required. In order to complete this program, students must satisfy all the requirements for the Ph.D. in the department of physics and astronomy and the M.S. degree in the department of electrical engineering and computer science. Some courses will satisfy both requirements. Students will normally enter the program after passing the Ph.D. qualifying examination in physics and satisfying the entrance requirements to the electrical engineering and computer science graduate program. The student's Ph.D. dissertation adviser will be in physics, and an adviser in electrical engineering and computer science will serve as the outside member on the student's advisory committee. Students will normally take one course per semester in electrical engineering and computer science, along with courses in physics.

Department of Political Science and Public Administration

Mark E. Denham, chair

Hugh F. Hinton, director, M.P.A. program

Renee J. Heberle, director, M.A. program

Master of Arts in Political Science (M.A.)

The master of arts program is designed to help students become thoroughly grounded in the knowledge base and research methods of political science. The department offers study in five areas of the discipline -- American government (including state and local politics), comparative government, international relations, political theory and methodology.

Admission Requirements

Requirements for admission are a bachelor's degree from an accredited educational institution, acceptable scores on the GRE General Test, and three letters of recommendation from those in a position to judge the academic qualifications of the applicant. Official results should be sent to the Graduate School. While the Graduate School allows a minimum undergraduate GPA of 2.7, those near this threshold should have demonstrated significant improvement in the last two years of their undergraduate work.

Those admitted to the M.A. program normally begin their study during the fall semester. Applications for admission and financial aid should be submitted by March 15, although applications for admission alone are welcome at any time.

Degree Requirements

The requirements for the master of arts in political science are 30 semester credit hours and include:

- One required course: PSC 6110 (3 hours);
- Three seminars or lecture courses open only to graduate students: several 5000-level courses (3 hours) and any 6000-level course (3 hours each);
- A required master's thesis: PSC 6960 (6 hours); and
- Two courses (6 hours) may be taken outside of the department.

Academic Standards

M.A. students must maintain a minimum cumulative GPA of 3.0 overall and in their political science courses. Only those classes with a grade of C or higher may be counted toward the degree. A student receiving two grades below a B (i.e., of 2.67 or less) may be removed from the program.

Master of Public Administration (M.P.A.)

The master of public administration (M.P.A.) is a professional degree for those pursuing administrative careers in government and nonprofit organizations. The program is accredited by the National Association of Schools of Public Affairs and Administration (NASPAA), and serves part-time and mid-career, as well as full-time students.

Admission Requirements

Applicants to the M.P.A. program must satisfy the following requirements:

- An undergraduate degree with a minimum GPA of 3.0 calculated on a 4.0 basis;
- Scores from the GRE. A combined score of 1,000 in the verbal and quantitative portions of the GRE is preferred, and the examination

must have been taken in the past two years. With permission, the applicant may substitute scores for the Law School Admission Test (LSAT) or the Graduate Management Aptitude Test (GMAT);

- Three or four letters of recommendation, which must be academically or employment related. These should be from individuals familiar with the applicant's academic abilities and professional goals. Applicants who obtained their undergraduate degrees in the last five years must submit at least two academic letters; and
- A thoughtfully drafted statement of purpose.

Degree Requirements

All students must satisfy the following University and program requirements:

- Program prerequisites: PSC 3420 (or equivalent), PSC 3110 (or equivalent). Students are expected to be proficient in basic spreadsheet and database microcomputer applications. Those who do not meet this requirement must complete an undergraduate-level database computer applications course from the department of political science and public administration or from any other department in the University. Approval of the master of public administration director should be sought if the course is offered outside the department of political science and public administration.
- General course work requirements: 12 graduate courses (36 hours), including at least five courses open only to graduate students, of which three must be at the 6000 level, with a minimum GPA of 3.0. This does not include prerequisites or experiential learning (Research Report for In-Service Students or Internship for Pre-Service Students).
- Common core requirements:

PSC 5140	Intermediate Social Science Statistics	3
PSC 5430	Public Personnel Administration	3
PSC 5440	Budgeting and Financial Administration	3
PSC 5470	Public Organization Theory	3
PSC 6410	Proseminar in Public Administration	3
PSC 6420	Quantitative Methods in Decision Making	3
PSC 6430	Seminar in Public Policy Theory & Analysis.....	3
- Electives: Students must take a minimum of five additional courses (15 hours from the list of elective courses in general management, criminal justice, economics and financial administration, health administration, human resources management, nonprofit organizations and urban administration). Electives should be selected in consultation with the M.P.A. adviser and may be used to develop an area of specialization.
- Experiential learning: All M.P.A. candidates must demonstrate the application of public administration theory, methods and techniques to a practical job situation. Those employed in a governmental or nonprofit agency at the professional level (in-service students) must complete PSC 5950. Those without government or nonprofit job experience at the professional level (pre-service students) must complete six credit hours of PSC 6940. At the end of the internship, the intern submits a final report and the agency supervisor submits an evaluation of the intern. Pre-service students should begin planning their internships with the program adviser before they expect to receive their degree.
- Comprehensive examination: Students must pass a written comprehensive examination. A student who fails the examination may retake it once.

Certificate Program in Municipal Administration

The primary purpose of this certification is to strengthen the professional management skills of personnel in responsible local government administrative positions. These include supervisors, department heads, administrative assistants and others who need more management training to enhance their career prospects. Students in the M.P.A. program may also use their electives to receive this certificate. In addition, this certificate program is appropriate for graduate students in geography and planning and civil engineering who wish to improve their knowledge of administration.

Certificate Program in Health Care Policy and Administration

This program is intended for students who are interested in pursuing mid-level careers in the health-care field or for those already working in the field who want to expand their knowledge without pursuing a formal graduate degree program in health administration. The program is composed of five courses in the departments of political science and public administration, health education, finance, and related areas.

Joint J.D./M.P.A. Degree

The J.D./M.P.A. dual degree program offers graduate students the opportunity to earn two graduate degrees evidencing the completion of the curriculum for the juris doctor (J.D.) from the College of Law and the curriculum for the master of public administration (M.P.A.) from the College of Arts and Sciences department of political science and public administration. The program is administered jointly by the College of Law and the department of political science and public administration. The program is designed for students who wish to be effective in administrative and regulatory positions in public and in private, nonprofit organizations.

Admission Standards and Requirements

To be admitted to the J.D./M.P.A. program, a student must first be admitted to both the College of Law and the M.P.A. program in the department of political science and public administration. The student must qualify for admission to each degree program, make separate application for admission to each program, and be admitted to each program in order to be eligible for the J.D./M.P.A. program.

After admission to the College of Law and the M.P.A. program in the department of political science and public administration, the student must be admitted to the J.D./M.P.A. program by the coordinating committee.

Requirements for Degrees and Continued Participation in the Program

Juris Doctor: In order to qualify for the juris doctor from the College of Law, a student must comply with all the academic and nonacademic rules of the college, with respect to the admission process and during the period after initial enrollment in the college until the granting of the degree. The College of Law will grant credit toward the J.D. for certain courses taken in the department of political science and public administration under the J.D./M.P.A. program, as detailed below.

Master of Public Administration Degree: In order to be eligible for the M.P.A. degree from the department of political science and public administration in the College of Arts and Sciences, a student must complete at least 12 graduate-level courses (36 credit hours), including at least five courses open only to graduate students, of which three must be at the 6000

level, with an overall minimum GPA of 3.0. A student must complete any prerequisite courses and all required courses, and the M.P.A. experiential learning requirement. The department of political science and public administration will grant credit toward the M.P.A. degree for certain courses taken in the College of Law, as detailed below.

Course Requirements

College of Law Credit for Certain Political Science Courses in the J.D./M.P.A. Program: Under the J.D./M.P.A. program, up to 12 semester credit hours of approved graduate M.P.A. courses may be applied toward the completion of the total credit hours required for the J.D. The student must earn a grade of B (3.0) or better in an M.P.A. course for the course to be credited toward the J.D.

The 12 hours of approved M.P.A. courses are as follows:

PSC 5430	Public Personnel Administration	3
PSC 5470	Public Organization Theory	3
PSC 6420	Quantitative Methods in Decision Making	3
PSC 6430	Public Policy Analysis	3

On written application by the student, and for good cause shown, the associate dean of the College of Law may substitute another graduate PSC course for one on the approved list.

Political Science Credit for Certain College of Law Courses in the J.D./M.P.A. Program: Under the J.D./M.P.A. program, up to 12 semester credit hours of approved upper-level courses in the College of Law may be applied toward the completion of the 36 credit hours required for the M.P.A. degree. In College of Law graded courses, the student must earn a grade of C (2.0) or better; and in College of Law ungraded courses, the student must earn a Pass or better for the course to be granted credit toward the M.P.A. degree.

Scheduling: A full-time student entering the College of Law must enroll full time exclusively in the College of Law beginning in the fall, for the first academic year. A part-time student entering the College of Law must enroll exclusively in the College of Law beginning in the fall of the first year, for two academic years.

After the initial first year or two years (as the case may be) in the College of Law, a student in the J.D./M.P.A. program is required to maintain his or her status as a student in the College of Law by taking at least one course for credit in the college during each academic year until the course requirements for the J.D. are completed.

Department of Psychology

Joseph D. Hovey, chair

Ricky S. Hefner, associate chair

Joni L. Mihura, director of clinical training

Requirements for the Master's Program

Students enrolled in the doctoral program earn the M.A. degree in partial fulfillment of requirements for the Ph.D. degree. For these students, requirements for the M.A. degree are an integral part of the doctoral program.

Students not enrolled in the doctoral program may apply for admission to the master's program in general psychology. Applicants must satisfy admission requirements of the Graduate School, the College of Arts and Sciences, and the department. Each applicant must submit an application, transcripts of previous academic work, three letters of recommendation, and GRE scores (including the advanced psychology test).

254 Graduate School

A minimum of 35 semester hours beyond the bachelor's degree is required. Each student must complete specific course-related requirements, including research practicum experience, and must complete a master's thesis. Although the program is designed to provide broad training in general psychology, it is expected that the thesis will be conducted within one of the following domains: cognitive psychology, developmental psychology, psychobiology and learning, or social psychology.

Master of Arts and Education

For the degree of master of arts and education, students must meet requirements for the degree as stated in the College of Education graduate section of this catalog.

Requirements for the Doctoral Program

A minimum of 92 semester hours of course work is required in the Ph.D. program in psychology, 47 hours of core requirements, and a minimum of 45 hours in one of two areas of concentration -- behavioral science or clinical psychology. Training in clinical psychology, which is fully accredited by the American Psychological Association, provides students with a broad educational foundation in the science and the practice of clinical psychology. Training in behavioral science allows students to focus on various aspects of cognitive psychology and language, developmental psychology, psychobiology and learning, and social psychology.

The purpose of the doctoral program is to prepare students for careers in academia (teaching, research, clinical work), in mental health programs, in clinical intervention settings, as well as in other settings. Doctoral training emphasizes the inculcation of scientific attitudes with regard to the gathering and evaluation of information; the solving of basic and applied research problems; and clinical assessment and psychotherapy. Each student must complete specific course-related requirements, a master's thesis, doctoral examinations, and a doctoral dissertation. The department's foreign language requirement also must be completed successfully. An individual plan of study is developed by the student in consultation with the academic adviser and advisory committee.

Applicants must satisfy admission requirements of the Graduate School and the department. Each applicant must submit an application, transcripts of previous academic work, three letters of recommendation, and GRE scores (including the advanced psychology test). A brief biological sketch also is required from each applicant in clinical psychology.

Department of Sociology and Anthropology

Barbara K. Chesney, chair

Elias T. Nigem, graduate director, adviser

Requirements for the Master's Program

Regular admission to the master of arts and master of arts and education degree programs in sociology requires meeting the admission requirements of the Graduate School, including presentation of scores on the aptitude sections of the GRE.

The master of arts in sociology requires a minimum of 37 credit hours of study. These hours are made up of required courses in theory, methods, and statistics (see B below); elective course work (see C below); and completion of a thesis, an internship or additional course work (see D below).

The program requirements are:

- A. Required background courses (0-9 hours)**
(For students who have not completed these or equivalent undergraduate courses):
- | | |
|---|---|
| SOC 5040 Classical Theory | 3 |
| SOC 5270 Social Research Methods | 3 |
| SOC 5290 Social Research Statistics | 3 |
- B. Core courses required of all students (10 hours)**
- | | |
|--|---|
| SOC 6000 Introduction to Graduate Studies in Sociology | 1 |
| SOC 6040 Advanced Sociological Theory or | |
| SOC 6050 Advanced Social Theory & Political Economy | 3 |
| SOC 6270 Advanced Social Research Methods | 3 |
| SOC 6290 Advanced Social Research Statistics | 3 |
- C. Program electives (21 hours):** These may be completed by choosing from 5000- and 6000-level courses offered in sociology. Students must take a minimum of two of these courses at the 6000 level.
- Students in the M.A. degree program may choose to use their elective hours to focus on a substantive area of the discipline. The faculty offers four areas of concentration – health and aging; class, race and gender; law and society; and social change.
- D. Thesis/Internship/Course Work:** Students may choose to complete a thesis (six hours), an internship (six hours) or six additional hours of course work with adviser approval. Organized and presented in a fashion consistent with Graduate School guidelines, the master's thesis is an original piece of research developed in collaboration with a full-time member of the departmental faculty who serves as thesis committee chair. Two additional full-time faculty members (at least one of whom is a member of the departmental faculty) may also serve as advisers to the student and are members of the thesis committee. Students should enroll in SOC 6960 for thesis credit; these hours will be graded on a S/NC basis.
- Students selecting the internship must develop this option in concert with two members of the full-time faculty, one of whom will serve as chair. A third member of the committee will come from the field in which the internship is located. Examples of internship settings include community organizations, health facilities, criminal justice facilities and government offices. Internships must place students in a position to make sociological observations about the setting. These observations will be the basis for an internship report to be filed with the graduate adviser, after approval by the internship committee. Students should enroll in SOC 6940 to receive credit for the internship; these hours will be graded on a S/NC basis.
- E. Independent Research:** Generally, students may take no more than three hours of independent study or research (5990, 6900, 6990) to complete their degree requirements. Exceptions may be approved by the graduate adviser to a maximum of six hours.
- Typically, students may apply no more than three hours taken outside the department toward completion of the degree requirements. Exceptions may be approved by the graduate adviser.

Students should consult with the graduate adviser for additional information about program requirements and options.

College Of Business Administration

Administration

David E. Chatfield, director, M.B.A./E.M.B.A. programs

Stranahan Hall Room 1033
Phone: 419.530.5231

Darlene Miller, manager, E.M.B.A program

Stranahan Hall Room 1029
Phone: 419.530.7982

S. Subba Rao, Ph.D., interim director, Ph.D. in manufacturing management program

Stranahan Hall Room 4034
Phone: 419.530.2421

Diana Franz, Ph.D., CPA, director, M.S. in accounting program

Stranahan Hall Room 3045
Phone: 419.530.4264

Elissa Teal, academic advisor, M.B.A. program

Stranahan Hall Room 1031
Phone: 419.530.5230

Degrees Offered

Degrees

The College of Business Administration is accredited by the The International Association for Management Education (AACSB) for undergraduate and graduate work. The graduate division of the college affords students an excellent opportunity to earn a degree on a full-time or part-time basis. The College of Business Administration offers the following degrees at the graduate level:

- Master of business administration (M.B.A.)
- Executive master of business administration (E.M.B.A.)
- A dual juris doctor/master of business administration (J.D./M.B.A.)
- A dual bachelor of science in engineering/master of business administration (B.S./M.B.A.)
- Master of science in accounting (M.S.A.)
- Doctor of philosophy in manufacturing management (Ph.D.)

Specializations within the Master of Business Administration Program

- Administration
- Finance
- Human Resource Management
- Information Systems
- International Business
- Marketing
- Operations Management

Admissions Policies

General Requirements

Refer to the Graduate School admissions section of this catalog for University of Toledo Graduate School admissions requirements and classification of graduate students.

Admission to Master of Business Administration (M.B.A.) Program

All decisions regarding admission to the M.B.A. program in business are made through the College of Business Administration Graduate Studies Office. Admission is available to those students who can demonstrate high promise of success in a graduate business degree program. The college has adopted qualitative admissions standards in which applicants are considered on the basis of their merits, with weight given to the quality of prior academic achievement, the Graduate Management Admissions Test (GMAT) scores, professional experience indicating increased levels of responsibility, and other relevant information that the candidate may share with the admissions committee. Although GMAT scores and GPA are important indicators of success, they will not be the sole basis for admissions decisions. Each candidate's qualifications also must meet the admission standards set by The International Association for Management Education (AACSB).

Student applications will be reviewed on the following criteria:

1. Academic record and overall GPA, as well as the trend and comparison of grades over a period of time.
2. Verbal, quantitative, written and total scores on the GMAT or other appropriate tests. An official GMAT score must be sent directly from the Graduate Management Admissions Council (GMAC) to the College of Business Graduate Studies Office and must be no more than five years old.
3. Managerial, professional and leadership potential as exhibited by work experience, extracurricular activities or community service.
4. The statement of purpose as required on the graduate application form.
5. In the case of students whose native language is not English, a score of at least 550/213 on the Test of English as a Foreign Language (TOEFL) is mandatory, unless the student has a degree from an American university.
6. Three letters of reference.
7. A voluntary personal interview through the College of Business Administration Graduate Studies Office.

Annual deadlines for submission of completed applications are as follows*:

Fall semester	Aug. 1
Spring semester	Nov. 15
Summer semester	April 15

* International students should submit completed applications as follows:

Fall semester	May 1
Spring semester	Oct. 1
Summer semester	March 1

All materials do not have to be submitted as a package, but a final decision on admission will be withheld until the package is complete. No materials submitted to the University will be returned to the applicant.

Admission to Executive Master of Business Administration (E.M.B.A.) Program

The E.M.B.A. program is designed for executives and professionals with a minimum of three to five years of management or professional experience. Applicants must be nominated, and may be sponsored, by their employers. Self-employed professionals may nominate themselves. An admissions committee of the college will select the participants. The admissions committee seeks candidates with proven leadership potential. Consideration will be given to the following areas:

- Completion of a bachelor's degree
- Completion of the GMAT*
- An assessment of the individual's work experience
- Evidence of the motivation, commitment and support necessary to complete a demanding program
- Voluntary personal interview

* The GMAT can be waived for applicants with sufficient executive experience.

Admission to Joint J.D./M.B.A. Program

Students applying for the J.D./M.B.A. program must already have a bachelor's degree. A student must apply and be admitted to the colleges of Law and Business Administration separately to be admitted to the J.D./M.B.A. The LSAT will be accepted by the College of Business Administration in lieu of GMAT scores. Refer to the College of Law and M.B.A. sections of this catalog for specific admission standards for each program

Admission to Joint B.S./M.B.A Degree Program

The College of Business Administration in conjunction with the College of Engineering offers a program whereby qualified students can earn simultaneously both a B.S. in engineering and an M.B.A. This program provides a unique opportunity to combine business and engineering skills to prepare graduates for global competitiveness. It supports the mission of the College of Business Administration to prepare corporate leaders for the future. The program should be particularly attractive to students interested in starting their own companies or those who want to develop an appreciation for how engineering and business complement each other.

This program will allow engineering students in their final two semesters of study to begin taking M.B.A. courses while completing their B.S. This arrangement should reduce the time it takes a student to receive both degrees by a year. The business undergraduate prerequisites can be satisfied as part of the undergraduate curriculum.

Students who wish to pursue the program should make this known to the associate dean for undergraduate studies in the College of Engineering by the end of their sophomore year. Interested students will take the GMAT at the end of their junior year and should apply for admission to the program to the Graduate School before the fall of their senior year. To be admitted to the program, students must have senior standing, score a minimum of 450 on the GMAT, and have at least a 3.0 cumulative GPA. Undergraduate requirements for the business minor must also be completed. Upon admission to the program by the Graduate School, the College of Business Administration and the College of Engineering, students will be classified as special provisional graduate students so that they may take graduate courses while simultaneously completing the requirements for the B.S. in engineering.

Students' special status must be tracked by the M.B.A. office to assure AACSB compliance and to assure the B.S. in engineering degree is granted prior to graduating with the M.B.A.

Admission to Master of Science in Accounting (M.S.A.) Program

All decisions regarding admissions to the M.S.A. program are made through the office of the director of graduate programs in accounting. Admission to the M.S.A. program is available for those students who demonstrate high promise of success in a graduate program. All applicants are considered on the basis of their merit with weight given to the quality of prior academic achievement, GMAT or GRE test scores, professional experience, and other relevant information. The admission procedures for the M.S.A. program are similar to those described for the M.B.A. program.

Admission to the Doctor of Philosophy in Manufacturing Management (Ph.D.) Program

Applicants should have a bachelor's degree, preferably in engineering or business. Letters of reference from college faculty acquainted with the student's character and ability, and official transcripts of all prior college work must be supplied. Applicants are expected to demonstrate preparation for, and a high promise of, success in the doctoral program. The following will be considered in evaluating an application to the Ph.D. program on an individual basis: the student's undergraduate and graduate record with general academic performance, as well as the trend and comparison of grades over a period of time; the student's verbal, quantitative and total scores on the GMAT (in certain cases, depending on the academic background of the student, GRE scores may be substituted for GMAT scores; it is to be stressed that, although GMAT and GPA are important, they alone will not be the basis of admissions decisions); evidence of the ability to do research (publications, presentations, etc.); statement of purpose explaining why the student wants to pursue a Ph.D. in manufacturing management; letters of reference; appropriate experience in a manufacturing organization; and, in the case of students whose native language is not English, acceptable performance on the TOEFL is mandatory unless the student has a degree from a U.S. institution.

While students may come from many academic disciplines, those students with bachelor's degrees in fields other than business or engineering may require more than 91 semester hours. Any student wishing to enter the program from a discipline other than engineering or business may do so with the approval of the program director and upon completion of the prerequisite courses. **Students admitted to the Ph.D. program will not receive graduate credit for any undergraduate courses they take.**

A student should take the Ph.D. comprehensive examination as soon as he/she and his/her adviser believes the student has mastered all the required subject areas and completed all course work. The format and other details of the examination are given in the handbook for Ph.D. students and are available from the program director. Following successful completion of the comprehensive examination, the student is admitted to candidacy for the Ph.D. and undertakes dissertation research. The student is responsible for initiating the application to candidacy on a form available from the Graduate School.

Each student will be assigned a faculty adviser by the Ph.D. program director at the time of admission. When a student enters the program, he/she will consult with the faculty adviser to determine which courses should be taken during the first year of study. Depending on the level and type of

preparation of the entering student, these courses will include foundation courses in business, engineering and manufacturing technology. During this first year of study, the student will choose an adviser who will assist the student in preparing a plan of study, choosing a dissertation topic, forming a dissertation committee and in other matters concerning the program.

Academic Policies

General Requirements

Refer to the general Graduate School section of this catalog for general academic policies that apply to all graduate students in areas such as advising, minimum enrollment, dishonesty, grievance, and probation and dismissal.

Academic Advising

Advising for the M.B.A. and E.M.B.A. programs is available in the Graduate Studies office on the first floor of Stranahan Hall. Advising for each M.S. and Ph.D. program is done by the respective program director. Students are encouraged to meet with an adviser regularly. Each student is ultimately responsible for correct and timely completion of degree requirements.

Financial Assistance

A limited number of graduate assistantships, which provide a stipend and/or cover instructional fees, are awarded to students each year. Awards are based upon scholastic achievement, work experience, research/computer experience and extracurricular activities. They are not based on financial need.

Applications are due by April 30 for the entire following academic year. Due to the competitive nature of these awards, however, students are encouraged to apply by the end of January.

Transfer Students

Students who have taken graduate course work at another AACSB-accredited university or from another college at The University of Toledo may, upon recommendation of the Graduate Studies in Business Office, be permitted to transfer up to nine semester hours of business-related course work toward the M.B.A. A grade of B or higher must be achieved in order to transfer any graduate courses.

Degree Requirements

GPA Requirements

Students must complete all requirements for their program of study with at least a 3.0 (4.0 scale) cumulative GPA. Students in the M.B.A. program must also maintain a minimum cumulative 3.0 GPA in courses taken in the area of specialization selected, if any.

Master of Business Administration (M.B.A.)

The M.B.A. curriculum may be built upon any bachelor's degree. The M.B.A. degree is granted to students who satisfactorily complete a minimum of 33 semester hours of 6000-level or higher graduate courses.

The length of the program will vary depending upon the nature of the undergraduate degree. The program consists of preliminary background

(9 hours), common body of knowledge (21 hours), core (24 hours) and specialization and/or elective (9 hours) courses. **Any or all preliminary background and common body of knowledge courses may be waived for equivalent coverage at the undergraduate or graduate level.**

Master of Science in Accounting (M.S.A.)

The master of science in accounting is a 30-semester hour program. The M.S.A. program is designed to prepare students for a professional career in accounting and to fulfill the requirements to sit for the Uniform CPA Exam in the state of Ohio. Candidates without a background in accounting can be admitted to the program but will be required to take additional courses.

Doctor of Philosophy in Manufacturing Management (Ph.D.)

The program requires at least 91 semester hours of study beyond the baccalaureate. For a full-time student with only a bachelor's degree, the course requirements before entering the dissertation stage can be completed in three years. Full-time students with an M.B.A. or a relevant M.S. degree should be able to complete the course work in two years before entering the dissertation stage. During the first year, the students without prior appropriate undergraduate or graduate work in business or engineering will acquire the foundation knowledge in business, engineering and manufacturing technology. Course waivers are possible at the foundation stage by passing competency examinations in appropriate areas.

Programs of Study

Master of Business Administration (M.B.A.)

Preliminary Background (9 hours maximum)

The M.B.A. program requires an introductory knowledge of computer and basic math skills. A grade of at least a C (2.0) in the appropriate course will be sufficient evidence of appropriate skill level. Computer skills can be demonstrated by proficiency test, Microsoft certification or an appropriate (as determined by the program adviser) equivalent course. Students without math skills will be required to take one or more of the following undergraduate courses:

MATH 1260	Modern Business Math I	3
MATH 1270	Modern Business Math II	3

Basic Core (21 hours maximum)

These courses represent the minimum background required of students prior to taking 6000-level courses in the M.B.A. program. Students admitted to the M.B.A. program can meet the requirements by taking the 5000-level courses or by proficiency examination. If a student can demonstrate that he/she has completed equivalent course work at the undergraduate level prior to admission to the M.B.A. program and has earned a grade of C (2.0) or better in the course(s), the corresponding 5000-level course may be waived.

ACCT 5000	Financial & Managerial Accounting	3
MGMT 5110	Management of Organizations	3
BANS 5210	Economics for Business Decisions	3
FINA 5310	Managerial Finance	3
MKTG 5410	Marketing Systems	3

OPMT 5510 Business Statistics with Computer Applications 3
 OPMT 5520 Analysis of Manufacturing and Service Systems.....3

Advanced Core (24 hours)

These courses are required of all students. They are reflective of business techniques, methodology and processes, and are designed to be cross-functional and integrative.

BUAD 6100 Accounting for Decision-Making 3
 BUAD 6200 Financial Systems 3
 BUAD 6300 Strategic Marketing & Analysis..... 3
 BUAD 6400 Results-Based Management..... 3
 BUAD 6500 International Business..... 3
 BUAD 6600 Supply Chain Management..... 3
 BUAD 6800 Information Technology & E-Business..... 3
 BUAD 6900 Strategic Management Capstone..... 3

Specialization Courses (9 hours)

Each student may select an area of specialization. An alternative is to select the administration specialization described below, which is designed for students who prefer to take a variety of electives in different areas. The substitution of any courses for an area of specialization requires the written approval of the department chair. No more than one independent study/research paper (three hours) may be taken in lieu of a course to fulfill a specialization requirement.

Areas of Specialization

Administration

The administration specialization is designed for students who want a general degree. Please select any three graduate-level electives within the college for which prerequisites have been fulfilled.

Finance

The graduate finance curriculum provides students with a background in all major areas of finance including corporate finance, investments and portfolio management, and financial institutions and markets. The prerequisite for all 6000-level finance courses is FINA 5310 or the equivalent undergraduate material. A student who wants to specialize in finance will take FINA 6130, Managerial Finance, plus two from the following list:

FINA 6150 Financial Institutions and Markets 3
 FINA 6330 Seminar in Financial Management..... 3
 FINA 6340 Seminar in Portfolio Management 3
 FINA 6350 Seminar in Financial Institution
 Management 3
 FINA 6370 International Financial Management..... 3
 FINA 6840 Small Business Financial Management..... 3

Human Resource Management

A specialization in human resource management is designed both for students who intend to seek or continue managerial careers in human resources, and for those who are seeking more general leadership positions, but need to understand approaches to attracting, retaining, compensating, motivating and managing employees in contemporary organizations.

Students are required to successfully complete HURM 6700, Human Resource Management, or its equivalent, by completing either an undergraduate degree in human resource management from an AACSB-accredited school, or by certification through the Human Resource Certification Institute.

In addition to HURM 6700, students must complete HURM 6740, Human Resource Strategy and Metrics, and then may select two additional courses from the following list:

HURM 6710 Employment and Labor Law 3
 HURM 6720 Advanced Negotiation 3
 HURM 6730 Performance Management..... 3
 HURM 6750 Current Topics in HRM..... 3

Information Systems

Specialization in information systems provides the student with a managerial overview of computers and information systems. Emphasis is placed on the role and function of the computer as a managerial tool to store, process, analyze and present information. The prerequisite for this option is previous training in a programming language. The prerequisite can be satisfied by the completion of INFS 5400 or by passing a proficiency test covering the material in this course. A specialization in this area includes INFS 6560 and 6610 and one of the following: INFS 6570, 6750, 6810 or 6930.

International Business

The international business program provides training for entry in careers in corporations with a global orientation, particularly multinational corporations, export-import firms, banks, transportation and logistics, and government and international agencies involved in international trade, finance and economic development. Students specializing in international business must choose three of the following courses: FINA 6370; IBUS 6360, 6390 and 6490; MKTG 6080 and 6400; and, subject to approval of the department chair, IBUS 6100 Study Abroad.

Operations Management

Specialization in operations management provides the student with the decision-making and problem-solving skills required for managing people and resources more effectively, whether in manufacturing firms, service industries, nonprofit organizations or government operations. A specialization in this area includes OPMT 6680 and 6690 and one of the following: OPMT 6510 or 6720, or INFS 6750.

Marketing

Students specializing in marketing should take any three of the following courses: MKTG 6120, 6210, 6230, 6290 and 6400; BANS 6310; or MKTG 6080 or 6980.

Graduate Certificate in Supply Chain Management (15 hours)

This certificate is offered as part of the graduate programs in the College of Business Administration. The program requires five graduate courses, totaling 15 hours of graduate credit, including a three-hour prerequisite course that may be waived for applicants who can demonstrate knowledge of the subject area. Applicants may be accepted directly to the certificate program, but must meet the entrance requirements for the MBA program with the exception of the GMAT exam. Students who subsequently apply and are accepted into the MBA program may use these credits to partially satisfy the requirements for that program, subject to University and MBA program regulations.

The certificate is intended for those who wish an entry-level credential into the supply chain management field, and for those currently in the field who wish to deepen their knowledge. Completion of the certificate program should prepare the student to take the first four exams of the

APICS CPIM certification, which itself is a prerequisite for the APICS CSCP certification.

Except for the prerequisite course, the courses may be taken in any order:

OPMT 5520 Manufacturing and Service Systems. (prerequisite, required for all courses below)

BUAD 6600 Supply Chain Management.

MKTG 6080 International Supply Management

OPMT 6680 Total Quality Management and SPC

OPMT 6690 Supply Chain Resources Management

Executive M.B.A. Program

The College of Business Administration offers an innovative executive M.B.A. (E.M.B.A.) program for executives of mid-sized and growing firms. The program curriculum is designed to enhance the ability of managers to manage the change and growth common in today's competitive environment. To accomplish this, participants in the program take courses built around three major integrative themes – entrepreneurship/intrapreneurship and integration of business functions, the e-business competitive challenge, and competition in a global marketplace.

The E.M.B.A. program is designed with experienced managers in mind and is tailored to fit their schedules. Through the use of a structured approach, executives are able to pursue an M.B.A. with their peers at a level and pace appropriate to their business experience. The program is completed in 15 months. Courses are taught in a convenient two-week-end-on, and-one-weekend-off format. Classes are held on Friday evenings and all day Saturday.

Required Courses:

EMBA 5500 Analytical Foundations for Executives	3
EMBA 6100 Global Competitive Challenge	3
EMBA 6120 Cultural, Legal & Operational Issues in Doing Business Abroad.....	3
EMBA 6200 Entrepreneurship and Personal Strategic Planning	3
EMBA 6140 Accounting & Financial Foundations for Executives	3
EMBA 6210 Problem Solving & Interpersonal Skills.....	3
EMBA 6220 Accounting Systems for Operational Control & Strategic Management.....	3
EMBA 6230 Market Driven Analysis	3
EMBA 6240 Entrepreneurial Financial Management	3
EMBA 6250 Leadership & Performance Management.....	3
EMBA 6290 Strategic Management in a Global Environment	3
EMBA 6300 E-Business Competitive Challenge.....	3
EMBA 6310 Managing Global Supply Chains	3
EMBA 6320 Product Development.....	3
EMBA 6330 Customer Relationship Management	3
EMBA 6470 Global/E-Business Field Trip.....	2

J.D./M.B.A. Dual Degree

This integrated program and curriculum leads to the awarding of two degrees. The juris doctor degree is awarded by the College of Law, and the M.B.A. degree is awarded by the College of Business Administration.

Juris Doctor (J.D.)

The College of Law requires the successful completion of 89 semester hours. The dual degree program would permit up to 12 semester hours of core courses from the College of Business Administration to be applied toward the satisfaction of the 89-hour requirement. The 12 hours of core courses from the College of Business Administration are:

BUAD 6100 Accounting for Decision-Making.....	3
BUAD 6200 Financial Systems.....	3
BUAD 6300 Strategic Marketing & Analysis	3
BUAD 6900 Strategic Management Capstone.....	3

M.B.A. Degree

To fulfill requirements for the M.B.A. degree, students must complete 33 semester hours at the 6000 level or above, including all eight M.B.A. core courses (24 hours). Students in the joint program may apply up to 12 hours of non-first year course work at the College of Law toward satisfaction of the M.B.A. electives. These 12 hours may come from the following courses or others approved by the program adviser:

Corporations.....	3/4
Agency/Partnership.....	2/3
Corporate Finance.....	2/3
Securities Regulation	2/3
Business Planning.....	2/3
Labor Law	2/3
Employment Law.....	2/3
Corporate Taxation.....	2/3
Partnership Taxation	2/3
Patent.....	2/3
Copyright Law	2/3
Labor Arbitration	2/3
Negotiations	2/3

Master of Science in Accounting (M.S.A.)

M.S.A. Curriculum

Accounting Core Courses (required of all students [three to five courses]):

ACCT 6130 External Financial Reporting III	3
ACCT 6190 Contemporary Financial Accounting Problems	3
ACCT 6210 Research in Accounting and Taxation	3
ACCT 6310 Advanced Managerial Accounting.....	3
ACCT 6420 Auditing.....	3

Accounting Electives (Select three to four courses):

ACCT 6150 International Accounting and Taxation	3
ACCT 6220 Corporate Tax	3
ACCT 6320 Cost Analysis and Control.....	3
ACCT 6410 Governmental and Not-for-Profit Accounting.....	3
ACCT 6330 Advanced Topics in Accounting Info Systems	3
ACCT 6430 Business Valuation	3

Diversification Electives (Select two to four courses):

BUAD 6200 Financial Systems.....	3
BUAD 6300 Strategic Marketing & Analysis	3
BUAD 6400 Results Based Management	3
BUAD 6500 International Business	3
BUAD 6600 Supply Chain Management.....	3
BUAD 6800 Information Technology & E-Business.....	3

Background Core

Based on the candidate's prior course work, any or all of the basic core may be waived (each course is three semester hours):

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MATH 1260	Modern Business Math I
MATH 1270	Modern Business Math II
BUAD 1020	Microcomputer Applications in Business
BUAD 2040	Financial Accounting Information
BUAD 2050	Accounting for Business Decision Making
ACCT 3100	Financial Accounting and Systems
ACCT 3110	External Financial Reporting I
ACCT 3210	Individual Taxation
ACCT 3310	Accounting Information Systems
ACCT 4120	External Financial Reporting II
ACCT 4310	Internal Reporting
BANS 5210	Economics for Business Decisions
FINA 5310	Managerial Finance
OPMT 5510	Business Statistics with Computer Applications

Doctor of Philosophy in Manufacturing Management (Ph.D.)

The purpose of the Ph.D. program is to train scholars to meet traditional standards of excellence in, and contribute to, the manufacturing management field through research, teaching and publication in academic and professional journals. The program is designed for individuals who seek to contribute to the advancement and dissemination of knowledge in manufacturing management through an integrative approach with sound foundations in business, engineering and research methodology. Graduates are expected to pursue careers in academia, consulting, research or manufacturing organizations.

The basic philosophy underlying the doctoral program is researchers in manufacturing management require a careful and creative mix of functional management specialties, economics, engineering, manufacturing and information technologies, and analytical tools such as statistics, optimization and research methodology. Therefore, the program is designed to provide students with abilities and skills to integrate and synthesize manufacturing, engineering and business functions (e.g., finance, organizational behavior, strategy, marketing, managerial accounting and information systems).

Prerequisites

- One year (two semesters) of calculus
- Statistics (through regression and analysis of variance)
- Background in physics or chemistry
- One semester/quarter of computer systems with applications

Note: Prerequisites must be completed before starting the Ph.D. program.

Foundation Courses

Business:	ACCT 5000, ORGD 7110, FINA 7310, BANS 7210, MKTG 7410, OPMT 7520
Engineering:	MIME 5060, 5160, 5750 and 5980

Ph.D. Program

Research Tools and Methods:

MFGM 8630	Management Science	4
MFGM 8860	Advanced Statistics	4
MFGM 8880	Research Methods and Theory Building	4

Manufacturing Core Competencies:

OPMT 8270	Simulation and Facility Planning	3
OPMT 8680	Total Quality Management & SPC	3
OPMT 8690	Manufacturing Resource Management	3

Integrative Seminars:

MFGM 8480	Information Systems Issues in Manufacturing	4
MFGM 8830	Organizational Theory & Behavior for Implementing Advanced Manufacturing Technologies	4
MFGM 8840	Manufacturing Strategy	4
MFGM 8890	Advanced Manufacturing System Design	4

Field Research: (8 hours)

Dissertation:

MFGM 8990 (16 hours)

Dissertation Research

The dissertation must be based on work initiated and undertaken specifically for that purpose. It must reflect a high level of scholarship, must constitute a substantial piece of work, and must indicate and document its claim to be a significant contribution to knowledge in its subject area.

Details regarding the dissertation research, starting with the dissertation proposal and ending with the final defense, are available in the handbook for Ph.D. students available from the program director.

College of Education

Graduate Programs

The College of Education offers programs leading to the degrees of master of education, doctor of education and doctor of philosophy. The College of Education collaborates with the College of Arts and Sciences to offer the master of arts and education and the master of science and education degrees. Sixth-year education specialist degree programs are available in educational administration and supervision, as well as in curriculum and instruction.

Admission to Graduate Programs

Admission requirements for Graduate School are described in a prior section of the Graduate School section of this catalog. Admission to graduate study in the College of Education is open to graduates of accredited four-year colleges and universities who meet the minimum admission requirements of the Graduate School, as well as the specific admission requirements of the college, department and program. Please refer to the degree program descriptions for specific information.

Note: Previously admitted students wishing to transfer to a different program within the College of Education must apply for admission to the new program. Admission to one program does not guarantee admission to another program.

Administration of Programs

All graduate programs in the College of Education are administered jointly by the college and the Graduate School. Students may contact the specific department, the college or the Graduate School for further information on programs or admission requirements. The college's associate dean for graduate programs and research coordinates the graduate policies within the college.

Master's Degree Programs

The college offers the master of education degree. The degrees of master of arts and education and master of science and education are offered in collaboration with the College of Arts and Sciences. Specific areas of study for these degree programs are indicated below:

Master of Education (M.Ed.)

Art education
 Career and technical education
 Curriculum and instruction
 Early childhood education PreK-3
 Educational administration and supervision
 Educational psychology
 Educational research and measurement
 Educational technology
 Educational theory and social foundations
 Elementary and early childhood education
 Health education
 Higher education
 Middle childhood education
 Physical education
 Secondary education
 Special education

Master of Music (M.M.E.)

Music education

Master of Arts and Education (M.A.E.)

Education and anthropology
 Education and classics
 Education and economics
 Education and English
 English as a second language (ESL)
 Education and French
 Education and German
 Education and history
 Education and mathematics
 Education and political science
 Education and sociology
 Education and Spanish

Master of Science and Education (M.E.S.)

Education and biology
 Education and chemistry
 Education and geology
 Education and mathematics
 Education and physics

Admission to Master's Degree Programs

In addition to Graduate School requirements, the College of Education requires the following:

1. A bachelor's degree from an accredited four-year institution.
2. An overall grade point average (GPA) of at least 2.7 on a 4.0 scale in all undergraduate work. Students who fail to meet this requirement may be considered for **provisional admission**, provided they demonstrate excellent promise for graduate study.
3. Three recommendations concerning the prospective graduate student, which, depending upon the student's status at the time, may come from such sources as the undergraduate major adviser, current employer, school principal or others who are knowledgeable about the applicant's ability to engage in graduate work in the desired program.
4. Any additional published criteria established by a program.

5. Some programs have selective admissions and may admit a limited number of students. Thus, meeting all formal criteria does not guarantee admission.

Admission Classifications

1. **Regular** – meets all of the admission requirements.
2. **Provisional** – fails to meet all admission requirements, but has demonstrated promise for graduate study. The candidate is required to immediately complete the GRE (quantitative and verbal portions only) and earn a minimum combined score of 800. If the student fails to achieve these GRE results, a 3.5 GPA in the College Core Requirement (four courses) is required for **regular admission**. The student must achieve regular admission status based on the above criteria as submitted prior to the completion of 15 hours of course work to continue in the program.

General Requirements for Master's Programs

1. Master's programs require a minimum of 30 or 36 semester hours (depending on program) of approved graduate course work, with a minimum GPA of 3.0 on a 4.0 scale for all graduate course work. Programs also leading to licensure or endorsement may require additional semester hours to fulfill credential as well as degree requirements.
2. **All** course work for master's programs must be taken within a **six-year period** immediately preceding the date the degree is awarded.
3. All master's programs require the completion of a thesis, project, seminar or field experience (practicum). Refer to specific program descriptions for additional information.
4. No more than six semester hours of credit from workshops (5950), problems or special topics courses (5980 or 6980) and independent studies (5990 or 6990) may be included in the degree program. A maximum of 10 semester hours of transfer course work may be applied to a master's program.
5. College Core Requirements (12 semester hours). All students completing master's degrees must fulfill the college's core requirements by completing one course from each of the following four areas within the first 21 semester hours of course work:

a. Psychological Foundations Core Courses

EDP	5110	Basic Educational Psychology	3
EDP	5120	Alternative Approaches to Discipline	3
EDP	5210	Child Behavior and Development	3
EDP	5220	Adolescent Behavior and Development	3
EDP	5230	Adult Development	3
EDP	5310	Issues and Innovations in Learning and Instruction	3
EDP	5320	Instructional Psychology	3
EDP	5330	Behavior Management	3

b. Research Foundations Core Courses

RESM	5110	Quantitative Methods I	3
RESM	5210	Educational Testing and Grading	3
RESM	5310	Educational Research	3
RESM	5330	Qualitative Research I	3

c. Social Foundations Core Courses

TSOC	5100	Group Processes in Education	3
TSOC	5110	Modern Educational Controversies	3

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TSOC	5200	Sociological Foundations of Education	3
TSOC	5210	Multicultural Non-Sexist Education	3
TSOC	5230	Intergroup and Intercultural Education	3
TSOC	5300	Philosophy and Education	3
TSOC	5400	History of Schooling & Teaching in the U.S.....	3

d. Curriculum Foundations Core Courses.....3

A specific set of courses that satisfy the curriculum requirement is approved for each degree program. Students should check with their faculty adviser for additional information.

Faculty Adviser

An adviser from the program will be assigned by the department upon admission to the program. It is the student's responsibility to work with the adviser on the development of the master's plan of study, evaluation of the program, and other aspects pertinent to graduate study.

Plan of Study

For each program, a student must develop a plan of study that will specify the curriculum that must be completed to fulfill degree requirements. The master's degree requires a minimum of 30 or 36 semester hours (depending on program). The plan of study must be approved first by the faculty adviser and then filed through the college associate dean for graduate programs and research by the completion of 15 hours of graduate course work. Upon final approval by the college and the Graduate School, a copy of the plan of study will be returned to the student. The copy may be picked up in the Graduate School office or the college office.

Teacher Licensure

Master's degree programs also meeting requirements for initial teacher licensure follow the same policies and guidelines for field/clinical experience, student teaching/internship and licensure examinations that undergraduate programs do. Students should consult policies and guidelines published in the undergraduate College of Education section of the catalog for more information.

Thesis or Master's Project Deadlines

Students completing a thesis or project must meet the published deadlines for submission to the College of Education and the Graduate School.

Program Requirements

Master of Education in Art Education

A.	College core	12
	Curriculum core must be AED 5500 or 5320	
B.	Specialization	21
	AED 5000, 5320 or 5500, Electives	
	<i>Courses must be approved by the faculty adviser.</i>	
C.	Culminating experience (choose one)	3
	AED 5000, 6920, 6940 or 6960	

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Education in Career and Technical Education

A.	College core	12
	Curriculum core must be CTE 5160 or 5830	
B.	Specialization.....	15
	<i>Courses must be approved by the faculty adviser.</i>	

C.	Project, thesis or practicum (choose one).....	3
	CTE 6920 or 6960	

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Education in Curriculum and Instruction

A.	College core	12
	Curriculum core must be CI 6800, CI 6810, CI 6830, CI 6840, CI 5860, CI 5870, SPED 5000, CIEC 5350 or CIEC 6310	
B.	Specialization	15
	<i>Courses must be approved by the faculty adviser.</i>	
C.	Project or thesis (choose one).....	3
	CI 6920 or 6960	

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Education in Early Childhood Education PreK-3

A.	College core	12
	Curriculum core must be CIEC 5340 or 6310	
B.	Specialization.....	18
	<i>Courses must be approved by the faculty adviser.</i>	
C.	Theory and research requirement	3
	CIEC 6950	
D.	Seminar, project or thesis (choose one)	3
	CIEC 6900, 6920 or 6960	

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Education in Educational Administration and Supervision

A.	College core	12
B.	Specialization.....	21
	<i>Courses must be approved by the faculty adviser.</i>	
C.	Seminar, project or thesis (choose one)	3
	EDAS 6900 or 6920 or 6960	

Programs leading to the M.Ed. degree in educational administration and supervision also may meet some of the requirements for the principal and/or administrative specialist license in Ohio. Students should consult their adviser for detailed information.

Master of Education in Educational Psychology

A.	College core	12
B.	Specialization	21
	Areas of focus may include learning/cognition or human development.	
	<i>Courses must be approved by the faculty adviser.</i>	
C.	Project or thesis (choose one).....	3
	EDP 6920 or 6960	

Master of Education in Educational Research and Measurement

A.	College core	12
B.	Specialization	21
	Areas of focus may include statistics, measurement or evaluation.	
	<i>Courses must be approved by the faculty adviser.</i>	

- C. Project or thesis (**choose one**) 3
RESM 6920 or 6960

Master of Education in Educational Technology

- A. College core 12
Curriculum core must be CIET 6300 or ETPT 5100
- B. Specialization 15-16
Areas of focus may include instructional technology, educational computing or instructional design.
Courses must be approved by the faculty adviser.
- C. Seminar, project or thesis (**choose one**) 2-3
CI 6900, 6920 or 6960

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Education in Educational Theory and Social Foundations

- A. College core 12
- B. Specialization 21
Areas of focus may include historical foundations, philosophical foundations, multicultural or urban education.
Courses must be approved by the faculty adviser.
- C. Project or thesis (**choose one**) 3
TSOC 6920 or 6960

Master of Education in Elementary and Early Childhood Education

- A. College core 12
Curriculum core must be CI 6800, CI 6810, CI 6830, CI 6840, CI 5860, CI 5870, SPED 5000, CIEC 5340 or CIEC 6310
- B. Specialization 18-19
Courses must be approved by the faculty adviser.
- C. Theory and research requirement (**choose one**) 3
(CI 6490, 6590, 6690, or 6790 or CIEC 6950)
- D. Seminar, project or thesis (**choose one**) 2-3
(CI 6900, 6920 or 6960 or CIEC 6900, 6920 or 6960)

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Education in Health Education

- A. College core 12
- B. Specialization 21
HEAL 6500, 6600 and electives
Courses must be approved by the faculty adviser.
- C. Project or thesis (**choose one**) 3
HEAL 6920 or 6960

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Education in Higher Education

- A. College core 12
- B. Specialization 18
Areas of focus may include college student personnel, community college administration or general administration. *Courses must be approved by the faculty adviser.*
- C. Practicum 3
HED 6940
- D. Project or thesis (**choose one**) 3
HED 6920 or 6960

Master of Education in Middle Childhood Education

- A. College core 12
- B. Specialization 12
Areas of focus can be English/language arts, mathematics, science, or social studies. *Courses must be approved by the faculty adviser.*
- C. Theory and research requirement (**choose one**) 3
CI 6490, 6590, 6690 or 6790
- D. Seminar, project or thesis (**choose one**) 3
CI 6900, 6920 or 6960

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Education in Physical Education

- A. College core 12
- B. Specialization 21
Areas of focus may include adapted physical education or teacher development. Specialization in Adapted Physical Education leads to endorsement by the State of Ohio.
Courses must be approved by the faculty adviser.
- C. Seminar, project or thesis (**choose one**) 3
CIEC 6900 or PED 6920 or 6960

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Education in Secondary Education

- A. College core 12
Curriculum core must be CI 6800, CI 6810, CI 6830, CI 6840, CI 5860, CI 5870 or SPED 5000
- B. Specialization 15-16
Areas of focus can be English/language arts, mathematics, science, or social studies.
Courses must be approved by the faculty adviser.
- C. Seminar, project, or thesis (**choose one**) 2-3
CI 6900, 6920 or 6960

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Education in Special Education

- A. College core 12
Research foundations core must be RESM 5110, 5210 or 5310.
Curriculum foundations core must be SPED 5250, 6070, 5180, 5160 or 5000
- B. Specialization 18
Areas of focus may include, but are not limited to, general special education, gifted and talented, and vision impairment.
Courses must be approved by the faculty adviser.
- C. Culminating experience (**choose one**) 6
SPED 6930:001 and one of the following: SPED 6930:002 or SPED 6920 or 6960

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Music in Music Education

- A. College core 12
Curriculum core must be MED 5360
- B. Specialization 24
MUS 5900, 5350, MED 5370, Music Ensembles (2 hours), Music Electives
Courses must be approved by the faculty adviser.

C. Project or thesis (**choose one**) 3
 MED 6920 or 6960

Students will be required to pass comprehensive written and oral examinations, normally given during the last semester of work.

Requirements for initial teacher licensure may be met as part of the M.Ed. degree. Students should consult their adviser for detailed information.

Master of Arts and Education

This degree program is offered by the College of Education in collaboration with the College of Arts and Sciences. This degree is designed for students who wish to enhance their knowledge in an arts or humanities field and education. As a general rule, students will have an adviser in the College of Education and in the College of Arts and Sciences who will jointly plan and direct the program. Students who wish to complete their culminating experience in education will work with their College of Education adviser. Students who wish to complete their culminating experience in their arts or humanities field will work with their College of Arts and Sciences adviser.

A. College of Education core 12
 Curriculum core must be CI 6800, CI 6810, CI 6830, CI 6840, CI 5860, CI 5870 or SPED 5000

B. Specialization 21
 Select a minimum of 15 semester hours in Anthropology, classics, economics, English, English as a second language, French, German, history, mathematics, sociology or Spanish.
Courses must be approved by the faculty adviser.

C. Seminar, project, or thesis 3

Requirements for initial teacher licensure may be met as part of the M.A.E. degree. Students should consult their adviser for detailed information. However, the master of arts and education ordinarily requires licensure as a prerequisite.

Master of Science and Education

This degree program is offered by the College of Education in collaboration with the College of Arts and Sciences. This degree is designed for students who wish to enhance their knowledge in a science field or mathematics and education. As a general rule, students will have an adviser in the College of Education and in the College of Arts and Sciences who will jointly plan and direct the program. Students who wish to complete their culminating experience in education will work with their College of Education adviser. Students who wish to complete their culminating experience in their science field or mathematics will work with their College of Arts and Sciences adviser.

A. College of Education core 12
 Curriculum core must be CI 6800, CI 6810, CI 6830, CI 6840, CI 5860, CI 5870 or SPED 5000

B. Specialization 21
 Select a minimum of 15 semester hours in biology, chemistry, geology, mathematics or physics
Courses must be approved by the faculty adviser.

C. Project or thesis 3

Requirements for initial teacher licensure may be met as part of the M.E.S. degree. Students should consult their adviser for detailed information. However, the master of science and education ordinarily requires licensure as a prerequisite.

Licensure Alternative Master’s Program (LAMP)

See the description in the Licensure Programs section.

Education Specialist (Ed.S.) Degree Programs

Education specialist (Ed.S.) degree programs are advanced graduate programs that provide students an area of educational specialization with emphasis on practice. Specific areas of study for these degree programs are listed below:

Administration and Supervision: The Ed.S. in administration and supervision is designed to meet the needs of individuals whose career goals include licensure for advanced administrative positions in public and private schools (district administrator, vocational director, administrative specialist and/or building administrator) or the area of organizational leadership.

Curriculum and Instruction: The Ed.S. in curriculum and instruction is designed to meet the needs of individuals involved with the curriculum, teaching and supervision aspects of discipline-centered areas of study. The degree provides patterns of study for teachers and supervisors who want an education beyond the master’s degree as a specialist, but who are not interested in a doctoral degree. Specific areas represented are educational technology, elementary education, early childhood education, secondary education, special education and career and technical education. For the program and requirements of a specific area, contact a faculty adviser.

Admission to Educational Specialist Degree Programs

General admission requirements to the Ed.S. programs include:

1. A bachelor’s degree from an accredited four-year institution.
2. A master’s degree from an accredited institution with a minimum GPA of 3.0 (on a 4.0 scale).

General Requirements for Educational Specialist Programs

1. Completion of a minimum of 32 semester hours of approved graduate coursework beyond the master’s level with a minimum GPA of 3.0 on a 4.0 scale.
2. All course work for the Ed.S. must be taken within a **six-year period** preceding the date the degree is awarded.
3. Most programs require the completion of a culminating experience, which may include field experiences, internships, projects, etc.
4. No more than six semester hours of credit from workshops (5/7950), problems or special topics courses (5/7980 or 6/8980) and independent studies (5/7990 or 6/8990) may be applied to a specialist’s program.
5. Students are required to develop a plan of study with their adviser that specifies the coursework that must be completed to fulfill degree requirements. This plan must be filed prior to the completion of 15 semester hours and must be approved by the adviser, the college associate dean for graduate programs and research and the Graduate School. Forms are available from the college office.

Doctoral Degree Programs (Ph.D. & Ed.D.)

The college offers a doctor of philosophy (Ph.D.) degree or a doctor of education (Ed.D.) degree, depending on the program. The Ph.D. is a research-oriented degree, whereas the Ed.D. is a practitioner-oriented degree. Because doctoral programs are long and complex, students are encouraged to discuss a prospective program with appropriate faculty prior to submitting an application. Students should refer to the College of Education *Doctoral Programs Handbook* for additional information.

Doctoral Majors

Doctoral degree programs (Ph.D. and/or Ed.D.) are offered in the following areas of specializations within the specified departments:

Department of curriculum and instruction
and the

Department of early childhood, physical, and special education

Curriculum and instruction (Ph.D. or Ed.D.) with concentrations in

Curriculum and instruction

Educational media

Elementary

Gifted and talented (Ph.D. only)

Secondary

Special education

Department of educational leadership

Educational administration and supervision (Ed.D.)

Higher education (Ph.D.)

Department of foundations of education

Foundations of education (Ph.D. or Ed.D.) with concentrations in

Educational psychology

Areas of focus may include learning/cognition or human development

Educational sociology

Foundations of education

History of education

Philosophy of education

Research and measurement

Areas of focus may include statistics, measurement or evaluation

Doctoral Minors

The major fields listed for doctoral specialization also are available as minor areas of study for other doctoral programs that require a minor. Additional areas of study for the minor are available within the college, as well as areas from the Colleges of Arts and Sciences, Business Administration, and Health and Human Services. Students should discuss these alternatives with their advisers.

Admission to Doctoral Programs

Individuals applying for admission to doctoral study in the College of Education must meet the admission requirements of the Graduate School, the College of Education and the program in which the individual wishes to pursue a major field of study. The following is a composite of Graduate School and College of Education admission requirements. Any exception

to the first two criteria must be reviewed and adjudicated for each applicant by the College of Education, doctoral monitoring committee (DMC) for referral to the Graduate School for final approval.

1. A baccalaureate or professional degree granted by an accredited institution.
2. At least one of the following:
 - a. A minimum 2.7 cumulative GPA, using a 4.0 scale, on all undergraduate academic work.
 - b. A minimum 3.0 cumulative GPA, using a 4.0 scale, in the last 60 semester hours of undergraduate course work.
 - c. A minimum 3.25 cumulative GPA, using a 4.0 scale, on all previous graduate academic work.
 - d. A minimum 3.5 cumulative GPA, using a 4.0 scale, in the last nine semester hours of graduate work taken before application.
3. Acceptable GRE verbal and GRE quantitative scores, as determined by individual programs.
4. Evidence in prerequisite academic work that the applicant can successfully complete the doctoral program in which the applicant wants to study.
5. An autobiographical sketch that describes *why the applicant wishes to pursue the selected doctoral program*. This sketch also should include information on previous study, educational experience, professional accomplishments, immediate and future professional goals, a proposed time schedule for completing the degree, and any other information that the applicant believes is relevant for admission into the desired program.
6. Evidence of research and writing ability, if required by the doctoral program. Such evidence may include a master's thesis, proctored writing sample, a written research report, one or more reprints of publications, a paper presented to a professional society, or similar evidence of competence in this respect.
7. A personal interview, if required by the doctoral program.
8. Evidence of successful teaching experience, if required by the doctoral program.

General Requirements for Doctoral Programs

Each doctoral program has different requirements for each of its program components. Students should contact the department in which their desired doctoral program is housed for specific information regarding each program component. Each doctoral student is expected to:

1. Concentrate in one area of specialization (i.e., a major) and pass a written examination (major examination) that covers the major area of concentration;
2. Depending on program, have no, one or two minor areas of concentration and pass a separate written examination for each minor area of concentration;
3. Pass an oral examination that covers the doctoral program;
4. Be proficient in tools of research;

5. Have a background in general foundations of education;
6. Have an extended period of concentrated study (i.e., a residency);
7. Generate a contribution to the research or practitioner literature (i.e., a dissertation); and
8. Present and defend a dissertation in a public forum.

Advising/Committees

The student is assigned a temporary adviser upon admission to a program. This adviser guides the student through the formation of a doctoral program committee.

The doctoral program committee shall be formed before the student completes 18 hours of credit. The doctoral program committee has a minimum of three members who are selected from the membership of the graduate faculty of the University. Specific composition of the committee is outlined in the College of Education *Doctoral Programs Handbook*.

The doctoral program committee is responsible for assisting the student in the development of a plan of study and assuring competence by overseeing the qualifying examination (if required), doctoral major exam, doctoral minor exam(s) and doctoral orals. After passing doctoral orals, the student must form a dissertation committee to guide the development of the dissertation. Guidelines for this committee are outlined in the College of Education *Doctoral Programs Handbook*.

Plan of Study

The doctoral program specification sheet, a form listing all courses to be included in the student's program, is available in the College of Education office or the Graduate School office. Requirements for foundations, research methodology, major, minor(s) and dissertation credit are included on the form. The plan must be approved by the doctoral program committee, the associate dean for graduate programs and research of the college, and the dean of the Graduate School. The plan must be filed before 18 semester hours of the doctoral program are completed.

Residence Requirements

A student who is seeking the Ph.D. degree **must complete two consecutive full-time semesters of concentrated study**. A student who is seeking the Ed.D. may meet the above requirement or may complete two consecutive full-time summer semesters of concentrated study across two calendar year summers.

The residence requirement implies a period of full-time concentration in academic study. A program of nine semester hours is recognized as the minimum for full-time residence in any semester or in a complete 12-week summer semester (terms I and II). The student must meet the residence requirement under a plan that is submitted in writing to the doctoral program committee for prior approval.

Examinations

A set of examinations must be passed successfully by students who complete doctoral programs. Consult the College of Education *Doctoral Programs Handbook* for specific information.

Dissertation Deadlines

Students completing the dissertation must meet the published deadlines for submission to the College of Education and the Graduate School.

Doctoral Monitoring Committee (DMC)

The DMC of the College of Education is responsible for reviewing all requests not consistent with College of Education and Graduate School policies and making recommendations to the college's associate dean for graduate programs and research and the dean of the Graduate School. Consult the College of Education *Doctoral Programs Handbook* for additional information.

Endorsement and Licensure Programs

The College of Education offers graduate programs to meet Ohio Teacher Education Licensure Standards in the following areas. Students should consult their adviser for details.

Licensure Programs

Administrative Specialist – Curriculum, Instruction and Professional Development

Administrative Specialist – Educational Staff Personnel Administration

Administrative Specialist – School-Community Relations

Administrative Specialist – Career and Technical Education Administration

Early Childhood Intervention Specialist (ECIS) (ages 3-8) – Ohio Department of Education

MR/DD Early Intervention Certificate (birth-3) – Ohio Department of Mental Retardation/Developmental Disabilities

Licensure Alternative Master's Program (LAMP)

The alternative master's is a program for individuals who are looking for a career change and are interested in becoming teachers. These LAMP programs provide a sequence of courses that lead to recommendation for teacher licensure from the university to the state of Ohio Department of Education and a master's degree. LAMP programs lead to licensure to teach in middle childhood (grades 4-9) or adolescent and young adult (grades 7-12) or to be an intervention specialist (special education—K-12). For middle childhood and adolescent and young adult, licensure may be obtained in the following areas: language arts, mathematics, science and/or social studies, foreign language, music education, and visual arts education. The program is designed to provide students with many opportunities to spend time in schools and non-school settings and to place these experiences into perspective through on-campus reflective seminars. Interested individuals should contact the college director of student services.

Principal – PreK-9 (ages 3-12 and 8-14)

Principal – 4-12 (ages 8-14 and 10-21)

School Counseling and School Psychology

Students completing master's degrees in the College of Education or the College of Health and Human Services may also complete requirements for licensure. For further information, contact the department of counselor education and school psychology in the College of Health and Human Services.

School Nurse

The school nurse licensure program is aligned with the master of education in health education degree program. Degree requirements can be found in the College of Health and Human Services portion of the Graduate School section of this catalog, under master of education in health education (school nurse licensure). For more information, contact the school nurse program adviser in the College of Health and Human Services.

Speech-Language Pathology

To obtain both teacher and clinical licensure in speech-language pathology, students should consult the program director, the department or the associate dean for research and graduate education in the College of Health and Human Services to insure an approved baccalaureate program, master's degree and suitable practicum experience.

School District Leader (Superintendent)

Endorsements

Adapted Physical Education (for Educators with a Physical Education Teaching License or Certificate)

Career and Technical Education

An endorsement for a student holding a valid teacher certificate/license may be recommended for the following. Students should consult their advisers for specific details.

Adult education

Career-based intervention

Transition to work

Career and technical education

Work-site teacher/coordinator

EEH Validation (ages 3-5 Early Childhood Special Ed) – Professionals Holding Special Education Certification/Licensure

EEH Validation (ages 3-5 Early Childhood Special Ed) – Professionals Holding Early Childhood Certification/Licensure or PreK Validation

Gifted and Talented Education (grades K-12) – Professionals Holding K-3/1-8 Certification or a valid Ohio Teaching License

PreK Validation (ages 3-5) – Professionals Holding K-3/1-8 Certification

Reading (PK-12)

College of Engineering

Graduate Programs

The College of Engineering offers graduate programs in bio-medical, chemical, civil, electrical, industrial and mechanical engineering. Requirements for the engineering graduate programs are identified below. In addition, students should be familiar with the general Graduate School requirements (found in a preceding section of this catalog).

Entrance Requirements

The graduate program is open to all qualified individuals with a bachelor of science (B.S.)/master of science (M.S.) in engineering. Applicants should have a grade point average (GPA) of at least 3.0 in previous undergraduate work and at least 3.3 in previous graduate work. Students with a degree in another field may be eligible for admission, provided they meet the minimum background requirement, which includes two years of calculus through differential equations and one year of engineering physics. In some cases, other prerequisite courses may be required. Course credits for meeting undergraduate prerequisites are not applied toward the graduate degree.

An applicant for admission must do the following:

- Submit a completed application for admission to the Graduate School.
- Submit the application for graduate assistantship to the Graduate School.
- Submit a complete financial statement (for international students).
- Pay the relevant application fee.
- Submit three letters of recommendation.
- Submit a statement of purpose on the application and indicate those areas of engineering in which one is interested.
- Submit official transcripts of all previous college-level work.
- Submit scores of the Graduate Record Exam (GRE), if required.
- All students from non-English speaking countries must submit scores for the Test of English as a Foreign Language (TOEFL). The minimum acceptable score for the TOEFL is 550 (for paper-based test) or 213 (for computer-based test) or 80 (for internet-based test).

The above documentation should be sent to the Graduate School, The University of Toledo, Toledo, Ohio 43606-3390, USA. Admission to the graduate program is contingent on the availability of openings for incoming students. To receive full consideration for financial support starting from the fall semester, the application should be received by March 1. Normally, however, all applications are considered as they are received. Because of the sequential nature of courses, full-time students are admitted for the fall semester of the academic year. Please be advised that only complete application files will be considered.

Admission

Application for admission should be made to one of the engineering departments for study in specific focus areas. Application materials should be sent directly to the Graduate School.

To be admitted to a graduate program in the College of Engineering, the applicant must have a bachelor's degree in engineering or a closely related field. Admission is made on an individual basis, taking into account the applicant's previous academic record, the intended area of study and professional experience. Individual departments may have additional requirements, which are listed in their departmental descriptions. Generally, a GPA of at least 3.0 is required for admission. Applicants having a GPA of less than 3.0 who demonstrate potential for graduate study may be admitted to the master's program on a provisional or other basis at the option of the department. All students from non-English speaking countries must submit scores for the TOEFL; some departments will require completion of the GRE, as well. Application procedures and general requirements for admission to doctoral programs are described elsewhere in this catalog. The completed Graduate School application form and all required accompanying materials should be sent directly to the Graduate School.

The graduate program director of the department that houses the student's proposed area of study will make the admission decision, subject to departmental policies and review by the Graduate School. Therefore, the applicant should clearly indicate an area of intended concentration and/or the department of intended study. The criteria for admission include the baccalaureate and previous graduate record (grades and curricular content), the student's potential for success as indicated by professional references and relevant post-baccalaureate experience, and, for international students, the scores on required standardized tests.

Most successful applicants for the Ph.D. program will have completed a master's degree in the intended area of study or a closely related field. For an applicant who has an outstanding undergraduate record and no master's degree, direct admission to the doctoral program is available. Applicants seeking direct admission must satisfy all prerequisites for graduate study in the intended field of study and must have achieved an undergraduate GPA of at least 3.0.

Early Admission to M.S. in Engineering

The College of Engineering encourages students who wish to continue their education and earn graduate degrees in engineering to take the M.S. in engineering early admission option. By entering the M.S. program prior to completing their B.S. degree requirements, talented students may begin working on their graduate research while completing B.S. degree requirements. They may apply certain graduate courses toward selected B.S. course requirements (subject to departmental restrictions).

Students enrolled in a B.S. degree program in engineering at The University of Toledo who are within 18 hours of graduation, have a minimum 3.3 cumulative undergraduate GPA, and have completed their minimum co-op work requirements may be accepted for early admission into an M.S. engineering degree program. Applications will be accepted no earlier than one year (33 semester credit hours) prior to the expected completion of the B.S. program. An expedited application package contains 1) a completed regular application for graduate admission (special student application is not accepted); 2) three letters of recommendation; and 3) a biographical sketch (one page). Students accepted through this process will be granted provisional admission to allow them to enroll in graduate level courses and will be admitted to the M.S. program in the College of Engineering upon completion of their B.S. degrees.

A student must file an M.S. plan of study immediately after being granted early admission to the M.S. program. The plan must specify up to nine credit hours of graduate course work that will be applied in lieu of specific B.S. degree requirements. The student must meet all the requirements of the M.S. program as specified by the Graduate School, the college and the department.

Master of Science Programs

The master's degree programs are intended to provide advanced study in a relevant area of engineering. The programs provide sufficient flexibility to allow students to develop an area of specialization, broaden their educational experience into additional areas of engineering, or synthesize an integrated program of interdepartmental studies through a thesis or project.

Plan of Study

The master of science in engineering, master of science in bioengineering, master of science in chemical engineering, master of science in civil engineering, master of science in electrical engineering, master of science in industrial engineering, and master of science in mechanical engineering are offered with the following options:

1. **Master of science degree with thesis option:** A minimum of 30 credit hours of approved graduate study, including nine credit hours of master of science thesis under the supervision of a faculty member, is required. Students are required to submit a written thesis and successfully complete the oral defense of the thesis work. Additional guidelines and requirements may exist for individual departments.
2. **Master of science degree with non-thesis option:** The master of science with non-thesis option is available with the approval of the department chair or the department graduate program director:
 - a. **Master of science degree with project option:** Students are required to complete 30 credit hours of approved graduate study, including six hours of master of science project as specified by individual department guidelines and requirements. Students are required to submit a written project report to the department.
 - b. **Master of science degree with course work-only option:** Students are required to complete 36 credit hours of approved graduate-level course work. Additional hours of course work to replace thesis or project are selected from departmental electives approved by the department chair or the graduate program director.

A plan of study that specifies the entire master's program to include thesis or project and graduate course work, as well as any specified preparatory undergraduate course work, is to be developed by the student working with his/her adviser. This plan of study is to be submitted for review and approval to the department's graduate director, the department chair and the Graduate School before 10 graduate credits are completed. Graduate course work is selected from that available in engineering, math, science, business and related fields to include required core courses and/or to satisfy course category restrictions specified by the individual programs. Students should consult the departmental program descriptions for additional requirements.

Doctoral Degree Program

The doctor of philosophy program in the College of Engineering is intended for academically outstanding students with appropriate bachelor's degrees. The program requires the completion and defense of a significant, original

research dissertation. Potential fields of study are designated as areas of research focus by individual departments. Potential concentrations are bioengineering, chemical engineering, civil engineering, computer science and engineering, electrical engineering, environmental engineering, industrial engineering, manufacturing engineering, and mechanical engineering. A Ph.D. degree program in manufacturing management and engineering also is offered through the department of mechanical, industrial and manufacturing engineering.

Advisory Committee

Doctoral students, in consultation with the graduate program director and departmental chair, should select an adviser during their first term of study. Since the adviser is expected to become the student's dissertation supervisor, selection should be based on mutual agreement and common interests, with the expectation that the student and adviser can work effectively together. Notification of the adviser's appointment should be forwarded to the department's graduate program director, the college's associate dean of graduate studies, and the Graduate School for approval.

When the student and adviser have agreed on a general area for the dissertation within the first year of study, an advisory committee should be appointed, subject to the approval of the graduate program director and departmental chair. This committee, in general, is composed of a minimum of five graduate faculty members, with at least one of whom from outside the focus area and one from outside the department of the adviser. The duties of the advisory committee include developing a plan of study that will prepare the student in the chosen field and facilitate successful completion of the dissertation; reviewing and approving the dissertation proposal; advising and assisting in the completion of the dissertation research and preparation of the manuscript; and conducting the dissertation defense. Students are referred to additional details and requirements provided in the Graduate Student Handbook of individual departments.

Plan of Study

The advisory committee's first responsibility is to develop and submit for approval a doctoral program plan of study that meets all University, college and departmental requirements. This document specifies the course work and other requirements for the Ph.D.; it sets a tentative schedule for the examinations, and for presentation and defense of the dissertation proposal. Submission of the plan of study for approval to the graduate director, the departmental chair and the Graduate School also accomplishes official appointment of the advisory committee.

The plan of study requires a minimum of 45 credit hours each of dissertation and course work. (Students admitted to the Ph.D. program with an M.S. degree are granted up to 30 course work credits for their M.S. degree.) Course work must satisfy core course and other requirements specified for the student's focus area by the department.

Residence Requirement

The minimum residence requirement for the Ph.D. degree is the completion of one academic year of full-time study and/or research conducted at The University of Toledo. This requirement will be met by the completion of 24 dissertation or course work credits in two consecutive semesters while in residence at the University.

Examinations

At the discretion of the student's department, either a qualifying examination, a comprehensive examination or both will be required prior to admis-

sion to candidacy. Please refer to departmental and University requirements for details of the qualifying or comprehensive examinations.

Admission to Candidacy

When notified the required qualifying or comprehensive examination(s) have been passed and all other departmental requirements for candidacy are fulfilled, the student should initiate formal admission to candidacy. This requires the signed approval of the graduate program director and department chair and notification to the Graduate School.

Dissertation Proposal

The student, working with the adviser, should develop a detailed written dissertation proposal for presentation to the advisory committee. The proposal should state the objectives, provide appropriate background, and describe the general approach to accomplish the research clearly and completely. Specific procedures and details for the timing, preparation, distribution and defense of this proposal are noted in departmental requirements. An approved copy of the accepted proposal, signed by each member of the advisory committee, will be kept in the student's file.

Dissertation Defense

After the adviser and committee have approved the dissertation proposal, the student should carry out the dissertation plan. When the adviser and student believe the work is complete and ready for defense, a dissertation manuscript should be prepared, with the adviser providing suggestions for improvement, until both the adviser and the student believe the document is ready for publication.

The student should distribute the final adviser-approved manuscript and schedule a defense before the advisory committee.

The defense is open to the public. Notice of the exam should be sent to the departmental graduate director, associate dean of graduate studies of the College of Engineering, and the Graduate School, and should be posted on College of Engineering bulletin boards.

Following the examination, the advisory committee will vote on whether to approve the dissertation and its defense. The committee will advise the student on what additions or corrections are necessary before another defense is scheduled. When the examination is passed, there are generally revisions for improvement to be implemented before final approval of the document. When the final corrected, signed dissertation is submitted to the Graduate School through the departmental graduate director, the department chair and the associate dean of graduate studies, the student is certified academically for graduation.

J.D./M.S. Dual Degree Program

The J.D./M.S. dual degree program offers a student who has been admitted to The University of Toledo College of Law and one of The University of Toledo College of Engineering master of science programs the opportunity to complete requirements for both the J.D. and the M.S. degrees through a program of integrated curriculum in an accelerated period of study. The program is designed for full-time students who have an undergraduate degree in engineering or its equivalent. Students with a non-engineering undergraduate degree will be required to complete all prerequisite courses required by the College of Engineering, depending on the nature of the undergraduate degree.

Admission

Students should apply for the dual degree program using both the College of Law standard application form and the Graduate School application form. A joint admissions committee consisting of admission committee members from both colleges will review those College of Law applications that request dual admission. Although admission to both colleges is required before the student can begin the joint degree program, a student can begin a program in one college and later add the dual-degree program. In this case, only courses completed after admission to the dual-degree program can be counted toward the degree requirements in the discipline.

Advising

The College of Law and the College of Engineering, with the Graduate School, will administer and advise with regard to that school's curriculum, requirements and guidelines. Within the College of Engineering, advising is handled within the individual department of enrollment and coordinated through the associate dean of graduate studies. A dual program oversight committee will review policies and monitor the progress of students toward the dual degree completion.

Awarding of Degrees and Credit

A student enrolled in the dual degree program will not receive either the J.D. or M.S. degree until all the work required for both degrees has been completed. A student who withdraws from the dual degree program and remains in either the College of Law or College of Engineering shall receive only as much credit for work in the other college as the dean may authorize under the rules of that college.

No credit for work in the other college shall be awarded unless the student achieves an acceptable grade in the college offering the course. In addition, degrees must be awarded within time limits established by the Graduate School, the College of Law and the College of Engineering.

Description of the Curriculum

The integrated program and curriculum leads to the awarding of two degrees. The juris doctor degree will be awarded by The University of Toledo College of Law, and the master of science degree will be awarded by The University of Toledo College of Engineering.

Masters of Science in Engineering Degree: To fulfill requirements for the M.S. degree with thesis/project option, 30 credit hours at graduate level are required, while 36 credit hours at graduate level are required for the course work-only option. Students in the joint program may apply up to 12 credit hours of non-first year course work at the College of Law toward meeting the M.S. degree requirements. With the M.S. thesis/project option, students must complete 18 credit hours at the graduate level from the College of Engineering, including nine hours of M.S. thesis or six hours of M.S. project. With the M.S. course work-only option, students must complete 24 credit hours at the graduate level from the College of Engineering. The credit of 12 credit hours from the College of Law would be determined in consultation with the associate dean of graduate studies of The University of Toledo College of Engineering.

Juris Doctor Degree: The College of Law requires the successful completion of 89 credit hours. The dual degree program would permit up to 12 credit hours of core courses done in the College of Engineering to be applied toward the satisfaction of the 89-hour requirement. The 12 hours of course work from the College of Engineering would be determined in consultation with the associate dean of The University of Toledo College of Law.

Graduate Departments

Department of Bioengineering

Vijay Goel, chair

Patricia Relue, graduate program director

Bioengineering is a relatively new discipline with rapidly growing job opportunities. Bioengineers apply engineering and life science principles to study, understand, modify and control biological systems. The goal of bioengineering is to develop new technologies and techniques that can be applied to a variety of problems in medicine and in the manufacture of bio-related products.

Achievement of these goals requires engineering graduates who are trained in engineering and the life sciences. The department of bioengineering is multidisciplinary in nature. It draws on faculty resources, collaborative research programs, and course offerings throughout the College of Engineering, the College of Arts and Sciences, the College of Pharmacy, and departments at the Medical University of Ohio and other area medical institutions.

The graduate programs in the Department of Bioengineering are open to all qualified individuals with a Bachelor of Science (B.S.) or Master of Science (M.S.) in Engineering. Students with a B.S./B.A. or M.S./M.A. degree in a related field are also eligible but students may be required to complete prerequisite courses without graduate credit. The Department of Bioengineering requires the GRE of all students for admission decisions to graduate programs.

Master of Science Program

The master of science in bioengineering degree requires the completion of a minimum of 30 credit hours of approved graduate course work and the successful defense of a research-based thesis. All course work must be approved by the student's adviser (or the graduate director if the permanent adviser has not been selected). The M.S. curriculum is designed to provide a general, flexible framework for students in selecting course work that is relevant to their specific area of research. Each student must meet the following minimum general course work requirements:

- Register and attend the weekly bioengineering department seminar. Registration and attendance are mandatory every semester. Seminar is graded as satisfactory/unsatisfactory (S/U) based on attendance.
- Complete 12 hours of bioengineering major course work, including BIOE 5980 Research Methods for Bioengineers.
- Complete six hours of elective course work as approved by the adviser to support the research area.
- Complete three hours of course work to satisfy the mathematics requirement.
- Complete nine hours of bioengineering M.S. thesis research.

Doctor of Philosophy Program

The doctor of philosophy degree in engineering is conferred on the basis of extended study and high scholarly attainment in the field of bioengineering. The entrance requirement for the Ph.D. program in bioengineering is the M.S. in bioengineering or another engineering field that meets the requirements of the bioengineering department. The M.D., D.D.S. and D.V.M. are acceptable, provided the student presents evidence of an appropriate engineering background at the undergraduate level, including a minimum of two years of calculus through differential equations and

one year of physics. Highly qualified B.S. engineering graduates can be admitted directly into the Ph.D. program. Direct admission students will not write and defend an M.S. thesis or receive an M.S. degree en route to the Ph.D. degree.

The doctor of philosophy degree in engineering requires a minimum of 90 semester hours of approved graduate course work beyond the B.S. degree or 60 semester hours beyond the M.S. degree. For students directly admitted into the Ph.D. program with a B.S. degree, the M.S. course work and the Ph.D. course work requirements must be satisfied. All course work must be approved by the student's adviser. Each student must meet the following minimum general course work requirements beyond the M.S. degree requirements:

- Register and attend the weekly bioengineering department seminar. Registration and attendance are mandatory every semester. Seminar is graded as satisfactory/unsatisfactory (S/U) based on attendance.
- Complete six hours of bioengineering major course work at the 7000/8000 level, including Research Methods for Bioengineers if not previously taken.
- Complete six hours of elective course work as approved by the adviser to support the research area.
- Complete three hours of course work to satisfy the mathematics requirement.
- Complete at least 45 semester hours of dissertation research.

In addition to course work requirements, continuation within the Ph.D. program requires that the student pass two major examinations: (1) the qualifying exam and (2) defense of the dissertation research proposal. Completion of the Ph.D. degree requires the writing and defense of the dissertation, and presentation and publication of the research findings.

Admission to Candidacy

To be admitted to doctoral candidacy, all doctoral students must meet the following requirements:

- Pass the bioengineering qualifying examination.
- Select a faculty adviser and dissertation committee.
- Pass the bioengineering dissertation research proposal examination.
- Earn at least a 3.0/4.0 GPA for all graduate level course work.

Qualifying Exam

For students accepted into the Ph.D. program, the qualifying exam will occur after completion of the second semester and before the end of the second academic year. For students enrolled in the M.S. program who are electing to pursue the Ph.D., the qualifying exam should be taken at the time of application to the Ph.D. program, prior to completion of the M.S. degree.

The qualifying exam consists of two parts: a student assessment and an oral examination. Although all qualifying exams follow a similar format, the actual examinations will vary from student to student, depending on the course work taken and the composition of the qualifying examination committee. The student assessment is a detailed analysis by the qualifying examination committee members of the student's potential for succeeding at the doctoral level in the field of bioengineering. It is based on the student's entire record prior to joining the department and on the student's performance while at UT. The oral examination is approximately two hours in length. The exam will include subjects of importance to the student's

program and will probe areas of strength and weakness. The questions will be open-ended, and student responses will be discussed in-depth. The exam also is used to evaluate the student's oral communication skills, ability to respond to questions extemporaneously, and ability to analyze problems qualitatively and quantitatively.

Students either pass or fail the exam, to be decided at the sole discretion of the examination committee members. Students who fail the exam will have one opportunity to retake the exam and must be retested within six months of the initial examination.

Department of Chemical and Environmental Engineering

G. Glenn Lipscomb, chair

Arunan Nadarajah, graduate program director

The department of chemical and environmental engineering offers graduate courses and conducts research in the areas of advanced materials, polymer science and engineering, environmental engineering and biotechnology. Students may select from a variety of courses and research topics in each area. The department offers two graduate degrees, a master of science in chemical engineering (M.S.Ch.E.) and a doctor of philosophy in engineering (Ph.D.).

In advanced materials, the research is focused on developing novel materials. Applications include fuel cell materials, polymer nanocomposites, membranes and nanosensor materials. In polymer science and engineering, the emphasis is on transport in polymer systems, polymer processing and polymer physical chemistry to better utilize polymer materials for packaging applications. In environmental engineering, the emphasis is in environmental catalysis, purification of drinking water and bioremediation. The biotechnology area focuses on protein separation processes, such as chromatography, crystallization and membrane separations, and on biofilms. Research efforts address problems related to downstream processing in the biotechnology industries and on biomaterials development.

Degree Requirements

The graduate curriculum consists of four core classes, technical electives and a seminar. Master's and doctoral students must complete the following four core classes: Transport Phenomena I, Transport Phenomena II, Advanced Chemical Engineering Thermodynamics and Advanced Chemical Reaction Engineering. To complete the elective requirement, students may take most courses at the 5000 level or higher in the College of Engineering, the College of Pharmacy, or the College of Arts and Sciences departments of earth, ecological and environmental sciences; biology; chemistry; mathematics; or physics and astronomy. Students will choose specific courses with their advisers and will focus on classes in their specific research area. In addition, all graduate students must enroll continuously in seminars in chemical and environmental engineering.

Degree Requirements for the Master of Science in Chemical Engineering (M.S.Ch.E.)

Students may select one of two M.S.Ch.E. degree programs: the thesis option, which requires 30 credit hours, or the course work option, which requires 36 credit hours. The thesis option requires successful defense of a thesis and typically takes two years to complete. The course work option does not require a thesis and typically takes one and a half years to complete. Minimum requirements are:

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- A. 12 hours in four chemical engineering courses:
CHEE 6500 Advanced Chemical Reaction Engineering
CHEE 6510 Advanced Chemical Engineering Thermodynamics
CHEE 6550 Transport Phenomena I
CHEE 6560 Transport Phenomena II
- B. Nine hours of elective graduate course work (excluding the graduate seminar)
- C. Continuous registration for the graduate seminar
- D. Nine hours of thesis work (thesis option) completed to the satisfaction of the thesis committee or 15 additional hours of graduate course work (course work option)

A total of 30 credit hours (thesis option) or 36 credit hours (course work option), plus seminar credit, is required. Only credit hours obtained with a letter grade of C or higher, or an S grade for the limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill degree requirements.

All graduate course work must satisfy the following restrictions:

- No more than three hours of independent study, special problems or special topics, or six hours if the student opts for the course work option.
- No more than seven hours in dual level courses; courses with a minority enrollment of selected undergraduates are not restricted.
- All courses must be taken at the 5000 level or higher, including most graduate level courses, in the engineering departments of the College of Engineering (see advisor for approved list), the College of Pharmacy, or the College of Arts and Sciences departments of earth, ecological and environmental sciences; biology; chemistry; mathematics; or physics and astronomy.

All students must register for one hour of CHEE 5930, Seminars in Chemical Engineering, each semester during the academic year. This course is usually graded on a satisfactory/unsatisfactory basis. To receive a grade of S, students must attend all seminars or provide a written explanation for their absence.

Degree Requirements for the Doctor of Philosophy in Engineering (Ph.D.)

The doctoral degree requires a total of 90 credit hours split equally between course work and dissertation research. However, to be formally admitted to candidacy for the degree, doctoral students must first pass the preliminary and qualifying examinations. After admission to candidacy, the completion of 45 credit hours of course work and 45 credit hours of dissertation research, doctoral candidates must prepare a written dissertation documenting their research efforts. Final approval for graduation is contingent upon a successful oral defense of the dissertation before the dissertation committee in a public forum.

The minimum requirements for the doctor of philosophy (Ph.D.) in engineering are:

- 12 hours in four chemical engineering courses:
CHEE 8500 Advanced Chemical Reaction Engineering
CHEE 8510 Advanced Chemical Engineering Thermodynamics
CHEE 8550 Transport Phenomena I
CHEE 8560 Transport Phenomena II
- An additional 33 hours of graduate course work (excluding the graduate seminar)

- Ph.D. degree candidates must continuously register for the graduate seminar and pass the preliminary and the qualifying exams. All students must register for one hour of CHEE 5930, Seminars in Chemical Engineering, each semester during the academic year. This course is usually graded on a satisfactory/unsatisfactory basis. To receive a grade of S, students must attend all seminars or provide a written explanation for their absence.
- Passage of the preliminary exam
- Passage of the qualifying exam
- 45 hours of dissertation research completed to the satisfaction of the dissertation committee for a total of 90 credit hours. Only credit hours obtained with a letter grade of C or higher, or an S grade for the limited number of classes offered on a satisfactory or unsatisfactory basis, will fulfill degree requirements.

The graduate course work must satisfy the following restrictions:

- No more than 15 hours of independent study, special problems or special topics
- No more than 11 hours of dual level courses, except for courses with a minority enrollment of selected undergraduates.
- All courses must be taken at the 5000 level or higher, including most graduate level courses, in the College of Engineering (see advisor for approved lists), the College of Pharmacy, or the College of Arts and Sciences departments of earth, ecological and environmental sciences; biology; chemistry; mathematics; or physics and astronomy.

The faculty may award students admitted with a master's in chemical engineering up to 30 hours of credit toward the Ph.D. This may include credit for core classes if the faculty deems classes taken as a master's student are comparable to the core classes. The student must satisfy all other requirements as listed above. Additional course work must satisfy the following restrictions:

- No more than three hours of independent study, special problems or special topics.
- No more than four hours of dual level courses, except for courses with a minority enrollment of selected undergraduates.
- All courses must be taken at the 5000 level or higher, including most graduate level courses, in the engineering departments of the College of Engineering (see advisor for approved list), the College of Pharmacy or the earth, ecological and environmental sciences, biology, chemistry, mathematics or physics departments of the College of Arts and Sciences.

Preliminary and Qualifying Examinations

The purpose of the preliminary exam is to determine whether a student possesses the necessary background to complete doctoral degree requirements. This is an oral exam given at the end of the spring semester, on the first Tuesday following the spring commencement. The exam will cover core chemical engineering areas – transport phenomena, thermodynamics and reaction engineering. Specific questions are tailored to match a student's background (e.g., a student with a polymer background may answer questions in the above areas with a polymer emphasis). The exam tests material covered at the undergraduate level, as well as material from the fall and spring semester graduate classes. The faculty also will evaluate students' oral communication skills and their ability to analyze problems qualitatively.

The qualifying exam consists of an oral defense of the proposed dissertation research before a committee of five faculty members. Prior to the defense, students submit a written proposal to their committee. The defense consists of a brief presentation of the written proposal followed by a ques-

tion and answer session. The committee will assess the appropriateness of the proposed research for a doctoral dissertation and the student's ability to successfully complete it. Students must take the qualifying exam within one calendar year of passage of the preliminary exam. Upon passing the qualifying exam, students are admitted to candidacy.

Department of Civil Engineering

Ashok Kumar, chair and acting graduate program director

The department of civil engineering offers graduate degree programs and conducts research in two focus areas – environmental and infrastructure engineering. Environmental engineering includes advanced study in areas such as outdoor and indoor air quality; sustainable buildings; beneficial reuse of waste material; contaminated sediments; microbial degradation of organic compounds; microbial sensors; computer modeling of contaminant release and dispersion in soils and in air; environmental decision making; unsaturated soils; air quality models for industries; risk assessment; modeling of hazardous releases; environmental modeling and environmental sensing; air pollution modeling; and wastewater treatment processes. Infrastructure engineering includes structural and earthquake engineering, transportation engineering and geotechnical engineering. Geotechnical engineering includes advanced study in areas such as shallow and deep foundations, groundwater and seepage, and experimental and theoretical soil mechanics. Structural engineering includes advanced study in areas such as earthquake engineering; structural optimization; structural repair and rehabilitation; numerical and experimental analysis; and design. Transportation engineering includes advanced study in areas such as traffic and facility design; urban transportation planning; pavement materials' properties and design; pavement management; intelligent transportation systems; and transportation system management and economics.

The department offers two graduate degrees – master of science in civil engineering and doctor of philosophy in engineering.

Master of Science in Civil Engineering Degree Requirements

For the master of science in civil engineering (M.S.C.E.) degree, a minimum of 30 credit hours is required – 21 hours of graduate course work (a minimum of nine credit hours should be at the 6000 level or above) and nine hours of thesis research (CIVE 6960) performed under the supervision of a full-time faculty member of the department of civil engineering. The department also offers a M.S.C.E. degree with a project or course work option with the written approval of the department chair or graduate program director. In the project option, a minimum of 30 credit hours is required – 24 hours of graduate course work (a minimum of 12 credit hours should be 6000 level or above) and six hours for the project report. In a course work option, a minimum of 36 credit hours in graduate course work is required, of which a minimum of 18 credit hours should be at the 6000 level or above. Courses taken on an audit basis do not count toward the degree. Additional requirements include:

- A maximum of six hours of independent study are allowed toward the degree.
- Students must prepare a plan of study in conjunction with the adviser (graduate program director for the first semester) with a concentration of required and elective courses in one of the department's research focus areas of graduate study and receive approval from the graduate program director. Required core courses in each area are determined by the faculty comprising that research area in conjunction with the graduate program director.

- No more than nine credit hours toward the M.S.C.E. may be earned at another university, and in no case may the thesis or project be satisfied by work completed at another institution.

Doctor of Philosophy Degree Requirements

The doctoral degree requires a minimum of 90 credit hours, of which 45 credit hours are for course work and 45 credit hours are for dissertation research. To be formally admitted to candidacy for the degree, however, doctoral students must first pass a qualifying examination. All Ph.D. students should note that admission to the doctoral program does not constitute admission to candidacy. The doctoral program is normally a full-time program throughout all of the course work and the dissertation. The department of civil engineering does not encourage part-time studies in the Ph.D. program.

For the Ph.D. degree, a minimum of 60 graduate credit hours beyond the M.S.C.E. degree (90 credit hours beyond the B.S. degree) are required, of which at least 12 credit hours are for graduate course work (largely departmental), an additional three credit hours for graduate level mathematics course work, and 45 credit hours for dissertation research under the supervision of a full-time faculty member of the department of civil engineering. A minimum of 45 credit hours beyond the M.S. must be completed at The University of Toledo.

To be awarded the Ph.D. degree, the student must have at least a B average (minimum GPA of 3.0) for all credits in the program of study. In addition, the student must be admitted to doctoral candidacy and pursue an original research problem. The research must be completed and the dissertation written and successfully defended in public before the Ph.D. degree is conferred.

Admission to Candidacy for the Ph.D. Degree

To be formally admitted to candidacy for the doctoral degree, students must first pass the qualifying examination. The purpose of the qualifying exam is to determine whether a student possesses the necessary potential to complete doctoral degree requirements. The exam consists of two parts – a written examination and an oral proposal defense. The written exam is given in the middle of the spring semester. It is intended to test the breadth and depth of the student's understanding of fundamentals and the most important and basic elements of the broad area of graduate studies in which the student is specializing.

The oral defense of the proposed dissertation research is held before an advisory committee of at least five faculty members. Prior to the defense, students submit a written proposal to the committee. The defense consists of a brief presentation of the written proposal followed by a question and answer session. During the exam, the committee will assess the appropriateness of the proposed research for a doctoral dissertation and the student's ability to successfully complete it. Students must defend their proposal in the fall semester following passage of the written exam. Upon passing both parts of the qualifying exam, students may apply for admission to candidacy.

After completion of a minimum of 45 credit hours of course work beyond the bachelor's degree and 45 credit hours of dissertation research, doctoral candidates must prepare a written dissertation documenting their research results. Final approval for graduation is contingent upon a successful oral defense of the dissertation before the advisory committee in a public forum.

Students applying for admission are expected to have completed a B.S. in civil engineering. Those with degrees in other areas of engineering or science will have to take certain undergraduate courses to prepare for graduate courses. These courses will be identified prior to admission and will appear on the student's plan of study.

Department of Electrical Engineering and Computer Science

Roger J. King, interim chair

Junghwan Kim, graduate programs director

The department of electrical engineering and computer science (EECS) offers advanced study leading to M.S. and Ph.D. degrees. Graduate courses and research include topics in computer systems design and applications (hardware and software); communications; control and manufacturing systems; intelligent systems; machine vision and imaging; power systems; power electronics; microelectronics; VLSI design automation; fault tolerance and reliability; computer networks; robotics; signal processing; computer graphics and visualization; automotive systems; electromagnetics; remote sensing; and transportation informatics.

EECS department faculty members participate in four academic and research focus areas. Research activities of faculty often overlap the focus area, so several faculty participate in more than one focus area. Each focus area has a recommended list of courses for all graduate students pursuing that area of specialization. Courses to complete the degree requirements are to be selected by the student in consultation with an adviser. In order to provide some breadth in their programs of study, students also are encouraged to select courses from other focus areas in consultation with their advisers. The focus areas are as follows:

- **Advanced Computational Systems (ACS):** Computer operating systems, distributed and parallel computing, digital design, computer networking protocols, performance, reliability, modeling, and simulation. **M. Alam** (coordinator), M.M. Jamali, D. Kaur, L. Miller, H.M. Standley.
- **Applied Electrosciences and Control Systems (AECS):** Solid state electronics, VLSI, power electronics, power systems, robotics, feedback, nonlinear and adaptive controls. **T.A. Stuart** (coordinator), S. Giles, V.J. Kapoor, R. King, A.D. Johnson.
- **Communications and Signal Processing (CSP):** Communications, signal and systems analysis, random signals, information theory, image processing, image and video compression, wireless network design, vision, and applications. **E. Salari** (coordinator), J. Kim, W. Li.
- **Software and Intelligent Systems (SIS):** Database systems, systems software and security, software engineering, language design and implementation, algorithms, computer-human interfaces, computer graphics, neural networks, and client/server software design. **H. M. Standley** (coordinator), H.F. Ledgard, G. Serpen, G. Heuring, K. Makki, A. Upal.

Master of Science Programs

Two M.S. degrees are offered by the department – one in electrical engineering and the other in engineering. Students studying under the ACS or SIS focus groups receive the M.S. in engineering, with concentration in computer science and engineering, while those working under the other groups receive the M.S. in electrical engineering degree. The master of science degree is offered with the following options.

1. **Master of science degree with thesis option:** A minimum of 30 credit hours of approved graduate study, including nine credit hours of master of science thesis under the supervision of a faculty member, is required. Students are required to submit a written thesis and successfully complete the oral defense of the thesis work.
2. **Master of science degree with non-thesis option:** The degree requirements for master of science with non-thesis option are available with the approval of the department graduate program director:
 - a. **Master of science degree with project option:** Students are required to complete 30 credit hours of approved graduate study including six hours of master of science project as specified by individual department guidelines and requirements. Students are required to submit a written project report to the department.
 - b. **Master of science degree with course work-only option:** Students are required to complete 36 credit hours of approved graduate-level course work

Students must complete the following additional requirements:

- An approved plan of study.
- A minimum of 18 hours of EECS courses (including thesis/project and independent study).
- At least six hours of EECS courses at the 6000 level, excluding thesis and independent study.
- One credit hour (included in the required 30 hours for the program) of the EECS graduate seminar course EECS 5930 with a maximum of two excused absences in the semester.

Students are encouraged to include higher-level math courses in their program, subject to approval of their advisers.

Courses taken on an audit basis do not count toward the degree. Courses outside of the College of Engineering require prior approval.

In order to be awarded the master of science degree, the student must have at least a B average (a minimum GPA of 3.0/4.0) for all graduate course credits in the program of study as well as for the entire graduate transcript.

Doctor of Philosophy Program

Doctoral study in EECS leads to the degree of doctor of philosophy in engineering. A student must complete a total at least 90 hours of graduate credit (including dissertation) beyond the bachelor's degree, less allowances for transfer credits or other credits such as an M.S. degree. Doctoral candidacy requires satisfactory performance on the doctoral qualifying examination, selection of an academic adviser, and formation of a dissertation committee. Candidates are awarded the Ph.D. degree following: 1) satisfactory completion of a minimum of 60 credit hours beyond the M.S. degree or a minimum of 90 semester hours beyond the B.S. degree in a closely related field; and 2) successful defense of a dissertation that constitutes a fundamental advancement of knowledge in the field. The Ph.D. usually takes a minimum of three full years of graduate study beyond the M.S. degree.

The general requirements for the Ph.D. degree are:

- A minimum of 60 credit hours beyond the M.S. degree and a minimum of 90 credit hours beyond the B.S. degree.
- At least 45 credit hours of graduate-level course work beyond the

B.S. degree, of which the credit allowance for the master's degree will not exceed 30 semester credit hours. Usually, 45 credit hours of dissertation research are required.

- No more than three credit hours of independent study for students with an M.S. degree and no more than 15 credit hours of independent study for students with a B.S. degree may be counted toward the Ph.D. course requirement.
- The student must pursue, complete and publish a research study that is demonstrated to be an original contribution to the field of study.
- The dissertation must be written and successfully defended publicly before the Ph.D. degree is conferred.
- The student must submit a minimum of two journal papers based on the dissertation research. Copies of the official letters of acknowledgments for the submitted papers should be given to the graduate director. Also, every student is required to attend the seminar class in EECS and maintain at least an 80 percent attendance rate.

It is the responsibility of the student and the faculty adviser to formulate a program of study to satisfy requirements for the Ph.D. degree. The student's program of study should contain both breadth of knowledge and depth of specialization in one of the focus areas outlined earlier. The program must be approved by the faculty adviser, the advisory committee, the graduate program director and the Graduate School.

Department of Mechanical, Industrial and Manufacturing Engineering

Abdollah A. Afjeh, chair

Mohamed Samir Hefzy, graduate programs director

Graduate students enrolled in the department of mechanical, industrial and manufacturing engineering (M.I.M.E.) may pursue the following degree programs: master of science in industrial engineering, master of science in mechanical engineering and doctor of philosophy in engineering. The guidelines and procedures for the master's and doctoral programs in the M.I.M.E. department are listed in greater detail in the M.I.M.E. Graduate Student Handbook.

Research Focus Areas

The current research focus of the department is in the following areas:

- **Computational and Experimental Thermal Sciences:** The computational and experimental thermal science research focus group encompasses broad research activities. These include research in such areas as computational fluid dynamics and heat transfer; tribology; flow stability and transition; vortex dynamics; drag reduction; micro-gravity flows; thermal systems simulation; biofluid flow dynamics; turbulent boundary layer characterization; experimental methods using hot wire/film anemometry; laser Doppler velocimetry; particle image velocimetry; flow visualization techniques; and thin film heat flux gauge research. **T. Ng** (coordinator), A. Afjeh, D. R. Hixon, T. Keith, K. C. Masiulaniec, D. Oliver.
- **Materials, Mechanics and Design:** The objectives of the materials, mechanics and design focus group are to conduct research that will advance the engineering knowledge base and lead to new processes and products in the broad areas of mechanical systems, dynamic systems and control, mechanical behavior of materials and mechanical design. More specifically, the research thrust of this group

includes but is not limited to the dynamic behavior and control of mechanisms, machines, mechanical systems, processes, structures and smart material systems, including MEMS, biomechanics, design methodology, fatigue and fracture mechanics, machine dynamics, noise and vibration analysis and control, solid modeling and vehicle dynamics. **A. Fatemi** (coordinator), L. Berhan, M. Elahinia, M. S. Hefzy, A. H. Jayatissa, S. Kramer, N. Naganathan, E. Nikolaidis, M. Pourazady, P. White, H. Zhang.

- **Manufacturing and Systems:** The manufacturing and systems focus group emphasizes solving industrial and manufacturing problems. Example problems include planning and modeling manufacturing systems; forecasting industrial needs for materials; logistics; development of processes for products; basic understanding of metal forming and cutting; design of assembly systems; and improving the environmental impact of industry. A key aspect of this group is the blend of practical plant expertise with the benefits of computational technologies, including computer aided design and manufacturing. Processes are understood from a "hands-on" perspective and expanded through theoretical defining models. Engineering materials are studied throughout their life cycle, from raw material acquisition, product creation and usage, remanufacturing, recycling and final material disposal. Key expertise within this group includes internationally recognized faculty in computer aided design and manufacturing, rapid prototyping, system optimization, artificial intelligence, process engineering, grinding and abrasives engineering, facilities planning and modeling, and environmentally conscious design and manufacturing. **W. Olson** (coordinator), R. Abella, R. Bennett, A. H. Jayatissa, I. Marinescu, H. Zhang.

Master of Science Programs

Applicants must hold a bachelor of science in mechanical or industrial engineering, or a closely related field, from an accredited engineering program. If the baccalaureate is in a non-engineering or science area, students may be required to complete prerequisite courses without graduate degree credit. The master of science degree program may be pursued with thesis and non-thesis options.

1. **Master of science degree with thesis option:** The plan of study must include 30 hours of graduate work selected from those approved for graduate study (5000 level or above). A minimum of 12 hours of course work must be in the student's focus area of study. This option requires a minimum of nine hours of thesis credit.
2. **Master of science degree with non-thesis options:**
 - a. **Master of science degree with project option:** Students are required to complete 30 credit hours at the graduate level, including six hours of master of science project under the supervision of a M.I.M.E. faculty member. The project option must be approved by the M.I.M.E. departmental chair or the graduate program director. Students are required to submit a professional, written project report to the department after due approval by the faculty adviser. The project report will then be logged and archived in the department as a technical report.
 - b. **Master of science degree with course work-only option:** Students are required to complete a minimum of 36 credit hours of graduate level course work as specified by the department. This option has to be approved by the M.I.M.E. department chair or graduate program director.

The majority of a student's course work for all of the options will normally be from M.I.M.E. courses. Six or more hours of the course work must be from approved courses in advanced mathematics. An individual student may be required to complete more than the required minimum hours to satisfy prerequisite deficiencies specified as provisional admission conditions and/or to fulfill educational requirements of the program as specified by the adviser or department.

In addition to the above requirements, all supported students are required to enroll and/or participate in a graduate seminar (MIME 6930 or equivalent) each semester. The department, for satisfactory completion as well as enhancement of degree objectives, may specify additional credit or non-credit requirements. The plan of study for the master of science degree must be filed before 16 hours of academic course work has been completed. For full-time students, this normally will require that the plan of study be filed before registration for the second term.

For transfer credit, students should refer to the general policies of the Graduate School.

Doctoral Degree Program

A satisfactory doctoral degree plan is developed jointly by the student and the dissertation adviser, subject to the approval of the department chair or graduate program director.

A minimum of 15 credit hours of regular departmental courses taken for a letter grade beyond the M.S. degree is required for the doctoral degree program. Twelve credit hours must be departmental courses. Students entering the direct doctoral program with a bachelor's degree must complete 27 credit hours of regular departmental courses beyond their bachelor's degree, of which at least 15 credit hours must be at the 6000/8000 level. Project credits may not be counted toward the 27 credit hours of regular, letter-grade course work. All required courses are at the advanced graduate level as determined by the department. Other courses taken may include courses not listed as departmental courses, independent study courses, and courses taken S/U.

In addition to the above course requirements, all students are required to enroll and participate in a graduate seminar (MIME 8930 or equivalent) each semester. The department, for satisfactory completion as well as enhancement of degree objectives, may specify additional credit or non-credit requirements.

For transfer credit, students should refer to the general policies of the Graduate School.

Doctoral Degree Candidacy

Doctoral candidacy requires satisfactory performance in the doctoral qualifying examination, filing an approved doctoral program plan, selection of an academic adviser, formation of a doctoral dissertation committee and maintaining good academic performance as specified in the M.I.M.E. department Graduate Student Handbook.

When the above requirements have been met, the student may file his/her application for doctoral candidacy. The department requires that the application be filed within one year of the time the doctoral qualifying examination is passed. Doctoral students must have established candidacy for the doctoral degree before presenting and defending dissertation research.

Doctoral Dissertation

After the student and the adviser have agreed on a dissertation topic, the student must write a dissertation proposal. The student will present the proposal to the doctoral dissertation committee and successfully defend his/her dissertation proposal.

The doctoral dissertation committee must consist of at least five members. The chair of the committee will be the candidate's principal adviser. The other members usually will be the co-adviser (if any), faculty members or experts in a related field, with at least one committee member outside the department. The signatures of the committee on the candidate's dissertation indicate approval of the dissertation research and represent the final certification of its adequacy.

Doctor of Philosophy in Manufacturing Management and Engineering

In addition to the doctor of philosophy in engineering offered by the department, the Colleges of Engineering and Business Administration offer the degree of doctor of philosophy in manufacturing management and engineering. The doctoral degree program offers engineering and management tracks of study.

The applicants should have preferably completed a master's degree in one of the following areas: industrial, manufacturing, mechanical or production engineering or engineering management. For those applicants with master's degrees, the doctoral program of study involves a minimum of 60 credit hours, including business and engineering foundation courses, core courses, integrative seminars/technical electives, and dissertation research.

For additional information regarding this program, please consult specific program guidelines published by the Colleges of Engineering and Business Administration.

Department of Engineering Technology

Daniel J. Solarek, chair

Ella Fridman, graduate program director

The department of engineering technology administers the College of Engineering's part-time master of science in engineering program. This engineering master's degree program is intended for students who are full-time employees seeking the master's degree to facilitate career advancement or achievement of personal educational goals. To accommodate students who are full-time employees, course work for this degree program may be taken online via distance learning or as traditional on-campus courses.

Master of Science in Engineering Degree Requirements

The part-time master of science in engineering program requires 24 hours of approved graduate-level course work and a six-hour, work-related project, for a total of 30 credit hours. The student is expected to meet the following general requirements:

- Nine hours of engineering core courses to establish a common foundation in engineering. These courses include Management of Projects

and Technical Innovation, Advanced Computational Methods, and Probability and Statistics in Engineering and Management Science. The engineering core courses are designed to update computer analysis skills, provide a background in applied statistics and to furnish tools for the management of projects and technological innovation.

- Nine hours of business core courses that cover introduction to financial and managerial accounting, analysis of manufacturing and service systems, and business, government and society. The business core is intended to acquaint engineers, scientists and technologists with financial, managerial, and social issues that can help the engineer succeed in today's marketplace.
- Six hours of engineering elective courses to support the student's focus area. Each elective course is worth three credit hours, so two courses are required. Graduate offerings in the bioengineering, chemical and environmental engineering, civil engineering, electrical engineering and computer science, engineering technology, or mechanical, industrial and manufacturing engineering departments are eligible for selection as electives.
- Six credit hours of a work-related project. The topic and other specifics of the project require prior approval of the department's graduate program director and should include approval and cooperation of the employer.
- 30 credit hours total.

The project may be completed in two semesters plus the summer. Students may complete their course requirements in four semesters by taking the recommended two courses per semester.

For transfer credit, students should refer to the general policies of the Graduate School. No more than nine credit hours toward the master of science in engineering may be earned at another university, and in no case may the project be satisfied by work already completed at another institution or on the job.

In order to be awarded the master of science in engineering degree, the student must have at least a B average (minimum GPA of 3.0/4.0) for all graduate course credits in the program of study as well as for the entire graduate transcript.

Admission Requirements

To be admitted to the part-time master of science in engineering program, applicants must have a bachelor's degree in engineering, engineering technology or in a closely related field (e.g., one of the mathematical, physical or biological sciences). Applicants must be employed or have experience in private industry, government or nonprofit organizations. Admissions are made on an individual basis and take into account the applicant's previous record, the intended area of study, and the needs and capacity of the College of Engineering.

Generally, a minimum GPA of 2.7 is required for admission. Applicants having a GPA less than 2.7 who demonstrate potential for graduate study may be admitted to the master's program on a provisional or other basis, at the option of the department. Students with an undergraduate GPA below 2.7 must register and take the GRE. Information on the GRE is available on the GRE Web site: <http://www.gre.org>. Students who graduated with a bachelor's degree from The University of Toledo do not need to submit official transcripts. Students who did not graduate from The University of Toledo need to contact the office of the registrar at their undergraduate institution to arrange for transmission of the undergraduate transcripts.

For additional information regarding this program, please consult the College of Engineering's Web site at <http://www.eng.utoledo.edu/main.shtml> for specific program guidelines developed in cooperation with the College of Business Administration.

College of Health and Human Services

Graduate Programs

The College of Health and Human Services offers flexible programs leading to diverse master's, education specialist and doctoral degrees. In addition, the College of Health and Human Services has joined with the Medical University of Ohio and Bowling Green State University to form the Northwest Ohio Consortium for the purpose of offering a joint master of public health degree. All their students are encouraged to discuss programs with graduate faculty in their respective departments.

Admission to Graduate Programs

Admission requirements for Graduate School are discussed in a prior section of the Graduate School section of this catalog. Admission to graduate study in the College of Health and Human Services is open to graduates of accredited colleges and universities meeting the minimum admission requirements of the Graduate School as well as specific admission requirements of the department and/or program. Previously admitted students wishing to transfer to a different department or program must apply for admission to that new department or program. Admission to one program does not guarantee admission to another program. Please refer to the degree program descriptions for specific information.

Administration of Programs

All graduate programs in the College of Health and Human Services are administered jointly by the college and the Graduate School of The University of Toledo. Students may contact specific departments, the college's Student Service Center or the Graduate School for further information on programs or admission requirements. The associate dean for research and graduate education coordinates graduate policies within the college.

Advising

Students must meet with their program adviser for the purpose of developing a plan of study. It is the student's responsibility to meet all requirements for the degree as specified by the graduate program, the department, the Graduate School and the University. Students are encouraged to complete the plan of study during the first semester of matriculation.

Graduate Committee

The College of Health and Human Services (CHHS) Graduate Committee is responsible for reviewing all requests not consistent with College of Health and Human Services and Graduate School policies. The CHHS Graduate Committee also is responsible for making recommendations to the college's associate dean for research and graduate education and the dean of the Graduate School.

Graduate Degrees Offered

Master of Arts in Counselor Education

- Community Counseling
- School Counseling

Master of Arts in School Psychology

Education Specialist in School Psychology

Doctor of Philosophy in Counselor Education

Master of Arts in Criminal Justice

Master of Science in Exercise Science

- Applied Biomechanics
- Clinical Kinesiology
- Exercise Physiology
- Athletic Training

Doctor of Philosophy in Exercise Science

Master of Public Health

Master of Arts in Recreation and Leisure Studies

- Recreation Administration
- Recreational Therapy
- Recreational Therapy and Therapeutic Arts

Master of Arts in Speech-Language Pathology

Doctor of Philosophy in Health Education

Master of Social Work

Department of Counselor Education & School Psychology

Dr. Paula Dupuy, chair

Accreditation

The Council for Accreditation of Counseling and Related Educational Programs (CACREP) has conferred accreditation to the master's degree programs in school counseling and community counseling and the Ph.D. program in counselor education.

Master's and Education Specialist Programs

Department admission requirements, in addition to the Graduate School requirements, include the following: Undergraduate degree in an appropriate foundational field with a 3.0 (on a 4.0-point scale) undergraduate grade point average (GPA), submit an official Graduate Record Examination (GRE) score (taken within the last five years) with a preferred combined score (verbal plus quantitative) of 1000. Applicants will submit a typed personal statement (suggested length two to three pages) detailing significant personal and professional experiences that relate to the applicant's decision to pursue a career in counseling (e.g., rationale for seeking the degree, commitment to counseling as a profession). The personal statement also should address such topics as the applicant's skills or knowledge, preparation through education and/or experience, strengths and weaknesses, rationale for academic deficiencies, etc. The statement of purpose should be typed and submitted to the Graduate School. Submission of a professional resumé also is required. Applicants who meet academic admission criteria will be invited to interview with the department admissions committee before a final admissions decision is rendered. Application deadlines for interviews are Sept. 15, Jan. 15 and May 15.

Master of Arts in Counselor Education: School Counseling Track

Prospective applicants are urged to review information on the department Web site at <http://hhs.utoledo.edu/cesp/>. Applicants should contact the program coordinators for further details. Applicants expecting to practice outside of Ohio should consult that state's department of education to determine the current certification requirements. The curriculum leading to eligibility to take the State Department of Education examination for school counselors consists of 48 semester hours of training. Note: Neither Ohio nor Michigan require teacher certification to be licensed as a school counselor.

General Core Requirements (3 hours)

RESM 5310 Educational Research

School Counseling Major Courses (45 hours)

Required Courses

COUN	5010	Professional Orientation to School Counseling
COUN	5110	Career Counseling & Development
COUN	5120	Individual & Group Assessment
COUN	5130	Group Counseling
COUN	5140	Counseling Theories & Techniques
COUN	5150	Counseling Across the Lifespan
COUN	5160	Cultural Diversity for Counselors & School Psychologists

SPSY	5170	Consultation I: Theories & Techniques
COUN	5190	Counseling Practicum
COUN	6/8940	Counseling Internship
SPED	5000	Issues in Special Education
		or
SPED	5120	Students with Special Needs

(SPED not required for students with Special Education Teacher Licensure)

Elective Courses *

COUN	5980	Special Topics in Counselor Education
COUN	6210	Psychopathology
COUN	6220	Child, Adolescent, Family Therapy
COUN	6230	Crisis Intervention Counseling
COUN	6240	Diagnosis and Mental Health
COUN	6/8470	Drugs and Mental Health Counseling
COUN	6960	Master's Research Thesis (Instructor Permission)
COUN	6990	Master's Independent Study (Instructor Permission)
COUN	8460	Substance Abuse Counseling
EDP	5210	Child Behavior and Development
EDP	5220	Adolescent Behavior and Development
SPSY	5040	Legal & Ethical Issues for School Psychologist & Counselors

**Other courses may be approved by adviser.*

Total: 48 hours

School Counseling Licensure Endorsement Program

Any licensed or license-eligible professional counselor or professional clinical counselor or student in the Community Counseling Master's Program who wants school counselor licensure, but is not seeking admission to the Master's Degree in School Counseling, must apply for admission to the School Counseling Licensure Endorsement Program. The application shall consist of an application form, official transcripts of graduate work in counseling, three letters of recommendation, and a personal statement clarifying why the applicant wishes to become a licensed school counselor. (Current CESP master's students do not have to provide transcripts or letters of recommendation as these are already on file.) There is no fee for the

application, and the application is submitted directly to the Department of Counselor Education and School Psychology. CESP faculty will review the application, and the applicant may be required to appear for an interview with one or more faculty members.

Master of Arts in Counselor Education: Community Counseling Track

Prospective applicants are urged to review information on the department Web site at <http://hhs.utoledo.edu/cesp/>. Applicants should contact the program coordinators for further details. The curriculum leading to the master's degree consists of 48 semester hours of training. Applicants seeking licensure as Professional Counselors or Professional Clinical Counselors in Ohio need to be aware that the Ohio Counselor, Social Worker, and Marriage and Family Therapist Board requires an additional 12 hours of graduate study beyond the 48 hours required of the master's degree.

General Core Requirements (3 hours)

RESM 5310 Educational Research

Community Counseling Major Courses (45 hours)

Required Courses

COUN	5020	Prof Orient to Community Counseling
COUN	5110	Career Counseling & Development
COUN	5120	Individual & Group Assessment
COUN	5130	Group Counseling
COUN	5140	Counseling Theories & Techniques
COUN	5150	Counseling Across the Lifespan
COUN	5160	Cultural Diversity for Counselors & School Psychologists
COUN	5190	Counseling Practicum
COUN	6/8940	Counseling Internship

Elective Courses: *

SPSY	5/7170	Consultation I: Theories and Techniques
COUN	6/7210	Psychopathology
COUN	6/7220	Child, Adolesc, Family Therapy
COUN	6/7230	Crisis Intervention Counseling
COUN	6/7240	Diagnosis & Mental Health
COUN	6/8470	Drugs & Mental Health Counseling
COUN	7540	Advanced Personality Assessment
COUN	8460	Substance Abuse Counseling
EDP	5/7230	Adult Development
EDP	5210	Child Behavior & Development
EDP	5220	Adolescent Behavior & Development

*Other courses may be approved by adviser.

Total: 48 hours

Master of Arts/Education Specialist Degree in School Psychology

The graduate program in school psychology, leading to eligibility to take the State of Ohio Department of Education School Psychology licensure exam, consists of three years of full-time study, which includes 77 graduate semester hours of course work (80 for those without a teaching license) and a full-time internship (minimum of 1200 clock hours) completed in a school setting.

The application deadline for the school psychology program is Jan. 15. To apply to the program, applicants must meet the minimum academic prerequisite and submit the following materials:

Minimum academic prerequisite: Undergraduate GPA of 2.7 (for admission to the Graduate School) and for the school psychology program, a preferred undergraduate GPA of 3.0.

Submit GRE scores (taken within the last five years) with a required minimum combined score (verbal plus quantitative) of 800 and a preferred combined score of 1000.

Graduate school application for the master's degree in school psychology.

Three letters of recommendation, at least one of which must address the applicant's academic potential (i.e., from a university faculty member).

Statement of purpose, between two to three pages, that details why the applicant would like to pursue a career in school psychology and includes personal experiences. The statement of purpose should be typed and submitted to the Graduate School.

Official undergraduate transcripts (and graduate transcripts, if applicable).

Professional resumé.

To be consistent with national training standards and to ensure sufficient faculty members to advise and mentor students, a limited number of applicants will be admitted into the program each year. As a result, admission is competitive. The CESP Department Screening Committee will notify those applicants who are invited for a campus interview. All applicants interested in being considered for the program must participate in an interview (preferably on campus) with the CESP Department Admissions Committee. When the Admissions Committee has completed all scheduled interviews, final determinations will be made and interviewed applicants will be notified of the committee's decision by mail.

Students earn a master's degree (M.A.) after completing the M.A. requirements (32 hours of course work) and earn the education specialist degree (Ed.S.) after completing all remaining course work, all program requirements and a two-semester internship.

The curriculum leading to the master's degree and education specialist degree in school psychology consists of the following:

Master of Arts in School Psychology

A. Core Requirements (6 hours)

RESM	5110	Quantitative Methods I
RESM	5310	Educational Research

B. Required Courses (minimum of 26 hours)

SPSY	5030	Role & Function of the School Psychologist
SPSY	5040	Legal & Ethical Issues for School Psychologists & Counselors
SPSY	5170	Consultation I: Theory & Techniques
SPSY	5300	Psychoeducational Assessment & Interventions
SPSY	5/7310	Psychoeducational Assessment & Interventions II
EDP	5/7330	Behavior Management
		or
SPED	5340	Advanced Behavior Management

Select two of the following:

COUN	5/7140	Counseling Theories & Techniques
COUN	5/7160	Cultural Diversity for Counselors & the School Psychologists
EDAS	6000	The Individual in Organizations (Note: only for those without current teaching license)
EDP	5210	Child Behavior & Development
EDP	5/7320	Instructional Psychology
SPSY	6/7260	Developmental Child Psychopathology
		or

280 Graduate School

PSY	6270	Clinical Child Psychology
SPED	5000	Issues in Special Education
Total for master's degree:		Minimum of 32 hours

Education Specialist in School Psychology

Required Courses (minimum of 32 hours beyond the master's degree)

SPSY	7180	Consultation II: Promoting System Success
SPSY	7320	Psychoeducational Assessment & Interventions III
SPSY	7330	School Psychology Practicum I
SPSY	7340	School Psychology Practicum II
SPSY	7940	Internship in School Psychology (Fall and Spring Semester)

Select all of the following courses not previously taken for the master's degree:

COUN	5/7 140	Counseling Theories & Techniques
COUN	5/7160	Cultural Diversity for Counselors & the School Psychologists
EDAS	6000	The Individual in Organizations (note: only for those without current teaching license)
EDP	5210	Child Behavior & Development
EDP	5/7320	Instructional Psychology
SPSY	6/7260	Developmental Child Psychopathology
or		
PSY	6270	Clinical Child Psychology
SPED	5000	Issues in Special Education

Total for education specialist degree:

Minimum of 32 hours beyond the master's degree

Doctor of Philosophy in Counselor Education

The department of counselor education and school psychology offers course work leading to the doctor of philosophy (Ph.D.) in counselor education and supervision. Opportunities exist within this program to create areas of specialization that are relevant to the academic, professional or research interests of the student. The doctoral program in counselor education and supervision is intended to prepare professional leaders in their respective fields. Applicants are expected to possess the entry-level knowledge and skills received at the master's and/or specialist level. The program objectives and curricular experiences of the doctoral program reflect an extension of those offered at the master's and specialist levels.

Persons applying for admission to doctoral study must meet the admission requirements of the Graduate School, the College of Health and Human Services, and the department of counselor education and school psychology. Admission requirements for the Graduate School and the College of Health and Human Services are described in detail in the Doctoral Programs Brochure. These requirements include an official transcript with two copies of any and all undergraduate/graduate credits and degrees earned, a professional resumé, three letters of reference and a non-refundable application fee (check or money order payable to The University of Toledo) that must be submitted to the Graduate School to begin the admission process. In addition, departmental requirements for admission to the doctoral program are:

A minimum GPA of 3.0 on a 4.0-point scale for all undergraduate academic work and a minimum GPA of 3.5 on a 4.0-point scale for all graduate-level academic work.

A master's degree in counseling or school psychology from a program that is approved by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). Applicants with degrees from non-accredited programs will have to demonstrate their equivalency to approved programs or make up any deficiencies that may be present in their training.

Submit GRE scores (taken within the last five years) with a preferred combined score (verbal plus quantitative) of 1040.

A resumé and autobiographical statement of three to five pages in length.

One writing sample. The writing sample consists of your responses to questions about your academic and professional background and goals. These questions can be obtained by contacting the departmental secretary. The writing sample is designed to determine your writing ability and your suitability to the profession and to the doctoral program.

A personal interview with departmental faculty and an interview with current doctoral students to determine the personal and professional suitability and leadership potential of the applicant. Applicants will be notified if they are selected for an interview. Applicants are interviewed and admitted to doctoral study in the department during the fall, spring and summer semesters of each academic year. Completed application materials must be received by Sept. 15, Jan. 15 or May 15. Thus, application materials must be submitted to the Graduate School for processing at least six weeks prior to the above departmental deadlines.

The department retains the right to waive any requirement for admission in those cases where there is evidence to suggest that the applicant would successfully complete his or her degree program. The curriculum leading to the doctor of philosophy degree in counselor education consists of a minimum of 60 semester hours of training.

A. Research Tools (12 hours)

RESM	7330	Qualitative Research I
RESM	8120	Quantitative Methods II
RESM	8320	Research Design

Select one course from the following:

RESM	8130	Multivariate Statistics
RESM	8160	Nonparametric Statistics
RESM	8340	Qualitative Research II
RESM	8350	Methods of Survey Research
HEAL	8700	Epidemiology

B. Counseling Major Courses (38 hours)

Required courses (34 hours)

COUN	6/8500	Adv Theory and Practice of Career Couns
COUN	7510	Supervision in Couns & Sch Psyc
COUN	7520	Educ & Leadership in MH Profession
COUN	7530	Adv Theories Couns & Consultation
COUN	7930	Doctoral Research Seminar
COUN	8410	Adv Pract Indiv & Group Couns
or		
COUN	8420	Adv Practicum in Family Therapy
COUN	8440	Adv Group Theory and Practice
COUN	8480	Adv Train Prof, Legal and Ethical Issues
COUN	8940	Counseling Internship

Elective Courses (4 hours *)

COUN	7210	Psychopathology
COUN	7220	Child, Adoles, Family Therapy
COUN	7230	Crisis Intervention Counseling

COUN	7240	Diagnosis and Mental Health
COUN	7540	Adv Personality Assessment
COUN	8450	Couples and Family Therapy
COUN	8460	Substance Abuse Counseling
COUN	8470	Drugs & Mental Health

* Other courses may be approved by program committee.

C. **Doctoral Dissertation** (10 hours)

Total: 60 hours

Department of Criminal Justice

Dr. Eric Lambert, chair

The department of criminal justice offers a graduate program leading to a master of arts in criminal justice. In addition, the criminal justice department and the College of Law offer a joint degree program leading to the master of arts in criminal justice and the juris doctor.

Master of Arts in Criminal Justice

The master of arts in criminal justice is designed to provide students with a broad understanding of the criminal justice system, social control and the nature of crime, in addition to developing and improving skills necessary to critically assess criminal justice problems and to develop meaningful responses to these problems. In addition, the program provides students with the ability to conduct applied research and evaluation, as well as the ability to understand empirical scholarly publications. The program allows students to develop a plan of study that will help prepare for leadership roles in the field of criminal justice and to pursue criminal justice doctoral studies. The program allows a person to be either a full-time or part-time student. A full-time student can complete the program in one year, while a part-time student should be able to complete the program in two or three years.

In addition to the Graduate School and college requirements, evaluation of applicants for the criminal justice graduate program is based on the following criteria: (a) application, (b) three letters of recommendation, (c) personal statement, (d) official transcripts with a grade point average (GPA) of at least 3.0. Applicants with a GPA of less than 3.0 must take the Graduate Record Exam (GRE). Prospective students should contact the department for further information. Finally, meeting the minimum admission requirements does not guarantee entrance into the program. Admission is competitive and is dependent on the availability of space within the program. Under special circumstances, the department graduate admissions committee may choose to admit a promising applicant as a provisional student in the program.

The master of arts in criminal justice requires 33 semester hours. A student can elect to complete a thesis in lieu of six credit hours of elective course work. A student who does not complete a thesis must pass a comprehensive exam after earning 33 approved semester graduate credit hours. Although a student can earn up to all 33 semester credit hours from criminal justice courses, a minimum of 24 semester credit hours must be from criminal justice courses. The remaining nine hours can be from approved graduate courses in other areas that meet the academic and career objectives of the student.

A. **Core Courses** (15 hours)

CRIM	6000	Advanced Theories in the Criminal Justice System
CRIM	6100	Metropolitan Problems and the Criminal Justice System
CRIM	6200	Data Analysis
CRIM	6400	Research Methodology
CRIM	6420	Advanced Criminal Procedure

B. **Criminal Justice Electives** (9 hours)

C. **Electives** (9 hours)

Total: 33 hours

Certificates in Juvenile Justice and Severe Behavioral Spectrum

Two certificate programs are offered as part of the master of arts in criminal justice degree program: juvenile justice and severe behavioral spectrum. These certificates are designed to provide a student with a more in-depth study of each area. Each certificate requires the successful completion of the requirements for the master of arts in criminal justice degree. The certificate in juvenile justice requires a minimum of 12 credit hours. The certificate in severe behavioral spectrum requires a minimum of 15 credit hours. Specific course requirements may be obtained by contacting the department of criminal justice. A student may not pursue a certificate or enroll in any certificate course without first obtaining written approval from the criminal justice graduate coordinator.

A. **Juvenile Justice Certificate** (12 hours) **Required:**

CRIM	6310	Juvenile Justice in the Metropolitan Community
		Select 9 credit hours from the below list:
CRIM	5370	Disproportionate Confinement of Minority Youth
CRIM	5400	Criminal Justice Field Study (Must be a placement in the community with an agency/program that deals with juvenile delinquents, troubled juveniles or at-risk youths.)
CRIM	6990	Independent Study in Criminal Justice (Must be on an aspect dealing with the juvenile justice system, juvenile delinquents, troubled youths or youths at risk.)
SBS/CRIM	6/8410	Theory and Research: Emotional Behavioral Disorders
SBS/CRIM	6/8440	Teaching Youth with Emotional Behavioral Disorders
SBS/CRIM	6/8450	Adjudicated-Locked Setting: Emotional Behavioral Disorders
SBS/CRIM	6/8460	Hospital Setting: Emotional Behavioral Disorders
SBS/CRIM	6/8510	Behaviors - Incarcerated Child/Youth
SBS/CRIM	6/8520	Practicum: Child Study Institute

Note: The student must complete the 15 credit hours of core requirements for the master of arts in criminal justice degree and have at least nine additional hours of approved criminal justice electives. The remaining nine credit hours may be either CRIM courses or approved non-CRIM courses. A minimum of 33 credit hours is required.

B. **Severe Behavioral Certificate** (15 hours)

Select 15 credit hours from the list below:

SBS/CRIM	6/8410	Theory and Research: Emotional Behavioral Disorders
SBS/CRIM	6/8440	Teaching Youth with Emotional Behavioral Disorders
SBS/CRIM	6/8450	Adjudicated - Locked Setting: Emotional Behavioral Disorders
SBS/CRIM	6/8460	Hospital Setting: Emotional Behavioral Disorders

SBS/CRIM	6/8510	Behaviors - Incarcerated Child/Youth
SBS/CRIM	6/8520	Practicum: Child Study Institute
SBS	6/8420	Public School: Emotional Behavioral Disorders
SBS	6/8430	Alternative School Setting: Emotional Behavioral Disorders
SBS	6/8470	Theory and Research: Autism
SBS	6/8480	Teaching Children: Autism
SBS	6/8990	Independent Study: Severe Behaviors

Note: The student must complete the 15 credit hours of core requirements for the master of arts in criminal justice degree and have at least 18 hours of approved electives, of which nine credit hours must be CRIM courses, for a minimum total of 33 credit hours.

Joint M.A. in Criminal Justice/Juris Doctor

Students pursuing this joint degree program must be first admitted to the College of Law. After successful completion of the first year, a student of the College of Law may apply for the joint degree program. For more information on this joint degree program, please contact the criminal justice department.

Department of Kinesiology

Dr. Charles W. Armstrong, chair

The department of kinesiology offers graduate programs leading to the master of science in exercise science (M.S.E.S.) and the doctor of philosophy in exercise science (Ph.D.) degrees. These programs involve a combination of courses, seminars, clinical experiences and research that is intended to prepare individuals for a wide range of careers that relate to exercise science. The programs are interdisciplinary by design and all students are exposed to multiple dimensions of the field. As part of this program, students typically take courses that support their work from a variety of other departments across the campus and at the Medical University of Ohio. Involvement in research is emphasized throughout the program. Admission into the master's and doctoral programs is selective and is based on the applicant's previous academic training, academic record, scores on the GRE, letters of recommendation, intended area of study and space within the graduate program. Meeting the minimum standards for admission does not guarantee acceptance into any of the department's programs.

Master of Science in Exercise Science

The master of science in exercise science (M.S.E.S.) is designed to provide students with an opportunity to specialize in one of four areas: applied biomechanics, clinical kinesiology, exercise physiology and athletic training. Each of these programs involves a minimum of 36 semester hours of instruction, and all master's students are required to complete a thesis. Full-time students typically are able to complete the programs in two years.

- A. **Research Foundations** (12 hours)
- | | | |
|-----------|------|---|
| KINE | 5110 | Measurement and Statistical Inference |
| or | | |
| RESM | 5110 | Quantitative Methods I |
| KINE | 6230 | Scientific Writing and Research Methods |
| KINE | 6960 | Thesis |
- B. **Kinesiology Core** (6 hours)
- | | | |
|------|------|------------------------|
| KINE | 6100 | Physiology of Exercise |
|------|------|------------------------|

KINE	6130	Biomechanics of Human Motion
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- C. **Specialization Requirements** (6 hours)
- D. **Specialization Electives** (12 hours)
- Total** (36 hours)

In addition to the Graduate School and college requirements, evaluation of applicants for admission to the master of science in exercise science program is based on the following criteria: (a) minimum undergraduate GPA of 3.0 in the last 60 hours of the undergraduate program; (b) completion of the GRE, with a recommended minimum combined score of 900 for the quantitative and verbal portions of the exam; (c) a clearly defined statement of purpose that specifies the area of specialization within the degree program; (d) a minimum of three letters of reference from faculty members with specific expertise in kinesiology (or a closely related area) who have worked with the applicant in an academic setting; (e) demonstrated knowledge in human anatomy, human physiology and two additional areas of kinesiology (exercise physiology, motor learning, biomechanics, etc.); and (f) all other pertinent information requested in the application. Prospective students should contact the department for further information. Meeting the minimum admission requirements does not guarantee admission to the program. Admission to a specific program area is dependent on the availability of space within the specialization area (i.e. the number of students currently being advised by faculty in the specialization area). Under special circumstances, the department graduate admissions committee may choose to waive any of the above requirements.

Doctor of Philosophy in Exercise Science

The doctor of philosophy in exercise science is designed to provide qualified applicants with an opportunity to pursue advanced study and research leading to the completion of the Ph.D. degree. The program involves a variety of courses, seminars and independent research experiences, and typically requires four years of full-time study to complete (part-time study is possible, but usually requires five to six years). Students work closely with a faculty mentor to design a program that meets the unique needs of the individual. This includes courses in the major area that may be taken from a variety of departments and may also include courses in a cognate area (a secondary area of specialization). Upon the completion of all course work, students must pass written and oral comprehensive examinations and complete a dissertation.

In addition to the Graduate School and college requirements, evaluation of applicants for the doctoral program is based on the following criteria: (a) completion of a master's degree in exercise science or closely related area, (b) completion of the GRE, with a recommended minimum combined score of 1060 for the quantitative and verbal portions of the exam, (c) a clearly defined statement of purpose that specifies the area of specialization within the degree program, (d) a minimum of three letters of reference from faculty members with specific expertise in kinesiology (or a closely related area) who have worked with the applicant in an academic setting. Prospective students should contact the department for further information. Note: Meeting the minimum admission requirements does not guarantee entrance into the program. Under special circumstances, the department graduate admissions committee may choose to waive any of the above requirements.

Department of Public Health and Rehabilitative Services

Dr. Ruthie Kucharewski, chair

The department of public health and rehabilitative services offers a variety of degree options and graduate courses in health/wellness and rehabilitation. In health/wellness, master's level options include the master of public health and the master of arts in recreation and leisure studies. The doctor of philosophy degree is offered in health education. In rehabilitative services, the master of arts in speech-language pathology and the master of arts in recreation and leisure studies with specialization in recreational therapy or recreational therapy and therapeutic arts is available.

Master of Public Health

This degree program provides advanced study beyond the bachelor's degree for persons wishing to update professional skills and obtain new professional competencies in the area of public health through courses offered by UT, MUO and BGSU. The program prepares students to enhance public health in the community and to be advocates for needed change. Graduates will be prepared to assess factors affecting health, critique and apply research findings and, in turn, develop strategies and implement various measures for health promotion and disease prevention. Students choose one of five tracks: health promotion and education, epidemiology, public health nutrition, public health administration or environmental and occupational health. UT offers the health promotion and education track and jointly offers the epidemiology and public health nutrition tracks.

A. Master of Public Health Core (24 hours)

HEAL	6600	Health Behavior
HEAL	6640	Issues in Public Health
PUBH	600	Public Health Statistics
PUBH	601	Public Health Epidemiology
PUBH	601	Public Health Administration (BGSU)
PUBH	680	Environmental Health (BGSU)

B. Specialization (12 hours)

Select from: health promotion and education, epidemiology, public health nutrition, environmental and occupational health or public health administration.

Health Promotion and Education Specialization

HEAL	6300	Community Health Organization
HEAL	6360	Evaluation Models
HEAL	6460	Health Promotion Programs
HEAL	6200	Methods and Materials in Public Health

Epidemiology

PUBH	603	Advanced Statistics
PUBH	606	Advanced Epidemiology
HEAL	6820	Epidemiology Methods
HEAL	6550	Chronic Disease or Epidemiology
or		
PUBH	612	Epidemiology of Infectious Diseases (BGSU)

Public Health Nutrition

HEAL	6250	Nutritional Epidemiology
HEAL	6520	Public Health Nutrition

Select two of the four listed below:

F&N	535	Nutrition Through Lifestyle I (BGSU)
F&N	536	Nutrition Through Lifestyle II (BGSU)
F&N	609	Micronutrients Through the Lifespan (BGSU)
F&N	610	Macronutrients Through the Lifespan (BGSU)

Public Health Administration

PUBH	525	Public Health Economics (BGSU)
PUBH	621	Management of Public Health Agencies (BGSU)
PUBH	622	Budget and Finance in Public Health (BGSU)
PUBH	635	Public Health Law (BGSU)

Environmental and Occupational Health

PUBH	502	Occupational Health Science, Regulations and Management
PUBH	516	Environmental Health Science, Regulations and Management

With adviser, select two of the three courses listed below:

PUBH	5521	Biological Agents - Pathogenicity, Evaluation and Control
PUBH	531	Chemical Agents - Toxicity, Evaluation and Control
PUBH	506	Occupational Safety Science, Regulations and Management

Electives (9 hours)

Select courses in consultation with an adviser.

Practicum or project (3 hours)

HEAL	6940	Internship
or		
HEAL	6960	Master's Research Thesis

Master of Education in School Health Education/School Nurse Certification

The department of public health and rehabilitative services also provides major course work for the master of education in health education and for the master of education in health education with school nurse certification.

A. Required Education Courses (12 hours)

Students must complete at least one course from each of the four basic areas.

Cultural Foundations:

Choose 1 course from the following (3 hours)

TSOC	5100	Group Process in Education
TSOC	5110	Modern Educational Controversies
TSOC	5200	Sociological Foundations of Education
TSOC	5210	Multicultural Non-Sexist Education
TSOC	5230	Intergroup & Intercultural Education
TSOC	5300	Philosophy & Education
TSOC	5400	History of Schooling & Teaching in U.S.

Research Foundations: Choose 1 course from the following

(3 hours)

RESM	5110	Quantitative Methods
RESM	5210	Educational Testing & Grading
RESM	5310	Educational Research
RESM	5330	Qualitative Research Methods I: Introduction & Basic Methods

Curriculum:

Choose 1 course from the following (3 hours)

CI	5870	Secondary School Curriculum
CI	6300	Principles of Instructional Development
CI	6810	Curriculum Development K-12
CI	6820	Program Development for Non-School Settings
CI	6830	Trends in School Curriculum
CI	6840	Curriculum for Educational Leaders
HEAL	6850	Patient Health Education
SPED	5000	Issues in Special Education

Psychology Foundations: Choose 1 course from the following (3 hours)

EDP	5110	Basic Educational Psychology
EDP	5120	Alternative Approaches to Discipline
EDP	5210	Child Behavior & Development
EDP	5220	Adolescent Behavior & Development
EDP	5230	Adult Development
EDP	5310	Issues & Innovations in Learning & Instruction
EDP	5320	Instructional Psychology
EDP	5330	Behavior Management
EDP	6340	Theories of Learning

B. Required Health Courses (9 hours)*

HEAL	6500	Issues in School Health
HEAL	6600	Health Behavior
HEAL	6920	Master's Research Project in Health Education
or		
HEAL	6960	Master's Research Thesis in Health Education (3 hours)

C. Electives (15 hours)

At least 18 hours must be HEAL courses.

Master of Education in School Health Education (School Nurse Licensure)**A. Required Education Courses** (22 hours)**Cultural Foundations**

TSOC	5200	Sociological Foundations of Education
or		
TSOC	5230	Intergroup & Intercultural Education

Research Foundations

RESM	5100	Quantitative Methods I
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Curriculum

SPED	5000	Issues in Special Education
HEAL	6850	Patient Health Education

Psychological Foundations

EDP	5210	Child Behavior and Development
EDP	5220	Adolescent Behavior and Development

Counselor and Human Service Education

COUN	5010	Introduction to School Counseling
COUN	5150	Counseling Across the Lifespan

B. Required Health Courses (18 hours)

HEAL	5400	Professional Issues in School Nursing
HEAL	5940	School Health Internship
HEAL	5950	School Nurse Workshop
HEAL	6500	Issues in School Health
HEAL	6530	Drug Use and Misuse
HEAL	6920	Master's Research Project in Health Education
or		
HEAL	6960	Master's Research Thesis in Health Education

Master of Arts in Recreation and Leisure: Recreation Administration

The recreation and leisure studies program offers advanced study beyond the bachelor's degree in recreation administration. This degree focuses on the study of the profession of recreation and leisure with an emphasis on administrative careers in community and natural environments.

A. Research Core (9-12 hours)

Research Foundations	(3-6 Hours)
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Research Design (select one)

AED	5000	Action Research in Art Education
RESM	5310	Introduction to Educational Research
RCRT	5420	Leisure Program Research Techniques
SOC	5270	Sociology Research Methods

Research Statistics (select one for project/thesis option)

HEAL	6750	Applied Biostatistics
RESM	5110	Quantitative Methods I
SOC	5290	Sociology Research Statistics

Research Culminating Experience (3-6 Hours)**Internship Option**

RCRT	5/6940	Internship
------	--------	------------

Project Option

RCRT	6920	Master's Project
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Thesis Option

RCRT	6960	Master's Thesis
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B. Recreation Core (6 hours)

RCRT	6000	Issues and Trends in Recreation /Recreational Therapy
RCRT	6020	Financial Resources of Recreation and Recreational Therapy

C. Specialization Area (12-15 hours)

Courses selected from the graduate recreation course offering with adviser approval.

D. General Electives (3-6 hours)

Approved by adviser to accommodate a total of 36 hours.

Master of Arts in Recreation and Leisure: Recreational Therapy or Recreational Therapy and Therapeutic Arts

The recreation and leisure studies program offers advanced study beyond the bachelor's degree in recreational therapy. This degree focuses on the study of treatment programming and research within a variety of settings. The recreational therapy and therapeutic arts specialization focuses on the study of therapeutic arts as they are related to the practice of recreational therapy.

A. Research Core (9-12 hours)

Research Foundations	(3-6 Hours)
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Research Design (select one)

AED	5000	Action Research in Art Education
RESM	5310	Introduction to Educational Research
RCRT	5420	Leisure Program Research Techniques
SOC	5270	Sociology Research Methods

Research Statistics (select one for project/thesis option)

HEAL	6750	Applied Biostatistics
RESM	5110	Quantitative Methods I
SOC	5290	Sociology Research Statistics

Research Culminating Experience (3-6 Hours)**Internship Option**

RCRT	5/6940	Internship
------	--------	------------

Project Option

RCRT	6920	Master's Project
------	------	------------------

Thesis Option

RCRT	6960	Master's Thesis
------	------	-----------------

B. Recreation Core (6 hours)

RCRT	6000	Issues and Trends in Recreation/Recreational Therapy
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RCRT 6020 Financial Resources of Recreation and
Recreational Therapy

- C. **Specialization Area** (12-15 hours)
Select courses from the recreational therapy support area with adviser.
- D. **Electives** (3-6 hours)
Approved by adviser to accommodate a total of 36 hours.

Master of Arts in Speech-Language Pathology

This degree is designed to contribute required course work and clinical experiences toward attainment of certification and state licensure in the area of speech-language pathology. The process of certification and/or licensure includes completion of a master's degree, approved undergraduate preparation, suitable clinical experiences, demonstration of learning outcomes, and successful completion of the national specialty examination. Students seeking certification and/or licensure for speech-language pathology should meet with the graduate program adviser to assess prior experience and design a program that is tailored to the student's individual situation.

For fall admission to the speech-language pathology program, all materials, including GRE scores, must be received by the program admissions committee before Jan. 15 to receive complete consideration.

The program is accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association.

- A. **Research Core** (6 hours)
- | | | |
|-----------|---------------------------------|-----------|
| KINE 6320 | Scientific Writing and Research | |
| RESM 5110 | Quantitative Methods | or |
| RESM 5310 | Educational Research | or |
| HEAL 6750 | Applied Biostatistics | |
- B. **Speech-Language Pathology Courses** (35-41 hours)
- | | |
|--------------|---|
| SLP 6100 | Diagnosis of Speech and Language Disorders |
| SLP 6210 | Preschool Language Disorders |
| SLP 6220 | Language Disorders in School-Age Children |
| SLP 6300 | Phonological and Articulatory Disorders |
| SLP 6400 | Neurological Disorders: Aphasia |
| SLP 6450 | Neurological Disorders: Brain Injury and Dementia |
| SLP 6500 | Motor Speech Disorders |
| SLP 6550 | Augmentative and Alternative Communication |
| SLP 6600 | Voice Disorders |
| SLP 6650 | Dysphagia and Oropharyngeal Disorders |
| SLP 6700 | Assessment and Remediation of Fluency Disorders |
| SLP 6800 | Aural Rehabilitation |
| SLP 6930.003 | Seminar: Clinical Methodology |
- Clinical experiences from: SLP 6000, 6010, 6020 and 6940
- C. **Thesis or Comprehensive Examination** (3-6 hours)
- | | |
|--------------|--------------------------------------|
| SLP 6930.002 | Seminar in Speech-Language Pathology |
| or | |
| SLP 6960 | Research Thesis |

Doctor of Philosophy in Health Education

The doctoral degree program in health focuses on advanced study and research in community/public health. The program prepares advanced students to contribute to the field of health through research. Although research and health courses are required, the program is individualized through selection of a cognate and elective courses to develop each

student for leadership roles in universities, public service or the private health sector.

Admission to the program includes completion of a master's degree from an accredited institution. In addition to the Graduate School requirements, evaluation of applicants is based on the following criteria: (1) completion of the GRE, (b) a clearly defined statement of purpose that specifies the area of specialization within the degree program and (c) a minimum of three letters of reference from faculty members with specific expertise in health who have worked with the applicant in an academic setting. Evidence of research and/or writing ability through a master's thesis, project, paper, report, publication or paper presented to a professional society will be considered. International applicants must submit a TOEFL score of 550 or higher for admission to the program. Prospective students should contact the department for further information.

- A. **General Core Requirements** (12 credit hours)
- | | |
|-----------|------------------------------|
| HEAL 8880 | Scientific Writing in Health |
| RESM 8120 | Quantitative Methods II |
| RESM 8320 | Research Design |
- Select one from: RESM 7330, 8130, 8160, 8350 **or** HEAL 8700
- B. **Major Courses** (36 hours)
- Required courses:**
- | | |
|-----------|---|
| HEAL 8000 | Professional Issues in Health Education |
| HEAL 8100 | College Teaching of Health Education |
| HEAL 8200 | Methods and Materials in Public Health |
| HEAL 8300 | Community Health Organization |
| HEAL 8460 | Health Promotion Programs |
| HEAL 8600 | Health Behavior |
| HEAL 8640 | Issues in Public Health |
| HEAL 8800 | Evaluation of Health Programs |
| HEAL 8900 | Grant Writing |
- Elective courses:**
Consult with adviser to develop appropriate sequence of courses to meet student's goals.
- C. **Cognate Areas** (12 hours)
Consult with adviser.
- D. **Doctoral Dissertation** (10 hours)

Department of Social Work

Dr. Terry Cluse-Tolar, chair

Master of Social Work

The master's in Social Work program is currently in candidacy status for accreditation by the Council on Social Work Education (CSWE). Candidacy is the first step toward the initial accreditation process. Accreditation cannot be granted before one class of students completes the program. Once a program is granted initial accreditation, those graduating students who were admitted while the program was in candidacy are considered to have graduated from an accredited program. The MSW expects to become a fully accredited program in 2007.

The MSW has an advanced generalist perspective, preparing students to create change at all system levels, from individuals to communities. Students may select a concentration in either mental health or in child and family services.

An Advanced Standing Program exists for students with a baccalaureate social work degree from an undergraduate social work program accredited by CSWE who meet specific criteria. Students with related degrees will not be admitted under Advanced Standing Status but are eligible for admission for the 60-credit-hour program.

Admission Requirements

In addition to the admission criteria established by the Graduate School at The University of Toledo, the applicant to the MSW Program must have completed undergraduate course work in the following areas: statistics, human biology, political science, sociology, economics and psychology, as well as submit a personal statement that speaks to her/his commitment to social and economic justice as well as the applicant's professional goals over the next 10 years. The personal statement is important because the program is not designed to prepare graduates for work in private practice. Consequently, an applicant indicating that private practice is his/her professional goal will be advised to consider other MSW Programs that will be better suited to meet this goal.

Additionally, the personal statement and references from both employers and prior faculty members will be evaluated for a "fit" with the social work profession and our program's focus on social and economic justice. Applicants must convey their adherence to the values and ethics of the profession. Applicants with no evidence of the above will not be admitted to the program.

The Council on Social Work Education does not permit programs to provide course credit for work experience. It is our hope that each class admitted would have a mixture of students who have experience as well as those without extensive professional experience. However, this will not be a condition of admission.

We plan to encourage diversity among the students accepted to the program. This includes diversity of gender, age, race/ethnicity, sexual orientation, ability and experience in the profession, etc.

Advanced Standing Program

In addition to the admission criteria established by the Graduate School at The University of Toledo, the applicant applying for regular admission to the Advanced Standing Program must meet the following requirements: Hold a baccalaureate degree in social work from a CSWE-accredited social work program; have a minimum undergraduate GPA of 3.0; and have a minimum social work major GPA of 3.3. Additionally, the personal statement and references will be evaluated on the same basis as listed under the MSW Program.

Degree Requirements for the Master's in Social Work

The complete MSW Program requires 60 semester hours for graduation that is consistent with MSW programs across the country. Foundation course work is offered in the first year of the program and advanced course work in the second year. Students must enroll in 16 credit hours of field education to obtain the required 900 hours required by CSWE. Six of these hours are taken during the foundation year and 10 at the advanced year.

Students who are awarded advanced standing complete 33 credit hours to obtain the MSW degree. The advanced standing program focuses on the advanced generalist courses and field placements. Courses at the 6000 level are required for the advanced stranding program.

A. Required Core Courses

SOCW	5010	Social Work Research and Analysis
SOCW	5110	Social Work Practice I
SOCW	5120	Social Work Practice II
SOCW	5130	Social Work Practice III
SOCW	5210	Micro Social Work Perspectives on Human Behavior in the Social Environment
SOCW	5220	Macro Social Work Perspectives on Human Behavior in the Social Environment
SOCW	5330	Policy Issues and Analysis in Social Work

SOCW	5990	Foundation Social Work Field Lab
SOCW	5910	Foundation Social Work Field Placement
SOCW	6110	Advanced Generalist Practice I
SOCW	6120	Advanced Generalist Practice II
SOCW	6130	Advanced Generalist Practice III
SOCW	6140	Advanced Social Work Assessment
SOCW	6900	Advanced Social Work Field Experience I
SOCW	6910	Advanced Social Work Field Experience II

B. Concentration Courses (8 hours required)

Child and Family Services Concentration

SOCW	6410	Child and Family Social Work Practice
SOCW	6430	Social Work Policy Issues: Child and Family Services
SOCW	6460	Social Work Journal Review Seminar I: Child and Family Services
SOCW	6470	Social Work Journal Review Seminar II: Child and Family Services

Mental Health Services Concentration

SOCW	6510	Social Work Practice in Mental Health
SOCW	6530	Social Work Policy Issues in Mental Health
SOCW	6560	Social Work Journal Review Seminar I: Mental Health Practice
SOCW	6570	Social Work Journal Review Seminar II: Mental Health Practice

C. Advanced Research Elective (3 hours required)

SOCW	6030	Research Methods for Macro Social Work Practice
SOCW	6040	Research Methods for Micro Social Work Practice

Total: 60 semester hours

Advanced Standing: 33 semester hours

College of Pharmacy Graduate Programs

Master of Science in Pharmaceutical Sciences

Degrees Offered

The master of science in pharmaceutical sciences degree is designed to prepare an individual for responsibilities in professional practice, the pharmaceutical industry and scientific research beyond those possible with a baccalaureate.

Although a single degree is conferred, specialization is possible in that the curriculum is organized into three distinct disciplines. Applicants must select the program of study (option) they wish to pursue.

The master of science in pharmaceutical sciences is granted to the student who satisfactorily completes a minimum of 30 semester hours of graduate credit with a 3.0 or better GPA. Of the 30 semester hours, a maximum of six semester hours is granted for thesis research.

Admission Requirements

In general, a baccalaureate in the sciences is required for admission,

although applicants possessing other bachelor's degrees will be considered if the latter represent adequate preparation. Certain options and graduate courses require undergraduate preparation as prerequisites, and this preparation should be completed as soon as possible upon admission to the Graduate School. The total time required for completion of the graduate program leading to the master of science in pharmaceutical sciences degree will depend upon the preparation of the student entering the Graduate School. Normally two years of study and research are required.

The admission requirements of the Graduate School of the University apply. The basic requirement is a 2.7 (on a 4.0 scale) GPA on all undergraduate work leading to the bachelor's degree. Applicants having less than a 2.7 GPA on all undergraduate work will be considered for admission if other criteria for estimation of potential success in graduate studies are positive.

Each student must submit three copies of transcripts, one of which must be official and show all post-secondary academic work and degrees granted, three letters of recommendation from college faculty members acquainted with the applicant's character and ability, and scores from the aptitude portion of the GRE.

International students are required to take the TOEFL, which will be given in their own country by the Educational Testing Service.

Normally, acceptance will be decided by April 1 for admission during the following fall semester. The priority deadline for completed applications is Jan 15. International students are encouraged to submit applications one month prior to the stated deadline to allow for delays in international correspondence.

Curriculum and Options – M.S. Program in Pharmaceutical Science

The options available to graduate students are pharmacology/toxicology, administrative pharmacy and industrial pharmacy.

Pharmacology/Toxicology option:

Undergraduate courses required (or their equivalents):

CHEM 3710	Physical Chemistry For The Biosciences I	3
CHEM 3720	Physical Chemistry For The Biosciences II.....	3
MATH 1750	Calculus for the Life Sciences I	4
MATH 1760	Calculus for the Life Sciences II.....	3
MBC 3310	Medicinal Chemistry I: Drug Action and Design	3
MBC 3320	Medicinal Chemistry II: Drug Targeting to Receptors	3
MBC 4300	Medicinal Chemistry III: Chemotherapy and Immunotherapy	3
PHCL 2600	Functional Anatomy and Pathophysiology I.....	4
PHCL 2620	Functional Anatomy and Pathophysiology II	4

Graduate courses required:

BIOL 5610	Advanced Biostatistics or	
PHCL 5140	Interpretation of Pharmaceutical Data	2-4
PHCL 5700	Pharmacology I-Principles of Pharmacology, Autonomic Pharmacology and Non-Steroidal Anti-Inflammatory Agents and Related Pharmacology.....	3

PHCL 5720	Pharmacology II: Endocrine and CNS Pharmacology	3
PHCL 5730	Toxicology I	3
PHCL 5760	Toxicokinetics.....	3
PHCL 5900	Drug Disposition.....	2
PHCL 6150	Advanced Pharmacokinetics or	2
PHCL 6600	Seminar in Pharmacology	1
PHCL 6700	Pharmacology III: CNS and Cardiovascular/ Renal Pharmacology	3
PHCL 6720	Pharmacology IV: Chemotherapeutics	3
PHCL 6900	M.S. Thesis Research in Pharmacology	1-6
PHCL 6920	M.S. Thesis Research in Pharmacology	1-6

Additional course work may be selected from the following:

CHEM 6310	Separation Methods	2-4
MBC 5620	Biochemical Techniques	2
MBC 6190	Advanced Medicinal Chemistry	4
PHCL 5300	Selected Topics in Pharmacology	2
PHCL 5420	Advanced Neuroscience.....	2
PHCL 5750	Toxicology II.....	3
PHCL 5760	Toxicokinetics	3
PHCL 6770	Toxicological Risk Assessment	3

Administrative Pharmacy option:

Undergraduate courses required (or their equivalents):

BUAD 2040	Financial Accounting Information	3
ECON 1200	Principles of Microeconomics	3
PHPR 3510	Pharmaceutic Dimensions of Health Care System	3
PHPR 4520	Pharmaceutical Management and Marketing.....	3

Required courses include (or their equivalents):

FINA 5310	Managerial Finance.....	3
MGMT 5110	Introduction to Management.....	3
MKTG 5410	Marketing Systems.....	3
PHPR 6520	Analysis of the Pharmaceutical Environment.....	3
PHPR 6530	Research Methods in Pharmacy Practice.....	3
PHPR 6600	Seminar in Administrative Pharmacy	1
PHPR 6960	M. S. Thesis Research in Pharmacy.....	1-6
RESM 5110	Quantitative Methods I	3
RESM 6120	Quantitative Methods II.....	3

Additional course work may be selected from these (or their equivalents; others as approved by adviser):

BANS 5210	Economics for Business Decisions	3
BANS 6520	Managerial Economics.....	3
BLAW 5150	Dynamics of Legal Environment of Business	3
FINA 6130	Managerial Finance.....	3
INFS 6460	Management Information Systems	3
OPMT 5520	Analysis of Manufacturing & Service Systems	3
ORGD 6170	The Individual and the Organization	3
ORGD 6590	Organization Theory and Design	3
PHPR 5990	Problems in Pharmacy Practice	1-6
PHPR 6550	Management Topics for Clinical Practice.....	2
PHPR 6810	Hospital Pharmacy Administration	3
PHPR 6820	Selected Topics in Hospital Pharmacy	3
PHPR 6830	Advanced Community Pharmacy Administration	3
PHPR 6840	Selected Topics in Community Pharmacy	3

Industrial Pharmacy option:**Undergraduate courses required:**

Courses will be evaluated for students with a B.S. in pharmacy, Pharm. D. or B.S.P.S. degree.

MBC 3550	Physiological Chemistry I: Structure and Function of Biological Macromolecules.....	3
MBC 3560	Physiological Chemistry II: Chemical Regulation of Cells and Organisms.....	3
PHPR 3070	Pharmaceutics and Pharmaceutical Technology I and	
PHPR 3080	Pharmaceutics and Pharmaceutical Technology II	
	or	
CHEM 3710	Physical Chemistry for the Biosciences I and	
CHEM 3720	Physical Chemistry for the Biosciences II and	
CHEM 3730	Physical Chemistry I.....	8-9
PHPR 4520	Pharmaceutical Management and Marketing.....	3
PHPR 4550	Analysis of the Pharmaceutical Environment.....	3

Graduate required courses:

CHEM 6300	Advanced Analytical Chemistry.....	2-4
CHEM 6310	Separation Methods.....	2-4
EEES 5710	Advanced Biostatistics.....	4
PHCL 6150	Advanced Pharmacokinetics.....	2
PHPR 5690	Dosage Form Design.....	3
PHPR 5700	Equilibrium Phenomenon.....	2
PHPR 5720	Pharmaceutical Rate Processes.....	3
PHPR 6600	Seminar in Administrative Pharmacy.....	1
PHPR 6850	Product Development.....	3

Additional course work may be selected from the following:

CHEM 6320	Characterization of Condensed Phases and Surfaces.....	2-4
CHEM 6330	Spectroscopic Methods and Analysis of Spectra.....	2-4
CHEM 6720	Physical Chemistry of Material Transformations.....	2-4
CHEM 6810	Materials Science I.....	4
CHEM 6820	Materials Science II.....	4
CHEM 6980	Special Topics in Chemistry.....	2-4
PHCL 5760	Toxicokinetics.....	3
PHPR 5680	Parenteral Manufacturing.....	2
PHPR 5710	Selected Topics in Pharmaceutical Technology.....	2-4
PHPR 5990	Problems in Pharmacy Practice.....	1-6
PHPR 6530	Research Methods in Pharmacy Practice.....	3
PHPR 6610	Seminar I.....	1
PHPR 6960	M.S. Thesis Research in Pharmacy.....	1-6

Applicants for the administrative pharmacy and industrial pharmacy options who possess a B.S. in pharmacy, Pharm.D. or bachelor of science in pharmaceutical sciences degree from an ACPE-accredited institution will be given preference for admission into those options. International applicants must have earned pharmacy degrees from their home institutions.

Master of Science in Medicinal Chemistry**Admission Requirements**

Satisfactory completion of a bachelor's degree in chemistry, biology, pharmacy or a related discipline is required. It is assumed the undergraduate training will include differential and integral calculus, college physics, a one-year course in general and inorganic chemistry including a laboratory, a one-year course in organic chemistry including a laboratory, and training in analytical chemistry. An undergraduate course in physical chemistry is recommended.

The admission requirements of the Graduate School of the University apply.

Degree Requirements

Master's students need to complete the following courses as partial fulfillment of their requirement for an M.S. degree:

MBC 5100	Research Practices in Medicinal Chemistry.....	1
MBC 5620	Biochemical Techniques.....	2
MBC 5900	Medicinal Chemistry Seminar (4 hours required).....	1
MBC 6190	Advanced Medicinal Chemistry.....	4
MBC 6200	Biomedical Chemistry.....	4
MBC 6550	Biochemistry.....	4
MBC 6960	M.S. Thesis Research in Medicinal Chemistry (6 hours required).....	1-15

Other 5000- to 6000-level courses as advised

In addition, the following items also must be completed:

- Minimum of 30 semester hours of graduate credit, of which no more than six hours are counted from the category of M.S. thesis or Ph. D. dissertation research (MBC 6960/8960)
- Preparation of a written M.S. thesis based upon the results of an original research investigation performed by the student during the M.S. program at The University of Toledo.
- Successful oral defense of the thesis before the thesis advisory committee (consisting of the thesis adviser and two other members) and presentation of the results of the thesis research in a seminar before the department of medicinal and biological chemistry.
- Acceptance of this thesis by the M.S. thesis adviser and the thesis advisory committee.
- Maintenance of a GPA of 3.0 or higher.

Doctor of Philosophy in Medicinal Chemistry**Admission Requirements**

Satisfactory completion of a bachelor's degree in chemistry, biology, pharmacy or a related discipline is required. It is assumed that the undergraduate training will include differential and integral calculus, college physics, a one-year course in general and inorganic chemistry including a laboratory, a one-year course in organic chemistry including a laboratory, and training in analytical chemistry. An undergraduate course in physical chemistry is recommended.

The ability to excel in graduate studies and research must be evident based on grades from undergraduate studies, recommendations from college faculty, results from standardized aptitude and achievement examinations (Graduate Record Examination), and performance in research and independent study.

Students with M.S. degrees in medicinal chemistry or related fields may be admitted directly to the Ph.D. program. Students without M.S. degrees may be admitted directly to the Ph.D. program, but must take 30 credits at the master's level prior to accruing doctoral level credits.

Degree Requirements

Ph.D. students need to complete the following courses as partial fulfillment of their requirement for a Ph.D. degree. Additional graduate courses

(5000 to 8000 level) may be required, as advised during the development of each student's plan of study.

MBC	5100/7100	Research Practices in Medicinal Chemistry	1
MBC	5620/7620	Biochemical Techniques.....	2
MBC	5900/7900	Medicinal Chemistry Seminar (6 hours required).....	1
MBC	6190/8190	Advanced Medicinal Chemistry.....	4
MBC	6200/8200	Biomedical Chemistry.....	4
MBC	6300/8300	Biomedical Chemistry Laboratory I.....	4
MBC	6310/8310	Biomedical Chemistry Laboratory II	4
MBC	6550/8550	Biochemistry	4
MBC	8960	Ph.D. Dissertation Research in Medicinal Chemistry (30 hours required).....	1-15

Select 8 hours in chemistry, biology, or medicinal and biological chemistry:

Chemistry Courses

CHEM	6330	Spectroscopic Methods.....	2-4
CHEM	6400/8400	Advanced Organic Chemistry	2-4
CHEM	6410/8410	Organic Synthesis.....	2-4
CHEM	6420	Physical Organic Chemistry	2-4
CHEM	6510/8510	Protein Chemistry.....	2-4
CHEM	6520/8520	Enzymology.....	2-4
CHEM	6530/8530	Nucleic Acid Chemistry	2-4

Biology Courses

BIOL	6010/8010	Advanced Molecular Biology.....	4
BIOL	6020/8020	Advanced Molecular Biology Laboratory.....	3
BIOL	6090/8090	Advanced Cell Biology	4
BIOL	6100/8100	Research Methodology: Cell and Molecular Biology.....	3

Medicinal and Biological Chemistry Courses

MBC	5380/7380	Medicinal and Poisonous Plants	3
MBC	6100/8100	Advanced Immunology.....	2
MBC	6800/8800	Methods in Biotechnology.....	3
Other MBC courses as advised			

In addition, all students must satisfy the following:

1. Minimum of 60 semester hours of graduate credit beyond the master's level (see master of science in medicinal chemistry), including a minimum of 15 hours of courses, laboratories and seminars (exclusive of dissertation research) and a minimum of 30 hours of Ph.D. dissertation research.
2. Satisfactory overall performance on a written qualifying examination covering graduate-level medicinal chemistry, biochemistry and either organic chemistry or advanced cell/molecular biology.
3. Selection of a doctoral research adviser, preparation of an acceptable written Ph.D. dissertation proposal in consultation with the adviser, and the satisfactory oral defense of the proposal before the dissertation advisory committee. The written qualifying examination and the defense of the dissertation proposal will constitute the examination requirements necessary for advancement to candidacy for the Ph.D. in medicinal chemistry. The chair of the doctoral dissertation advisory committee will be the student's doctoral research adviser. The dissertation advisory committee will consist of two additional faculty, plus one member from outside the student's department or college.
4. Subsequent to admission to candidacy for the Ph.D. degree, the student is expected to spend a minimum of two semesters in full-time study at The University of Toledo.
5. Preparation of a Ph.D. dissertation based on the results of an original

research investigation performed by the student during his/her Ph.D. program at The University of Toledo.

6. Successful oral defense of the dissertation before the dissertation advisory committee and presentation of the results of the dissertation research in a seminar before the department of medicinal and biological chemistry.
7. Acceptance of the dissertation by the Ph.D. dissertation adviser and the dissertation advisory committee.
8. Maintenance of a GPA of 3.0 or higher

Doctor of Pharmacy Degree Programs

The curriculum as outlined in the current catalog is subject to modifications with immediate implementation to keep pace with changing trends in pharmaceutical education and in accordance with accreditation standards.

Admission Requirements

An applicant is considered for admission to the doctor of pharmacy program on the basis of general criteria as well as minimum specific requirements listed below. General criteria include the performance of the applicant in the undergraduate program; the performance of the applicant in the professional setting; and recommendations from college faculty members and professional colleagues acquainted with the student's character and ability. Specific requirements include a bachelor of science in pharmacy degree earned from a school or college of pharmacy accredited by the Accreditation Council for Pharmacy Education and a written statement of purpose stating the applicant's short-term and long-term goals after obtaining the doctor of pharmacy degree. An on-site interview may be required of qualified candidates prior to the final decision for admission.

All applications should be completed by Jan. 15 in order to be considered for admission into the doctor of pharmacy program starting the subsequent June. Normally, notification of acceptance into the program will be sent by the first week in March.

Program Requirements

The curriculum consists of a minimum of 58 semester hours of didactic course work at the graduate level and 32 semester hours (eight months) of experiential training.

Students who hold bachelor of science in pharmacy degrees from a school or college of pharmacy accredited by the Accreditation Council for Pharmacy Education are required to successfully complete PHPR 6450 (PPT: Nephrology) and course work equivalent to PHPR 4440 (PPT: Immunology).

In order to obtain a doctor of pharmacy degree students must meet the current Academic Performance Standards.

Graduate Pharmacy Core-Curriculum in the Pharm.D. Program

First Semester: Summer Immediately Following Fourth Year

PHCL	5140	Interpretation of Pharm. Data	2
PHPR	6210	Introduction to Research Methods.....	2
PHPR	6440	PPT: Infectious Disease	4
PHPR	6940	Early Practice Exposure.....	2
		Graduate Professional Electives*	2-3

(PHPR 6940 will consist of 80 hours of pharmacy practice.)

290 Graduate School

Second Semester: Fall Semester-Fifth Year

PHPR	6160	Advanced Applied Pharmacokinetics	3
PHPR	6230	Patient Care Rounds I	3
PHPR	6380	PPT: Endocrinology	2
PHPR	6420	PPT: Cardiology	4
PHPR	6430	PPT: Pulmonary	3
PHPR	8470	PPT: Rheumatology	1
		Graduate Professional Electives*	2

Third Semester: Spring Semester-Fifth Year

PHPR	6240	Patient Care Rounds II	3
PHPR	6250	Self Care	3
PHPR	6510	PPT: Poison Management	1
PHPR	6550	Management Topics for Clinical Practice	2
PHPR	6610	Seminar I	1
PHPR	8390	PPT: Gastroenterology	2
PHPR	8480	PPT: Neurology and Psychiatry	3
		Graduate Professional Electives*	2-3

Fourth Semester: Summer Immediately Following Fifth Year

PHPR	6370	PPT: Critical Care/Nutrition	1
PHPR	6490	PPT: Hematology/Oncology	3
PHPR	8260	Jurisprudence & Ethics for Pharmacy	1
PHPR	8500	PPT: Geriatrics and Pediatrics	2
PHPR	8620	Seminar II	1
PHPR	8640	PPT: Capstone	2
		Graduate Professional Electives*	2-3

* A total of 5 credit hours of Graduate Professional Electives are required

Fifth Semester: Fall Semester-Sixth Year

PHPR	8630	Seminar III	2
PHPR	8940:001	Clerkship I	4
PHPR	8940:002	Clerkship II	4
PHPR	8940:003	Clerkship III	4
PHPR	8940:004	Clerkship IV	4

Sixth Semester: Spring Semester-Sixth Year

PHPR	8940:005	Clerkship V	4
PHPR	8940:006	Clerkship VI	4
PHPR	8940:007	Clerkship VII	4
PHPR	8940:008	Clerkship VIII	4

Note: At the end of the sixth year, students are candidates for a Pharm.D. degree.

Pharm.D. Professional Electives

The following is a list of recommended professional electives. Other electives may be chosen with the written approval of a faculty adviser.

MBC

MBC	5100/7100	Research Practices in Medicinal Chemistry	1
MBC	5380	Medicinal & Poisonous Plants	3
MBC	5620/7620	Biochemical Techniques	2
MBC	6100/8100	Advanced Immunology	2
MBC	6190/8190	Advanced Medicinal Chemistry	4
MBC	6200/8200	Biomedical Chemistry	4
MBC	6420	Protein Chemistry/CHEM 6510/8510	2 or 4
MBC	6430/8430	Nucleic Acid Chem/CHEM 6530/8530	2 or 4
MBC	6440/8440	Enzymology/CHEM 6520/8520	2 or 4

MBC	6750/8750	Bioorganic Chemistry: Chemical Approaches to Enzymes	3
MBC	6800/8800	Methods in Biotechnology	3

PHCL

PHCL	5300	Selected Topics in Pharmacology	2
PHCL	5630	Cancer Chemotherapy	3
PHCL	5730	Toxicology I	3
PHCL	5750	Toxicology II	3
PHCL	5760	Toxicokinetics	3
PHCL	5900	Drug Disposition	2
PHCL	5990	Problems in Pharmacology	1 to 6
PHCL	6150	Advanced Pharmacokinetics	2
PHCL	6600	Seminar in Pharmacology	1
PHCL	6770	Toxicological Risk Assessment	3

PHPR - Administration

PHPR	5990	Problems in Pharmacy Practice	1 to 6
PHPR	6530	Research Methods in Pharmacy Practice	3
PHPR	6600	Seminar in Administrative Pharmacy	1
PHPR	6810	Hospital Pharmacy Administration	3
PHPR	6820	Selected Topics in Hospital Pharmacy	3
PHPR	6830	Advanced Community Pharmacy Administration	3
PHPR	6840	Selected Topics in Community Pharmacy	3
PHPR	6980	Special Topics	1 to 5

PHPR - Industrial

PHPR	5680	Parenteral Manufacturing	2
PHPR	5690	Dosage Form Design	3
PHPR	5710	Selected Topics in Pharmaceutical Techniques	2 to 3
PHPR	5720	Pharmaceutical Rate Processes	3
PHPR	5990	Problems in Pharmacy Practice	1 to 6
PHPR	6950	Seminar in Industrial Pharmacy	1
PHPR	6980	Special Topics	1 to 5

PHPR - Clinical

PHPR	6980	Special Topics	1 to 5
PHPR	8540	Geriatric Monitoring Principles	3

Doctor of Pharmacy Clerkship

Experiential Performance Standards

Any student who fails to pass a single clerkship rotation or is dismissed from a single clerkship rotation (for reasons other than an action detrimental to patient care and/or to the clinical service) will be placed on academic probation immediately upon completion or dismissal from the rotation. The student will continue on academic probation for the duration of his/her clerkship rotation experience.

Any student on probation who fails to pass a clerkship rotation or is dismissed from a clerkship rotation will be immediately removed from the clerkship program, receive a record review by the academic performance committee, and be subject to dismissal from the doctor of pharmacy program. All previously scheduled clerkship sites will become available for other clerkship students.

If the situation leading to the dismissal of a student from a clerkship rotation is related to an action that is detrimental to patient care and/or the clinical service, the student will be immediately removed from the clerkship program. The academic performance committee will review the

situation, and the student may be subject to dismissal from the doctor of pharmacy program. All previously scheduled clerkship sites will become available for other clerkship students.

Actions that are subject to dismissal are outlined in the Experiential Dismissal Policy.

Experiential Dismissal Policy

Pharmacy students may be dismissed from a clerkship site at any time during the rotation by the clerkship site and/or preceptor through the initiation of the dismissal procedure described below.

Actions Subject to Dismissal

Following are circumstances or actions under which clerkship students may be dismissed using the dismissal procedure described below:

- * Failure to adhere to clerkship site policy and/or procedure.
- * Failure to adhere to UT clerkship program policy and/or procedure.
- * Failure to meet a UT clerkship program requirement.
- * Blatantly unacceptable or continuously unacceptable clerkship program performance.
- * Mistreatment of UT and/or clerkship site employees.
- * The performance of an action that is detrimental to the care of a patient.
- * The performance of an action that is detrimental to the clinical service provided by the site and/or preceptor.

Dismissal Procedure

When a circumstance or action that is determined to be grounds for dismissal occurs, the clerkship preceptor will inform the student and director of experiential programs of the situation. The situation will then be handled as follows:

- a) If the situation is related to failure to meet a requirement, failure to follow policy or procedure, improper behavior or inadequate clerkship performance, the student will be given a specific outline by the clerkship preceptor as to how his/her performance must improve and/or meet expectations within five class days. A copy of this outline will be sent to the director of experiential programs. If after five class days such performance has not been achieved, the student will be removed from the clerkship site and will receive a grade of U or IN as determined by the director of experiential programs.
- b) If the situation is related to an action that is detrimental to patient care and/or to the clinical service, upon discussion of the situation between the clerkship preceptor and clinical coordinator, the student shall be subject to immediate removal from the clerkship site and shall receive a grade of U.

If a student has any question over the handling of his/her dismissal procedure by the director of experiential programs and/or preceptor, he/she should contact the chair of the department of pharmacy practice.

Combined Pharm.D. – Ph.D. in Medicinal Chemistry Program

Admission Requirements

Students who are admitted to both programs separately may pursue both degrees concomitantly.

Program Requirements

Although the requirements for both programs will be met, there is some overlap and flexibility, allowing a student to complete graduate-level requirements for both degrees in four to four and a half years. In general terms, students will follow the sequence for the Pharm.D. curriculum during the first four semesters, taking one graduate-level medicinal chemistry course each semester. In the fifth semester, students will take the required Pharm.D. clerkships, plus the two-hour seminar, with at least one clerkship rotation involving a research experience. The Ph.D. requirement for MBC 6550 (Biochemistry) will be waived. Beginning with sixth semester (summer following the second year), students will complete the requirements for the Ph.D. in medicinal chemistry.

COLLEGE OF LAW

Graduate Program

Degree Offered

The College of Law offers a masters degree in the study of law. The master of studies in law (MLW) is an entry-level nonprofessional degree designed for those who seek a better understanding of the law, legal institutions and legal methods. The degree does not qualify the holder to sit for a bar examination or to practice law, nor will it be considered as a qualifier for entry into the J.D. program. Classes taken toward the master of studies in law degree will, under no circumstances, be later applied toward a J.D. degree.

Requirements

The master of studies in law program requires students to successfully complete the equivalent of one year of full-time study, consisting of 30 semester credit hours. Students also may enroll in the program on a part-time basis. It is expected that a student pursuing the master of studies in law on a part-time basis will take three to four years to earn the degree. Students will need to satisfy the same retention and graduation requirements as other graduate programs at The University of Toledo.

Required courses include an introductory course offered only to master of studies in law students (LAWM 5000 Law and the Legal System, 3 hours), Legal Research and Writing I (3 hours), at least one of the basic courses required for J.D. students, and a law seminar or independent research project (2-3 hours). Law and the Legal System is a prerequisite to all other law courses. The seminar or independent research project is the degree capstone course. In addition, master of studies in law students pursuing a concentration in a particular area of study may be required to take other specified law courses. The student is required to work closely with and obtain registration permission for specified law classes from a College of Law faculty adviser.

Sample Areas of Concentration

Because of the diverse and rich curriculum and the varied scholarly and teaching backgrounds of the instructional staff at the College of Law, master of studies in law students may design specific areas of concentration to fit their particular interests and needs. Sample areas of concentration include business law, criminal justice law, education law, employment and labor law, environmental law, health law, homeland security law, intellectual property law, international law, and real estate law. Other possibilities include constitutional law, commercial law, dispute resolution, estate planning law, family law, general law, litigation, political theory, and tax law. Many of these courses are offered not only during the day, but also in the evening and during summer sessions, enabling part-time students to take full advantage of course offerings.

Grading

Master of studies in law students will take classes side-by-side with J.D. students. However, master of studies in law student grades will be determined using the standards associated with other graduate programs at The University of Toledo.

The College of Law permits master of studies in law students to earn up to six credit hours of graduate-level courses in a related field at institutions offering graduate programs. To transfer the credits toward the master of studies in law degree, the student must earn a minimum grade of B (or Satisfactory, if graded on a satisfactory/no credit basis) in the non-law graduate course. Master of studies in law students may take advantage of the concurrent enrollment program available to graduate students to enroll in courses offered at Bowling Green State University or the Medical University of Ohio.

Application

Application forms can be obtained from The University of Toledo Graduate School (available electronically at www.gradschool.utoledo.edu) or from the College of Law (available electronically at www.utlaw.edu.)

Master of studies in law applicants will need to complete an application for graduate study; submit transcripts from all baccalaureate and post-baccalaureate programs attended; submit standardized test scores from the LSAT or another predictive test such as the GRE, GMAT, or MCAT; and submit a personal statement. Applicants also must meet with a member of the master of studies in law program committee for a personal interview.

Admission to the master of studies in law program does not require undergraduate or graduate academic preparation in law. To qualify for admission, all applicants must meet the admission criteria set by the Graduate School at The University of Toledo, which requires a minimum undergraduate GPA of 2.7. However, students with significant employment experience who do not meet the minimum GPA standard can be accepted provisionally based on the results of the standardized tests.

The College of Law will make final recommendations for admission.

For more information, contact the College of Law Admissions Office at 419.530.4131, or send an e-mail to law.admissions@utoledo.edu.