

**MASTER OF SCIENCE IN ENGINEERING
IN ENVIRONMENTAL ENGINEERING
Environmental and Water Resources Engineering Program
Department of Civil and Environmental Engineering
College of Engineering
The University of Michigan
(Revised August 2008)**

REQUIREMENTS AND PROCEDURES

These guidelines have been developed to assist graduate students working toward the M.S.E. degree in Environmental Engineering in planning a program of study to meet the requirements of that degree. Each student is responsible for planning such a study program, generally with the guidance of an advisor selected or assigned from the Environmental and Water Resources Engineering (EWRE) program faculty:

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I. REGULATIONS

The basic requirements for the M.S.E. degree are established by the Horace H. Rackham School of Graduate Studies. The faculty of the Department of Civil and Environmental Engineering has adopted certain additional requirements. These requirements as they relate to the M.S.E. in Environmental Engineering degree are described in these guidelines.

Each M.S.E. student must take personal responsibility for seeing that all requirements are met prior to the dates specified by the Graduate School. If special decisions or actions are needed, they should be initiated by the student through consultation with the graduate program advisor and the chairman of the Graduate Committee.

II. PROGRAM INFORMATION

A. Degree Offered

Master of Science in Engineering in Environmental Engineering, administered by the Environmental and Water Resources Engineering (EWRE) program in the Department of Civil and Environmental Engineering.

The purpose of the Environmental Engineering degree is to permit a higher level of specialization in Environmental Engineering than achieved in an undergraduate degree. The Environmental and Water Resources Engineering program also offers the M.S.E. degree in Civil Engineering with a specialization in Hydraulics and Hydrology. Students interested in this program should consult the separate Civil Engineering M.S.E. guidelines.

B. Admission

Completion of the Graduate Record Examination (GRE), general examination (verbal, quantitative, analytical) is required for consideration of an application.

To be granted regular admission to the M.S.E. in Environmental Engineering program, an applicant would normally hold a B.S. degree in any traditional engineering discipline (e.g., civil, chemical, etc.) and have attained an undergraduate grade point average (GPA) of at least 3.2/4.0. Students holding B.S. degrees in physical and biological science or related fields may be admitted if they have achieved the technical background required to pursue advanced work in Environmental and Water Resources Engineering. The EWRE Graduate Program Advisor reviews each application to determine whether these requirements are met. Applicants who do not meet the requirements, but who otherwise present sufficient evidence that they can meet the scholastic requirements of advanced study, may be granted either conditional admission or non-candidate for degree (NCFD) admission. Students should consult the Graduate School BULLETIN for details concerning these types of admission status. In any case, students seeking a graduate degree in Environmental Engineering are expected to be proficient in both the scientific and engineering aspects of the field.

A student admitted to the M.S.E. (Environmental Engineering) program is expected to have certain background knowledge. Undergraduate core requirements for the M.S.E. degree include:

Math 216	Differential Equations
CEE 325	Fluid Mechanics
CEE 360	Environmental Process Engineering

None of the courses listed above may be used for graduate credit. Students who have not taken these courses or their equivalent are required to have taken them prior to completion of the M.S.E. degree and preferably prior to commencement of their graduate studies. It is necessary to maintain a B average in these courses.

It is also expected that a student will have breadth in the fundamentals of environmental engineering. The following list of courses must be completed to meet this requirement:

CEE 460 – Design of Environmental Engineering Systems or CEE 500 – Environmental Systems and Processes I
CEE 581 – Aquatic Chemistry
CEE 582 – Environmental Microbiology
CEE 428 – Introduction to Groundwater Hydrology or CEE 526 – Design of Hydraulic Systems
NRE 562 – Env. Policy, Politics and Organizations or ME 589 – Ecodesign and Manufacturing or
NRE 510 – Env. Governance, Choices, Institutions and Outcomes or NRE 575 – Thinking Analytically for Policy Decisions or ESE 501 – Seminars on Energy Systems, Technology and Policy

Equivalent courses taken at other universities (even to meet undergraduate degree requirements) can be used to satisfy the breadth requirement. In the cases where a choice of two courses is allowed, an equivalent course in either topic can be used to meet the breadth requirement. Determination of equivalence of graduate or undergraduate coursework from another institution will be assessed by the Graduate Program Advisor.

C. General Requirements and Policies

1. Credit Hours and Normal Progress

A minimum of 30 credit hours of approved graduate work must be completed for the M.S.E. degrees. Nine to twelve hours of credit per term is the usual full-time graduate course load. Graduate students with research or teaching appointments generally elect no more than six to nine credit hours per term.

2. Grades

The average grade for all graduate level courses taken while enrolled in the Graduate School and for the 30 credit hours used to fulfill the credit hour requirement must be at least B (5.0/8.0). A grade below C in any course is unacceptable. A course in which a lower grade than C is obtained is not counted toward the credit hour requirement but is considered in the computation of the overall grade point average.

3. Thesis

A thesis is not required, but up to 6 hours of credit of directed study can be used toward the 30 degree credit hour requirement by electing Special Problems or Research courses in hydraulics/hydrology (CEE 622 or 921) or environmental engineering (CEE 682 or 980). Up to 2 credit hours of CEE 880 (Seminar in Environmental and Water Resources Engineering) can substitute as part of 6 hours of directed study.

4. Language

Proficiency in the English language, both spoken and written, is expected. There is no requirement for proficiency in any other language.

5. Comprehensive Examination

Comprehensive examinations are required only for those students who wish to study beyond the M.S.E. degree.

6. Residence Requirements

The Graduate School residence requirements are satisfied by full-time students enrolled for 2 or more semesters. Students pursuing the M.S.E. degree on a part-time basis should become familiar with special requirements relating to part-time enrollment (see the BULLETIN).

7. Time Limit

A student must complete all work within a period of six consecutive years after first enrollment in the Graduate School.

8. Transfer Credits

The Horace H. Rackham School of Graduate Studies guidelines permit transfer of up to half the minimum number of credit hours required for the M.S.E. degree from inter-university and intra-university sources combined according to the following rules:

a. Graduate Credit

A maximum of 6 hours of graduate credit may be transferred from another institution. These must be approved graduate-level courses taken while enrolled in a degree program with a grade of B or better from a graduate school of an accredited institution approved by the Horace H. Rackham School of

Graduate Studies. Graduate extension courses will be considered only from The University of Michigan, Wayne State University, Michigan State University, Western Michigan University, Central Michigan University, Eastern Michigan University, Northern Michigan University and Oakland University. Considerations of credit transfer will be made only upon written application of the student to the Graduate School through the Department of Civil and Environmental Engineering, and only after the student has established an overall graduate grade point average of B or better in resident work. Courses cannot be transferred for credit if already applied toward another degree, or if taken more than five years before beginning of graduate study at The University of Michigan.

b. Pre-graduate Credit

Credit for courses taken by the student with a B grade or better earned during the senior year in The University of Michigan's College of Engineering may be included in the student's graduate study program subject to the following regulations: (1) credit was not used to meet the bachelor's degree requirement, either as required coursework or as required credit hours, (2) credit was earned no more than two years before formal admission to the Graduate School and (3) credit was earned in courses approved for graduate credit by the Graduate School. The student may request the transfer of such credits by the Graduate School through the Department of Civil and Environmental Engineering any time after admission.

D. Study Program

A minimum of 15 hours of the total 30 hours required for the M.S.E. degree must be elected from courses offered by the Department of Civil and Environmental Engineering. Graduate level courses taken to fulfill the breadth requirements described above may be counted towards this fifteen hour requirement. In addition to the courses required to fulfill the breadth requirements, a student must complete at least three other environmental and water resources engineering related electives (9 credit hours) in the department. Up to six credits of directed study (CEE 622, 682, 921, 980), including up to two credits of CEE 880, may be taken to meet this requirement. It is expected that the selection of the elective courses will provide the student with more in-depth knowledge of a particular area within environmental engineering.

The 30 hours of graduate work must include at least two cognate courses (course work related to the field of specialization) from a department other than Civil and Environmental Engineering. Courses cross-listed with the Department of Civil and Environmental Engineering cannot be accepted as cognate courses. Each cognate course must be a minimum of two credit hours. One cognate course may be used to satisfy the advanced mathematics requirement described in the following paragraph. The graduate courses from the School of Natural Resources and the Environment (NRE 562 and 571) required to fulfill the breadth requirement may also be used as one of the cognate courses.

The student must complete at least one course in mathematics, probability, statistics, or mathematical programming that is taught at a level consistent with a pre-requisite of Math 215. A list of courses that are unacceptable to satisfy this requirement is available from the graduate program advisor.

A 400 level course that is listed in the BULLETIN of the Horace H. Rackham School of Graduate Studies may be elected for graduate credit when approved by the student's advisor. Of all the 400-level courses elected, no more than a total of 12 hours, and no more than 9 hours of 400-level Civil and Environmental Engineering courses, will be accepted towards the 30 hour requirement.