

MICHIGAN TECHNOLOGICAL UNIVERSITY
ENVIRONMENTAL ENGINEERING PH.D. PROGRAM
INSTITUTIONAL GOVERNANCE AND OPERATING PROCEDURE
As revised October 15, 2014

GOVERNANCE OF NON-DEPARTMENTAL PH.D. PROGRAMS IN ENGINEERING

The original proposal which led to the establishment of the non-departmental Ph.D. programs in engineering (Proposed Degree Offering for the Doctor of Philosophy in Engineering, M.T.U. June 14, 1984, 163 pages) outlined a procedure for institutional administration and governance of the overall program. Subsequently, Michigan Tech Faculty Senate Proposals 3-84 (Ph.D. in Engineering) and 2-85 (Doctor of Philosophy in Engineering, Environmental Engineering) provided additional information on program operation and governance. The Graduate School was designated as the unit with primary responsibility for quality control and general administration. The **University Non-Departmental Studies Committee** was designated to assist the Graduate School in overseeing the individual thrust area programs and in ensuring program quality. This Committee is to consist of:

- three elected members from the graduate council,
- two faculty members appointed by the Deans of the Graduate School and College of Engineering
- the Deans of the Graduate School and College of Engineering as ex-officio members

The individual thrust areas are to be governed by advisory graduate committees composed of participating faculty. Each of these committees is to be charged with development and administration of comprehensive examinations, recommendation to the graduate school concerning individual Ph.D. committee memberships, and similar matters. The advisory graduate committee for the Environmental Engineering thrust area is thereafter referred to as the **Environmental Engineering Faculty Committee**. From this point on in this governance document, this committee is simply referred to as the **Faculty Committee**.

Responsibility for formulating individual student programs and for making individual pass/fail decisions lies with the individual student's Ph.D. committee, hereinafter called the **Advisory Committee**. All examinations and/or deliberations are open to Graduate Faculty observers; however, those not on the Advisory Committee are limited to providing comments to the Advisory Committee. Graduate Faculty observers are to be welcomed in every facet of evaluation of a student's progress. Transparency in all operations of the Advisory Committee will aid in quality control of the program.

FACULTY COMMITTEE

The Chair of Advisory Committees shall be a member of the Faculty Committee.

Membership: The current Faculty Committee membership is:

Dr. Martin T. Auer, Professor of Civil and Environmental Engineering
Dr. Nancy A. Auer, Professor of Biological Sciences

Dr. Brian D. Barkdoll, Associate Professor of Civil and Environmental Engineering

Dr. Jennifer Becker, Associate Professor of Civil and Environmental Engineering
Dr. Rupali Datta, Associate Professor of Biological Sciences
Dr. George R. Dewey, Associate Professor of Civil and Environmental Engineering
Dr. Paul V. Doskey, Professor of Civil and Environmental Engineering and Forest Resources and Environmental Sciences
Dr. John S. Gierke, Professor of Geological and Environmental Engineering
Dr. Sarah Green, Professor of Chemistry
Dr. Veronica W. Griffis, Associate Professor of Civil and Environmental Engineering
Dr. Kathleen E. Halvorsen, Professor of Social Sciences and Forest Resources and Environmental Science
Dr. David W. Hand, Professor of Civil and Environmental Engineering
Dr. Yun Hang Hu, Professor of Materials Science and Engineering
Dr. Jiann-Yang (Jim) Hwang, Professor of Materials Science and Engineering
Dr. Evan S. Kane, Assistant Professor of Forest Resources and Environmental Science
Dr. Alex S. Mayer, Professor of Geological and Environmental Engineering
Dr. Ann Maclean, Professor of Forest Resources and Environmental Sciences
Dr. Claudio Mazzoleni, Associate Professor of Physics
Dr. Lynn R. Mazzoleni, Assistant Professor of Chemistry
Dr. Daisuke Minakata, Assistant Professor of Civil and Environmental Engineering
Dr. Amlan Mukherjee, Associate Professor of Civil and Environmental Engineering
Dr. Michael E. Mullins, Professor of Chemical Engineering
Dr. Kurtis G. Paterson, Associate Professor of Civil and Environmental Engineering
Dr. Judith A. Perlinger, Professor of Civil and Environmental Engineering
Dr. Eric Seagren, Professor of Civil and Environmental Engineering
Dr. Noel R. Urban, Professor of Civil and Environmental Engineering
Dr. Joseph Wagenbrenner, Assistant Professor of Forest Hydrology
Dr. David W. Watkins, Professor of Civil and Environmental Engineering
Dr. Shiliang Wu, Associate Professor of Atmospheric Chemistry and Environmental Engineering
Dr. Pengfei Xue, Assistant Professor Civil and Environmental Engineering

Selection and Appointment to the Faculty Committee: Advisors of students in this degree program shall be members of the Faculty Committee. Faculty Committee members shall have demonstrated expertise in environmental engineering and sciences. New members may be nominated by current members by submitting a two-page curriculum vitae to the Chair, who will send notice of the nomination and the nominee's curriculum vitae to the Faculty Committee. Committee members will approve new members by majority vote of those present at a committee meeting. A current member may request in writing to the Chair if s/he wishes to be removed from the committee. At the beginning of the academic year the Chair will contact the committee membership and ask if they would like to continue to serve on the Faculty Committee.

Chair: The Chair of the Faculty Committee is appointed by the Dean of the Graduate School in consultation with the Faculty Committee. The term of appointment is four years. Responsibilities of the Chair are:

- Overall responsibility for management of the Environmental Engineering Ph.D. program.
- Appointment of members to, and deletion of members from the Faculty Committee in consultation with the Committee and with the concurrence of the Dean of the Graduate School.
- Make recommendations to the Dean of the Graduate School regarding admission or rejection of prospective students.
- Make recommendations to the Dean of the Graduate School regarding appointments to Advisory Committees.

Vice Chair: This person will be elected by the Faculty Committee and will function as Chair in the absence of the Chair.

ADVISORY COMMITTEE

An advisory committee for an individual student will consist of at least four faculty who are either regular or *ad hoc* members of the Michigan Tech Graduate Faculty and will be appointed as follows:

- Advisor: This will normally be the faculty member who has responsibility for the sponsored research project on which the student will be working and doing his/her dissertation research. The advisor has primary responsibility for guiding the student's academic and professional progress. The advisor must be a member of the Graduate Faculty and the Faculty Committee. An advisor for a student will be appointed as soon as possible after admission of the student. By the end of the student's second term, the student will have prepared an initial course plan and schedule of anticipated progress. This course plan and schedule will form the basis for the student's Preliminary Program of Study (D3 Form) submitted to the Graduate School during the second term of study.
- Two initial members will be nominated by the Advisor and recommended by the Chair for appointment (D4A Form). These appointments will take place during the first term of the student's program.
- The membership of the initial three-member advisory committee may be revised after one year to more closely reflect the student's research interests.
- A fourth member will be recommended by the Advisor to the Chair for appointment prior to the preparation and administration of the Comprehensive Exam.
- At least one member of the Advisory Committee will be an external member. For non-departmental degree programs, University Policy states that the external member shall not be a member of the Faculty Committee. The external member of EPD2 Program Advisory Committees will be appointed by the Dean of the Graduate School.
- Members additional to the four members above may be recommended for appointment by the Advisory Committee to the Chair.

COMPREHENSIVE EXAMINATION

All Environmental Engineering Ph.D. students must pass a two-part Comprehensive Examination. This examination consists of a Qualifying Part and a Proposal Defense. Upon

successful completion of the Comprehensive Exam, the student is elevated to the status of Doctoral Candidate.

Qualifying Part (D4)

The Qualifying Part is designed to test the student's mastery of topics related to environmental engineering. This is a written or, possibly, a combined written and oral examination normally requiring four to eight hours and consisting of two sub-parts:

General Environmental Engineering
Environmental Engineering Research Area

The Qualifying Part will normally be administered once a year depending on the number of students in the program and will normally be scheduled to occur within 12 months after a student who already holds a MS degree begins the Ph.D. program. Students taking the qualifying exam will be notified by letter as to the schedule for and the general contents of the exam.

The General Environmental Engineering part of the Comprehensive Exam will be based on information covered in the following courses:

CE3501 Environmental Engineering Fundamentals
CE4501 Environmental Engineering Chemical Processes
BL3310 Environmental Microbiology, BL3400 Principles of Ecology,
or BL5451 Aquatic Ecology
CE5501 Environmental Process Engineering

Consequently, it is recommended that all candidates for the examination either take these courses or have equivalent knowledge from previous study.

It is expected that two or more students will write the examination simultaneously. Each student will be given an identical General Environmental Engineering Part. When multiple advisory committees are involved, the Chair of the Environmental Engineering Doctoral Program Faculty Committee may call a pre-examination conference in formulating the General section of the Qualifying Part.

The Environmental Engineering Research Area Part will be prepared by the student's Advisory Committee. All Advisory Committee members are expected to contribute questions for this part, relating the questions to the student's particular specialty area and research interests.

The student will complete the written portion of the exam, and, within the week of the exam, the Advisory Committee may require the student to appear before the Committee to further elaborate upon and explain his or her written answers and solutions.

Concurrence of three Advisory Committee members is necessary for the student to pass the Qualifying Part. If a student fails the Qualifying Part, s/he may retake it once with the majority approval of the Advisory Committee. However, the retake of the exam must occur within three months and these results are final. The Qualifying Part of the Exam and the students' answers must be filed with the Chair and made available to the Faculty Committee and Dean of the Graduate School.

Proposal Defense (D6)

This part is designed to test the student's in-depth knowledge and understanding of the subject material and literature related to the student's proposed doctoral research project. To qualify for the Proposal Defense, the student must first pass the Qualifying Part and, with the aid of the Advisory Committee, prepare a substantial, specific proposal and plan for the doctoral research project. The student must defend the proposed research project and, in so doing, demonstrate an in-depth knowledge of the subject material and related literature. This Part will normally require two to four hours and should be held within six months after the Qualifying Part. Concurrence of three Advisory Committee members is necessary for the student to pass the Proposal Defense of the Comprehensive Examination. Upon successful completion of both the qualifying and preliminary parts of the comprehensive examination, the D4, D5, and D6 Forms are to be filed with the Graduate School.

Although a Master's degree is not prerequisite for the doctoral degree in environmental engineering, most students will either have the Master's degree prior to beginning the doctoral program or will take the Master's degree enroute to the doctoral degree. It is expected that the candidate will take coursework beyond the Master's degree requirement. The Graduate School requires a minimum of 30 course and/or research credit hours beyond the M.S. degree (or its equivalent) or a minimum of 60 course and/or research credit hours beyond the Bachelor's degree. Of the 30 credits beyond the M.S., a minimum of 10 coursework credits are required; Of the 60 credits beyond the Bachelor's, a minimum of 30 coursework credits are required unless the advisor petitions the EPD2 Steering Committee for a waiver of this requirement.

REQUIRED COURSEWORK FOR DEGREE

The required courses for the degree are:

- ENVE5501 – Environmental Process Engineering (3 credits)
- ENVE5991 or ENVE5992 – Environmental Engineering Seminar (1 credit)

Both courses should be taken within the first two years of the program.

FINAL ORAL EXAMINATION

This exam is designed to allow the candidate to defend the significance and validity of the doctoral research dissertation. The D7 Form (Scheduling of Final Oral Examination) must be filed with the Graduate School at least two weeks in advance of the examination. All Graduate Faculty are invited to attend and participate in questions regarding the dissertation.

Concurrence of at least three of the four (or four of the five) advisory committee members is necessary for acceptance of the dissertation and award of the doctoral degree.