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WELCOME

1.1 Advantages of a graduate degree in Civil Engineering

A graduate degree in Civil Engineering opens doors that are not otherwise accessible. These opportunities include research positions at corporations and national laboratories as well as teaching and research positions in academia. A career at this level brings the satisfaction of being able to explore your own ideas and fully utilize your creativity. A graduate degree will allow you to expand your knowledge and acquire new skills in analysis and problem solving, creating challenging opportunities for a full, rewarding career.

First and foremost among the talents required to succeed in a graduate program is a desire to learn, coupled with a natural curiosity and a desire to advance the state-of-the-art. Graduate students are motivated by the enhanced independence that an advanced degree brings and the challenge of placing oneself at the forefront of technology.

We have designed this Handbook to help prospective and current graduate students select an appropriate graduate program and provide information about the educational, research and work opportunities available in the Department. We thank you for considering our graduate program. All the best in your engineering career!

The most recent version of this document and additional information can be found at http://www.egr.msu.edu/cee/

1.2 The Civil Engineering Graduate Program at Michigan State University

The Department of Civil & Environmental Engineering offers graduate programs leading to the Master of Science and Doctor of Philosophy graduate degrees in Environmental Engineering and Civil Engineering. The program requirements for these two programs are handled separately. This handbook provides information concerning the graduate program in Civil Engineering. Graduate study in Civil Engineering is organized into the following areas of specialization:

- Geotechnical and Geoenvironmental Engineering
- Pavement Engineering
- Structural Engineering, Mechanics and Materials
- Transportation Engineering (Ph.D. only)
- Water Resources
In spite of the areas defined above, an interdisciplinary approach marks many of the research projects that faculty share with graduate students.

Our graduate program is built on the quality of our faculty, our graduate students, and the quality of their collaborative research. We believe that the background and interests of our faculty, the research facilities, and the academic excellence of our students make our Department an attractive environment for graduate study. As a Department, we look ahead to the future knowing that change and growth are important aspects of and inevitable in our discipline. The Department currently has approximately 20 faculty members, 300 undergraduates, and 90 graduate students, with a strong commitment to the importance of diversity among peers and faculty for the professional development of all graduate students. A graduate degree at MSU will enable you to develop the intellectual skills you need to compete among the best engineers in the world and you will receive world-class training preparing you for a fulfilling career in industry, research, or teaching.

1.3 Student participation

The Department’s graduate degree programs have certain course requirements as outlined in detail in section 3 of this handbook. However, graduate students in the Department quickly discover that their education is advanced in a number of ways beyond traditional coursework. One of the major opportunities is the chance to work side by side with faculty members who are deeply interested in finding answers to research problems. Most M.S. students are expected to be involved in thesis work and all doctoral students are involved in dissertation research. Doctoral students demonstrate mastery of the subject matter at various levels by passing a qualifying exam and a comprehensive exam. They also develop a dissertation proposal and present the results of their research in a dissertation defense. Students are encouraged to participate in professional society meetings and to publish their research results in society journals, transactions, and conference proceedings.

Graduate students also have the opportunity to participate in academic governance at the College, and University level. At the College level, graduate students have representation on the Engineering College Advisory Council and on the Engineering Research and Graduate Studies Committee. At the University level, graduate students are selected and have voting membership on the University Graduate Council, Academic Council, and other such committees as specified by the University Bylaws for Academic governance.
1.5 For further information

If you have any questions or concerns relating to your graduate experience, requirements, or policies, you are encouraged to discuss them with:

1. Your graduate advisor

2. Ms. Margaret Conner, CEE Graduate Secretary
   3546 Engineering Building
   (517) 355-5107
   (517) 432-1827 fax
   ceeograd@egr.msu.edu

3. Prof. Rigoberto Burgueño, Associate Chair for Graduate Studies and Research
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In addition to this handbook, the relevant publications and resources are available on-line and provided in Appendix V of this handbook.
PART I - MASTER OF SCIENCE PROGRAM IN CIVIL ENGINEERING (M.S. CE)

1. PROGRAM OVERVIEW

1.1 The M.S. Degree and the Practice of Civil Engineering

A M.S. graduate degree in Civil Engineering opens doors and enhances employment opportunities that are not otherwise accessible. Most tangible at the M.S. level is the opportunity to enter the Civil Engineering practice in specific areas of expertise. A career at this level brings the satisfaction of being able to explore your own ideas and fully utilize your creativity. A graduate degree will allow you to expand your knowledge and acquire new skills in analysis and problem solving, creating challenging opportunities for a full, rewarding career.

First and foremost among the talents required to succeed in a graduate program is a desire to learn, coupled with a natural curiosity and a desire to advance the state-of-the-art. Graduate students are motivated by the enhanced independence that an advanced degree brings and the challenge of placing oneself at the forefront of technology.

1.2 Linked Bachelor’s-Master’s Degree in Civil Engineering

The department welcomes applications from Michigan State University Civil Engineering undergraduate students in their junior and senior year who wish to pursue a linked BS-MS degree in civil engineering. Admission applications must be made during the prior spring semester for an anticipated spring graduation or the prior fall semester for an anticipated fall graduation to allow admission before the final semester as a Civil Engineering undergraduate. Admission to the program requires a minimum undergraduate grade-point average of 3.50 and an approved program of study for the Master of Science degree in Civil Engineering at the time of admission.

Admission to the Linked Bachelor’s-Master’s program allows the application of up to 9 credits toward the master’s program for qualifying 400-level and above course work taken at the undergraduate level at Michigan State University or an external accredited institution. The number of approved credits, not to exceed 9, are applied toward the credit requirement of the master's degree. Credits applied to the Linked Bachelor's-Master's program are not eligible to be applied to any other graduate degree program.
1.3 A road map to your degree

Students pursuing the M.S. Degree in Civil Engineering can follow the thesis, project option or coursework option. Students funded on departmental funds, including fellowships and research assistantships, are expected to complete the thesis option. The typical path towards a M.S. Degree in Civil Engineering is as follows:

- Gain admission to the program.
- You will be assigned an advisor upon admission. Once you arrive you should meet with that academic advisor to plan your first semester schedule. If you find that you wish to change advisors, you are free to do so unless your advisor is providing you with a research assistantship on a specific project. If you are supported as a R.A., but there are extenuating situations that necessitate changing advisors, you should meet with your current advisor as soon as you decide this is necessary. As part of this meeting, you should plan to discuss how you will fulfill the obligations of your research assistantship. After meeting with your advisor, you should also meet with the graduate coordinator and your perspective advisor as soon as possible and complete the Change of Advisor form.
- Design a Program of Study with your advisor. This includes coursework and research credits necessary to graduate.
- Submit the Program of Study for signatures.
- Complete the required coursework and your thesis or research project (if you choose the latter two options). Most master's degree students in our program finish within two years.
- Additional details are provided in Chapter 3.

1.4 Student Participation

The Department's graduate degree programs have certain course requirements as outlined in detail in section 3 of this handbook. However, graduate students in the Department quickly discover that their education is advanced in a number of ways beyond traditional coursework. One of the major opportunities is the chance to work side by side with faculty members who are deeply interested in finding answers to research problems. Most M.S. students are expected to be involved in thesis. Students are encouraged to participate in professional society meetings and to publish their research results in society journals, transactions, and conference proceedings.

Graduate students also have the opportunity to participate in academic governance at the College, and University level. At the College level, graduate students have representation on the Engineering College Advisory Council and on the Engineering Research and Graduate Studies Committee. At the University level, graduate students are selected and have voting membership on the University Graduate Council, Academic Council, and other such committees as specified by the University Bylaws for Academic governance.
2. PROGRAM COMPONENTS

During the first semester of graduate study, the student is expected to work with the advisor to develop a Program Plan that meets the academic needs and interests of the student and complies with the M.S. CE Program requirements. The Program Plan specifies the courses and optional project or thesis that the student will complete. The initial consideration for most students is whether to satisfy the degree requirements through a coursework-only program, or by completing a M.S. project or thesis.

All M.S. programs require that students complete 30 credit hours, including a specified set of required courses, and elective courses chosen in consultation with the advisor. Four credits are allowed under the thesis or project options for a research product, which is counted toward the 30 credit requirement. The thesis is generally a more in-depth and more formal product than a project, and is recognized as an important accomplishment for students who wish pursue research careers.

Students receiving fellowships, teaching assistantships or research assistantships as financial assistance for a M.S. degree are required to conduct research with a faculty member in the Department of Civil Engineering and produce a thesis from their work under Plan A.

2.2 Master's Plan A (Thesis)

The thesis option is designed for students with a strong interest in research, and who participate in a research project throughout their M.S. program. It is strongly recommended for those who wish to continue their graduate education at the Ph.D. level, and is required for those receiving fellowships, teaching assistantships or research assistantships.

The Master’s Plan A program consists of (1) prescribed course work, (2) research, (3) a master’s thesis, and (4) an oral defense of the master’s thesis. For more information about the prescribed course work, please see Chapter 7. The oral defense is described in Chapter 6.

The M.S. thesis is based on original research conducted under the guidance of a faculty committee. A written thesis is prepared according to a set of guidelines established by the graduate school, and an oral defense of the work is presented to the guidance committee. The guidance committee must approve both the written product and oral defense as meeting the standard of high quality research. It is also generally expected that the M.S. thesis will provide the basis for at least one publication in a scientific or technical journal.
2.3 Master’s Plan B1 (Project)

The project option is designed for students with an interest in research, or in conducting an independent project with a focus on innovative analysis or design. In practice, it can be essentially the same as a thesis, but allows for greater flexibility and may be less intensive than a thesis. Students pursuing this option may participate in research projects over only a discrete portion of their graduate program.

The Master’s Plan B1 program consists of (1) prescribed course work as described in Chapter 7, (2) a special project involving either research or a design and (3) an oral defense of the project. The oral defense is described in Chapter 6.

Preparation the project report is based on work conducted under the guidance of a faculty committee. There is no specific format for the report. The guidance committee must approve both the written product and oral defense as meeting the standard of competent research, analysis or design.

2.4 Master’s Plan B (Coursework)

The coursework option is designed for students who are primarily interested in gaining specialty knowledge and skills beyond that offered at the B.S. level through advanced coursework. Requirements are met by completion of approved core and elective courses.

The Master’s plan B consists of 30 credits of approved coursework. There is no requirement for a thesis, project or creative component.
3. DEGREE REQUIREMENTS

3.1 Meeting Provisional Admission and Collateral Course Requirements

The discipline diversity in the field of Civil Engineering leads to a student body with diverse backgrounds, and students are sometimes admitted under provisional status, and there may be collateral course requirements (courses that must be completed, but do not count toward the 30 credit requirement). These decisions are made on the basis of submitted course materials, and should be considered preliminary, based on our best estimate of your preparation for the M.S. program. Regardless of the type of admission, you will discuss your background and interests in your first meeting with your advisor, and he/she may suggest additional preparation as a part of your M.S. program.

International students who are admitted provisionally with a requirement for additional English language testing or coursework must address this before the start of their first semester. The English Language Center will administer the tests and provide requirements to your advisor for any language courses you will need as well as guidance on an appropriate first-semester academic load.

If you are admitted with other provisional requirements, you should make sure your advisor is aware of them and you should discuss how to address them early in your program. The provisional status will be changed to regular status when the conditions specified on the admission form have been met, as determined by the Associate Chair for Graduate Studies and approved by the Associate Dean for Graduate Studies.

3.1 Requirements for M.S. CE Plan A

The Plan A master's degree consists of prescribed course work, research, thesis, and a final oral examination.

**Master's credit requirements.** The student must complete at least 30 credits at the 400 level or higher. At least 20 of these credits, including the thesis credits, must be at the 800 level or higher. In addition, credit requirements for core-courses, supporting courses, and the master's thesis must be met. Courses below the 400 level may not be counted toward the requirements of the degree. Please see Appendix 2 for guidelines to help plan your course of study for the M.S. in Civil & Environmental Engineering.

**Master's thesis credit requirements.** At least 4 credits and no more than 6 credits of CEE/ENE 899 are required.

**Master's transfer credits.** As many as 9 semester credits of graduate course work (excluding research and thesis credits) may be transferred into a 30 credit master's degree program.
program from other accredited institutions, or international institutions of similar quality, if they are appropriate to a student's program and provided they were completed within the time limits for the degree. Please see the MSU Academic Programs publication for additional information. If you wish to transfer credits, please see the graduate secretary at the beginning of the program so that an MSU Credit Evaluation form can be initiated.

As a member of the Michigan Coalition for Engineering Education (MCEE), MSU will accept 14 credits required for the M.S. degree program in transfer from other MCEE member institutions provided that: (1) the student earned a grade of at least 3.0 or equivalent in the related courses; (2) the credits were not earned in research or thesis courses; and (3) the total number of credits accepted in transfer from MCEE member institutions or from other institutions does not exceed 14 credits. Universities included in the MCEE are Michigan Technological University, Wayne State University and the University of Michigan.

Master's Degree Program Plan filing. Each student admitted to the Master's program must define and file a Degree Program. The student's program of study must be approved before the student completes 6 credits of graduate work in order for the student to continue to enroll in the master's degree program. The subject material and the instructor must be specified for any independent study or selected topics course that is included in the student's approved program of study. The academic adviser will assist the student in planning a program satisfactory to the needs of the student. Changes in program plans may be made only with the approval of the adviser, the graduate coordinator, and the Associate Dean for Research and Graduate Studies. Please see Appendix 2 for guidance on planning a program in various specialty areas of graduate study in civil & environmental engineering. When you are ready to file your program, go to the on-line graduate tracking system at https://www.egr.msu.edu/apps/gts2 to complete your program. The graduate secretary will pre-approve your program and generate the form for appropriate signatures.

Modifications to the master's program. None of the following types of changes will be allowed in the student's approved program of study:

1. Adding or deleting a course for which a grade has already been assigned under any of the three grading systems (numerical, Pass-No Grade, or Credit-No Credit).
2. Adding or deleting a course for which grading was postponed by the use of the DF-Deferred marker.
3. Adding or deleting a course which the student dropped after the middle of the semester and for which "W" or "N" or "0.0" was designated.
4. Adding or deleting a course during the final semester of enrollment in the master's degree program.

Residency requirement for the Master's degree. At least 9 credits must be taken in residence at MSU.
Time limit for the Master's degree. The time limit for the completion of the requirements for the master's degree is five calendar years from the date of enrollment in the first course included for degree certification.

Grade point average for graduation. The Engineering College requires a minimum GPA of 3.0 for courses on the approved Master's degree program. The University requires a minimum total GPA of 3.0. The total GPA may be different than the program GPA if classes are taken that were not listed on the program.

Master's degree examinations. The student is required to pass an oral examination in defense of the thesis or project. Section 6 of the handbook describes this examination.

Master's thesis distribution. The thesis, an abstract of the thesis, and an abstract title page must be prepared in accordance with the specifications in The Formatting Guide-Master's Theses and Doctoral Dissertations, a handbook that is available, along with a packet of required forms relating to the thesis from the Office of the Graduate School. An unbound, original copy with abstract is provided to the Office of the Graduate School.

One microfilm copy of the dissertation will be deposited in the University Library and will be available on interlibrary loan. The abstract will be published in Master's Abstracts which will announce the availability of the thesis in film form.

Final semester. The student must complete the diploma card when registering for the final semester. All deferred grades should be cleared at least two weeks before the end of the final semester, but must be cleared by the Friday of finals week.

DF-Deferred grades: The required work must be completed and a grade reported within 6 months with the option of a single six-month extension. If the required work is not completed within the time limit, the DF will become U-Unfinished and will be changed to DF/U under the numerical and Pass-No Grade (P-N) grading systems, and to DF/NC under the Credit-No Credit (CR-NC) system. This rule does not apply to graduate thesis or dissertation work.

3.2 Requirements for M.S. CE Plan B1

The Plan B1 master's degree consists of prescribed course work, a special project, and a final oral defense of the project. All requirements from Plan A apply to plan B1 except that: (1) a minimum of 18 credits must be in courses at the 800-900 level; and (2) those requirements specifically related to the thesis do not apply. The final oral defense of the project is presented to the guidance committee.

DF-Deferred grades: The required work must be completed and a grade reported within 6 months with the option of a single six-month extension. If the required work is not
completed within the time limit, the DF will become U-Unfinished and will be changed to DF/U under the numerical and Pass-No Grade (P-N) grading systems, and to DF/NC under the Credit-No Credit (CR-NC) system. This rule does not apply to graduate thesis or dissertation work.

3.3 Requirements for M.S. CE Plan B

The Master's plan B consists of 30 credits of approved coursework, at least 18 credits must be at the 800-900 level. There is no requirement for a thesis, project or creative component.

DF-Deferred grades: The required work must be completed and a grade reported within 6 months with the option of a single six-month extension. If the required work is not completed within the time limit, the DF will become U-Unfinished and will be changed to DF/U under the numerical and Pass-No Grade (P-N) grading systems, and to DF/NC under the Credit-No Credit (CR-NC) system.
4. THE GRADUATE ADVISOR

Graduate education, research, and creative activities take place within a community of scholars where constructive relationships between graduate students and their advisors and mentors are essential for the promotion of excellence in graduate education and for adherence to the highest standards of scholarship, ethics, and professional integrity. Initiation and successful completion of independent research requires early and continued advice and oversight by a faculty advisor.

For students in the civil engineering master’s graduate program, Plan A, the faculty advisor is the student’s academic advisor and thesis advisor. For Plan B1 master’s students, the faculty advisor is the academic advisor. Faculty advisors must be members of the civil & environmental engineering faculty, appointed at the level of Assistant Professor or higher.

4.1 Advisor Assignment and Selection Process

At the time of admission into the program, all students are assigned an advisor. Students who are admitted to the graduate program with a research assistantship that is provided by a particular faculty member will be assigned to that faculty member as their academic advisor and thesis/dissertation advisor. Other students may be admitted with a graduate assistantship or fellowship that is from general funds or third-party funds and not explicitly tied to a particular faculty member. In those cases, the selection of an advisor is based on mutual research interests, but the student is free to change advisors, if the student and advisor mutually agree that the change would be beneficial. A common reason to switch advisors is that the student is more interested in the research done by another faculty member than that of the advisor to which he/she was assigned.

The Department’s policy is to establish that there is interest from at least one faculty member in advising the applicant prior to sending a letter of admission. When more than one faculty member has expressed interest in serving as academic advisor to a student who was admitted with an assistantship or fellowship from general funds or third parties, the student should select an advisor within the time frame described in the previous section. A listing of faculty is provided in Appendix I. Current research projects are described on the Departmental webpage (www.egr.msu.edu/cee)

4.2 Time Line for Selection of a Permanent Faculty Advisor

All students in the civil engineering graduate program must have a faculty advisor. Master's degree students should have selected a permanent advisor prior to the completion of 6 credits in their master’s degree program (See Section 1.3).
4.3 Roles and Responsibilities of the Thesis Advisor

The role of the advisor includes the following:

- Ensuring that graduate students receive information about requirements and policies of the graduate program.
- Advising graduate students on developing a program plan, including appropriate course work, research or creative activity, and on available resources.
- Advising graduate students on the selection of a thesis or project topic with realistic prospects for successful completion within an appropriate time frame and on the formation of a guidance committee.
- Providing training and oversight in creative activities, research rigor, theoretical and technical aspects of the thesis or project work, and in professional integrity.
- Encouraging graduate students to stay abreast of the literature and cutting-edge ideas in the field.
- Helping graduate students to develop professional skills in writing reports and papers, making professional presentations, establishing professional networks, interviewing, and evaluating manuscripts and papers.
- Providing regular feedback on the progress of graduate students toward degree completion, including feedback on research or creative activities, course work, and teaching, and constructive criticism if the progress does not meet expectations.
- Helping graduate students develop into successful professionals and colleagues, including encouraging students to participate and disseminate results of research or creative activities in the appropriate scholarly or public forums.
- Facilitating career development, including advising graduate students on appropriate job and career options, as well as on the preparation of application materials for appropriate fellowship, scholarship, and other relevant opportunities.
- Writing letters of reference for appropriate fellowship, scholarship, award, and job opportunities.
- Providing for supervision and advising of graduate students when the faculty advisor is on leave or extended absence.

4.4 Roles and Responsibilities of the Student

The student also has responsibilities in the advisor/student relationship. These include the following.

- Learning and adhering to University and academic unit rules, procedures, and policies applicable to graduate study and research or creative activities, including those outlined in the publications Academic Programs, Graduate Student Rights and Responsibilities, and Academic Freedom for Students at MSU.
- Meeting University and academic unit requirements for degree completion.
- Forming a guidance committee that meets University requirements as well as requirements that are outlined in the Graduate Handbook of the academic unit.
• Following disciplinary and scholarly codes of ethics in course work, thesis or project work, and in creative activities.
• Practicing uncompromising honesty and integrity according to University and federal guidelines in collecting and maintaining data.
• Seeking regulatory approval for research in the early stages of thesis or project work where applicable.
• Keeping the faculty advisor and guidance committee apprised on a regular basis of the progress toward completion of the thesis or project.

4.5 Roles and Responsibility of the Department

Once a permanent thesis/dissertation advisor is selected, it is unusual to change advisors. However, if a situation arises where a change seems imperative, the student should consult with the Department’s graduate coordinator who will facilitate changes of faculty advisor. The procedures for changing M.S. and Ph.D. advisors are described in Sections 1.4.1 and 1.4.2, respectively.

Should the student’s advisor leave MSU, it is the department chair’s responsibility to facilitate arrangements that allow the student to successfully complete his/her degree program.
5. FORMATION OF THE GUIDANCE COMMITTEE

Graduate students selecting the Project or Thesis options have the responsibility to form a guidance committee with the approval and assistance of the student's advisor, and approval of the Graduate Program Coordinator. The guidance committee will consist of at least three Michigan State University regular faculty members, at least two of whom must be on the faculty of the Department of Civil and Environmental Engineering, and must include the student's advisor, who normally serves as the committee chairperson. Please see the *MSU Academic Programs* publication for additional information regarding definition of regular faculty.

The responsibilities of the guidance committee include the following:

- Advising graduate students on course work, research, or creative activities.
- Providing, at least annually, feedback and guidance concerning progress toward the degree.
- Reviewing the thesis or dissertation in a timely, constructive and critical manner.
- Committee chairpersons on leave shall provide for the necessary guidance of their advisees during their absence.

The responsibilities of the student include the following:

- Identifying, in consultation with the advisor, faculty members with the expertise and interest in supervising the proposed research, and meeting with them to discuss their willingness to serve in this capacity.
- Meeting with the guidance committee before the research plan is finalized to review the proposed work, and modify as appropriate.
- Keeping the committee informed on the progress of the research and soliciting their input to address unforeseen issues or to improve quality.
- Scheduling the final examination and providing the committee with a copy of the final written product at least two weeks before the examination.
6. THESIS/PROJECT FINAL ORAL EXAMINATION

6.1 Nature and Scope of the Thesis

The final master's examination is the culmination of a student's graduate education and training and reflects not only the accomplishments of the graduate student but also on the quality of the graduate program. An approved thesis that is accepted by the graduate school becomes a single-author publication and contributes to the body of knowledge of the civil engineering discipline.

6.2 Examination Regulations and Format

The graduate student will present the results of the thesis/project in a seminar open to the community. The student should arrange a suitable examination date after consulting with the thesis advisor and members of the examination committee. The student should also arrange for a suitable room in which to hold the seminar by consulting with the office staff of the Civil & Environmental Engineering Department. This should be done in communication with the Department graduate secretary, who will arrange for announcement of the upcoming defense. The student should also ensure that all necessary computer equipment, such as a laptop and data projector, is available.

The following regulations apply.

- The final oral examination must be scheduled for a date not earlier than two weeks after the dissertation and abstract have been submitted to the chairperson of the guidance committee, other guidance committee members, and any appointed examiner.
- The student must be registered during the semester in which the final oral examination is taken.
- The thesis/project and the student's performance on the final oral examination must be approved by a positive vote of at least three-fourths of the voting examiners and with not more than one dissenting vote from among the Michigan State University regular faculty members of the guidance committee.

For both the thesis option master's degree candidate, the following format is typical. The examining committee members may or may not choose to meet before the exam to discuss the procedure. The candidate presents the results in seminar fashion and responds to questions and comments from those in attendance. After the general audience has had opportunity to raise questions and comments, they are excused from the room and the defense continues with only the examining committee. At the end of the examination, the student is asked to step out of the room, and the examining committee members each indicate in writing a pass or fail grade. The student is then asked to reenter the room to receive the result of the final examination. A summary report of the
examination result is submitted to the Dean of Engineering and the Chairperson of the Department.

6.3 M.S. Degree Examining Committee

The M.S. degree examination committee consists of at least three Michigan State University regular faculty members, at least two of whom must be on the faculty of the Department of Civil & Environmental Engineering. The committee is selected by the thesis/project advisor and student with the approval of the Department’s graduate coordinator. One member of the committee must be the thesis/project advisor. Other interested faculty members may attend the examination without vote.
7. AREA-SPECIFIC MS PROGRAM REQUIREMENTS

7.1 MS CE - Geotechnical and Geoenvironmental Engineering

If a student chooses an emphasis in geotechnical and geoenvironmental engineering, and does not have the required background as determined by the advisor, any or all of the following courses must be completed as collateral.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Credits</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 312</td>
<td>4</td>
<td>Soil Mechanics</td>
</tr>
<tr>
<td>CE 337</td>
<td>4</td>
<td>Civil Engineering Materials</td>
</tr>
</tbody>
</table>

Students must complete the following core courses or other courses approved by the advisor as a substitute or supplement:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Credits</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 418</td>
<td>3</td>
<td>Geotechnical Engineering</td>
</tr>
<tr>
<td>CE 485</td>
<td>3</td>
<td>Landfill Design</td>
</tr>
<tr>
<td>CE 812</td>
<td>3</td>
<td>Properties of Soils</td>
</tr>
<tr>
<td>CE 802 &amp; CE 813</td>
<td>3</td>
<td>Soil Dynamics</td>
</tr>
<tr>
<td>CE 815</td>
<td>3</td>
<td>Selected Topics in Geotechnical Engineering (Slope Stability and Stabilization Techniques)</td>
</tr>
<tr>
<td>CE 818</td>
<td>3</td>
<td>Advanced Geotechnical Design</td>
</tr>
</tbody>
</table>

Total Core 18

OPTIONS

Plan A - Thesis Option (approved by MS guidance committee)
- MS thesis 4-6
- Elective courses 6-8

Plan B1 - Project Option (approved by faculty advisor)
- MS Project 3-4
- Elective courses 8-9

Plan B - Coursework Option (approved by faculty advisor)
- Elective courses 12

TOTAL MINIMUM CREDITS 30
Elective Courses

Students need to complete any or all of the elective courses listed below as approved by the advisor. The following list of courses is not comprehensive. Any other courses that may be appropriate for the student's program plan would be considered but need to be approved by the advisor. The elective courses may allow the student to elect courses of interest and also strengthen the student's skills for performing MS thesis or project.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Credits</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 804</td>
<td>3</td>
<td>Advanced Mechanics for Civil Infrastructure</td>
</tr>
<tr>
<td>CE 821</td>
<td>3</td>
<td>Groundwater Hydraulics</td>
</tr>
<tr>
<td>CE 831</td>
<td>3</td>
<td>Advanced Concrete Pavement Analysis and Design</td>
</tr>
<tr>
<td>CE 832</td>
<td>3</td>
<td>Advanced Asphalt Pavement Analysis and Design</td>
</tr>
<tr>
<td>CE 822</td>
<td>3</td>
<td>Groundwater Modeling</td>
</tr>
<tr>
<td>CE 823</td>
<td>3</td>
<td>Stochastic Groundwater Modeling</td>
</tr>
<tr>
<td>GLG 811</td>
<td>3</td>
<td>Advanced Hydrogeology</td>
</tr>
<tr>
<td>ME 872</td>
<td>3</td>
<td>Finite Element Method</td>
</tr>
<tr>
<td>CSS 825</td>
<td>3</td>
<td>Clay Mineralogy and Soil Genesis</td>
</tr>
<tr>
<td>CSS 840</td>
<td>3</td>
<td>Soil Chemistry</td>
</tr>
<tr>
<td>CSS 850</td>
<td>3</td>
<td>Soil Physics</td>
</tr>
</tbody>
</table>
7.2 MS CE - Pavement Engineering

Students wishing to receive an MS degree in civil engineering with an emphasis in pavement engineering must satisfy the college and university requirements, and the requirements outlined below. In general, each student must complete 30 credits while satisfying core requirements with additional electives being taken in a related area depending on interest. Some of the core requirements can be satisfied with equivalent courses taken elsewhere and/or at the undergraduate level.

Preparatory/Undergraduate Core Courses
Although an undergraduate degree in civil engineering is not required as a prerequisite to the program, students who do not have a BS in civil engineering will normally be required to complete those undergraduate courses that provide appropriate background. Required undergraduate preparation would generally include mathematics through differential equations and an introductory course in statistics (e.g., STT 351 at Michigan State) or an equivalent. A course in civil engineering materials (e.g., CE 337 at Michigan State) is also required. While 300 (junior)-level courses cannot count toward the program requirements, a limited number of 400 (senior)-level classes (12 credits) can.

Required Basic/Core Courses (9 credits)
Basic/core courses (9 credits) provide exposure to the various aspects of pavement and highway engineering. Students who have already taken such courses have an increased number of electives that they can take as part of their program.

- CE 431 Pavement Analysis and Design
- CE 432 Pavement Rehabilitation
- CE 449 Highway Design

Students must either take the classes above or show that they have taken equivalent courses in their undergraduate program or in another graduate program.

Required 800-Level Core Courses (9 credits)
In addition to the required courses above (pavement analysis and design, pavement rehabilitation, and highway design), MS students are also required to take nine (9) credits from the following list of courses.

- CE 831 Advanced Concrete Pavement Analysis and Design
- CE 832 Advanced Asphalt Pavement Analysis and Design
- CE 835 Engineering Management of Pavement Networks
- CE 837 Advanced Concrete Materials

While (any) three of the above courses are required, the fourth can also be taken as an elective.
Exemption from Fulfilling Core Course Requirement
An exemption from the core course requirement may be granted to a thesis student with particular professional needs. However, the student's faculty adviser and the MS committee must approve the MS program for such students.

Project or MS Thesis Requirements (3 or more credits)
All students in the MS program who receive financial assistance during their studies through appointments as a teaching or research assistant must complete either a thesis (CE 899) or research project (CE 892). The course-work-only option is available for students who are unsupported throughout the MS program. Unsupported students may elect to undertake a research project or thesis if they so desire. For the project/thesis option, the student is required to form a three-member MS committee. Students electing to take an MS thesis are governed by department and college rules. For the MS project, the student will take a three-five (3-5) credit project (CE 892), prepare a written report, and undertake an oral defense before the MS committee. The student's faculty adviser must approve the topic of the project/thesis.

CE 892  Master's Research Project (3 or more credits)
CE 899  Master's Thesis Research (3 or more credits)

Elective Courses (varies depending on option and prior coursework)
Each student must also choose electives that provide depth in his/her chosen area of specialization within pavement and transportation engineering and/or appropriate breadth. These courses are to be selected in conjunction with and approved by the student's faculty advisor. The number of electives is reduced if the student elects (or is required) to take the project or thesis option for the MS.

Pavement Engineering Electives (6 credits)
MS students must choose courses totaling at least 6 credits from the following list of pavement engineering electives:

CE 802/813  Introduction to Dynamics and Earthquake Engineering/Soil Dynamics
CE 804  Advanced Mechanics for Civil Infrastructure
CE 810  Reliability-Based Design in Civil Engineering
CE 836  Material Science for Civil Engineers

While any three of the four courses below are required core courses (as above), the remaining course can be used as a pavement engineering elective.

CE 831  Advanced Concrete Pavement Analysis and Design
CE 832  Advanced Asphalt Pavement Analysis and Design
CE 835  Engineering Management of Pavement Networks
CE 837  Advanced Concrete Materials
Other Related Electives (6 or more credits)

Other electives can be selected (in consultation with the student's advisor) from the approved list (see list below), from the list of pavement engineering electives (above), or from offerings by other departments. Please note that this is a partial listing—other courses could also be selected depending on student interest and direction. Also note that courses below may have pre-requisites which are not listed.

Civil Engineering (CE)
CE 400  Structural Mechanics
CE 405  Design of Steel Structures
CE 406  Design of Concrete Structures
CE 418  Geotechnical Engineering
CE 444  Traffic Engineering
CE 448  Transportation Planning
CE 471  Construction Engineering – Equipment, Methods and Planning
CE 485  Landfill Design
CE 800  Bridge Design
CE 801  Nonlinear Structural Mechanics
CE 802  Introduction to Dynamics and Earthquake Engineering
CE 803  Structural Dynamics
CE 804  Advanced Mechanics for Civil Infrastructure
CE 805  Advanced Design of Steel Structures
CE 806  Advanced Structural Concrete Design
CE 807  Seismic Structural Design
CE 808  Structural Fire Engineering
CE 809  Advanced Composite Materials and Structures
CE 812  Properties of Soils
CE 813  Soil Dynamics
CE 815  Selected Topics in Geotechnical Engineering
CE 818  Advanced Geotechnical Design
CE 831  Advanced Concrete Pavement Design and Analysis
CE 832  Advanced Asphalt Pavement Design and Analysis
CE 835  Engineering Management of Pavement Networks
CE 836  Materials Science for Civil Engineers
CE 837  Advanced Concrete Materials
CE 860  Advanced Computational Methods for Engineers
CE 861  Introduction to Risk and Reliability
CE 862  Reliability-Based Design
CE 890  Independent Study in Civil Engineering
CE 891  Special Topics in Civil Engineering:
CE 892  Master's Research Project
CE 893  Master's Design Project
CE 899  Master's Thesis
Chemical Engineering (CHE)
CHE 472 Composite Materials Processing
CHE 473 Chemical Engineering Principles in Polymers and Materials Systems

Construction Management Program (CMP)
CMP 810 Construction Systems
CMP 811 Advanced Project Scheduling
CMP 815 Advanced Cost Estimating & Analysis
CMP 817 Construction Project Management & Information Systems
CMP 822 Contracts & Legal Issues in Construction
CMP 831 Lean Construction Principles and Methods
CMP 891-1 Trenchless Technology
CMP 891-2 Smart Growth & Sustainability
CMP 892 CM Research Seminar
PDC 901 Integrated Approach to Planning, Design and Construction
PDC 992 Advanced Research Methods in Planning, Design and Construction

Computer Science and Engineering
CSE 435 Software Engineering
CSE 440 Introduction to Artificial Intelligence
CSE 802 Pattern Recognition and Analysis
CSE 841 Artificial Intelligence
CSE 881 Data Mining
CSE 848 Evolutionary Computation
CSE 885 Artificial Neural Networks

Mathematics (MTH)
MTH 424 Applied Advanced Calculus
MTH 425 Complex Analysis
MTH 441 Ordinary Differential Equations
MTH 442 Partial Differential Equations
MTH 443 Boundary Value Problems for Engineers
MTH 451 Numerical Analysis I
MTH 452 Numerical Analysis II
MTH 841 Boundary Value Problems I
MTH 842 Boundary Value Problems II
MTH 848 Ordinary Differential Equations
MTH 849 Partial Differential Equations
MTH 850 Numerical Analysis I
MTH 851 Numerical Analysis II
MTH 852 Numerical Methods for Ordinary Differential Equations

Materials Science and Engineering (MSE)
MSE 465  Design and Application of Engineering Materials
MSE 851  Thermodynamics of Solids
MSE 855  Advanced Rate Theory and Diffusion
MSE 862  Dislocation Theory
MSE 865  Advanced Theory of Solids
MSE 870  Electron Microscopy in Materials Science
MSE 875  Engineering Ceramics
MSE 876  Advanced Polymeric Materials

Mechanical Engineering (ME)
ME 424  Computational Mechanics
ME 425  Experimental Mechanics
ME 426  Introduction to Composite Materials (ME approval required)
ME 440  Aerospace Engineering Fundamentals
ME 451  Control Systems
ME 465  Computer Aided Optimal Design (ME approval required)
ME 800  Engineering Analysis
ME 820  Continuum Mechanics
ME 821  Linear Elasticity
ME 823  Fracture Mechanics and Fatigue
ME 824  Plasticity
ME 825  Experimental Mechanics
ME 826  Laminated Composite Materials
ME 827  Energy Methods in Mechanics
ME 828  Advanced Strength of Materials
ME 829  Micromechanics of Materials
ME 855  Digital Data Acquisition and Control
ME 860  Theory of Vibrations
ME 863  Nonlinear Vibrations
ME 872  Finite Element Method
ME 875  Optimal Design of Mechanical Systems

Statistics and Probability (STT)
STT 421  Statistics I
STT 422  Statistics II
STT 441  Probability and Statistics I: Probability
STT 442  Probability and Statistics II: Statistics
STT 461  Computations in Probability and Statistics
STT 464  Statistical Methods for Biologists I
STT 465  Statistical Methods for Biologists II
STT 471  Statistics for Quality and Productivity
STT 826  Nonparametric Statistics
STT 841  Linear Statistical Models
STT 843  Multivariate Analysis
STT 844  Time Series Analysis
STT 861  Theory of Probability and Statistics I
STT 862  Theory of Probability and Statistics II
STT 865  Modern Statistical Methods
7.3 MS CE - Structural Engineering, Mechanics and Materials (SEMM)

All students wishing to receive an MS degree in civil engineering with emphasis in the structural engineering, mechanics, and materials (SEMM) area must satisfy the college and university requirements, and the requirements outlined below.

Undergraduate Core Courses
Students who do not have a BS in civil engineering will normally be required to complete those undergraduate courses that provide the required background for an MS degree emphasizing SEMM. Typically remedial courses may be required in computing, calculus and differential equations, introductory structural analysis, soil mechanics and/or civil engineering materials. Only 12 credits of 400 level courses can be used in the MS program. To compensate for deficiencies in the areas noted above, students may be required to complete a limited number of collateral courses in these areas for the MS degree. The requirement for remedial courses will be determined on a case by case basis by the student's adviser.

MS Core Courses
If a student chooses an emphasis in structural engineering, mechanics and materials, and does not have the required background as explained above, the following courses must be completed as collateral:

<table>
<thead>
<tr>
<th>Collateral Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 305 Structural Analysis and Design</td>
</tr>
<tr>
<td>CE 312 Soil Mechanics</td>
</tr>
<tr>
<td>CE 337 Civil Engineering Materials</td>
</tr>
</tbody>
</table>

Students must complete at least one course in each of the following core areas as part of the degree program:

<table>
<thead>
<tr>
<th>Approved Courses in Core Areas</th>
<th>Approved Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Analysis</td>
<td>CE 400</td>
<td>3</td>
</tr>
<tr>
<td>Finite Element Analysis</td>
<td>CE 804 or CE/ME 872</td>
<td>3</td>
</tr>
<tr>
<td>Structural Dynamics</td>
<td>CE 802 &amp; CE 803 or ME 426</td>
<td>3</td>
</tr>
<tr>
<td>Structural Design</td>
<td>CE 805 or CE 806</td>
<td>3</td>
</tr>
<tr>
<td>Structural Materials</td>
<td>CE 836 or CE 837 or CE 809 or ME 426</td>
<td>3</td>
</tr>
<tr>
<td>Statistics and Probability</td>
<td>CE 861 &amp; CE862, or STT 421, or STT 422</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses not listed above may be used to fulfill the core course requirement with the consent of the student's advisor.
In addition to fulfilling core course requirements, all SEMM graduate students are expected to regularly attend the SEMM Seminar Series while enrolled as a graduate student.

**Exemption from Fulfilling Core Course Requirement**

An exemption from the core course requirement may be granted to a thesis student with particular professional needs. However, the student's faculty adviser and the MS committee must approve the MS program for such students.

**Project or MS Thesis Requirements (3 or more credits)**

All students in the MS program who receive financial assistance during their studies through appointments as a teaching or research assistant must complete either a thesis (CE 899) or research project (CE 892). The course-work-only option is available for students who are unsupported throughout the MS program. Unsupported students may elect to undertake a research project or thesis if they so desire. For the project/thesis option, the student is required to form a three-member MS committee. Students electing to take an MS thesis are governed by department and college rules. For the MS project, the student will take a three-five (3-5) credit project (CE 892), prepare a written report, and undertake an oral defense before the MS committee. The student's faculty adviser must approve the topic of the project/thesis.

CE 892 Master's Research Project (3 or more credits)
CE 899 Master's Thesis Research (3 or more credits)

**Related Courses**

A list of courses that are acceptable for inclusion in the MS Program is given below.

Civil Engineering (CE)
CE 400 Structural Mechanics
CE 405 Design of Steel Structures
CE 406 Design of Concrete Structures
CE 418 Geotechnical Engineering
CE 431 Pavement Design and Analysis I
CE 432 Pavement Rehabilitation
CE 444 Traffic Engineering
CE 448 Transportation Planning
CE 449 Highway Design
CE 471 Construction Engineering - Equipment, Methods and Planning
CE 485 Landfill Design
CE 800 Bridge Design
CE 801 Nonlinear Structural Mechanics
CE 802 Introduction to Dynamics and Earthquake Engineering
CE 803 Structural Dynamics
CE 804 Advanced Mechanics for Civil Infrastructure
CE 805  Advanced Design of Steel Structures
CE 806  Advanced Structural Concrete Design
CE 807  Seismic Structural Design
CE 808  Structural Fire Engineering
CE 809  Advanced Composite Materials and Structures
CE 812  Properties of Soils
CE 813  Soil Dynamics
CE 815  Selected Topics in Geotechnical Engineering
CE 818  Advanced Geotechnical Design
CE 831  Advanced Concrete Pavement Design and Analysis
CE 832  Advanced Asphalt Pavement Design and Analysis
CE 835  Engineering Management of Pavement Networks
CE 836  Materials Science for Civil Engineers
CE 837  Advanced Concrete Materials
CE 860  Advanced Computational Methods for Engineers
CE 861  Introduction to Risk and Reliability
CE 862  Reliability-Based Design
CE 890  Independent Study in Civil Engineering
CE 891  Special Topics in Civil Engineering:
CE 892  Master's Research Project
CE 893  Master's Design Project
CE 899  Master's Thesis

Chemical Engineering (CHE)
CHE 472  Composite Materials Processing
CHE 473  Chemical Engineering Principles in Polymers and Materials Systems

Construction Management Program (CMP)
CMP 810  Construction Systems
CMP 811  Advanced Project Scheduling
CMP 815  Advanced Cost Estimating & Analysis
CMP 817  Construction Project Management & Information Systems
CMP 822  Contracts & Legal Issues in Construction
CMP 831  Lean Construction Principles and Methods
CMP 891-1 Trenchless Technology
CMP 891-2 Smart Growth & Sustainability
CMP 892  CM Research Seminar
PDC 901  Integrated Approach to Planning, Design and Construction
PDC 992  Advanced Research Methods in Planning, Design and Construction

Computer Science and Engineering
CSE 435  Software Engineering
CSE 440  Introduction to Artificial Intelligence
CSE 802  Pattern Recognition and Analysis
CSE 841  Artificial Intelligence
CSE 847  Machine Learning
CSE 881  Data Mining
CSE 848  Evolutionary Computation
CSE 885  Artificial Neural Networks

Electrical and Computer Engineering
ECE 402  Applications of Analog Integrated Circuits
ECE 410  VLSI Design (ECE approval required)
ECE 418  Algorithms of Circuit Design (ECE approval required)
ECE 477  Microelectronic Fabrication (ECE approval required)
ECE 813  Advanced VLSI Design
ECE 814  Embedded Wireless RF Transceivers
ECE 821  Advanced Power Electronics and Applications
ECE 831  Analog Circuit Theory
ECE 832  Analog Integrated Circuit Design
ECE 885  Artificial Neural Networks

Mathematics (MTH)
MTH 424  Applied Advanced Calculus
MTH 425  Complex Analysis
MTH 441  Ordinary Differential Equations
MTH 442  Partial Differential Equations
MTH 443  Boundary Value Problems for Engineers
MTH 451  Numerical Analysis I
MTH 452  Numerical Analysis II
MTH 841  Boundary Value Problems I
MTH 842  Boundary Value Problems II
MTH 848  Ordinary Differential Equations
MTH 849  Partial Differential Equations
MTH 850  Numerical Analysis I
MTH 851  Numerical Analysis II
MTH 852  Numerical Methods for Ordinary Differential Equations

Materials Science and Engineering (MSE)
MSE 465  Design and Application of Engineering Materials
MSE 851  Thermodynamics of Solids
MSE 855  Advanced Rate Theory and Diffusion
MSE 862  Dislocation Theory
MSE 865  Advanced Theory of Solids
MSE 870  Electron Microscopy in Materials Science
MSE 875  Engineering Ceramics
MSE 876  Advanced Polymeric Materials
**Mechanical Engineering (ME)**
- ME 424 Computational Mechanics
- ME 425 Experimental Mechanics
- ME 426 Introduction to Composite Materials (ME approval required)
- ME 440 Aerospace Engineering Fundamentals
- ME 451 Control Systems
- ME 465 Computer Aided Optimal Design (ME approval required)
- ME 800 Engineering Analysis
- ME 820 Continuum Mechanics
- ME 821 Linear Elasticity
- ME 823 Fracture Mechanics and Fatigue
- ME 824 Plasticity
- ME 825 Experimental Mechanics
- ME 826 Laminated Composite Materials
- ME 827 Energy Methods in Mechanics
- ME 828 Advanced Strength of Materials
- ME 829 Micromechanics of Materials
- ME 855 Digital Data Acquisition and Control
- ME 860 Theory of Vibrations
- ME 863 Nonlinear Vibrations
- ME 872 Finite Element Method
- ME 875 Optimal Design of Mechanical Systems

**Statistics and Probability (STT)**
- STT 421 Statistics I
- STT 422 Statistics II
- STT 441 Probability and Statistics I: Probability
- STT 442 Probability and Statistics II: Statistics
- STT 461 Computations in Probability and Statistics
- STT 464 Statistical Methods for Biologists I
- STT 465 Statistical Methods for Biologists II
- STT 471 Statistics for Quality and Productivity
- STT 826 Nonparametric Statistics
- STT 841 Linear Statistical Models
- STT 843 Multivariate Analysis
- STT 844 Time Series Analysis
- STT 861 Theory of Probability and Statistics I
- STT 862 Theory of Probability and Statistics II
- STT 865 Modern Statistical Methods
7.4 MS CE - Water Resources

All students wishing to receive an MS degree in civil engineering with emphasis in water resources must satisfy the college and university requirements, and the requirements outlined below.

**Undergraduate Core Courses**

Students who do not have a BS in civil engineering will normally be required to complete those undergraduate courses which provide the required background for an MS degree emphasizing the water resources area. Remedial courses may be required in computing, calculus and differential equations, engineering hydrology (CE421) or applied hydraulics (CE422. Only 12 credits of 400-level courses can be used in the MS program. The requirement for remedial courses will be determined on a case-by-case basis by the student's adviser.

**MS Core Courses**

With the consent of the faculty advisor and the MS committee, the student must develop a coherent, individualized program. The program must expose the student to the core courses in the areas of groundwater and surface water hydrology and related areas as shown in the list of courses in Table 1.

**Table 1. Courses in water resources and related disciplines.**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
<th>Summer</th>
<th>Fall</th>
<th>Spring</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 321</td>
<td>Introduction to Fluid Mechanics</td>
<td>4</td>
<td>Y</td>
<td>Y</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>CE421</td>
<td>Engineering Hydrology</td>
<td>3</td>
<td>Y</td>
<td></td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>CE422</td>
<td>Applied Hydraulics</td>
<td>3</td>
<td></td>
<td>Y</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>CE390</td>
<td>Numerical Analysis</td>
<td>3</td>
<td></td>
<td></td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>ENE 801</td>
<td>Dynamics of Environmental Systems</td>
<td>3</td>
<td>Y</td>
<td></td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>CE829</td>
<td>Mixing and Transport in Surface Waters</td>
<td>3</td>
<td>Y</td>
<td></td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>CE821</td>
<td>Groundwater Hydraulics</td>
<td>3</td>
<td>Y</td>
<td></td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>CE822</td>
<td>Groundwater Modeling</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1. (Cont’d.) Courses in water resources and related disciplines.

<table>
<thead>
<tr>
<th>Recommended Electives</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CE823 Stochastic Groundwater Modeling</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE891 Advanced Hydrologic Modeling</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Electives</th>
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<tr>
<td>ME840 Computational Fluid Dynamics and Heat Transfer</td>
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<td>ME 941 Advanced Computational Fluid Dynamics and Heat Transfer</td>
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<td>ME 830 Fluid Mechanics I</td>
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<td>ME 832 Fluid Mechanics II</td>
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<td>CHE822 Advanced Transport Phenomena</td>
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<td>GLG 411 Hydrogeology</td>
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<td>GLG412 Glacial Geology and the Record of Climate Change</td>
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<td>GEO306 Environmental Geomorphology</td>
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<td>CE 812 Properties of Soil</td>
<td>3</td>
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<td>CSS NEW Vadose Zone Hydrology</td>
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<td>FOR810 Forest Hydrology</td>
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<td>BE481 Land and Water Conservation Engineering</td>
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<td>RD452 Watershed Concepts</td>
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<td>MTH 451 Numerical Analysis I</td>
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<td>STT 844 Time Series Analysis</td>
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<td>O</td>
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<td>ME 872 Finite Element Methods</td>
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<td>STT 886 Stochastic Processes and Applications</td>
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<td>GEO 325 Geographic Information Systems</td>
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PART II – DOCTOR OF PHILOSOPHY PROGRAM IN CIVIL ENGINEERING (Ph.D. CE)

8. PROGRAM OVERVIEW

8.1 The Ph.D. Degree and the practice of Civil Engineering

A Ph.D. degree in Civil Engineering opens doors that are not otherwise accessible. These opportunities include research positions at corporations and national laboratories as well as teaching and research positions in academia. A career at this level brings the satisfaction of being able to explore your own ideas and fully utilize your creativity. A graduate degree will allow you to expand your knowledge and acquire new skills in analysis and problem solving, creating challenging opportunities for a full, rewarding career.

First and foremost among the talents required to succeed in a graduate program is a desire to learn, coupled with a natural curiosity and a desire to advance the state-of-the-art. Graduate students are motivated by the enhanced independence that an advanced degree brings and the challenge of placing oneself at the forefront of technology.

8.2 A road map to your degree

The typical path toward a doctorate degree in Civil Engineering at Michigan State University is as follows:

- Gain admission to the program. For most of our admitted students, financial aid is provided in the form of a graduate assistantship.
- You will be assigned an academic advisor based on your interests. If you receive a R.A., then your academic advisor will be the faculty member providing your R.A. support. Your advisor will be a member of the Department faculty and will serve as the chairperson of your doctoral guidance committee. If you find that you wish to change advisors, you are free to do so unless your advisor is providing you with a research assistantship on a specific project. If you are supported as a R.A., but there are extenuating situations that necessitate changing advisors, you should meet with your current advisor as soon as you decide this is necessary. As part of this meeting, you should plan to discuss how you will fulfill the obligations of your research assistantship. After meeting with your advisor, you should also meet with the graduate coordinator and your perspective advisor as soon as possible and complete the Change of Advisor form.
- Pass the doctoral qualifying examination at the beginning of the second semester in the program. Current master’s students transferring to the Ph.D. should take the qualifying examination prior to starting the Ph.D. or during the first semester in the
Ph.D. Details about the qualifying examination can be found in Section 9.5. and Chapter 11.

- Choose your committee after passing the Qualifying Examination.
- Design a program of coursework with your guidance committee. The Program of Study should be submitted to the Graduate Coordinator before the end of your second semester, if you passed the Qualifying Examination in your second semester. If you require an extra semester to pass the Qualifying Examination, you have until the end of the semester in which you pass your Qualifying Exam to submit the Program of Study, but no later than the end of your third semester. (Summer semesters do not count).
- Pass the comprehensive examinations, including a successful presentation of a dissertation proposal. This is done when coursework is finished, or substantially finished.
- Complete your research, write your dissertation, and defend it in an oral examination. Historically, the civil and environmental engineering doctoral programs at MSU require an average of approximately three to four years (beyond the M.S. degree) to finish.

8.3 Student participation

The Department’s graduate degree programs have certain course requirements as outlined in detail in section 3 of this handbook. However, graduate students in the Department quickly discover that their education is advanced in a number of ways beyond traditional coursework. One of the major opportunities is the chance to work side by side with faculty members who are deeply interested in finding answers to research problems. All doctoral students are involved in dissertation research and are expected to demonstrate mastery of the subject matter at various levels by passing a qualifying exam and a comprehensive exam. They also develop a dissertation proposal and present the results of their research in a dissertation defense. Students are encouraged to participate in professional society meetings and to publish their research results in society journals, transactions, and conference proceedings.

Graduate students also have the opportunity to participate in academic governance at the College, and University level. At the College level, graduate students have representation on the Engineering College Advisory Council and on the Engineering Research and Graduate Studies Committee. At the University level, graduate students are selected and have voting membership on the University Graduate Council, Academic Council, and other such committees as specified by the University Bylaws for Academic governance.
9. DEGREE REQUIREMENTS

9.1 The Doctor of Philosophy Degree

The Doctor of Philosophy degree consists of (1) prescribed course work, (2) a qualifying examination, (3) a comprehensive examination, (4) research, (5) a dissertation, and (6) a final oral examination. Each student working toward a Doctor of Philosophy must conduct research upon which a dissertation that makes a significant contribution to knowledge is prepared and published. All Ph.D. students must have at least one paper ready for submission to a peer-review scholarly journal as a condition for graduation. At a minimum, the paper must be reviewed and approved by the student’s dissertation committee. The research is to be under the direction of and acceptable to the doctoral guidance committee.

The courses prescribed by the student’s guidance committee are listed on the student’s College of Engineering Doctoral Degree Program Plan, which is signed by the student, members of the guidance committee, the Department chairperson, and the Dean. Further information about the required coursework is in section 3 of the handbook, and further information about the guidance committee formation is in section 5 of the handbook. The final oral examination is described in section 6.

9.2 Meeting Provisional Admission and Collateral Course Requirements

The discipline diversity in the field of Civil Engineering leads to a student body with diverse backgrounds, and students are sometimes admitted under provisional status, and there may be collateral course requirements (courses that must be completed, but do not count toward the required number of course credits). These decisions are made on the basis of submitted course materials, and should be considered preliminary, based on our best estimate of your preparation for the M.S. program. Regardless of the type of admission, you will discuss your background and interests in your first meeting with your advisor, and he/she may suggest additional preparation as a part of your Ph.D. program.

International students who are admitted provisionally with a requirement for additional English language testing or coursework must address this before the start of their first semester. The English Language Center will administer the tests and provide requirements to your advisor for any language courses you will need as well as guidance on an appropriate first-semester academic load.

If you are admitted with other provisional requirements, you should make sure your advisor is aware of them and you should discuss how to address them early in your program. The provisional status will be changed to regular status when the conditions
specified on the admission form have been met, as determined by the Associate Chair for Graduate Studies and approved by the Associate Dean for Graduate Studies.

9.3 Overview of Ph.D. Degree Requirements

The Doctor of Philosophy degree consists of prescribed course work, a qualifying examination, a comprehensive examination, research, journal paper submission, a dissertation, and a final oral examination. Each student working toward a Doctor of Philosophy must conduct research upon which a dissertation that makes a significant contribution to knowledge is prepared and published. The research is to be under the direction of and acceptable to the doctoral guidance committee.

**Doctoral guidance committee.** Each graduate student admitted to the doctoral program must form a guidance committee in consultation with the adviser. The Associate Chair for Graduate Studies and Research must approve the guidance committee. Section 5 of the handbook provides additional information regarding the guidance committee.

**Course credit requirements.** The doctoral program must minimally include twenty-four (24) dissertation credits (CE/ENE 999). Additional coursework may be required as determined by the guidance committee.

**Transfer credits.** The guidance committee may, in considering the department doctoral course credit requirements, count courses taken in graduate programs at other institutions of similar quality if they are appropriate to the student's program and provided they were completed within the time limits approved for earning the degree. Such courses must be documented for department records and the documentation must be included with the doctoral plan of study. It is not necessary to formally transfer such credits and they are not listed on the College of Engineering Doctoral Degree Program Plan. Instead, such courses are listed on the department's Supplement to the Report of the Guidance Committee. This supplement should also list graduate courses taken in other graduate degree programs at MSU that the guidance committee wishes to count toward the department's doctoral course credit requirements.

**Doctoral program filing.** The student's program of study shall be submitted as a guidance committee report for approval to the department and to the dean by no later than the end of the student's second semester of enrollment in the doctoral program, assuming that the student passed the qualifying examination in the first or second semester of their Ph.D. study. If the student did not pass the qualifying examination on the first attempt, an extra semester is allotted for completion of the qualifying examination and submission of the Program of Study. The subject material and the instructor must be specified for any selected topics course that is included in the student's program of study.
Please see Appendix 3 for guidelines that you may use in planning your doctoral program. When you are ready to file your program, go to the on-line graduate tracking system at https://www.egr.msu.edu/apps/gts2 to complete your program. The graduate secretary will pre-approve your program and generate the form for appropriate signatures.

**Modifications to the doctoral program.** None of the following types of changes will be allowed in the student's approved program of study:

1. Adding or deleting a course for which a grade has already been assigned under any of the three grading systems (numerical, Pass-No Grade, or Credit-No Credit).
2. Adding or deleting a course for which grading was postponed by the use of the DF-Deferred marker.
3. Adding or deleting a course which the student dropped after the middle of the semester and for which “W” or “N” or “0.0” was designated.
4. Adding or deleting a course during the final semester of enrollment in the master's degree program.

**Full time status.** Full time status for doctoral students is defined as a minimum of 1 credit for those students who:

   a. Have successfully completed all comprehensive examinations and are actively engaged in dissertation research; or
   b. Are doing department-approved off-campus fieldwork related to preparation of their dissertation.

All students defending their thesis or dissertations in the Summer need to be registered for at least one credit during that Summer, regardless of their being enrolled in the preceding Spring semester.

**DF-Deferred grades:** The required work must be completed and a grade reported within 6 months with the option of a single six-month extension. If the required work is not completed within the time limit, the DF will become U-Unfinished and will be changed to DF/U under the numerical and Pass-No Grade (P-N) grading systems, and to DF/NC under the Credit-No Credit (CR-NC) system. This rule does not apply to graduate thesis or dissertation work.

Receipt of externally funded fellowships by students who have written their own grant applications and worth at least $20,000 (direct costs) now makes the students eligible for in-state tuition rate. The in-state tuition rate applies only to the semesters during which the student is supported by the fellowship. This policy applies only to grants funded through a competitive process by a US institution/agency/foundation. Funds obtained through non-competitive processes (e.g., need-based fellowships) or from international sources do not qualify the students for in-state tuition rates. For more information contact Melissa Del Rio (mdelrio@msu.edu) in 110 Linton Hall.
9.4 Prescribed Course Work

Ph.D. students are required to take a minimum of 12 credits of coursework beyond the M.S. degree. The required courses will depend upon the student's academic background in relation to the selected research specialization. The guidance committee will prescribe courses to ensure that the student has a comprehensive knowledge of a major research field and related subjects. Students may not include courses on their Doctoral Program Plan that have been counted toward the M.S. degree.

9.5 The Ph.D. Qualifying Examination

The intent of the Ph.D. qualifying examination (the exam) is to assess a student's potential for successfully completing doctoral-level studies and research in the Department.

The Departmental Qualifying Examination is the first of three examinations that the Ph.D. student is required to pass. The Qualifying Examination is usually taken at the beginning of the second semester in the program. Current master's students transferring to the Ph.D. should take the qualifying examination prior to starting the Ph.D. or during the first semester in their Ph.D. program. The exam is administered by an Examining Committee composed of least three faculty members from the student's research area. Since the student's advisor must approve the examination areas, students are advised to seek such approval well before their expected examination date, preferably while planning their graduate studies. Students must complete an application to take the qualifying exam at least one month prior to taking the exam. Although students are not required to take particular courses in preparation for the departmental examination, the scope of the scholastic examination is associated with a set of MSU graduate courses. It is the candidate's responsibility to review syllabi, and/or discuss course content with faculty experienced in teaching courses in the areas selected for examination, in order to develop an understanding of the level of knowledge expected in the examination. See Chapter 11 for specific requirements concerning the qualifying exam in each area.

Passing the qualifying examination shall require:

a. Satisfactory performance on the written examination (if any)
b. Satisfactory performance on the oral examination (if any)

Evaluation of the qualifying examination. The Committee will consider all of the information available, including an interview with the student to clarify unresolved issues, and render one of the following decisions:

a. The student passes the exam and, except for identified deficiencies for which the Committee will prescribe a remedy, the student is encouraged to finish all remaining requirements at the earliest possible time.
b. The student fails the exam but is given permission to repeat a portion or all of it after certain conditions are met.
c. The student fails the exam and is asked to withdraw from the program.

Repeats of qualifying examination. At the discretion of the Examining Committee, an individual may be permitted to repeat the examination once.

Communicating the outcome of the exam. Results of the exam will be communicated to students by their lead advisor. When multiple students take the exam during the same period, results will be communicated at the end of the examination period.

Appeals of the evaluation. A student may appeal the Examining Committee's decision. Such an appeal must be made in writing to the Associate Chair for Graduate Studies and Research. The written appeal must contain explicit reasons for requesting that the review be conducted. The appeal must be filed within two weeks from the date the student is notified of the Examining Committee's decision.

Time limit. If a student leaves the graduate program after passing the qualifying examination and then wishes to reenter the doctoral program at a later date, a pass is considered valid for up to 5 years from the time the examination is taken.

9.6 Doctoral Comprehensive Examination

The objectives of the Ph.D. comprehensive examinations are to: (a) identify the student's proposed areas of doctoral research; (b) assess the adequacy of the student's general preparation for the proposed research area and related fields and possibly recommend areas for additional study; and (c) review and evaluate the content and style of the thesis proposal and the student's ability to present the ideas orally.

The general guidelines for the Ph.D. comprehensive exam are listed below. Additional requirements for the Ph.D. program in Environmental Engineering are included in Appendix 3.

Schedule of the comprehensive examination. When the prescribed course work is substantially complete as defined by the Guidance Committee, the doctoral student is eligible to take the comprehensive examination. A student must be registered during the semester that the comprehensive exam is administered. The comprehensive examination must be taken at least six months before the Ph.D. dissertation is defended.

The written portion (research proposal) of the comprehensive examination must be submitted to the faculty advisor by the date agreed upon by the faculty advisor and the
student. Failure to submit the proposal in a timely manner will result in the student failing the comprehensive examination.

Once the faculty advisor approves the proposal, the student must submit copies of the proposal to the examiners for evaluation at least two weeks prior to the scheduled exam.

On the scheduled exam date the student will present his/her proposal orally to the examining committee. A decision of whether the student passes or fails the comprehensive exam will be made at the end of the questioning period that follows the presentation.

Passing the comprehensive examination shall require:

   b. A satisfactory written thesis proposal.

Evaluation criteria for the comprehensive examination. The Committee will consider all of the information available, including an interview with the student to clarify unresolved issues, and render one of the following decisions:

   a. The student passes the exam and is encouraged to finish all remaining requirements at the earliest possible time.
   b. The student passes the exam and, except for identified deficiencies for which the Committee will prescribe a remedy. The student is encouraged to finish all remaining requirements at the earliest possible time.
   c. The student fails the exam but is given permission to repeat a portion or the entire exam after certain conditions are met.
   d. The student fails the exam and is asked to withdraw from the program.

Passing the comprehensive examination requires approval of at least two thirds of the student’s guidance committee. A written evaluation must be provided.

Appeals of the comprehensive examination evaluation: A student may appeal the Guidance Committee's decision. Such an appeal must be made in writing and directed to the Department Chairperson. The written appeal must contain explicit reasons for requesting that the review be conducted. The appeal must be filed within two weeks from the date the student is notified of the Guidance Committee's decision.

Once the comprehensive examination is completed, the faculty advisor should submit the Record of the Comprehensive Examinations for Doctoral Degree to the examiners for their signature and further processing.
Should the degree requirements not be completed within the eight-year time limitation, the comprehensive examination must be retaken.

After having successfully completed the comprehensive written and oral exams, the minimum enrollment for doctoral students is one credit and the student is considered a Ph.D. Candidate.

For students who were enrolled in the Spring semester and are taking their comprehensive exams during the immediate Summer semester, the department can request a waiver of the requirement that the student be enrolled for at least one credit the semester of the comprehensive exam. These requests are to be directed to the Graduate School and must be endorsed by the student’s department and college.

9.7 Doctoral research

Each student working toward a Doctor of Philosophy must conduct research upon which a dissertation that makes a significant contribution to knowledge is prepared and published. The research is to be under the direction of and acceptable to the doctoral guidance committee.

9.8 Doctoral dissertation

An approved thesis/dissertation that is accepted by the graduate school becomes a single-author publication and contributes to the body of knowledge of civil and environmental engineering. Again, for more information, please see section 6 of this handbook.

9.9 Final Examination – Dissertation Defense

The graduate student will present the results of the dissertation research in a seminar open to the community. The guidance committee evaluates the seminar and defense of the thesis. For more information, see section 6 of this handbook. The student should arrange the examination time and place with the graduate secretary at least two weeks in advance, and provide her with the dissertation title and abstract. The Graduate Secretary will publicize the defense at least one week in advance of the examination date.
10. THE GRADUATE ADVISOR

Graduate education, research, and creative activities take place within a community of scholars where constructive relationships between graduate students and their advisors and mentors are essential for the promotion of excellence in graduate education and for adherence to the highest standards of scholarship, ethics, and professional integrity. Initiation and successful completion of independent research requires early and continued advice and oversight by a faculty advisor.

For students in the civil engineering doctoral graduate program, the faculty advisor is the guidance committee chairperson as well as the academic advisor. That faculty member is the ‘major professor’ for the student. Faculty advisors must be members of the civil & environmental engineering faculty, appointed at the level of Assistant Professor or higher.

10.1 Advisor Assignment and Selection Process

At the time of admission into the program, all students are assigned an advisor. Doctoral Students who are admitted to the civil engineering graduate program with a research assistantship that is provided by a particular faculty member will be assigned to that faculty member as their academic advisor and thesis/dissertation advisor. Other students may be admitted with a graduate assistantship or fellowship that is from general funds or third-party funds and not explicitly tied to a particular faculty member. In those cases, the selection of an advisor is based on mutual research interests, but the student is free to change advisors, if the student and advisor mutually agree that the change would be beneficial. A common reason to switch advisors is that the student is more interested in the research done by another faculty member than that of the advisor to which he/she was assigned.

The Department’s policy is to establish that there is interest from at least one faculty member in advising the applicant prior to sending a letter of admission. When more than one faculty member has expressed interest in serving as academic advisor to a student who was admitted with an assistantship or fellowship from general funds or third parties, the student should select an advisor within the time frame described in the previous section. A listing of faculty is provided in Appendix I. Current research projects are described on the Departmental webpage (www.egr.msu.edu/cee)
10.2 Time Line for Selection of a Permanent Faculty Advisor

All students in the civil engineering graduate program must have a faculty advisor. Doctoral students must select a permanent advisor prior to the completion of two semesters (See Section 8.2).

10.3 Roles and Responsibilities of the Advisor

The role of the advisor includes the following:

- Ensuring that graduate students receive information about requirements and policies of the graduate program.
- Advising graduate students on developing a program plan, including appropriate course work, research or creative activity, and on available resources.
- Advising graduate students on the selection of a thesis or dissertation topic with realistic prospects for successful completion within an appropriate time frame and on the formation of a guidance committee.
- Providing training and oversight in creative activities, research rigor, theoretical and technical aspects of the thesis or dissertation research, and in professional integrity.
- Encouraging graduate students to stay abreast of the literature and cutting-edge ideas in the field.
- Helping graduate students to develop professional skills in writing reports, papers, and grant proposals, making professional presentations, establishing professional networks, interviewing, and evaluating manuscripts and papers.
- Providing regular feedback on the progress of graduate students toward degree completion, including feedback on research or creative activities, course work, and teaching, and constructive criticism if the progress does not meet expectations.
- Helping graduate students develop into successful professionals and colleagues, including encouraging students to participate and disseminate results of research or creative activities in the appropriate scholarly or public forums.
- Facilitating career development, including advising graduate students on appropriate job and career options, as well as on the preparation of application materials for appropriate fellowship, scholarship, and other relevant opportunities.
- Writing letters of reference for appropriate fellowship, scholarship, award, and job opportunities.
- Providing for supervision and advising of graduate students when the faculty advisor is on leave or extended absence.
10.4 Roles and responsibilities of the student

The student also has responsibilities in the advisor/student relationship. These include the following:

- Learning and adhering to University and academic unit rules, procedures, and policies applicable to graduate study and research or creative activities, including those outlined in the publications *Academic Programs, Graduate Student Rights and Responsibilities*, and *Academic Freedom for Students at MSU*.
- Meeting University and academic unit requirements for degree completion.
- Forming a guidance committee that meets University requirements as well as requirements that are outlined in the Graduate Handbook of the academic unit.
- Following disciplinary and scholarly codes of ethics in course work, thesis or dissertation research, and in creative activities.
- Practicing uncompromising honesty and integrity according to University and federal guidelines in collecting and maintaining data.
- Seeking regulatory approval for research in the early stages of thesis or dissertation work where applicable.
- Keeping the faculty advisor and guidance committee apprised on a regular basis of the progress toward completion of the thesis or dissertation.

10.5 Roles and responsibility of the department

Once a permanent thesis/dissertation advisor is selected, it is unusual to change advisors. However, if a situation arises where a change seems imperative, the student should consult with the Department’s graduate coordinator who will facilitate changes of faculty advisor. The procedures for changing M.S. and Ph.D. advisors are described in Sections 1.4.1 and 1.4.2, respectively.

Should the student’s advisor leave MSU, it is the department chair’s responsibility to facilitate arrangements that allow the student to successfully complete his/her degree program.
11. AREA-SPECIFIC Ph.D. QUALIFYING EXAM STANDARDS AND GUIDELINES

11.1 Pavement Engineering

All students interested in pursuing a Ph.D. degree within the pavement engineering area must take and pass the qualifying examination as described herein. The examining committee is to be composed of four faculty members, three of whom must be in student's field of study.

The guidelines for the two parts of the examination are as follows:

Scholastic Evaluation Component

- The student must satisfy a breath of knowledge pertaining to two of the areas of (a) materials, (b) analysis and (c) design, by identifying and being examined on four approved graduate courses in these areas with at least one course from each of the selected areas.
- The student's advisor and the qualifying examination coordinator for the TPE area must approve the selected courses; therefore students are advised to seek such approval well before their expected examination date, preferably while planning their graduate studies.
- Although students are not required to take particular courses in preparation for the departmental examination, the scope of the examination is associated with MSU graduate courses or their equivalents.
- Example courses for each focus area are:
  - Materials
    - CE 812 – Properties of Soils
    - CE 836 – Materials Science for Civil Engineers
    - CE 837 – Advanced Concrete Materials
  - Analysis
    - CE 802/813 – Soil Dynamics
    - CE 804 – Advanced Mechanics for Civil Infrastructure
    - CE 831 – Advanced Concrete Pavement Analysis and Design
    - CE 832 – Advanced Asphalt Pavement Analysis and Design
    - ME 872 – Finite Element Method
  - Design
    - CE 810 – Reliability-Based Design in Civil Engineering
    - CE 818 – Advanced Geotechnical Design
    - CE 831 – Advanced Concrete Pavement Analysis and Design
    - CE 832 – Advanced Asphalt Pavement Analysis and Design
    - CE 835 – Engineering Management of Pavement Networks
• A candidate who plans to be examined without taking the selected focus area graduate courses can develop a sense of the level of knowledge expected to be demonstrated during the examination by studying the appropriate syllabi and/or discussing the course content with faculty experienced in teaching the courses involved.

Research Potential Component
• The student must demonstrate independent research ability through the preparation of a short research paper on two areas.
• Two research topic questions will be prepared by two faculty members in the committee and provided to the student 3 weeks prior to the oral examination date (scholastic evaluation component).
• The student should provide a copy of the research papers to each of the committee members at least one week before the examination date (scholastic evaluation component).
• All members in the committee will evaluate the research paper.
• The student will be examined on this part by review of the submitted paper and by oral examination during the scholastic evaluation component exam at the discretion of the committee.

At the discretion of the committee, the student may be allowed to retake the qualifying examination once at a date specified by the committee.
11.2 Structural Engineering, Mechanics and Materials

All students interested in pursuing a Ph.D. degree within the Structural Engineering, Mechanics and Materials (SEMM) area must take and pass the qualifying examination as described herein. The Examining Committee will be composed of four faculty members, three of whom must be in student’s field of study.

The guidelines for the two parts of the examination are described below.

Scholastic Evaluation Component

- The student must satisfy a breath of knowledge pertaining to two focus areas within the student’s field of research by identifying and being examined on four approved graduate courses in these areas, with at least one course from each of the selected areas.
- The student’s advisor and the qualifying examination coordinator for the SEMM area must approve the selected courses. Therefore students are advised to seek such approval well before their expected examination date, preferably while planning their graduate studies.
- Although students are not required to take particular courses in preparation for the examination, the scope of the examination is associated with MSU graduate courses or their equivalents. The student is responsible for becoming acquainted with the courses they have chosen for examination by consulting with MSU faculty on the content and/or syllabi for those courses.
- Example courses for SEMM traditional focus areas are:

  o Materials
    - CE 809 – Advanced Composite Materials and Structures
    - CE 812 – Properties of Soils
    - CE 836 – Materials Science for Civil Engineers
    - CE 837 – Advanced Concrete Materials
    - ME 426 – Introduction to Composite Materials
    - ME 826 – Laminated Composite Materials

  o Mechanics
    - ME 820 – Continuum Mechanics
    - ME 821 – Linear Elasticity
    - ME 823 – Fracture Mechanics and Fatigue
    - ME 824 – Plasticity
    - ME 825 – Experimental Mechanics
    - ME 828 – Advanced Strength of Materials
• A student may also define, take, and be examined on a course sequence in an emerging area, such as advanced materials, sensing technology, nanotechnology, etc. Course sequences in emerging areas need to be defined by the student in consultation with the advisor.
• A candidate who plans to be examined without taking the selected graduate courses at MSU should review syllabi, and/or discuss course content with faculty experienced in teaching the courses, in order to develop an understanding of the level of knowledge expected in the examination.

Research Potential Component
• The student must demonstrate the ability for critical thinking by reviewing a research paper and answering questions posed by the Examination Committee.
• The student should provide a copy of the written response to each member of the Examination Committee members.
• All members in the Examination Committee will evaluate the written response.
• The student may be examined orally on this part during the scholastic evaluation component exam at the discretion of the committee.

At the discretion of the Examination Committee, the student may be allowed to retake the qualifying examination once at a date specified by the committee.
11.3 Transportation Engineering

The Departmental Qualifying Examination is the first of three examinations that a doctoral candidate is required to pass to complete the Ph.D. degree. The exam may be taken toward the end of an M.S. degree, prior to seeking admission to the Ph.D. program, or within the first two semesters of full-time graduate study in the Ph.D. program. This examination is intended to determine the candidate's ability to successfully pursue a research project at a level appropriate for the doctorate. The examination will be used to evaluate the student in two distinct areas: (1) knowledge pertaining to the student's field of study and (2) the student's independent research abilities.

The Transportation Engineering Qualifying Examination consists of both a written and an oral component. It is administered by three faculty members in the transportation engineering group. The written examination will be a treatise on a topic assigned by the faculty and will provide the basis to assess the student's ability to formulate a hypothesis and design an experiment to test the hypothesis. This treatise will be reviewed by all members of the examining committee. The oral exam will follow completion of the written component and will be conducted by all three members of the examining committee. Although students are not required to take particular courses in preparation for the oral examination, the scope of the examination will be associated with several of the transportation graduate courses offered by the department. The candidate can develop a sense of the level of knowledge expected to be demonstrated during the examination by studying the appropriate syllabi and/or discussing the course content with faculty experienced in teaching the courses.

At the discretion of the committee, the student may be allowed to retake the qualifying examination once, at a date specified by the committee.
11.4 Water Resources

All students admitted to the Ph.D. program in Environmental Hydrology must take and pass the qualifying examination as described herein. The objective of qualifying exam is to assess the student's scholastic aptitude and his/her ability to conduct independent research.

The examining committee must be set up and the exam must be administered in the first year of a student's Ph.D. program. The committee must consist of at least three tenure-stream faculty members, all of whom will normally be faculty in the Department of Civil and Environmental Engineering. Examination topics are drawn from areas in environmental hydrology (e.g., groundwater and surface water hydrology, applied hydraulics, computational methods, conceptual modeling etc.).

The qualifying exam will be focused on critical thinking skills associated with the student's research interests. The examination will be individually formulated and may include an assessment of the student's ability to critique a research paper or proposal, analyze data, and/or formulate a hypothesis and design an experiment to test that hypothesis. Each examiner, in collaboration with the student's advisor, will write and submit one or more questions to the student's advisor. The student's advisor, serving as examination coordinator, will compile the questions and administer the exam to the student. The student must complete the exam within three weeks after receipt from his/her major advisor. The student will provide a sufficient number of copies of the completed examination to his/her advisor for distribution to the committee. Within two weeks after completing the exam, the student will meet with his/her examining committee for an oral exam, which will focus on, but not be limited to, the written questions and answers. To pass the exam, the committee must unanimously agree that the student has both the scholastic aptitude and ability to conduct independent research at the doctoral level. The results of the exam will be determined in a meeting without the student present immediately following the oral exam.

At the discretion of the committee, the student may retake the qualifying exam once, but not in the same semester and before completion of the student's third semester in the program.
12. FORMATION OF THE GUIDANCE COMMITTEE

Each graduate student admitted to the doctoral program has the responsibility to form a guidance committee with the approval and the assistance of the student’s advisor, and the approval of the Department chairperson. The guidance committee should consist of at least four Michigan State University regular faculty members, including the committee chairperson. The committee chairperson is also the student’s academic advisor. At least two members of the guidance committee shall be from the Civil & Environmental Engineering Department and a least one member shall be from a different academic Department at Michigan State University. Please see the MSU Academic Programs publication for additional information regarding definition of regular faculty.

Persons who are not MSU regular faculty may serve as an additional committee member (e.g., a fifth member) provided that the number of such persons does not exceed the number of regular faculty. An exception may be granted by the dean of the graduate school to allow a non-tenure stream faculty member or an academic specialist to serve on your doctoral guidance or dissertation committee as one of the four required faculty members or as the chairperson of your doctoral guidance or dissertation committee.

An emeritus faculty member may serve as one of the four MSU regular faculty members on your doctoral guidance committee, with the approval of the department chairperson. In addition, an emeritus faculty member may continue to serve as chairperson of your doctoral guidance committee.

The responsibilities of the guidance committee include the following:

- Advising graduate students on course work, research, or creative activities.
- Providing, at least annually, feedback and guidance concerning progress toward the degree.
- Administering the comprehensive exams and the final oral defense in a fair and professional manner.
- Reviewing the thesis or dissertation in a timely, constructive and critical manner.
- Committee chairpersons on leave shall provide for the necessary guidance of their advisees during their absence.
13. DISSERTATION DEFENSE AND FINAL ORAL EXAMINATION

13.1 Nature and Scope of the Dissertation

The final doctoral examination is the culmination of a student’s graduate education and training and reflects not only the accomplishments of the graduate student but also on the quality of the graduate program. An approved dissertation that is accepted by the graduate school becomes a single-author publication and contributes to the body of knowledge of the civil engineering discipline.

13.2 Examination regulations and format

The graduate student will present the results of the dissertation in a seminar open to the community. The student should arrange a suitable examination date after consulting with the thesis advisor and members of the examination committee. The student should also arrange for a suitable room in which to hold the seminar by consulting with the office staff of the Civil & Environmental Engineering Department. This should be done in communication with the Department graduate secretary, who will arrange for announcement of the upcoming defense. The student should also ensure that all necessary computer equipment, such as a laptop and data projector, are available.

The following regulations apply:

- The final oral examination must be scheduled for a date not earlier than two weeks after the dissertation and abstract have been submitted to the chairperson of the guidance committee, other guidance committee members, and any appointed examiner.
- The student must be registered during the semester in which the final oral examination is taken.
- The dissertation and the student’s performance on the final oral examinations must be approved by a positive vote of at least three-fourths of the voting examiners and with not more than one dissenting vote from among the Michigan State University regular faculty members of the guidance committee.

The following format is typical of the final oral examination. The examining committee members may or may not choose to meet before the exam to discuss the procedure. The candidate presents the results in seminar fashion and responds to questions and comments from those in attendance. After the general audience has had opportunity to raise questions and comments, they are excused from the room and the defense continues with only the examining committee. At the end of the examination, the student is asked to step out of the room, and the examining committee members each indicate in writing a pass or fail grade. The student is then asked to reenter the room to receive the
result of the final examination. A summary report of the examination result is submitted to
the Dean of Engineering and the Chairperson of the Department.

13.3 Doctor of Philosophy Degree Examining Committee

The doctoral final oral examination committee consists of the student’s guidance
commitee. According to University policy, at the discretion of the Dean of Engineering,
the guidance committee may be augmented by one appointed faculty member. Other
interested faculty members may attend the examination without vote.
14. ACADEMIC PERFORMANCE

14.1 Academic Standards for the M.S. Program

**Grades.** The student must earn a grade of 2.0 or higher in each course in the approved program of study. The student must repeat any course for which the grade earned was below 2.0.

**Cumulative Grade-Point Average.** The student must maintain a cumulative grade–point average of at least 3.0 in the courses in the approved program of study.

**Probationary Status.** A student is placed on probationary status if the student's cumulative grade–point average for the courses in the approved program of study is below 3.0. A student in probationary status is not allowed to carry more than 7 credits per semester or to enroll in any course for which the primary focus is independent study. Unfunded international M.S. students who are placed on probationary status will be required to petition the Graduate School, with permission from their advisor, the department, and their College, for approval to enroll in an additional two credits, for a total of nine credits to meet visa requirements set by the Department of Homeland Security.

**Retention and Dismissal from the Master’s Program.**
- Should a student's cumulative grade–point average fall below 3.0 after having completed 16 or more credits in courses in the approved program of study, the student may be enrolled in probationary status in the master's degree program for one additional semester. If at the end of the additional semester the student's cumulative grade–point average is 3.0 or higher, the student may continue to enroll in the master's degree program. If at the end of the additional semester the student's cumulative grade–point average is still below 3.0, the student will be dismissed from the program.
- Each student's academic progress and professional potential are evaluated by March 15 of each year. A student who in the judgment of the faculty is making satisfactory academic progress and has professional potential may continue to enroll in the master's degree program, provided the grade point average is within the acceptable range as previously described. A student who in the judgment of the faculty is not making satisfactory academic progress or lacks professional potential will be notified in writing by his/her faculty advisor, that he/she will be placed on a six-month probationary period. Unless deficiencies are corrected within this six-month period, the student will be dismissed from the program.
14.2 Academic standards for the Ph.D. Program

Grades. The student must earn a grade of 2.0 or higher in each course in the approved guidance committee report, including collateral courses and courses accepted in transfer or used as part of the minimal number of doctoral credits. The student must repeat any course for which the grade earned was below 2.0.

Cumulative Grade–Point Average. The student must maintain a cumulative grade–point average of at least 3.0 in the courses in the approved guidance committee.

Probationary Status. A student is placed on probationary status if the student's cumulative grade–point average for the courses in the approved program of study is below 3.0.

Retention and Dismissal from the Doctoral Program.

• Should a student's cumulative grade–point average fall below 3.0 after having completed half of the courses in the approved guidance committee report, the student may be enrolled in probationary status in the doctoral degree program for one additional semester. If at the end of the additional semester the student's cumulative grade–point average is 3.0 or higher, the student may continue to enroll in the doctoral degree program. If at the end of the additional semester the student's cumulative grade–point average is still below 3.0, the student will be dismissed from the program.

• Should a student accumulate more than 3 deferred grades in courses other than those courses the primary focus of which is independent study, the student may be enrolled on probationary status in the doctoral program for one additional semester. If at the end of the additional semester the student has no more than 3 deferred grades, the student may continue to enroll in the doctoral degree program. If at the end of the additional semester, the student still has more than 3 deferred grades, the student will be dismissed from the program.

• Each student’s academic progress and professional potential are evaluated by March 15 of each year. A student who in the judgment of the faculty is making satisfactory academic progress and has professional potential may continue to enroll in the doctoral degree program, provided the grade point average and number of courses with deferred grades is within the acceptable range as previously described. A student who in the judgment of the faculty is not making satisfactory academic progress or lacks professional potential will be notified in writing by his/her faculty advisor, that he/she will be placed on a six-month probationary period. Unless deficiencies are corrected within this six-month period, the student will be dismissed from the program.

Note that the grading procedure for the qualifying examinations and the comprehensive examinations, and the policy for repeats of this examination are described in section 2 of this handbook.
14.3 Academic Hearing Grievance Procedures

Students are encouraged to address problems relating their academic performance by first speaking informally with their advisor. This may be followed by presenting the issue to the ENE Program Director, the Department Chairperson, and the Associate Dean for Graduate Studies, generally in this order. If the problem can not be resolved informally, students’ rights and responsibilities, including grievance procedures are detailed in the Academic Freedom for Students at Michigan State University. Procedures more specifically designed for graduate students may be found in the publication Graduate Student Rights and Responsibilities. Grievance procedures outlined in these documents shall be followed and the Engineering College Advisory Council, guided by the Associate Dean for Graduate Studies, shall be responsible for interpretation of these rules.

14.4 Student Records

The Department maintains an academic record for student's that is kept on file until 5 years after graduation. Graduate students have the right to inspect any of their own educational records, barring confidential letters of recommendation, including their official transcript. Students also shall have the right to inspect reports and evaluations of his or her academic performance.

Students can challenge the accuracy of their student file. To do so, they must write a memo stating their perspective, which will be inserted into their file.

A typical inventory of the Department record is as follows.

- College of Engineering Master's Plans and Doctoral Plans.
- Guidance Committee reports.
- Results of qualifying examinations, comprehensive examinations, and final oral examinations.
- Grade reports from the Office of the Registrar.
- Annual evaluation forms.
- Other forms filed by the student or on behalf of the student.
- Items from the student's application for admission, including transcripts, test scores, and reference letters.

The Department maintains a separate personnel file for teaching assistants, as prescribed by the GEU/MSU contract (http://grad.msu.edu/geu/agree.pdf).
14.4 Student Awards

There are a number of awards given to graduate students at MSU, including two departmental awards – the Outstanding CE and Outstanding ENE Graduate Student Awards. Students majoring in Civil Engineering degree programs (M.S. and Ph.D.) are eligible for the Outstanding CE Award. Students enrolled in Environmental Engineering degree programs (M.S. and Ph.D.) are eligible for the Outstanding ENE Award. A student can receive this award only once in his/her career at MSU.

The criteria for this award are 1) manuscripts published or accepted in journals, 2) manuscripts published in proceedings, 3) manuscripts submitted to journals, 4) GPA (in order of importance). If all else is equal, the Graduate Studies Committee will evaluate the broader impact of the student on the department. This includes participation in student groups and assisting other students.

Nominations for these awards are made by a faculty member and submitted in mid-January to the Department Chair. The nomination packet consists of a letter of endorsement from the student’s faculty advisor and the student’s curriculum vitae.
15. INTEGRITY AND SAFETY IN RESEARCH AND CREATIVE ACTIVITIES

15.1 The MSU perspective

Each graduate student shall have the document Guidelines for Integrity in Research and Creative Ideas. See section 1.5 for access to this document. The conduct of research and creative activities by faculty, staff, and students is central to the mission of Michigan State University and is an institutional priority. Faculty, staff, and students work in a rich and competitive environment for the common purpose of learning, creating new knowledge, and disseminating information and ideas for the benefit of their peers and the general public. The stature and reputation of MSU as a research university are based on the commitment of its faculty, staff, and students to excellence in scholarly and creative activities and to the highest standards of professional integrity.

As a partner in scholarly endeavors, MSU is committed to creating an environment that promotes ethical conduct and integrity in research and creative activities. Innovative ideas and advances in research and creative activities have the potential to generate professional and public recognition and, in some instances, commercial interest and financial gain. In rare cases, such benefits may become motivating factors to violate professional ethics. Pressures to publish, to obtain research grants, or to complete academic requirements may also lead to an erosion of professional integrity.

Breaches in professional ethics range from questionable research practices to misconduct. The primary responsibility for adhering to professional standards lies with the individual scholar. It is, however, also the responsibility of advisors and of the disciplinary community at large. Passive acceptance of improper practices lowers inhibitions to violate professional ethics.

Integrity in research and creative activities is based not only on sound disciplinary practice but also on a commitment to basic personal values such as fairness, equity, honesty, and respect. These guidelines are intended to promote high professional standards by everyone — faculty, staff, and students alike.

15.2 Key Principles

Integrity in research and creative activities embodies a range of practices that includes:

- Honesty in proposing, performing, and reporting research
- Recognition of prior work
- Confidentiality in peer review
- Disclosure of potential conflicts of interest
- Compliance with institutional and sponsor requirements
- Protection of human subjects and humane care of animals in the conduct of...
research.
  • Collegiality in scholarly interactions and sharing
  • Adherence to fair and open relationships between senior scholars and their coworkers

Honesty in proposing, performing, and reporting research. The foundation underlying all research is uncompromising honesty in presenting one's own ideas in research proposals, in performing one's research, and in reporting one's data. Detailed and accurate records of primary data must be kept as unalterable documentation of one's research and must be available for scrutiny and critique. It is expected that researchers will always be truthful and explicit in disclosing what was done, how it was done, and what results were obtained. To this end, research aims, methods, and outcomes must be described in sufficient detail such that others can judge the quality of what is reported and can reproduce the data. Results from valid observations and tests that run counter to expectations must be reported along with supportive data.

Recognition of prior work. Research proposals, original research, and creative endeavors often build on one's own work and also on the work of others. Both published and unpublished work must always be properly credited. Reporting the work of others as if it were one's own is plagiarism. Graduate advisors and members of guidance committees have a unique role in guiding the independent research and creative activities of students. Information learned through private discussions or committee meetings should be respected as proprietary and accorded the same protection granted to information obtained in any peer review process.

Confidentiality in peer review. Critical and impartial review by respected disciplinary peers is the foundation for important decisions in the evaluation of internal and external funding requests, allocation of resources, publication of research results, granting of awards, and in other scholarly decisions. The peer-review process involves the sharing of information for scholarly assessment on behalf of the larger disciplinary community. The integrity of this process depends on confidentiality until the information is released to the public. Therefore, the contents of research proposals, of manuscripts submitted for publication, and of other scholarly documents under review should be considered privileged information not to be shared with others, including students and staff, without explicit permission by the authority requesting the review. Ideas and results learned through the peer-review process should not be made use of prior to their presentation in a public forum or their release through publication.

Disclosure of potential conflicts of interest. There is real or perceived conflict of interest when a researcher has material or personal interest that could compromise the integrity of the scholarship. It is, therefore, imperative that potential conflicts of interest be considered and acted upon appropriately by the researcher. Some federal sponsors require the University to implement formal conflict of interest policies. It is the responsibility of all researchers to be aware of and comply with such requirements.
Compliance with institutional and sponsor requirements. Investigators are granted broad freedoms in making decisions concerning their research. These decisions are, however, still guided, and in some cases limited, by the laws, regulations, and procedures that have been established by the University and sponsors of research to protect the integrity of the research process and the uses of the information developed for the common good. Although the legal agreement underlying the funding of a sponsored project is a matter between the sponsor and the University, the primary responsibility for management of a sponsored project rests with the principal investigator and his or her academic unit.

Protection of human subjects and humane care of animals in the conduct of research. Research techniques must not violate established professional ethics or federal and state requirements pertaining to the health, safety, privacy, and protection of human beings, or to the welfare of animal subjects. Whereas it is the responsibility of faculty to assist students and staff in complying with such requirements, it is the responsibility of all researchers to be aware of and to comply with such requirements.

Collegiality in scholarly interactions and sharing of resources. Collegiality in scholarly interactions, including open communications and sharing of resources, facilitates progress in research and creative activities for the good of the community. At the same time, it has to be understood that scholars who first report important findings are both recognized for their discovery and afforded intellectual property rights that permit discretion in the use and sharing of their discoveries and inventions. Balancing openness and protecting the intellectual property rights of individuals and the institution will always be a challenge for the community. Once the results of research or creative activities have been published or otherwise communicated to the public, scholars are expected to share materials and information on methodologies with their colleagues according to the tradition of their discipline.

Faculty advisors have a particular responsibility to respect and protect the intellectual property rights of their advisees. A clear understanding must be reached during the course of the project on who will be entitled to continue what part of the overall research program after the advisee leaves for an independent position. Faculty advisors should also strive to protect junior scholars from abuses by others who have gained knowledge of the junior scholar’s results during the mentoring process, for example, as members of guidance committees.

Adherence to fair and open relationships between senior scholars and their coworkers. The relationship between senior scholars and their coworkers should be based on mutual respect, trust, honesty, fairness in the assignment of effort and credit, open communications, and accountability. The principles that will be used to establish authorship and ordering of authors on presentations of results must be communicated early and clearly to all coworkers. These principles should be determined objectively
according to the standards of the discipline, with the understanding that such standards may not be the same as those used to assign credit for contributions to intellectual property. It is the responsibility of the faculty to protect the freedom to publish results of research and creative activities. The University has affirmed the right of its scholars for first publication except for “exigencies of national defense”. It is also the responsibility of the faculty to recognize and balance their dual roles as investigators and advisors in interacting with graduate students of their group, especially when a student’s efforts do not contribute directly to the completion of his or her degree requirements.

15.3 Misconduct in Research and Creative Activities

Federal and University policies define misconduct to include fabrication (making up data and recording or reporting them), falsification (manipulating research materials, equipment or processes, or changing or omitting data such that the research is not accurately represented in the record), and plagiarism (appropriation of another person’s ideas, processes, results, or words without giving appropriate credit). Serious or continuing non-compliance with government regulations pertaining to research may constitute misconduct as well. University policy also defines retaliation against whistle blowers as misconduct. Misconduct does not include honest errors or honest differences of opinion in the interpretation or judgment of data.

The University views misconduct to be the most egregious violation of standards of integrity and as grounds for disciplinary action, including the termination of employment of faculty and staff, dismissal of students, and revocation of degrees. It is the responsibility of faculty, staff, and students alike to understand the University’s policy on misconduct in research and creative activities, to report perceived acts of misconduct of which they have direct knowledge to the University Intellectual Integrity Officer, and to protect the rights and privacy of individuals making such reports in good faith.

15.4 Research involving human subjects

The University Committee on Research Involving Human Subjects (UCRIHS) is an Institutional Review Board (IRB). Federal regulations and University policy require that all research projects involving human subjects and materials of human origin be reviewed and approved by an IRB before initiation. Research is defined as “a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge”. The “generalizable knowledge” criteria may include developing publications/papers, theses/dissertations, making public presentations, etc. A human subject of research is a) a living individual from whom an investigator obtains data by interaction or intervention or b) identifiable private information.
All research involving human subjects and/or data collected from living human subjects (including preexisting data) is subject to UCRIHS review. Instructions for applying for approval are available at the following web site. (http://www.humanresearch.msu.edu/applications/Initial_Application_Instructions.pdf).

15.5 Research involving animals

The use of vertebrate animals in research, teaching, and outreach activities is subject to state and federal laws and guidelines. University policy specifies that: all vertebrate animals under University care (that is, involved in projects under the aegis or sponsorship of the University) will be treated humanely; prior to their inception, all vertebrate animal projects receive approval by the All University Committee on Animal Use and Care (AUCAUC); Michigan State University (MSU) will comply with state and federal regulations regarding vertebrate animal use and care.

Responsibility for assuring compliance with state and federal regulations belongs to the Vice President for Research and Graduate Studies. The Vice President has designated the Assistant Vice President for Research and Graduate Studies to be the "Institutional Official" as defined in federal regulations.

The AUCAUC works closely with the Institutional Official, and has responsibility and authority under federal law for specific actions.

University Laboratory Animal Resources (ULAR), which reports to the Vice President for Research and Graduate Studies, provides a comprehensive program of animal care for all laboratory animal colonies, as well as training for researchers. ULAR also participates in developing institutional policies designed to insure humane treatment of vertebrate animals and to assist investigators in maintaining high quality care of animals used in MSU projects.

An animal use form (AUF) must be submitted to the AUCAUC for review prior to the start of the project, regardless of the source of funding for the project. The AUF can be obtained from the AUCAUC office; the completed form will include descriptions of experimental protocols, plans for animal care, available facilities, and any other matters relevant to the project. Some granting agencies require review and approval of the AUF before a grant application will be processed. An agency-approved grant will not be accepted by the Board of Trustees, nor will an account number be assigned, unless the AUF has been approved by the AUCAUC. For an animal use application form contact: Candy Flynn at 432-4151, email flynnnc@msu.edu
15.6 Office of Radiation Chemical and Biological Safety (ORCBS)

The use of hazardous materials in research, teaching, and outreach activities is subject to state and federal laws and guidelines. The Vice President for Research and Graduate Studies has been assigned responsibility to see that appropriate practices are followed where hazardous materials are involved, to maintain a safe environment for campus personnel, to protect the surrounding community, and to assure that MSU meets its obligations under the law.

Oversight of activities involving hazardous substances is provided by the ORCBS. ORCBS is assisted by faculty committees in the areas of radiation safety, chemical safety, and biological safety. The Radiation Safety Committee has responsibility and authority under federal law for specific actions.

It is University policy that faculty members and principal investigators (PIs) are responsible for the day-to-day safety and well-being of all personnel engaged in activities under their aegis. Administrative officers, and ORCBS, are responsible for making available to faculty information needed to maintain a safe working environment, for providing safety training, for keeping project directors informed about changes in regulations, and for assaying laboratories and work areas for radiation, chemical, or biological hazards.

All individuals who work with hazardous substances must accept shared responsibility for operating in a safe manner once they have been informed (a) about the extent of risk and (b) about safe procedures that should be followed.

The ORCBS provides live and on-line training classes throughout the year to educate the employees and students of Michigan State University on safe work practices. Completion of these courses by MSU personnel ensures that the university is fulfilling local, state and federal requirements in radiation, chemical, biological, hazardous waste, and environmental safety.

Your training requirements will depend on your specific job duties. Some general guidelines are listed below:

- Required for all laboratory employees engaging in the use of hazardous chemicals (and supervisors of the employees): Chemical Hygiene and Laboratory Safety; Hazardous Waste Refresher (required annually after completion of Chemical Hygiene & Laboratory Safety course) and Security Awareness.

- Required for all employees working with radiation: Radiation Safety Initial; Radiation Safety Refresher (required annually following completion of the Radiation Safety Initial course).
• Required for **all employees with a reasonable anticipated risk of exposure to blood-borne pathogens/human blood/bodily fluids**: Blood-borne Pathogen Initial; Blood-borne Pathogen Refresher; (required annually following completion of the Blood-borne Pathogen Initial course)

If you would like assistance determining which courses you should complete, please contact the ORCBS at 355-0153.
16. STUDENT CONDUCT AND CONFLICT RESOLUTION

16.1 Student Conduct

The University expects student conduct and behavior to reflect qualities of good citizenship. The out-of-classroom activities of Michigan State University students should reflect favorably upon the institution and should indicate the personal integrity of the individual. See Spartan Life: Student Handbook and Resource Guide for specific policies, ordinances and regulations that define some of the relevant University expectations.

16.2 Conflict Resolution

Conflicts involving a graduate student may be handled informally or, at the request of a party or parties, formally. Student’s rights and responsibilities, including grievance procedures, are detailed in the document: Academic Freedom for Students at Michigan State University. Procedures more specifically designed for graduate students are to be found in the publication Graduate Student Rights and Responsibilities. Grievance procedures outlined in these documents shall be followed and the CEE Advisory Committee shall be responsible for the interpretation and execution of these procedures in the College.

Setting Expectations and Resolving Conflicts - a program for graduate students and faculty to develop skills in conflict resolution, can be found at the following website: www.msu.edu/user/gradsch/conflict.htm.
17. WORK RELATED POLICIES

17.1 Overview

This section provides current and prospective graduate students in civil & environmental engineering with information regarding work related policies, information regarding financial support, and information regarding tuition and fees. Financial support for graduate students takes different forms and might include one or more of the following: a fellowship, a research assistantship, or a teaching assistantship. Specific awards change with time to reflect changes in tuition, fees, and the general cost of living. The Department of Civil & Environmental Engineering has a number of fellowships and assistantships available for qualified graduate students. Applicants for admission into either the M.S. (with thesis/project) or Ph.D. programs in civil & environmental engineering are automatically considered for financial support. Admission to the Ph.D. is linked to the availability of such support.

Sources of financial support include the University itself, the College of Engineering, the Department of Civil & Environmental Engineering, and off-campus organizations in both the public and private sector. Qualifications for receiving specific types of aid vary depending upon the funding source. Some financial aid packages place certain restrictions/responsibilities upon the recipient. For example, a half-time graduate assistantship would require the recipient to perform an average of twenty (20) hours per week of duties in service on the average to the University during the appointment period.

Many financial-support packages require that the student make satisfactory progress toward completing a degree of study. The Department's criteria for satisfactory academic progress includes: course credits completed per semester, the nature of these courses, the grades received, successful completion of required qualifying/comprehensive examinations, and progress in completing M.S. or Ph.D. dissertation research. In addition to satisfactory progress toward completing the degree, continuation of graduate support would depend upon the following: the recipient has performed the assigned duties satisfactorily; past level of support and total number of semesters of support; the availability of funds to continue the current level of financial assistance; the needs of the Department for the particular services for which the recipient is qualified to perform. When resources for financial aid are limited and the demand of aid exceeds the amount of funds available, continuation of financial aid for an individual will depend upon merit relative to others requesting aid and the needs of the Department to fulfill its overall mission of teaching, research and outreach.

Receipt of externally funded fellowships by students who have written their own grant applications and worth at least $20,000 (direct costs) makes the students eligible for in-state tuition rate. The in-state tuition rate applies only to the semesters during which the student is supported by the fellowship. This policy applies only to grants funded
through a competitive process by a US institution/agency/foundation. Funds obtained through non-competitive processes (e.g., need-based fellowships) or from international sources do not qualify the students for in-state tuition rates. For more information contact Melissa Del Rio (mdelrio@msu.edu) in 110 Linton Hall.

17.2 Teaching Assistantship Selection Criteria

In considering the assignment of CEE Teaching Assistantships, the Graduate Admissions, Recruitment and Financial Aid Committee has adopted a set of criteria as a guideline for selecting applicants for TA positions. These are intended to support the Department's teaching mission and research mission. The ranked criteria for TA appointment decisions are:

1. Those students to whom the Department has a prior commitment to provide support, such as students who have received recruitment offers upon admission or who have received a multi-year support offer.
2. New Ph.D. students with outstanding research potential and current Ph.D. students actively involved in research who do not have a research assistantship, fellowship, or like support. This would be considered an unusual and time limited situation because the normal expectation is that a doctoral student would have a research assistantship or other non-TA support. Appointments would usually be limited to no more than a year unless there were extenuating circumstances.
3. M.S. students doing a thesis who do not have a research assistantship, fellowship, or like support.

Academic performance and qualifications to teach a particular course will also be considered in TA appointment decisions. For students for whom English is not the official language of their home country, a minimum score of 50 on the SPEAK/TSE test is required. Please note that ETS has been rapidly phasing out the Test of Spoken English (TSE). Although MSU still accepts TSE scores as an alternative to the SPEAK test, the score report cannot have been issued more than two years prior to the student’s appointment as a TA. Also note that the spoken section of TOEFL does not substitute for the SPEAK test.

17.3 Research Assistantship Selection Criteria

Research assistants are generally selected from among the graduate student body and from among qualified applicants by individual faculty members. Research assistants are often selected to work on a specific research project or projects for which the faculty member has funding. Often, but not necessarily always, the work is related to the thesis work of the student. Renewal of research assistantships is based on satisfactory performance and availability of funds.
17.4 The Graduate Employees Union (GEU)

Teaching assistants should be aware of their rights and responsibilities under the current version of the contract between MSU and the GEU. You may obtain the agreement, and other information about the GEU, at the web site http://grad.msu.edu/geu/agree.pdf.

17.5 University Graduate Assistantship Policies

Graduate Assistants (including research assistants and teaching assistants) are available only to graduate students who are making satisfactory progress toward their degrees, including maintaining at least a 3.00 grade point average. Graduate assistants are appointed on a quarter-time, half-time, or three-quarter time basis. The academic year encompasses two appointment periods – August 16 – December 31 and January 1 – May 15. Summer appointments cover the period from May 16 – August 15. During each appointment period a graduate assistant’s duties to the University require an average of:

- 10 hours per week for a quarter-time stipend.
- 20 hours per week for a half-time stipend.
- 30 hours per week for a three-quarter time stipend.

The student is expected to be available during the appointment period. Any absences, including for attendance of professional meetings, must be arranged with the supervising faculty member and the Department.

Graduate assistants must be registered each semester in which they hold assistantships. For quarter-time appointments, the minimum enrollment is 6 credits for master’s degree students and 3 credits for doctoral students prior to completion of the comprehensive examination (including credits in 899 and 999) and the maximum enrollment is 16 credits (excluding credits in 899 or 999). For half-time appointments, the minimum enrollment is 6 credits for master’s degree students and 3 credits for doctoral students prior to completion of the comprehensive examination (including credits in 899 and 999) and the maximum enrollment is 12 credits (excluding credits in 899 or 999). For three-quarter time appointments, the minimum enrollment is 6 credits for master’s degree students and 3 credits for doctoral students prior to completion of the comprehensive examination (including credits in 899 and 999) and the maximum enrollment is 12 credits (excluding credits in 899 or 999). The minimum enrollment for doctoral students who have successfully completed all comprehensive examinations is 1 credit for all graduate assistantship levels.
International students should also be aware of minimum credit enrollments to satisfy visa requirements. The MSU Office of International Students and Scholars is an important resource of information in this regard.

17.6 Graduate Assistants Covered by the GEU

For GEU covered assistantships, please see the current MSU/GEU agreement for information regarding stipends, tuition and fee benefits, and health insurance coverage. Teaching Assistants will be provided with the required training that is specific to the assigned course at the start of Fall and Spring semesters, as well as throughout the semester as necessary.

17.7 Graduate Assistants not covered by the GEU

The information listed below is subject to yearly change. Please consult The Graduate School home page for the latest information at http://www.grad.msu.edu.

Stipends. Checks are distributed on a biweekly schedule (every two weeks-on a Friday). For fall semester 2009, the biweekly stipend for level-one assistantships is approximately $385 (monthly is $840) and $770 (monthly is $1,678) for ¼ time and ½ time appointments, respectively. For a level-two assistantship (requires a year of assistantship experience) the biweekly stipend is approximately $435 (monthly is $948) and $870 (monthly is $1,896) for ¼ time and ½ time appointments, respectively. Level-three teaching assistantships require six semesters of experience (including summers) and a Master’s degree or equivalent (minimum of 30 credits); the stipends for level 3 appointments are currently the same as for level 2.

Tuition and fee benefits. Even though the graduate student does not enroll for 10 credits or more, benefits include the following:

1. Tuition waiver in the amount of 9 credits for Fall semester, 9 credits for Spring semester, and 5 credits for summer session. The tuition waiver will be provided during the period of the assistantship, to a maximum of 23 credits per year.

2. Exemption from out-of-state resident tuition. This exemption applies to a summer session that precedes or follows an appointment for an entire academic year, regardless of whether the student was previously enrolled at MSU. If the student does not have a signed graduate assistantship form before registering for summer session, he or she will pay out-of-state resident course fees and tuition. Upon receiving a copy of the appointment form for the entire academic year through the middle of the semester of the subsequent fall semester, the Office of the Registrar will refund the full amount of out-of-state tuition that the student paid for the summer session.

3. Matriculation and infrastructure/technology support fees are waived.
Health Insurance. Graduate assistants (domestic and international) are automatically enrolled in a health insurance plan, the premium of which is paid by the University. The plan provides the following coverage:

a. Fall appointment only: coverage from August 15 to February 14 of the following year.

b. Fall and Spring appointments—coverage from August 15 to August 14 of the following year.

c. Spring appointment only—coverage from January 1 to August 14.

d. Summer appointment only—coverage from May 15 to August 14. Enrolled students may also insure their eligible spouse and/or dependent children (residing with the insured). For questions regarding coverage, enrollment or premium payment, contact The Chickering Group directly at 1-800-859-8452.

For questions concerning waiver processing or general information, contact the MSU Benefits office at (517) 353-4434 (Nisbet Building), East Lansing, MI 48823 and on the web: www.hr.msu.edu/depts/benefits; for the MSU Benefits Office and www.chickering.com for the Chickering Group.

17.8 Use of Department facilities and supplies

Graduate students in the civil engineering programs are provided with a campus mailbox in the Engineering Building. Graduate students in the environmental, fluids, and geoenviromental engineering programs are provided with a campus mailbox in the Research Complex-Engineering. All students have access to computer systems under the supervision of the Division of Engineering Computing Services (DECS), and server storage and email accounts, also via DECS. Most graduate students find it well worth their while to purchase their own personal computer, to supplement the services provided by DECS. Graduate assistants are provided with office space and telephone access for local and campus calls. Copy machines are available in the Engineering Library with a customary charge per page. Teaching assistants may have material copied that is required for their teaching duties by the office copying machine without charge, up to a per-semester allotment.

17.9 Fees and Rates

For current information regarding fees and rates associated with enrolling in the Graduate Programs in Civil & Environmental Engineering, please see the “Online Calculator” for Tuition, Fees, and Housing Calculator at the web site http://www.ctlr.msu.edu/studrec/
17.10 Outside work for pay

The assistantship represents an obligation for the student to perform various duties of benefit to the department in return for financial assistance. It is assumed that these duties in combination with the normal course of studies will amount to a full-time load.

Outside work for graduate assistants is discouraged. Before beginning outside employment the assistant should discuss with the assistantship supervisor the outside employment and how the assistantship obligations will be fulfilled.

17.11 Traveling Abroad

Students traveling abroad should visit the “Travel Smart” website (http://grad.msu.edu/travel/) before their trip. When students appointed as TAs or RAs travel outside the U.S. to conduct required thesis or dissertation research or to collaborate with investigators conducting research abroad, the department or research grant supporting the work will pay for all needed vaccinations and or medications (e.g., anti-malarials) as determined by the MSU Travel Clinic. Students may include those costs in applications for funds from the Research Enhancement or Travel Grant programs administered by the Graduate School.
18 UNIVERSITY RESOURCES

18.1 The University

Michigan State University has been advancing knowledge and transforming lives through innovative teaching, research, and outreach for nearly 150 years. It is known worldwide as a major public university with global reach and extraordinary impact. Its 14 degree-granting colleges and affiliated private law school offer 200 programs of study. They attract scholars worldwide who are interested in combining education with practical problem solving.

Students from all 83 counties in Michigan, all 50 states in the United States, and about 125 other countries are represented in the student body of 44,452 students (fall, 2003). There are approximately 4,500 faculty and academic staff, and approximately 6,000 support staff employees. Library resources include a research collection of approximately 4.5 million volumes housed in the main library and nine branch libraries across campus. More than 500 registered student organizations include honoraries; professional organizations and professional fraternities and sororities; recreational and athletic groups; and international, racial/ethnic, religious, academic interest area, political, social service, volunteer, and media organizations.

In Fall semester, 2003, there were 9,689 students in graduate and professional programs of study. The Graduate School at MSU provides programs that serve all graduate students, including a variety of free workshops throughout the year. The Council of Graduate Students represents all registered MSU graduate and graduate-professional students. The Graduate Employee’s Union represents Teaching Assistants.

18.2 The College

Michigan State University’s Engineering College offers graduate programs through 6 academic Departments: Biosystems Engineering, Chemical Engineering and Materials Science, Civil and Environmental Engineering, Computer Science and Engineering, Electrical and Computer Engineering, and Mechanical Engineering. The college houses many research centers and laboratories, which vigorously promote the interdisciplinary collaboration of its faculty members with each other, and with other university Departments, other universities, and the general public.

A $34.5 million addition and renovation in 1989 provided 167,000 square feet of space for laboratories, classrooms, offices, and the engineering library. The Engineering Building, constructed in 1962, underwent a $14-million, 46,000-square-foot addition in 1997, accommodating the Herbert H. and Grace A. Dow Institute for Materials Research, one of the premier facilities in the world for the study of composite materials.
Other facilities include the Engineering Facility at the MSU Research Complex; the Jolly Road Research Facility; the Automotive Research Experiment Station located in the Hulet Road Research Facility; and the Advanced Materials Engineering Experiment Station in Midland, Michigan.

18.3 The Department

The civil & environmental engineering graduate program has approximately 100 students, of which about 50% are doctoral students and 50% are master's students. The graduate students work in close relationship with the 23 faculty in the Civil & Environmental Engineering Department in a strong and growing research program. Typically, about 15 graduate courses are offered in an academic year, with an average class size of 10 students. We invite you to visit the Department's home web page at http://www.egr.msu.edu/cee/ to learn more about the Department, including the current events.

18.4 The campus

Campus cultural and other special centers include the Wharton Center for Performing Arts, Kresge Art Museum, MSU Museum, Kellogg Center, Abrams Planetarium, WKAR-AM/FM public radio, and WKAR public television. Sports devotees can follow the performance of any of the 25 men's and women's intercollegiate teams on campus. Those wishing to participate in athletics can take advantage of any of the many facilities available. These include gymnasiums for basketball and racquet sports, an indoor ice-skating rink, five swimming pools, a number of outdoor tennis courts, and two 18-hole golf courses. The intramural sports program is one of the largest in the nation.

The campus has been called "an academic park" and the beautiful gardens and landscaping are testimony to many generations of careful stewardship. The 5,200 acres, located three miles east of Michigan’s Capitol in Lansing, represent a unique blend of the traditional and the innovative and is adjacent to its college town, East Lansing. The Red Cedar River traverses the campus and offers opportunities for lively activities such as canoe races or quiet reflection for those who wish to walk or study along it tree-lined shores.

18.5 The Lansing community

The greater Lansing area, with a population of approximately a half-million, boasts a fine symphony orchestra which performs at the Wharton Center; several dance and theater groups, art galleries; the state capitol building, museums, state and local libraries; an
arboretum, a zoo, a variety of parks, and a number of restaurants to suit most pocketbooks and tastes.

Graduate students in need of a change of scene can take the train to Chicago from East Lansing or drive an hour or two to Ann Arbor, Grand Rapids, or Detroit. In addition, day or weekend jaunts can be made to such attractions as Greenfield Village and the Henry Ford Museum, the Irish Hills, the Kellogg Biological Station, numerous National and State Forests in both the lower and upper peninsulas, Lake Michigan and Lake Huron beaches and parks, and Mackinac Island. Recreational activities in Michigan are highlighted by water sports in the summer months and skiing in winter.
## List of Tenure-stream Faculty Advisors

<table>
<thead>
<tr>
<th>Name (Specialty area)</th>
<th>Room</th>
<th>Phone</th>
<th>e-mail address</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Geotechnical and Geoenvironmental Engineering</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baladi, Gilbert (geotechnical)</td>
<td>3553 EB</td>
<td>355-5147</td>
<td><a href="mailto:baladi@egr.msu.edu">baladi@egr.msu.edu</a></td>
</tr>
<tr>
<td>Chatti, Karim (geotechnical)</td>
<td>3557 EB</td>
<td>355-6534</td>
<td><a href="mailto:chatti@egr.msu.edu">chatti@egr.msu.edu</a></td>
</tr>
<tr>
<td>Khire, Milind (geotechnical, geoenvironmental)</td>
<td>A135 ERC</td>
<td>432-3130</td>
<td><a href="mailto:khire@egr.msu.edu">khire@egr.msu.edu</a></td>
</tr>
<tr>
<td>Kutay, Muhammed (geotechnical)</td>
<td>3554 EB</td>
<td>353-9297</td>
<td></td>
</tr>
<tr>
<td>Wolff, Thomas (geotechnical)</td>
<td>1410C EB</td>
<td>355-5128</td>
<td><a href="mailto:woff@egr.msu.edu">woff@egr.msu.edu</a></td>
</tr>
<tr>
<td><strong>Pavement and Transportation Engineering</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baladi, Gilbert (pavements)</td>
<td>3553 EB</td>
<td>355-5147</td>
<td><a href="mailto:baladi@egr.msu.edu">baladi@egr.msu.edu</a></td>
</tr>
<tr>
<td>Buch, Neeraj (pavements)</td>
<td>3556 EB</td>
<td>432-0012</td>
<td><a href="mailto:buch@egr.msu.edu">buch@egr.msu.edu</a></td>
</tr>
<tr>
<td>Chatti, Karim (pavements)</td>
<td>3557 EB</td>
<td>355-6534</td>
<td><a href="mailto:chatti@egr.msu.edu">chatti@egr.msu.edu</a></td>
</tr>
<tr>
<td>Kutay, Muhammed (pavements)</td>
<td>3554 EB</td>
<td>353-9297</td>
<td><a href="mailto:Kutay@egr.msu.edu">Kutay@egr.msu.edu</a></td>
</tr>
<tr>
<td>Lyles, Richard (transportation)</td>
<td>3569 EB</td>
<td>355-2250</td>
<td><a href="mailto:lyles@egr.msu.edu">lyles@egr.msu.edu</a></td>
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<tr>
<td>Maleck, Thomas (transportation)</td>
<td>3571 EB</td>
<td>353-6448</td>
<td><a href="mailto:maleck@egr.msu.edu">maleck@egr.msu.edu</a></td>
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<tr>
<td><strong>Structural Engineering, Mechanics and Materials</strong></td>
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<tr>
<td>Burgueño, Rigoberto (structures)</td>
<td>3574 EB</td>
<td>353-1743</td>
<td><a href="mailto:burgueno@egr.msu.edu">burgueno@egr.msu.edu</a></td>
</tr>
<tr>
<td>Harichandran, Ronald (structures)</td>
<td>3546 EB</td>
<td>355-5107</td>
<td><a href="mailto:harichan@egr.msu.edu">harichan@egr.msu.edu</a></td>
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<tr>
<td>Hong, J Ung-Wuk (structures)</td>
<td>3573 EB</td>
<td>432-0180</td>
<td><a href="mailto:jwh@egr.msu.edu">jwh@egr.msu.edu</a></td>
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<tr>
<td>Kodur, Venkatesh (structures)</td>
<td>3580 EB</td>
<td>353-9813</td>
<td><a href="mailto:kodur@egr.msu.edu">kodur@egr.msu.edu</a></td>
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<tr>
<td>Lajnef, Nizar (structures)</td>
<td>3568 EB</td>
<td>353-8883</td>
<td><a href="mailto:lajnefni@egr.msu.edu">lajnefni@egr.msu.edu</a></td>
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<tr>
<td>Soroushian, Parviz (structures and materials)</td>
<td>3576 EB</td>
<td>355-2216</td>
<td><a href="mailto:soroushi@egr.msu.edu">soroushi@egr.msu.edu</a></td>
</tr>
<tr>
<td><strong>Water Resources</strong></td>
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<td></td>
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<tr>
<td>Li, Shu-Guang (hydrology)</td>
<td>A133 ERC</td>
<td>432-1929</td>
<td><a href="mailto:lishug@egr.msu.edu">lishug@egr.msu.edu</a></td>
</tr>
<tr>
<td>Mantha, Phanikumar (hydrology)</td>
<td>A130 ERC</td>
<td>432-0851</td>
<td><a href="mailto:phani@egr.msu.edu">phani@egr.msu.edu</a></td>
</tr>
<tr>
<td>Wallace, Roger (hydrology)</td>
<td>A134 ERC</td>
<td>355-2360</td>
<td><a href="mailto:wallace@egr.msu.edu">wallace@egr.msu.edu</a></td>
</tr>
</tbody>
</table>
APPENDIX II - NEW STUDENT CHECK LIST

- **University Picture ID** - 150 Administration Building (Registrar's Office) 353-3300.

- **University email account** - see http://help.msu.edu/activate/ for instructions on how to set up your university email account. This must be done before your Engineering College computer accounts can be set up.

- **Engineering College computer account and email** - Division of Engineering Computer Services, 1325 Engineering Building

- **Apply for social security card** - Applications are available at the office for International Students & Scholars, 103 International Center, 353-1720.

- **Complete I-9 Form (TA/RA graduate assistants ONLY)** - Forms are available at 103 International Center. Return the form to Margaret Conner, 3546 Engineering Building.

- **Graduate Employees Union deduction/authorization form/membership card** - All teaching assistants, except for those teaching assistants specifically excluded by the MSU/GEU agreement, must fill out this card and check-off of the option of either union membership dues or representation fees

- **Vehicle Registration** - Parking permits are available for graduate assistants from the Department of Police and Public Safety located at 87 Red Cedar Road (355-8440). Graduate assistants may apply for a parking permit on-line at www.dpps.msu.edu. Your appointment form must be finalized on the system before you will be allowed to purchase a parking permit.

- **Housing** - 355-7457 (Student is responsible for housing arrangements)

- **Contact Advisor**

  Name: _____________________________  Room: ___________

  Phone: ___________________  Email: _______________________

- **Enroll for classes** - see
  
  [http://www.reg.msu.edu/ROInfo/EnReg/CEInfomation.asp](http://www.reg.msu.edu/ROInfo/EnReg/CEInfomation.asp)
APPENDIX III - DESIGNING YOUR M.S. PROGRAM

This appendix is intended to provide assistance in designing your M.S. Program in Civil Engineering. The program is to be filed before 6 credits are finished.

1. After you and your advisor agree on a program of courses, go to the on-line graduate tracking system at https://www.eegr.msu.edu/apps/gts2 to complete your program.
2. The graduate secretary will pre-approve the program and generate the form for signature.
3. The secretary will contact you when the plan is ready for your signature. After you sign it, it is to be signed by your advisor, the graduate coordinator, and the Associate Dean of Engineering to indicate that they all approve it.

With reference to the student's approved program of study, none of the following types of changes will be approved:

1. Adding or deleting a course for which a grade has already been assigned under any of the three grading systems (numerical, Pass-No Grade, or Credit-No Credit).
2. Adding or deleting a course for which grading was postponed by the use of the DF-Deferred marker.
3. Adding or deleting a course which the student dropped after the middle of a semester and for which a ‘W’ or ‘N’ or ‘0.0’ was designated.
4. Adding or deleting a course during the final semester of enrollment in the master's degree program.

See Appendix 3 Department Areas of Specialization for templates to assist you with planning your MS program in civil and environmental engineering at Michigan State University

Check to make sure your program meets the University, College, and Department requirements as listed in the ECE Graduate Student Handbook and the MSU publication Academic Programs. Some important check list items are:

- My advisor approves of these courses.
- I will have the necessary prerequisites.
- The courses are to be offered in the terms in which I plan to take them.
- The total number of credits is at least 30.
- All courses are at the 400 level or higher.
- If Plan A (with thesis), the number of CEE/ENE 899 credits is between 4 and 8.
- If Plan A (with thesis), the number of 800 level credits is at least 20.
- If Plan B1 (project) or Plan B (coursework), the number of 800 level credits is at least 18.
APPENDIX IV - DESIGNING YOUR Ph.D. PROGRAM

This document is intended to provide assistance in designing your Ph.D. Program in Civil Engineering. The program is to be filed within the first two semesters.

1. After you and your advisor agree on a program of courses, go to the on-line graduate tracking system at https://www.egr.msu.edu/apps/gts2 to complete your program.
2. The graduate secretary will pre-approve your program and generate the form for signatures.
3. The secretary will contact you when the plan is ready for your signature. After you sign it, it is to be signed by your advisor, the graduate coordinator, and the Associate Dean of Engineering to indicate that they all approve it.

With reference to the student’s approved program of study, none of the following types of changes will be approved:

1. Adding or deleting a course for which a grade has already been assigned under any of the three grading systems (numerical, Pass-No Grade, or Credit-No Credit).
2. Adding or deleting a course for which grading was postponed by the use of the DF-Deferred marker.
3. Adding or deleting a course which the student dropped after the middle of a semester and for which a ‘W’ or ‘N’ or ‘0.0’ was designated.
4. Adding or deleting a course during the final semester of enrollment in the master’s degree program.

Check to make sure your program meets the University, College, and Department as listed in the CEE Graduate Student Handbook and the MSU publication Academic Programs. Some important check list items are:

- My advisor and the other members of my guidance committee approve of these courses.
- I will have the necessary prerequisites.
- The courses are to be offered in the terms in which I plan to take them.
APPENDIX V – SOURCES OF ADDITIONAL INFORMATION

1. Michigan State University Academic Programs
   http://www.reg.msu.edu/ucc/ucc.asp

2. Michigan State University Description of Courses Catalog
   http://ntweb1.ais.msu.edu/j4100/scripts/CatalogSearch.asp

3. Michigan State University Schedule of Courses
   http://ntweb8.ais.msu.edu/ScheduleBook/schedule.asp

4. Graduate Students Rights and Responsibilities
   http://www.vps.msu.edu/SpLife/default.pdf

5. Guidelines for Graduate Student Advising and Mentoring Relationships
   http://www.grad.msu.edu/staff/mentoreport.pdf

6. Guidelines for Integrity in Research and Creative Activities
   http://grad.msu.edu/staff/mentoreport.pdf

7. MSU/Graduate Employees Union Contract
   http://grad.msu.edu/geu/agree.pdf

8. Graduate Employees Union website
   http://www.geuatmsu.org/

   http://www.vps.msu.edu/SpLife/index.htm

10. Academic Freedom for Students at Michigan State University
    http://www.vps.msu.edu/SPLife/acfree.htm

11. Tuition, Fees, and Housing Calculator
    http://www.ctlr.msu.edu/studrec/

12. The Graduate School
    http://www.msu.edu/user/gradschl/

13. Council of Graduate Students (COGS)
    http://www.msu.edu/user/cogs/

14. Office for International Students and Scholars at Michigan State University
    http://www.isp.msu.edu/oiss/

15. Graduate Students Professional Development
    http://grad.msu.edu/cpd.htm

16. Office of the Ombudsman
    http://www.msu.edu/unit/ombud