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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABET</td>
<td>Accreditation Board of Engineering and Technology</td>
</tr>
<tr>
<td>ACGS</td>
<td>Assistant Chair for Graduate Study</td>
</tr>
<tr>
<td>CArE</td>
<td>Department of Civil, Architectural, and Environmental</td>
</tr>
<tr>
<td>FLW</td>
<td>Fort Leonard Wood</td>
</tr>
<tr>
<td>GAC</td>
<td>Graduate Affairs Committee (Civil Engineering)</td>
</tr>
<tr>
<td>GPA</td>
<td>Grade Point Average</td>
</tr>
<tr>
<td>GRA</td>
<td>Graduate Research Assistant</td>
</tr>
<tr>
<td>GRE</td>
<td>Graduate Record Examination</td>
</tr>
<tr>
<td>GTA</td>
<td>Graduate Teaching Assistant</td>
</tr>
<tr>
<td>IEP</td>
<td>Intensive English Program</td>
</tr>
<tr>
<td>MO S&amp;T</td>
<td>Missouri University of Science and Technology</td>
</tr>
<tr>
<td>REEC</td>
<td>Engineering Education Center (St. Louis)</td>
</tr>
<tr>
<td>SPEAK</td>
<td>Spoken English Assessment Test</td>
</tr>
<tr>
<td>XEOAC</td>
<td>Engineering Officers Advanced Course</td>
</tr>
<tr>
<td>XEXT</td>
<td>Distance</td>
</tr>
</tbody>
</table>
KEY CONTACTS

- **Department Chair** – Dr. William P. Schonberg (wschon@mst.edu) (573-341-4787)
- **Assistant Chair for Graduate Study** – Dr. Richard Stephenson (stephens@mst.edu) (573-341-6549)
- **Graduate Affairs Committee Chair** is elected every fall.
- **Graduate Secretary**: Karen White (whitek@mst.edu) (573-341-4470)
- **Changes to The Department of Civil, Architectural, and Environmental Engineering Graduate Student Handbook** – Dr. Richard Stephenson (stephens@mst.edu) or Karen White (whitek@mst.edu) (573-341-4470)
- **GAC PhD Student Representative** – Aaron Archer (aradk4@mst.edu)
- **Website Location**: http://civil.mst.edu/
LETTER FROM THE CHAIR

WELCOME to the Missouri S&T Civil, Architectural and Environmental Engineering Department! In this handbook, we have tried to provide you with a single source of information, policies, and procedures relevant to your pursuit of an advanced graduate degree in our Department. Your adherence to these policies will help ensure that you have a rewarding and positive experience here at Missouri S&T.

The range of the research and teaching interests of the faculty in the Department is quite broad, affording graduate students opportunities for advance work in a variety of areas, including structures, geotechnical, transportation, environmental, hydro-recourses, materials, construction and even aerospace engineering!

I invite you to see me or other members of the Department whenever you need assistance. You should also make an effort to visit the faculty in the Department who have research and teaching interests similar to yours.

I welcome you to the Department, and hope that your association with us will be fulfilling and productive!

Sincerely,

William P. Schonberg
Professor and Chair
II. GENERAL INFORMATION FOR ALL GRADUATE STUDENTS

The italicized information below is from the Missouri University of Science and Technology Graduate Catalogue. Other information reflects the Missouri S&T Department of Civil, Architectural, and Environmental Engineering policy. All information is subject to change without notice.

II.A. GRADUATE DEGREES

II.A.1. Certificate Program

The Certificate Program is designed to appeal to working professionals. Certificate programs will be identified each year consisting of a four-course sequence of existing graduate courses that provide working professionals with the knowledge they need to understand and contribute to an emerging area. Once admitted to the individual certificate programs, the student must take four designated courses. In order to receive a Graduate Certificate, a student must have an average cumulative grade point average of 3.0 or better. Students admitted to the Certificate Program will have non-matriculated status; however, if they complete the four-course sequence with a grade of B or better in each of the courses taken, they will be admitted to the M.S. program if they so choose. The Certificate credits taken by students admitted to the M.S. program will count toward their master’s degrees. Students who do not have all of the prerequisite courses necessary to take the course in the Certificate program will be allowed to take “bridge” courses at either the graduate or undergraduate level to prepare for the formal Certificate courses.

Once admitted to a certificate program, a student will be given three years to complete the program so long as he/she maintains a B average in the courses taken.

The Department of Civil, Architectural, and Environmental Engineering requires that a student wishing to enroll in a certificate program have a minimum of one-year of professional employment experience before entering into the program.

II.A.2. Master of Science Degrees

The Department of Civil, Architectural, and Environmental Engineering offers a Master of Science in Civil Engineering and a Master of Science in Environmental Engineering. Emphasis areas for the M.S. Civil Engineering degree are construction engineering management, materials, environmental, geotechnical, hydro-resources, structural/infrastructure, and transportation engineering.

Thesis and non-thesis degree options are available for both M.S. degree programs. The choice of program is to be made in consultation with the student’s graduate advisor.

II.A.3 Doctoral Degrees

The Department of Civil, Architectural, and Environmental Engineering offers a Doctor of Philosophy and a Doctor of Engineering. Emphasis areas for the doctoral degrees are construction engineering management, materials, environmental, geotechnical, hydro-resources engineering, structural/infrastructure, and transportation engineering.

II.A.3.a. Doctor of Philosophy (Ph.D.)

The degree of doctor of philosophy is awarded to students who have pursued graduate study without serious interruption, who have submitted an acceptable dissertation, passed all prescribed examinations, and satisfactorily met all requirements described below. Recipients of this degree are attested by the graduate faculty as having attained a high level of learning by extensive study in some special branch and as having developed an ability to carry on independent research.
II.A.3.b. Doctor of Engineering

The degree of doctor of engineering, like the degree of doctor of philosophy, represents the highest level of attainment in engineering study and practice. This degree is awarded to candidates who have pursued a broad program of study, completed an acceptable engineering internship, passed all prescribed examinations, submitted an acceptable practice-oriented dissertation, and met satisfactorily all requirements described here.

II.B. NON-DEGREE SEEKING STUDENTS

Any person not desiring a graduate degree may be considered for admission as a non-degree graduate student as long as they meet Missouri S&T graduate requirements for admission.

II.C. DUAL MASTER’S DEGREE

A student having completed the master's degree at Missouri S&T or elsewhere in one major shall be eligible to receive a second master's degree upon the satisfactory completion of at least an appropriate additional 24 semester hours of graduate academic work (thesis or non-thesis). All other requirements including the use of out-of-department representatives on the appropriate committees must be fulfilled. In planning dual master's degrees, please note the need for defining which is to be completed first. A change in order will necessitate a change in program.

II.D DUAL ENROLLMENT

Admission for dual enrollment as an undergraduate and graduate student during the second semester of the student's senior year is granted by the director of admissions with the approval of the department chair and Vice Provost for Graduate Studies. Admission is normally given to those students who rank in the upper third of their undergraduate class. As an alternative to class rank, students who have a 3.00 or above cumulative GPA for the previous three semesters and a 3.00 mid-semester GPA in the semester prior to registering shall be permitted to dually enroll. Honors program students may be dually enrolled for two semesters of their senior year. A student who desires to dually enroll must submit an application to the director of admissions. Forms for this purpose can be obtained from that office. Students must declare which courses are to be taken for graduate credit in the first two weeks of each semester. A student must take at least three hours for undergraduate credit from Missouri S&T in a given semester.

Dual enrollment is limited to 16 credit hours per semester. Petitions for excess hours are considered by the Vice Provost for Graduate Studies. If a dually enrolled student fails to meet undergraduate requirements, the probationary status will be that of an undergraduate student and will be judged without reference to graduate grades.

II.E. OFF CAMPUS AND ON-LINE PROGRAMS

II.E.1. M.S. Degree On-Line

The Civil, Architectural and Environmental Engineering Department offers studies that lead to a Master of Science (M.S.) in Civil Engineering through distance (on-line) education. Typically, distance students enroll in the M.S. degree with a non-thesis option, which requires 30 credit hours of graduate course work. Major fields of study include geotechnical engineering and structural engineering. Additional specialties such as transportation and environmental engineering will be available soon. More information is available at http://dce.mst.edu/.
II.E.2 GRADUATE CERTIFICATES

Graduate Certificate programs at Missouri S&T give you the opportunity to broaden your knowledge in a particular discipline, learn the latest in developing fields, and stay competitive in today’s marketplace. By taking a few courses you will be able to demonstrate advanced knowledge in a filed without returning to school to complete a degree. All courses are available on-line. More information is available at: http://dce.mst.edu/.

Graduate Certificate programs at Missouri S&T may also provide a mechanism for acceptance into a regular graduate program. Acceptance into a graduate certificate program allows an opportunity to be accepted into its corresponding master’s program. If you complete the certificate program with a B or above in all courses, you can then be accepted into the corresponding master’s program without taking the GRE or requiring a minimum GPA from your undergraduate studies. This acceptance does not waive the need to complete any prerequisites for other advanced courses that are part of the degree program.

Current Certificate Programs:
- Contemporary Structural Engineering
- Geoenvironmental Engineering
- Geotechnical Earthquake Engineering
- Infrastructure Renewal
- Military Construction Management
- Project Engineering and Construction Management

II.E.3 Engineering Education Center (EEC) - St. Louis

The Engineering Education Center serves the population of Greater St. Louis by providing evening graduate programs in various engineering and computer-oriented disciplines. This service of the Missouri University of Science and Technology is mostly intended for practicing engineers and computer scientists interested in enhancing their qualification and status via acquiring an advanced degree. For additional information, please see http://eec.mst.edu/.

II.E.4 Fort Leonard Wood Program

The purpose of the program is to allow students of the Engineer Officer Advanced Course-4 (EOAC-4) (and other officers) to complete either of two Missouri S&T Master of Science degrees while at Ft. Leonard Wood: a) M.S. Environmental Engineering or b) M.S. Civil Engineering. Admissions criteria for EOAC students are the same as for on-campus graduate students. Students completing the program participate in graduation exercises at Missouri S&T during the regular spring commencement ceremony. For additional information, please see http://civil.mst.edu/
III. ADMISSION REQUIREMENTS

Any person who holds a bachelor’s degree in engineering from an ABET accredited program, a master’s degree, or their equivalents, from a college of good standing and who wishes to enroll as a graduate student in the Department of Civil, Architectural, and Environmental Engineering at Missouri S&T must submit an application for admission to the director of admissions. Forms for this purpose can be obtained from that office (applications are also available at http://admissions.mst.edu). Each application must be followed by an official transcript of both graduate and undergraduate records from each college or university attended. A statement of rank in the undergraduate graduating class also should be included along with official GRE scores. Letters of recommendation may be submitted in support of an application.

A. GRADE POINT AVERAGE (GPA) AND GRADUATE RECORD EXAMINATION (GRE) REQUIREMENTS

Admission is normally given to those students who ranked in the upper third of their baccalaureate graduating class or who have done quality work at the graduate level. For this requirement, a B average in the last two years of undergraduate effort is considered equivalent to an upper one-third standing. If the student’s undergraduate curriculum lacks some of the equivalent courses in the undergraduate curriculum at Missouri S&T, the student may be required to complete the deficiencies, for non-graduate credit, as determined by the Assistant Chair for Graduate Studies (ACGS) with the advice of the student’s advisor and the Vice Provost for Graduate Studies.

A minimum GPA (based on 4.0 scale) of 3.0 is required for both M.S. and Ph.D. program applicants for the last 60 hours of study. GRE scores of at least 1100 or higher (verbal plus quantitative) plus Analytical Writing of 4.0 or better are required. The GRE is not required for students with MO S&T BS degrees in CE, ArchE or Environmental Engineering who meet the 3.0 grade point requirement. The ACGS and the Vice Provost for Graduate Studies must approve admission as a graduate student pursuing a degree. Of the courses that are part of a graduate student's formal program of study (Graduate Form I for MS or Form VI for Ph.D.), a graduate student must have a GPA of 3.0 or better in civil engineering courses, and the student may have no more than one 'C' or below grade in civil engineering courses. To the extent that they equal or exceed these requirements, Missouri S&T rules still apply (overall GPA = 3.0 or better, no more than 9 hours of C or below). In the event that a graduate student has at least a 3.0 GPA in civil engineering courses, but has earned 4 to 9 credit hours of ‘C’ grade in civil engineering courses, the student may appeal to the Graduate Affairs Committee for a waiver. The Graduate Affairs Committee will evaluate the circumstances and make a recommendation for disposition of the waiver petition to the civil engineering faculty.

B. CONDITIONAL ADMISSION

Any person not eligible for admission as a regular graduate student (and has an undergraduate GPA between 2.75 and 2.99) may be considered for conditional admission. A 3.0 GPA must be attained in the first twelve (12) hours of graduate level courses (not including research) and maintained throughout the candidate’s program. Any conditional status graduate student who subsequently desires to become a candidate for a degree may be admitted to regular graduate standing upon the recommendation of the ACGS and approval of the Vice Provost for Graduate Studies. However, such consideration is not permitted until the student has completed a minimum of 12 semester hours of graduate course work with a GPA of 3.00 or higher. Only that portion of the work completed as a conditional graduate student which is approved by the student’s adviser, department chair, and the Vice Provost for Graduate Studies may be applied toward a graduate degree, but all work completed as a conditional graduate student—as well as GRE scores—will be considered relative to admission to degree candidacy. No
more than one semester beyond the semester of completion of the first 12 hours taken as a conditional student may be allowed in the conditional status. All graduate course work (excluding research and special problems) taken will be included in figuring the cumulative grade point average. Conditional students are not allowed to enroll for 490 credit until the semester in which the “minimum of 12 semester hours of graduate course work” which forms the trial schedule will be completed.

In practice, other students with special needs may take course work exclusive of 400-level courses as post-baccalaureate students with the approval of the applicable department chair and Vice Provost for Graduate Studies.

Students who have undergraduate courses to be taken due to a different undergraduate discipline, or for any other reason, but who otherwise meet graduate admission requirements, are encouraged to apply for graduate admission by the first semester that they plan on taking one or more graduate courses, may be permitted to enroll for these graduate courses.

III.C. LANGUAGE REQUIREMENTS

A minimum TOEFL score of 550 paper based or 213 computer based is required for international applicants. All foreign students who are not taking the Graduate Teaching Assistant (GTA) workshop and have a TOEFL score of 550-599 paper based or 213-247 computer based must take the Test of Spoken English (TSE) in the Department of English at Missouri University of Science and Technology. If they fail, they will be required to take remedial courses related to spoken English beginning the first semester and will continue until they pass the TSE or English courses specified by the Department. Ultimately, the student must demonstrate adequate English skills during their comprehensive examination.

III.C.1 Intensive English Program (IEP)

The Intensive English Program (IEP) at Missouri University of Science and Technology provides intensive instruction in the English Language for international students whose proficiency in the language is insufficient for admission into course work at the University. The IEP offers an integrated curriculum that helps students develop a high level of proficiency in all areas of the English language. The curriculum includes a minimum of 20 hours of coursework per week, plus time working individually with a mentor and time spent in the Applied Language Institute (ALI) English Language Computer Learning Center. The IEP focuses on students developing a solid understanding and usage of academic English. Upon arrival, students are tested to determine their level of English proficiency. Each student is then placed in the appropriate level of coursework. Students are not allowed to enroll in graduate courses until they have satisfied the University’s language requirement.

The Civil Engineering Department will accept the recommendation of the IEP program director to satisfy the university’s language proficiency requirement. (03/02)

III.D. APPLICATION FEES

All new applicants are required to pay an application fee of $50. This application fee is nonrefundable. The fee must be paid in U.S. currency only. To reach the home page for the Graduate Admissions Office of Missouri S&T use the following Universal Resource Locator (URL) http://admissions.mst.edu/ On the WWW there is information on degree programs, an information card, and scholarship information (including a scholarship application).
III.E. PREREQUISITES

Prerequisite courses may be required for students, seeking graduate degrees in Civil Engineering and Environmental Engineering.

III.E.1. Master of Science in Civil Engineering

The following prerequisites apply (by area), for students without a B.S. Civil Engineering degree. See Section III.E.2. for Environmental Engineering.

Prerequisites by area for students seeking M.S.C.E. degree in:

**Construction Engineering Materials**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 211</td>
<td>Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 215</td>
<td>Elementary Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE 217</td>
<td>Structural Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CE 223</td>
<td>Reinforced Concrete Design</td>
<td>3</td>
</tr>
<tr>
<td>CE 229</td>
<td>Foundation and Pavement Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 230</td>
<td>Elementary Fluid Mechanics</td>
<td>3</td>
</tr>
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</table>

*Plus three of the following:*

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<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 1</td>
<td>Surveying</td>
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</tr>
<tr>
<td>CE 216</td>
<td>Construction Materials</td>
<td>3</td>
</tr>
<tr>
<td>CE 221</td>
<td>Structural Design in Metals</td>
<td>3</td>
</tr>
<tr>
<td>CE 234</td>
<td>Water Resource Engineering</td>
<td>3</td>
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<tr>
<td>CE 245</td>
<td>Construction Engineering</td>
<td>2</td>
</tr>
<tr>
<td>CE 261</td>
<td>Introduction to Environmental Engineering and Science</td>
<td>3</td>
</tr>
<tr>
<td>CE 265</td>
<td>Water and Wastewater Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

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**Construction Engineering and Management**

<table>
<thead>
<tr>
<th>Course</th>
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<th>Hours</th>
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</thead>
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<td>Elementary Soil Mechanics</td>
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</tr>
<tr>
<td>CE 216</td>
<td>Construction Materials</td>
<td>3</td>
</tr>
<tr>
<td>CE 218</td>
<td>Structural Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CE 223</td>
<td>Reinforced Concrete Design</td>
<td>3</td>
</tr>
<tr>
<td>CE 229</td>
<td>Foundation and Pavement Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 241</td>
<td>Economy of Engineering Design</td>
<td>3</td>
</tr>
<tr>
<td>CE 248</td>
<td>Intro to Contracts and Construction Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

27

*Plus three of the following:*

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 1</td>
<td>Surveying</td>
<td>4</td>
</tr>
<tr>
<td>CE 211</td>
<td>Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 221</td>
<td>Structural Design in Metals</td>
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<tr>
<td>CE 230</td>
<td>Elementary Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE 234</td>
<td>Water Resource Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 247</td>
<td>Ethical Legal and Professional Engineering Practice</td>
<td>3</td>
</tr>
</tbody>
</table>

30
Transportation
Candidates for the transportation emphasis should have a B.S. engineering degree from an approved program at a college or university of recognized standing, and must have completed a course equivalent to CE 211.

Students that have a non-engineering B.S. degree must complete the following prerequisites:

Mathematics. At least 4 courses beyond trigonometry are required. Students must have completed math curriculum up to multivariable calculus and one additional math course, preferably statistics.

Physics. At least one semester of a calculus-based physics course is required.

Engineering Sciences. At least 4 courses chosen by student and advisor are required.

Geotechnical Engineering

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 1 Surveying</td>
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</tr>
<tr>
<td>CE 215 Elementary Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE 216 Construction Materials</td>
<td>3</td>
</tr>
<tr>
<td>CE 223 Reinforced Concrete Design</td>
<td>3</td>
</tr>
<tr>
<td>CE 229 Foundation and Pavement Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 230 Elementary Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>19 Total</td>
</tr>
</tbody>
</table>

Hydro-Resources Engineering

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 215 Elementary Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE 217 Structural Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CE 230 Elementary Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE 234 Water-Resources Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 265 Water and Wastewater Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>15 Total</td>
</tr>
</tbody>
</table>

Structural Engineering

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 215 Elementary Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE 216 Construction Materials</td>
<td>3</td>
</tr>
<tr>
<td>CE 217 Structural Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CE 221 Structural Design in Metals</td>
<td>3</td>
</tr>
<tr>
<td>CE 223 Reinforced Concrete Design</td>
<td>3</td>
</tr>
<tr>
<td>CE 229 Foundation and Pavement Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 230 Elementary Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>21 Total</td>
</tr>
</tbody>
</table>
**Materials Engineering**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 1</td>
<td>Fundamentals of Surveying</td>
<td>3</td>
</tr>
<tr>
<td>CE 211</td>
<td>Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 215</td>
<td>Fundamentals of Geotechnical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 216</td>
<td>Construction Materials, Properties &amp; Testing</td>
<td>3</td>
</tr>
<tr>
<td>CE 217</td>
<td>Structural Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>CE 223</td>
<td>Reinforced Concrete Design</td>
<td>3</td>
</tr>
<tr>
<td>CE 230</td>
<td>Elementary Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE 248</td>
<td>Fundamentals of Contracts &amp; Construction Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 261</td>
<td>Fundamentals of Environmental Engineering &amp; Science</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

**III.E.2. Master of Science in Environmental Engineering**

Prospective candidates for the M.S. Environmental Engineering and Doctoral degree (Environmental Emphasis), who have a B.S. engineering degree from an approved program at a college or university of recognized standing usually have no prerequisite courses required. Under some circumstances, selected prerequisites may be taken concurrently with graduate coursework.

**For non-engineers seeking M.S. Environmental Engineering or Ph.D. (environmental Emphasis):**

<table>
<thead>
<tr>
<th>Duration</th>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 semesters</td>
<td>Chemistry plus laboratory</td>
<td>6</td>
</tr>
<tr>
<td>3 semesters</td>
<td>Calculus</td>
<td>9</td>
</tr>
<tr>
<td>IDE50</td>
<td>Eng Mechanics Static</td>
<td>3</td>
</tr>
<tr>
<td>IDE110</td>
<td>Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>CE230</td>
<td>Elementary Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE234</td>
<td>Water Resources Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE/EnvE261</td>
<td>Intro Environmental Science &amp; Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(can be waived by advisor)</td>
<td></td>
</tr>
<tr>
<td>CE/EnvE265</td>
<td>Water and Wastewater Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>33</strong></td>
</tr>
</tbody>
</table>

**For non-Civil Engineers seeking M.S. Civil Engineering (Environmental Emphasis) degree:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDE 50</td>
<td>Engineering Mechanics – Statics</td>
<td>3</td>
</tr>
<tr>
<td>IDE110</td>
<td>Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>CE215</td>
<td>Elementary Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE230</td>
<td>Elementary Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE234</td>
<td>Water Resources Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE261</td>
<td>Intro Environmental Science &amp; Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(can be waived by advisor)</td>
<td></td>
</tr>
<tr>
<td>CE265</td>
<td>Water and Wastewater Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
</tr>
</tbody>
</table>
III.F. TRANSFER CREDITS
See Section VIII.A.2. for specific guidelines for MS and Doctoral programs.

III.G. REQUIREMENTS FOR CONTINUED ENROLLMENT
Students may continue to register for courses as long as they remain in good standing, here defined as satisfactory progress and achievement. **All graduate students must maintain a 3.00 in each semester of their graduate studies.** Prerequisite courses are excluded from this calculation, in the event that the student does not maintain a 3.00 grade point average, the student, with endorsement of his/her graduate advisory committee, may appeal to the Assistant Chair of Graduate Studies for a waiver. The student may have no more than one “C” or below grade in their graduate courses. To the extent that they equal or exceed these requirements, Graduate Studies and Missouri S&T rules still apply (overall GPA = 3.0 or better, no more than 9 hours of C or below). In the event that a graduate student has at least a 3.0 GPA in civil engineering courses, but has earned 4 to 9 credit hours of C or below grade in civil engineering courses, the student may appeal to the Graduate Affairs Committee of the Department of Civil, Architectural, and Environmental Engineering for a waiver. The Graduate Affairs Committee will evaluate the circumstances and make a recommendation for disposition of the waiver petition to the civil engineering faculty.
IV. ADVISING
A student is assigned a faculty advisor by the Graduate Advising Center upon admission to the graduate program. This assignment is made on the basis of the student’s intention of thesis topic and the mutual agreement between the student and the proposed faculty advisor. The Graduate Advising Center and the advisor will assist the student during the first two terms of registration and acquaint the student with the various rules, regulations and procedures of the Department. The Ph.D. student must establish an advisory committee after passing the Qualifying Examination to review their program of study.

IV.A ROLE OF THE STUDENT
A graduate student is to follow all the instructions outlined in this handbook. He/she should seek advice from his/her advisor with ample time before any critical deadline dates. The selection of the advisor is probably the most important decision in the graduate process and thus needs to be carefully considered.

IV.B. ROLE OF THE ADVISOR
The advisor has the responsibility to meet with the student on a regular basis and to guide the student in his/her graduate studies. The advisor provides comments on the academic and future career of the student and his possible options in future appointments in industry, government and/or academia. If the student is also involved in research with the advisor, the majority of the time will be devoted to the research topic.

IV.C. CHANGE OF ADVISOR
A graduate student on a sponsored GRA appointment may not change advisors without the express written consent of the student’s current advisor. If the student’s advisor will not agree to a change, and if an informal review by the ACGS does not resolve the issue, then the Graduate Affairs Committee will formally hear the views of both student and advisor, and will make a recommendation to the Civil Engineering faculty for final disposition of the matter.

IV.D. ADVISOR FROM A DIFFERENT DEPARTMENT
If a Civil Engineering graduate student has an out-of-department advisor, then the graduate student is required to have a CE "academic advisor" to guide him on the core courses required in his corresponding area of emphasis. This "academic advisor" should be part of his thesis committee.

If an out-of-department graduate student is being advised by a faculty member in the CE department, then the faculty member should follow the protocols established by the graduate student's department. An out-of-department graduate student should enroll for CE 490 - Research if he is being advised by a CE faculty member. A CE graduate student being advised by an out-of-dept faculty should enroll in the equivalent course in his faculty advisor's department. Co-advising should be treated in a case-by-case basis given the complexity of the potential advising situations.

IV.E. ROLE OF GRADUATE AFFAIRS COMMITTEE
The role of the Civil Engineering Graduate Affairs Committee (GAC) is to review and propose policy pertaining to the administration of graduate affairs and recruitment of graduate students, and pertaining to quality assurance in the graduate program. Problems associated with administration of departmental graduate policy, pro and con positions regarding graduate affairs issues, and draft policy positions (when appropriate or necessary) will be presented to the Civil Engineering faculty in a timely manner.
The GAC will ensure that a published record of faculty-approved graduate policy is kept current. When requested, the GAC will advise the Department Chair and the Assistant Chair for Graduate Affairs on matters of established departmental graduate affairs policy.
V. PERMISSIBLE SCHEDULES

All graduate teaching assistants, graduate research assistants, graders, graduate instructors, and graduate fellows are required to enroll for at least nine semester hours each semester and at least three semester hours in a summer session (if they are in residence at Missouri S&T).

All graduate students engaged in work toward a degree must be enrolled for credit commensurate with the activity, but in no case for less than three hours each semester and summer session. (For details refer to Missouri S&T Policy Memorandum Number II-20 which can be obtained from department offices or from the Vice Provost for Graduate Studies.)

A graduate student on a full-time academic program is limited to a maximum of 16 credit hours of classes during any regular semester and to nine credit hours in a summer term (eight-week session).

Graduate instructors, teaching fellows, and graduate teaching and research assistants must not exceed the following permissible schedules:

<table>
<thead>
<tr>
<th>Appointment</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regular Semester</td>
</tr>
<tr>
<td>0.250 Graduate Assistant FTE</td>
<td>14</td>
</tr>
<tr>
<td>0.375 Graduate Assistant FTE</td>
<td>13</td>
</tr>
<tr>
<td>0.500 Graduate Assistant FTE</td>
<td>12</td>
</tr>
<tr>
<td>0.625 Graduate Assistant FTE</td>
<td>11</td>
</tr>
<tr>
<td>0.750 Graduate Assistant FTE</td>
<td>10</td>
</tr>
<tr>
<td>Graduate Instructor</td>
<td>8</td>
</tr>
<tr>
<td>Teaching Fellow</td>
<td>9</td>
</tr>
</tbody>
</table>

The combined teaching and academic load of any graduate student or instructor who is involved in both activities shall not exceed 18 credit hours per regular semester or nine credit hours for the summer session.

In addition to the above schedule, any graduate student may enroll for not more than one credit hour in graduate seminar courses or for no credit as a "hearer" in a one-, two-, or three-hour foreign language course per semester.
VI. FINANCIAL ASSISTANCE AND APPOINTMENT

These are five major types of financial assistance available to graduate students at Missouri S&T:

- graduate teaching assistantships (GTA),
- graduate research assistantships (GRA),
- graduate instructorships,
- fellowships, and
- hourly research positions.

Students holding teaching (GTA) or research (GRA) assistantships must register for at least three (3) credit hours during the summer semester and for at least nine (9) credit hours for the fall and spring semesters. The Graduate Affairs Committee continuously reviews the record and progress of every graduate student. All appointments are conditional on satisfactory performance.

Campus policy II-12 states that GTA and GRA appointments are contingent upon students “maintaining satisfactory progress towards an advanced degree at Missouri S&T.” By definition, a conditional status student is not a candidate for a degree at Missouri S&T. Therefore, conditional students may not be appointed to GTA or GRA positions.

VI. A. ASSISTANTSHIPS

Assistantships are awarded by the Department on a competitive basis and are of three varieties:

VI.A.1. Graduate Research Assistantships (GRAs)

Graduate Research Assistantships are supervised by individual professors for research-related duties.

Typically, the appointments are 0.2-0.50 FTE. This means working up to 10-20 hours per week and currently earning $925-$1,850 per month. In addition, if the appointment is at least 0.25 FTE there is a waiver of the out-of-state fee increment (a savings of $9,683 per 9 mo.) and credit hour fees more than 6 hours are waived.

VI.A.2. Graduate Teaching Assistantships (GTAs)

Graduate Teaching Assistantships are supervised by the course section instructors for teaching-related duties.

CE Policy for GTAs

At the beginning of each semester, each faculty member assigned a Graduate Teaching Assistant (GTA) or Graduate Assistant (GA) will provide the GTA/GA with a clearly written statement outlining expectations and duties pursuant to the GTA/GA assignment.

Definitions:
GTA – Graduate Teaching Assistant – a graduate student on appointment who has taken and passed the GTA Workshop
GA – Graduate Assistant – a graduate student on appointment who has not yet taken or passed the GTA Workshop

Duties and responsibilities of GTA’s:
Graduate students serving as GTAs (i.e. those who have passed the GTA workshop) may, on occasion, substitute for the faculty member as a guest lecturer. Graduate students serving as GAs (i.e. those who have not yet taken or passed the GTA workshop) may not present any form
of instruction (lecture, lab, etc.) in lieu of a faculty member and will not make up or grade any types of exams nor will they assign final course grades. They may, however, recommend grades for the laboratory component of the course if appropriate. As per the 31 January 2002 memo from the Provost, GTA’s are not allowed to be in charge of instruction and will not have final grade authority in any and all first and second year courses.

**Duties of Faculty members:**
Faculty members are expected to supervise laboratory exercises, resolve disputes, and ensure that the laboratory equipment is maintained and in working condition. The faculty will ensure that their GTAs are proficient in all the equipment and procedures required to perform each lab exercise, will either provide GAs and GTAs with solutions or grading keys to all assigned work (including homework problems, laboratory reports, etc.) or review and approve solutions or grading keys developed by a GA or a GTA. Faculty will review all laboratory component grade recommendations made by a GTA, and will ensure that the GA’s or GTA’s time on task does not, on average, exceed the allocated time limit.

**GTA Workshop**
All students must take and pass the GTA workshop with a grade of B or higher before they can teach. If a student does not pass the workshop, he/she may be placed on appointment as a GA for one semester only. International students may defer taking the workshop for one semester. However, they must take and pass the workshop prior to their second semester as a GTA. The deferment MUST BE REQUESTED IN WRITING at the time the student is put on GTA. Student on deferred status can be graders, but cannot perform any type of classroom or laboratory instruction even in a temporary or substitute capacity. All deferments expire after one semester. At that point, the student must pass the GTA workshop or go on hourly appointment.

Graduate Instructorships require full-time teaching effort and are appointed for only exceptional circumstances.

**VI.B. FELLOWSHIPS**

Fellowships are offered from many venues including: Civil Engineering Fellowships, Chancellor’s Fellowships, National Science Foundation Fellowships, State and Federal Fellowships such as the GAANN fellowship offered by the U.S. Department of Education, Stephen P. Gorman Graduate Fellowships, and Industrial Fellowships. Applications for Civil Engineering Fellowships are available in the Graduate Studies office.

Sources include fellowships administered by the department, Chancellor’s Fellowships administered by the Vice Provost for Graduate Studies, and external fellowships funded and administered by outside entities.

The CARe departmental fellowships (administered within the department) are open to both MS and PhD students and usually are modest in size of award. There are 11 departmental fellowships: 7 geotechnical, and one each for asphalt materials, cold-formed steel (structures), construction, and consulting. Annual awards typically are $500-2000.

The Chancellor’s Fellowship is typically not open to MS students, but is more substantial, and includes a full waiver of all fees. If there are not enough qualified PhD applicants than MS applicants will be considered. Non-thesis master’s students are not eligible. The fellowship consists of a waiver of resident and applicable non-resident fees. Both PhD and MS students are limited to 6 (six) semesters and intervening summer sessions with a possible extension of 2 (two) semesters. The student must maintain a 3.50 cumulative GPA. Students may apply for these fellowships through the department chair.
External fellowships come from both industry and government, and range from a few hundred dollars to rather large levels. These usually are limited in number and are competitive at a national level. Examples are NUTC, NSF, ACI, AAPT, NAPA, and PCA.

VI.C. HOURLY RESEARCH POSITIONS

Hourly research positions involve assisting individual professors or research teams on specific projects and are paid at an hourly wage established by the University.
VII CERTIFICATE PROGRAMS

The italicized information below is from the Missouri University of Science and Technology Graduate Catalogue. Other information reflects the Missouri S&T Department of Civil, Architectural, and Environmental Engineering policy. All information is subject to change without notice. All courses are delivered on-line.

VII.A. ADMISSION

The Certificate Program is open to all persons holding a B.S., M.S., or Ph.D. degree and who have a minimum of 12-months of post-B.S. professional employment experience.

Once admitted to the program, the student must take four designated courses as given below. In order to receive a Graduate Certificate, the student must have an average cumulative grade of 3.0 or better in the certificate courses.

Students admitted to the Certificate program will have non-matriculated status; however, if they complete the four-course sequence with a grade of B or better in each of the courses taken, they will be admitted to the M.S. program if they so choose. The Certificate credits taken by students admitted to the M.S. program will count towards their master's degrees. Students who do not have all of the prerequisite courses necessary to take the course in the Certificate program will be allowed to take "bridge" courses at either the graduate or undergraduate level to prepare for the formal Certificate Courses.

Once admitted to the program, a student will be given three years to complete the program so long as he/she maintains a B average in the courses taken.

VII.B. GEOENVIRONMENTAL ENGINEERING

VII.B.1. Purpose

This certificate program is designed to provide formalized education in the area of Geoenvironmental Engineering.

VII.B.2. Curriculum

A minimum of two of the following geotechnical courses must be taken:

CE 314: Geosynthetics in Engineering:
CE 315: Intermediate Soil Mechanics
CE 329 Foundation Engineering II

A minimum of two of the following environmental courses must be taken:

CE 360: Environmental Law and Regulations
CE 361: Remediation of Contaminated Groundwater and Soil
CE 362: Public Health Engineering
CE 363: Solid Waste Management
CE 365: Environmental Engineering Analysis Laboratory (Rolla Campus Only)
CE 380: Water Resources and Wastewater Engineering

Other courses approved by the geoenvironmental faculty may be substituted for any of the above listed courses on a case-by-case basis. The Vice Chairman for Graduate Studies must approve the substitution prior to enrolling in the course.
VII.C. GEOTECHNICAL EARTHQUAKE ENGINEERING

VII.C.1 Purpose
This certificate program is designed to provide formalized education in the area of Geotechnical Earthquake Engineering.

VII.C.2. Curriculum:
The following courses are required:
CE 316: Soil Dynamics I
CE 413: Soil Dynamics II

Two of the following three courses are required:
CE 315: Intermediate Soil Mechanics
CE 329: Foundation Engineering II
CE 412: Numerical Methods in Geotechnical Engineering

Other courses approved by the geotechnical engineering faculty may be substituted for any of the above listed courses on a case-by-case basis. The Vice Chairman for Graduate Studies must approve the substitution prior to enrolling in the course.

VII.D. INFRASTRUCTURE RENEWAL

VII.D.1. Purpose
This certificate program is designed to provide formalized education in the area of Infrastructure Renewal.

Students will be exposed to the latest developments in assessment and repair/rehabilitation technologies using an interdisciplinary approach. Particular emphasis is placed on composite materials.

VII.D.2. Curriculum
Two of the following courses are required:
CE 374: Infrastructure Strengthening with Composites
AE 311/ME 382: Introduction to Composite Materials and Structures
CE 314: Geosynthetics in Engineering

One of the following courses is required:
CE 326: Advanced Steel Design
CE 327: Advanced Concrete Design
CE 328: Prestressed Concrete Design

One of the following courses is required:
CE 345: Construction Methods
CE 329: Foundation Engineering
CE 424: Structural Dynamics and Earthquake Engineering
AE/ME/EM 484: Analysis of Laminated Composite Structures

Other courses approved by the structural engineering faculty may be substituted for any of the above listed courses on a case-by-case basis. The Assistant Chairman for Graduate Studies must approve the substitution prior to enrolling in the course.
VII.E CONTEMPORARY STRUCTURAL ENGINEERING

VII.E.1 Purpose

This certificate program is designed to provide formalized education in the area of Contemporary Structural Engineering. Students will be exposed to the classical approaches of structural engineering and engineering mechanics. Students will be exposed to both the analysis and design of structural systems.

VII.E.2. Curriculum

One of the following courses is required:
CE 320: Structural Analysis II
CE 323: Classical and Matrix Methods of Structural Analysis
CE 319: Applied Mechanics in Structural Engineering

One of the following courses is required:
CE 326: Advanced Steel Structures Design
CE 327: Advanced Concrete Structures Design
CE 328: Prestressed Concrete Design

Two of the following courses are required:
CE 375: Low-Rise Building Analysis and Design
CE 424: Structural Dynamics and Earthquake Engineering
CE 425: Finite Element Application in Structural Design
CE 426: Advanced Design in Steel and Lightweight Structures
AE/ME/EM 334: Stability of Engineering Structures
AE/ME/EM431: Theory of Plates

Other courses approved by the structural engineering faculty may be substituted for any of the above listed courses on a case-by-case basis. The Assistant Chairman for Graduate Studies must approve the substitution prior to enrolling in the course.

VII.F PROJECT ENGINEERING AND CONSTRUCTION MANAGEMENT

VII.F.1 Purpose

This certificate program is designed to provide formalized education in the area of Project Engineering and Construction Management.

VII.F.2. Curriculum

Two of the following courses are required:
CE 345: Construction Management
CE 346: Management of Construction Costs
CE 349: Engineering Construction Contract Specifications
CE 442: Construction Administration Planning and Control
CE 445: Advanced Construction Engineering
Two of the following courses are required:
EMgt 308: Economic Decision Analysis
Emgt 314: Management for Engineers
Emgt 361: Project Management
Emgt 458: Case Studies in Project Management
Emgt 461: Advanced Project Management
VIII. MASTERS DEGREES

The italicized information below is from the Missouri University of Science and Technology Graduate Catalogue. Other information reflects the Missouri S&T Department of Civil, Architectural, and Environmental Engineering policy. All information is subject to change without notice.

- VIII.A. M.S. DEGREE PROGRAMS

Degree programs leading to a Master of Science in Civil Engineering and a Master of Science in Environmental Engineering are offered by the Department of Civil, Architectural, and Environmental Engineering. Emphasis areas for the M.S. Civil Engineering degree are construction engineering management, materials, environmental engineering, geotechnical engineering, hydro-resource engineering, infrastructure engineering, structural engineering, and transportation.

Thesis and non-thesis degree options are available for both M.S. degrees:
- M.S. with thesis (30 semester credit hours including 6 thesis credit hours);
- M.S. without thesis (30 semester credit hours of coursework).
- Master of Engineering (30 semester credit hours including 6 credit hours of research)

The choice of program is to be made in consultation with the student’s graduate advisor. Most master's student pursue the thesis option to provide a more complete graduate education.

Masters of Science degrees may be pursued on the Missouri S&T campus, at the Engineering Education Center (EEC) in St. Louis, through a Ft. Leonard Wood (FLW) Program for military officers, or through distance education centers. Please see Sections II.E.1 and II.E.2 for more information on the EEC and FLW programs, respectively.

VIII.A.1. Procedures and Timelines

Within six (6) weeks after the beginning of the semester in which the student takes his or her fifteenth graduate credit hour in residence, the student will make up a graduate program i.e., Graduate Form 1 in consultation with the student’s graduate advisor and selected committee. The form must be typed and signed by all committee members and advisor before being submitted to the chair of graduate studies for signature. The chair of the M.S. committee and at least one-half of the members of the M.S. committee should be members of the graduate faculty. The graduate Form I (a typewritten original) will be completed, submitted to the ACGS and Vice Provost for Graduate Studies for approval. Forms for making changes in this program (Graduate Form I-A) can be obtained from the offices of graduate studies or at http://grad.mst.edu/currentstudents/gradforms.html

A minimum of one-half of the course requirements for the degree should be completed after the filing of the graduate program.

The M.S. degree will be granted only if all graduate credit counted toward the degree has been obtained in the previous six (6) years. When recommended by the student’s advisory committee as many as six (6) semester hours of course work completed outside the six-year time limit may be validated by the committee by examination.

VIII.A.2 Transfer Credit

A maximum of nine (9) hours of course work for M.S. degrees may be transferred from universities outside the University of Missouri. Such credits for transfer must have been
registered as graduate courses when they were taken. A minimum grade of B must have been obtained before a transfer course can be used in the graduate program. The courses being transferred must be entered as a part of the student’s program as presented on Graduate Form I. The Missouri S&T equivalent should be stated, and transcript of the work should accompany the Form I. Approval of the Form I or Form I-A will cause the transfer course to be entered on the student’s Missouri S&T transcript.

VIII.B. MASTERS DEGREE WITH THESIS

VIII.B.1. Requirements

The master’s degree program with thesis shall consist of a minimum of 24 semester hours of graduate course credit in addition to any prerequisites. At least six semester hours of the required work will be from the group of lecture courses bearing numbers in the 4XX series. It is recommended that at least six (6) semester hours will be devoted to courses outside the major department. A maximum of six (6) hours of 200-level courses can be accepted in a M.S. program. Credit for research work conducted in preparation of the thesis is counted in terms of hours making up the total credit hours in research, special problems, special investigations, special readings, and graduate seminar, and must not exceed twelve (12) hours. A minimum of six (6) hours must be devoted to Graduate Research, Course 490.¹

Students pursuing an M.S. must petition the Assistant Chair for Graduate Affairs in order to include CE 400 Special Problems in their plan of study. The student must submit a one-page syllabus and a cover letter including motivation and thesis topic. Thesis option students may petition up to six credits; non-thesis students may petition up to three credits. It is preferred that the instructor be a faculty member other than the thesis advisor. The Assistant Chair for Graduate Affairs may request input from faculty with expertise in the specific topical area.

Research work will normally be conducted on the Missouri S&T campus. In special cases, all or part of the research may be conducted elsewhere, but must be supervised by a member of the faculty. Such off-campus research must have the prior written approval (Graduate Form “Application to Do Non-resident Research”) of the student’s graduate adviser, department chair, and vice provost for graduate studies. Care must be taken to provide an off-campus research and academic experience that promises results equivalent or superior to that, which might be expected at Missouri S&T.

For a more effective use of the Master’s Committee, the candidate should: (1) submit a written description of the proposed research to the members of the committee as soon as the topic is decided, (2) obtain written approval of the committee indicating that the proposed research is of M.S. caliber, and (3) submit periodic progress reports to the committee and discuss them with committee members or with the committee as a group (frequency of reports and method of discussion should be decided by the committee).

Thesis Requirements - The findings and results of research undertaken by the candidate for a master’s degree must be presented in a thesis. A minimum of an original and three (3) copies normally will be prepared following proper specifications.

Specifications for a thesis are described in a manual entitled “Regulations and Specifications for Theses and Dissertations (T/D)”. This manual is available at no charge from the offices of the department chair and Vice Provost for Graduate Studies. An alternative “manuscript option” may also be used for the thesis format. Please refer to the following website for additional information about this option: http://grad.mst.edu/currentstudents/ThesesDissertations.html

¹ When co-advising a thesis, course 490 credit may be shared by all departments involved.
The thesis must be presented to the vice provost for graduate studies, accompanied by the thesis approval form (Graduate Form II) signed by the committee members and department chair. The approval form signifies that the readers have examined the thesis closely for both scientific content and format, and deem it worthy of acceptance by the graduate faculty as meeting the requirements for a master's degree and as well as the action of the defense.

**VIII.B.2. Approval and Filing of the Thesis**

At the close of a successful thesis defense, the members of the examining committee will sign the thesis in the space provided on the title sheet to signify that they have read and approved the thesis.

_The approved copy of the thesis, including any corrections indicated by the examining committee, should be taken along with Form III (MS) to the Assistant Chair for Graduate Affairs. Once approved, the thesis is then forwarded to the office of graduate studies where it will be carefully checked to ensure that proper format has been followed._

2 After approval by the Vice Provost for Graduate Studies it will be forwarded to the librarian. The registrar will be notified by the Vice Provost for Graduate Studies that all thesis requirements have been completed by the candidate.

The student will present a copy of the approved thesis to the department chair, a second copy to the adviser, and will retain a copy.

**VIII.B.3. Procedures for Masters Candidates**

All students are required to have completed admissions requirements including transcripts, GRE scores, and TOEFL, if required. Specific procedures are:

- **Register after consulting with graduate advisor;**
  1. **Select advisor and committee and completes Form I within six (6) weeks after the beginning of the second semester in residence;**
  2. **Complete academic requirements;**
  3. **Within four (4) weeks of the beginning of their last semester, students must check with the registrar to make application for diploma;**
  4. **Submit thesis plus Graduate Form II (signed by the committee members and department chair) to graduate studies office;**
  5. **Candidate distributes copies of the thesis to examining committee at least two weeks before the oral defense;**
  6. **Arrange a date, time, and place for the oral defense of the thesis (the student must be enrolled at the time of the examination); Submit Dissertation Submittal and Schedule for Defense (see appendix D page D-5). Conduct thesis defense;**
  7. **Chair of examining committee reports the action of the committee to the vice provost for graduate studies (Graduate Form III accompanied by approved copy of thesis);**
  8. **When all requirements have been met and payment of enrollment or examination fees made, the graduate studies office notifies the registrar and forwards the approved thesis to the Missouri S&T library;**

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2 Liberal choices are allowed relative to the style manual used in the preparation of the thesis. Approval of the thesis requires following rigidly the style manual selected and/or rules obtainable from the Graduate Studies office and providing for a quality level suitable for publication.
9. Student presents one copy to the department chair, one to the adviser, and retains one copy;

10. If all requirements are met, student receives degree, granted by the Board of Curators upon the recommendation of the graduate faculty.

Dates for important deadlines may be found at: www.eng.mst.edu/info/deadlines.html

VIII.C. MASTERS DEGREE WITHOUT THESIS

VIII.C.1. Requirements

The master’s degree program without thesis shall consist of a minimum of 30 hours of graduate course credit in addition to any prerequisites. CE-300 Special Problems will be excluded from this 30-hour minimum. At least nine (9) semester hours of required work will be from the group of lecture courses bearing numbers in the 4XX series. It is recommended that at least six (6) semester hours will be devoted to courses outside the major department. A maximum of six (6) hours of 200-level courses can be accepted in a M.S. program.

Students pursuing an M.S. must petition the Assistant Chair for Graduate Affairs in order to include CE 400 Special Problems in their plan of study. The student must submit a one-page syllabus and a cover letter including motivation and thesis topic. Thesis option students may petition up to six credits; non-thesis students may petition up to three credits. It is preferred that the instructor be a faculty member other than the student’s graduate advisor. The Assistant Chair for Graduate Affairs may request input from faculty with expertise in the specific topical area.

VIII.C.2. Appointments

Students pursuing a non-thesis option are normally not eligible for salaried appointments such as a GTA or GRA. However, with the approval of the Chair of Civil Engineering, graduate students following the non-thesis option may be hired on an hourly basis.

VIII.C.3. Procedures for Masters Candidate Without Thesis

All students are required to have completed admissions requirements including transcripts, GRE scores, and TOEFL. Specific procedures are:

1. Register after consulting with graduate adviser;
2. Obtain adviser and completes Graduate Form I not later than six weeks after the beginning of the second semester in residence;
3. Complete academic requirements;
4. Within four (4) weeks of the beginning of the last semester, student must check with the registrar to make application for diploma.

If all requirements are met, student receives degree, granted by the Board of Curators upon the recommendation.

VIII.D. MASTERS DEGREE ON-LINE

VIII.D.1. Requirements
The Masters Degree on-line program is a non-thesis program with the same requirements and procedures as the on-campus non-thesis masters program. All courses may be taken via distance education (on-line, EEC, or transfer).

**VIII.E. MASTER OF ENGINEERING DEGREE**

The Masters of Engineering degree is a practice oriented program designed for full-time students with the possibility of completion of degree requirements in one year, and for students working in industry through distance education. The choice of this degree program is made in consultation with the student’s advisor and with the approval of the program director.

**VIII.E.1. Requirements**

The Master of Engineering program with project shall consist of a minimum of 30 semester hours of graduate credit over and above prerequisites. At least six semester hours of the required work be from the group of lecture courses bearing numbers in the 400 series, and it is recommended that at least three semester hours will be devoted to courses outside the major department. A maximum of six hours of 200-level courses can be accepted into M.Eng program. Credit for research and development work conducted in preparation for the practice oriented project is counted in terms of hours making up the total credit hours by mastering and improving at least one manufacturing process or system, but not less than 3 hours. A minimum of 6 hours must be devoted to Graduate Research, Course 400. (Depending on the advisor’s affiliation, course 400 credit is registered under the department involved.) Project work can be conducted on the Missouri S&T campus or in the industry with the approval of the advisor. Such industrial projects must be supervised by an industrial supervisor and have prior written approval (Graduate form “Application to Do Non-resident Research”) of the student’s graduate advisor and program director. Care must be taken to provide and industrial project that promises results equivalent to or superior to that which might be expected at Missouri S&T.

For more effective use of the committee, the candidate is encouraged to: (1) submit a written description of the proposed project to members of the committee as soon as the topic is decided and (2) obtain written approval of the committee indicating the proposed project is M.Eng. caliber.

**VIII.E.2. Project Report**

The findings and results of the practice oriented project undertaken by the candidate for a master of engineering degree must be presented in a report. A minimum of one (1) original and three (3) copies normally will be prepared following a format approved in advance by the advisor. After examining the report, the advisor will authorize the student to conduct an oral presentation of the project.

**VIII.E.3. Oral Presentation**

The student will distribute copies of the report to the project committee and arrange a time and place for the presentation of the project. The student must be enrolled at the time of the presentation in accordance with Missouri S&T Policy Memorandum Number II-20. Such presentations are normally scheduled only when the school is officially in session. Each committee member should be allowed to examine the report for at least three days before the oral presentation. During the presentation, the candidate should exhibit an acceptable knowledge of a professional are as defined by the program.

In order for the candidate to pass the project requirement, all the project committee members must vote affirmatively. If the majority of the committee votes not to pass the candidate, the program director shall appoint a new project committee, on which the dissenting member may
be replace, and the new committee will administer a second presentation. A student who fails a second time will no longer be eligible for a master of engineering degree. Immediately following the presentation, the chair of the committee will report the action of the committee to the program director.

VIII.E.4. Procedure for Master of Engineering Candidate

1. Go to steps 1 through 4 for regular graduate student
5. Submits report;
6. Advisor authorized presentation;
7. Candidate distributes copies of the report to project committee at least three days before the oral presentation
8. Arranges a date, time and place for the oral presentation of the project (the student must be enrolled at the time of the examination);
9. Chair of the examining committee reports the action of the committee to the program director;
9. If all requirements are met, student receives degree. Granted by the Board of Curators upon the recommendation of the graduate faculty.

VIII.F Core Curriculum for Graduate Students
VIII.F.1. Structures

Structures M.S. and Ph.D. students are required to fulfill a course core requirement. Students must choose one course from each of the following lists:

**List A**
- CE 319 Applied Mechanics in Structural Engineering

**List B**
- CE 301 Special Topics
- CE 320 Structural Analysis II
- CE 323 Computer Methods of Structural Analysis

**List C**
- CE 326 Advanced Steel Structures Design
- CE 327 Advanced Concrete Structures Design
- CE 328 Prestressed Concrete Design
IX. DOCTOR OF PHILOSOPHY

The italicized information below is from the Missouri University of Science & Technology Graduate Catalogue. Other information reflects the Missouri S&T Department of Civil, Architectural, and Environmental Engineering policy. All information is subject to change without notice.

IX.A. OVERVIEW

The degree of Doctor of Philosophy is awarded to students who have pursued graduate study without serious interruption, who have submitted an acceptable dissertation, passed all prescribed examinations, and satisfactorily met all requirements described below. Recipients of this degree are attested by the graduate faculty as having attained a high level of learning by extensive study in some special branch and as having developed an ability to carry on independent research.

IX.B. ACCEPTANCE OF CANDIDATES

To initiate candidacy\(^3\) for the degree of doctor of philosophy, the student will be required to pass a qualifying examination administered by the department in which the student expects to become a candidate. This examination may be taken prior to enrollment, if desired.\(^4\) The department chair will report to the vice provost of graduate studies the results of the qualifying examination (Graduate Form IV). Ph.D. forms are available at [www.eng.mst.edu/Info/gradforms.html](http://www.eng.mst.edu/Info/gradforms.html)

There are no general remedial or prerequisite courses required of qualified students with accredited (or equivalent) engineering degrees wishing to enter the doctoral program. Each area may set its own core and remedial course requirements. It is the responsibility of the doctoral committee to develop an appropriate program of study consistent with developing a student’s area of specialization and consistent with all pertinent existing policies. For non-engineers, each area’s prerequisites which apply to the MSCE or MSEnvE degree also apply for the doctoral program.

The student will consult with an advisor of his/her choice to select an advisory committee. The Ph.D. Advisory Committee will assist the major advisor of a Ph.D. student in ensuring the quality of the research work presented in the Ph.D. The assumptions, methodologies, and conclusions included in the dissertation must be well supported by high quality test data or based on some fundamental theories. The Committee will also assist the advisor in ensuring that the overall research work has significant contributions to the specialty area of the student. To meet the above expectations, it is expected that the Committee meet with the student at least once a year to understand the recent development of the student’s research and provide input to the completed or further research tasks.

The committee will consist of at least five members. Five of the committee members should be members of the graduate faculty. The committee will include at least one member from outside the candidate’s department. One member also should represent the department most closely associated with any minor field of study elected by the student. The names of the proposed members will be transmitted (Graduate Form V) by the student’s department chair to the Vice Provost for Graduate Studies for appointment. Additional members and replacement members will be appointed using Graduate Form VI-A.

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\(^3\) Technically a student can become a doctoral-level student only after satisfactorily completing 30 credit hours of graduate study. Prior to that time, the student is recorded as a master's-level student or candidate.

\(^4\) The Graduate Studies Office requires that the qualifying exam be passed by the end of the second semester after completion of the M.S. degree. The Program of Study (Form VI) must be submitted by the end of the qualifying semester.
For a more effective use of the doctoral committee, the candidate shall by 12 months of entering his/her doctoral program (1) submit a written description of the proposed research (i.e., a preproposal) to the members of his/her committee in NSF format, (2) present the preproposal to his/her advisory committee to allow oral discussion and questioning; (3) obtain written approval of the committee indicating that the proposed research is of Ph.D. caliber, and (3) submit periodic progress reports to the committee and discuss them with committee members or with the committee as a group (frequency of reports and method of discussion should be decided by the committee).

Passing of the qualifying examination and the approval of a course of study and research by the advisory committee, department chair, and the Vice Provost for Graduate Studies will signify acceptance as a candidate for the degree of doctor of philosophy.

A person who has held the rank of assistant professor or higher at Missouri S&T is not eligible to become a candidate for the Ph.D. at this institution.

IX.C. PROGRAM OF STUDY

IX.C.1. Consultation with Advisor

Prospective Ph.D. candidates who have received a bachelor’s degree but not a master’s should consult with their advisor, and an advisory committee (recommended by the department on Graduate Form V), which will be approved and appointed by the Vice Provost for Graduate Studies during the second semester of attendance as a graduate student. The committee will aid the student in preparing an outline of the course work and the research investigation proposed for the dissertation.

Prospective Ph.D. candidates who have received a master’s degree from Missouri S&T should consult with their advisor and select the proposed advisory committee (Graduate Form V) for appointment by the Vice Provost for Graduate Studies during the early part of their first semester of attendance after having received the master’s degree. They also must have reported the results of the qualifying exam on Graduate Form IV. The committee will aid the student in preparing an outline of the course work and the research investigation proposed for the Ph.D. This outline (Graduate Form VI-Ph.D.) must be submitted to the Vice Provost for Graduate Studies for approval before the student enrolls for a second semester. The program will show all graduate work above the baccalaureate to be considered as part of the doctoral program.

IX.C.2. Subjects of Study

The subjects of study may be chosen from one or more departments, as determined by the advisory committee, but shall constitute a definite plan of training for research or scholarly investigation in some particular field. A major field of study must be designated. A student is encouraged to elect one minor field of study consisting of at least twelve (12) semester hours of work outside his or her major area of study.

IX.D. REQUIREMENTS

IX.D.1. General Requirements

The doctoral program will include at least 24 semester credit hours of dissertation research (490)\(^5\). Ph.D. students will be required to take 24 hours of coursework post MS degree and 48 hours of coursework post BS. Coursework can include up to 3 hours of CArE Eng 300 or 400 special problems course. A doctoral student will have at least 9 credit hours of 4XX (15 hours are recommended) required excluding 400 and 490 post bachelor’s degree.

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\(^5\) When co-advising a dissertation, course 490 credit may be shared by all departments involved.
Correspondence and extension courses do not form part of the program for the Ph.D. degree except as they may be part of a master’s program. Additional work of this type beyond that allowed for the master’s degree is not acceptable.

Credit for research work conducted in the preparation of the dissertation is counted in terms of hours making up the total credit hours required for the degree. Research work will normally be conducted on the Missouri S&T campus. In special cases, all or part of the research may be conducted elsewhere, but must be supervised by a member of the faculty. Such research must have the prior written approval of the student’s advisory committee, department chair and Vice Provost for Graduate Studies.

The Ph.D. degree will be granted only if all graduate credit counted toward the degree has been obtained in the previous eight (8) years unless a formal request for an extension is initiated by the advisor and approved by the department chair and the Vice Provost for Graduate Studies. An extension, if granted, may involve revision of the candidate’s program to update course work and research. Alternately, for candidates who have the master’s degree or its equivalent (i.e. first 30 hours of graduate credit) or who have passed the qualifying examination, all remaining credit must be obtained within the last six (6) years. Acceptance of the prior work from a master’s degree or its equivalent, as part of the doctoral program, is up to the discretion of the student’s advisory committee.

The candidate for the degree of doctor of philosophy will normally complete the equivalent of three (3) years (6 semesters, 72 hours minimum) of full-time work beyond the bachelor’s degree, at least half of which must be taken at Missouri S&T. For those holding a master’s degree from Missouri S&T or another institution, the requirement can be met by completing the equivalent of two (2) years (4 semesters) of full-time work beyond the master’s degree. This will normally include a minimum of two (2) consecutive semesters in residence at Missouri S&T with a graduate registration of at least nine hours per semester.

**IX.D.2. Residence Requirements**

If any of the years of advanced work have been spent away from Missouri S&T, the vice provost for graduate studies, upon recommendation of the student’s advisory committee, will decide in each case whether these years may be properly regarded as having been spent under suitable guidance and favorable conditions. At least 15 hours of graduate course work, exclusive of research, special problems, special investigations and seminars, must be taken on the Rolla campus.

The candidate for the degree of doctor of philosophy will normally complete the equivalent of three years (six semesters, 72 hours minimum) of full-time work beyond the bachelor’s degree, at least half of which must be taken at Missouri S&T. For those holding a master's degree from Missouri S&T or another institution, the requirement can be met by completing the equivalent of two years (four semesters) of full-time work beyond the master's degree. This will normally include a minimum of two consecutive semesters in residence at Missouri S&T with a graduate registration of at least nine hours per semester. If any of the years of advanced work have been spent away from Missouri S&T, the Vice Provost for Graduate Studies, upon recommendation of the student's advisory committee, will decide in each case whether these years may be properly regarded as having been spent under suitable guidance and favorable conditions. At least 15 hours of graduate course work, exclusive of research, special problems, special investigations and seminars, must be taken on the Rolla campus.

For the purpose of computing the equivalent of full-time work, the following table will be used:

<table>
<thead>
<tr>
<th>Hours per Session</th>
<th>Equivalent Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 to 16</td>
<td>0.500 year</td>
</tr>
</tbody>
</table>
9 to 11 hours per session 0.375 year
6 to 8 hours per session 0.250 year
(6 to 9 hours, summer)
3 to 5 hours per session 0.125 year
0 to 2 hours per session 0.0

IX.D.3. Transfer Credits
The same requirements with respect to transfer credits apply in the Doctor of Philosophy program as for the Masters of Science Programs.

IX.D.4. Language Requirement
*The decision as to any doctoral language requirement rests with the department and the candidate’s advisory committee.*

IX.D.5. Dissertation Requirements
*The dissertation, embodying the results of an original investigation, must be written upon a subject approved by the major advisor.*

A manual\(^6\) entitled “Specifications for Thesis and Dissertations (T/D)” is available at [www.mst.edu/~gradchar/curr.html](http://www.mst.edu/~gradchar/curr.html).

IX.E. EXAMINATIONS

IX.E.1. Qualifying Exam

IX.E.1.a. Purpose
The purpose of the department-required Qualifying Examination is to determine the student’s understanding of the fundamentals of civil or environmental engineering and to guide the student in selecting appropriate courses.

IX.E.1.b. Scheduling
The qualifying exam will be conducted on the third Saturday of each academic semester.

*Thesis defense must be made at least two weeks prior to the defense date* (see Appendix C for CArE grad form PhD1).

*Students with M.S. Degree (Non-thesis) or with a M.S. Degree from another program or from another university:* Students with any non-thesis M.S. degree or with a M.S. degree from another program, department or university must take the Qualifying Examination no later than the end of their second semester in residence (see Appendix D page D-2 for CArE grad form PhD 2 and PhD 3).

\(^6\) Liberal choices are allowed relative to the style manual used in the preparation of the dissertation. Approval of the dissertation requires following rigidly the style manual selected and/or rules obtainable from the Web at: [http://www.Missouri S&T.edu/~gradchar/curr.html](http://www.Missouri S&T.edu/~gradchar/curr.html) and providing for a quality level suitable for a publication.
**Students without a M.S. Degree:** Students without a M.S. degree must take the Qualifying Examination after completion of 24 semester hours of graduate course work (not including CE 490), but no later than their fourth semester in residence.

**IX.E.1.c. Examiners**

The Qualifying Examination Committee, chaired by the Assistant Chair for Graduate Affairs, is appointed by the Department Chair and administers the Qualifying Examination. The members of the committee are selected from those areas designated by the student for examination (Section IX.E.1.d.).

**IX.E.1.d. Registering for the Qualifying Examination**

Students seeking Ph.D. candidacy register for the Qualifying Examination in the first two weeks of the semester. At this time, they declare their principal area of study and two other areas chosen from the following list:

**Students with a Civil Engineering undergraduate degree:**
Architectural Engineering
Construction engineering and management
Construction materials
Environmental engineering
Geotechnical engineering
Hydro-Resource engineering
Structural engineering
Transportation engineering

**Students with an undergraduate degree in another field:**

Students whose undergraduate degree and/or master’s degree are in a field other than civil engineering should declare their principal area of study from the above list. The two additional areas will be chosen from the student’s undergraduate program (e.g., Table 2) as determined by the faculty from the student’s principal area of study and approved by the Assistant Chair for Graduate Affairs.

**IX.E.1.e. Format**

The Ph.D. written Qualifying Examination is an open-book, open-notes written examination given in two three hour parts (morning and afternoon) in one day. Calculators are permitted, laptop computers are not permitted.

**IX.E.1.e.1 Part 1: Fundamental Concepts**

**Students with a Civil Engineering undergraduate degree:**
The morning examination tests the student’s understanding of fundamental concepts in civil engineering. The problems are at the level of basic undergraduate courses but are not restricted to material in specific courses. The morning examination consists of ten questions, one each chosen from the ten general subject areas listed below (Table 1). Corresponding Missouri S&T courses in which the subject matter is tested are also listed. The student must select five and only five problems to solve. If a student has documented that he or she has successfully passed the Fundamentals of Engineering (FE) Exam, Part 1 of the Qualifying Examination is waived.

**Students with an undergraduate degree in another field**
The morning examination tests the student’s understanding of fundamental concepts in their degree area. The problems are at the level of basic undergraduate courses but are not restricted
to material in specific courses. The morning examination consists of ten questions, one each selected from subjects chosen in consultation with the student, the student’s advisor and the Chair of the Qualifying Examination Committee. The student must select five and only five problems to solve. Table 2 is an example of subject areas for students seeking a Ph.D. with an Environmental Engineering Emphasis.

Table 1: Example of Qualifying Exam Subject Areas for B.S.C.E. Students

<table>
<thead>
<tr>
<th>Area</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation Engineering</td>
<td>CE 211</td>
</tr>
<tr>
<td>Soil Mechanics</td>
<td>CE215</td>
</tr>
<tr>
<td>Steel Design</td>
<td>CE 221</td>
</tr>
<tr>
<td>Concrete Design</td>
<td>CE 223</td>
</tr>
<tr>
<td>Foundation Design</td>
<td>CE 229</td>
</tr>
<tr>
<td>Hydraulic Engineering</td>
<td>CE 235</td>
</tr>
<tr>
<td>Engineering Hydrology</td>
<td>CE 233</td>
</tr>
<tr>
<td>Construction Engineering</td>
<td>CE 248</td>
</tr>
<tr>
<td>Environmental Engineering</td>
<td>CE 261</td>
</tr>
<tr>
<td>Water and Wastewater Engineering</td>
<td>CE 265</td>
</tr>
</tbody>
</table>

Table 2: Qualifying Exam Subject Area for Non-CE Degree Holding Students Seeking Ph.D. with an Environmental Engineering Emphasis

<table>
<thead>
<tr>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical/chemical water treatment</td>
</tr>
<tr>
<td>Biological wastewater treatment</td>
</tr>
<tr>
<td>Groundwater treatment</td>
</tr>
<tr>
<td>Inorganic environmental chemistry</td>
</tr>
<tr>
<td>Organic environmental chemistry</td>
</tr>
<tr>
<td>Analytical environmental chemistry</td>
</tr>
<tr>
<td>Groundwater hydrology/contaminant transport</td>
</tr>
<tr>
<td>Environmental biochemistry</td>
</tr>
<tr>
<td>Environmental microbiology</td>
</tr>
<tr>
<td>Air pollution</td>
</tr>
<tr>
<td>Environmental law and regulations</td>
</tr>
</tbody>
</table>

IX.E.1.e.2 Part 2: Advanced Concepts

The afternoon examination consists of six problems; four from the student’s chosen emphasis area and two from the two other areas selected by the student at the time of registration for the examination. The student must work six of the eight problems. The problems are at the level of advanced undergraduate and beginning graduate courses in the areas, but are not restricted to the material covered in specific courses.

IX.E.1.f. Results

Appropriate faculty grade the problems. The Qualifying Examination committee shall make the final decision on the Qualifying Exam outcome. The Assistant Chairman for Graduate Affairs shall serve as the non-voting member convener of the committee. A grade of 70% constitutes passing of the examination. Upon successful completion of the Qualifying Examination, the student is

IX- 6
admitted to Ph. D. candidacy. A student who fails the examination may take the entire examination again at the regularly scheduled time the next semester. A student may take the Qualifying Examination a maximum of two times. The Qualifying Examination Committee evaluates the results of the examination.

In a few cases, a student taking the Qualifying Examination for the second time has a record that is ambiguous enough that the Qualifying Examination Committee is unable to decide whether the student should be admitted to Ph.D. Candidacy. In such cases, the student is required to appear for an oral examination administered by the Qualifying Examination Committee. The oral examination is intended to probe the student’s strengths and weaknesses in the areas declared by the student for the morning and afternoon examinations. The student’s record and the oral examination report are evaluated by the Qualifying Examination Committee to decide whether the student should be admitted to Ph.D. candidacy.

A student who has been denied admission twice to Ph.D. candidacy is no longer eligible for admission to Ph.D. candidacy.

**IX.E.2. Comprehensive Examination**

The student is required to pass a comprehensive examination planned and administered by the student’s advisory committee during his/her candidacy.

The Vice Provost for Graduate Studies will authorize the student’s advisory committee to administer the comprehensive examination after the student has completed 75% of the course work on the doctoral program. It will be both written and oral.

With the approval of the student’s advisory committee, the candidate’s department may administer the written portion of the examination, but the final judgment of the candidate’s performance will be left to the advisory committee. Upon satisfactory completion of the written examination, the advisory committee will orally examine the candidate. It is recommended that these examinations be completed within a 30-day period.

A report of the comprehensive examination will be sent to the Vice Provost for Graduate Studies (Graduate Form VII). A candidate will be considered to have passed if all, or all but one, of the advisory committee vote that the student pass.

If failure is reported, the advisory committee will recommend suggested work or other remedial measures to the candidate. A second comprehensive examination may not be scheduled until after the lapse of 12 weeks. Failure of the second examination will automatically terminate the candidacy.

**IX.E.2.a. Purpose**

The primary purpose of the Comprehensive Examination is to evaluate the preparedness of the candidate to perform quality research as proposed.

**IX.E.2.b. Scheduling**

The comprehensive examination is taken following completion of 75% the candidate’s formal course work.

**IX.E.2.c Examiners**

The candidate’s Ph.D. Advisory Committee administers the Comprehensive Examination.

**IX.E.2.d. Format**

The comprehensive examination consists of an oral presentation of the student’s intended doctoral research work and an examination on subject matter related to the dissertation area.
The candidate must prepare a dissertation proposal in National Science Foundation (NSF) proposal format (Sections A-D) (visit http://www.nsf.gov/pubs/2004/nsf042/start.htm). The student must submit the proposal to his Advisory Committee Chair and the ACGS at least two weeks prior to the scheduled examination date. The Advisory Committee Chair will solicit written questions for the student to answer prior to the oral examination from Committee members.

The oral examination should begin with a presentation of the dissertation proposal. While the examination centers on the dissertation topic, it also assess the depth and breadth of the student’s knowledge and ability to solve fundamental research problems. The response of the student to the written questions can also be probed during this examination.

The Committee determines if the candidate (1) has sufficient ability and comprehensive knowledge to conduct the research, (2) has sufficiently reviewed the literature, and (3) has proposed research which has a reasonable scope and which should produce an original and acceptable research contribution.

IX.E.2.e. Results

The Committee shall (1) unconditionally approve the proposed research, (2) approve the proposed research with revisions, (3) reject the proposed research with specific reasons given and recommendations made, or (4) terminate the student from the Ph.D. program. Results 1 and 2 constitute passage; results 3 and 4 constitute failure. Following outcome 3, a reexamination may be held.

IX.E.3. Final Examination

Final Examination - Notice of the final examination shall be publicly announced at least one week prior to the examination. It will be an oral defense of the dissertation and may be attended by any interested person, who may question the candidate with permission of the chair of the advisory committee. Information regarding the announcement must be given to the Graduate Studies office prior to the one-week announcement.

A report of the examination will be sent to the Vice Provost for Graduate Studies (Graduate Form IX). A candidate will be considered to have passed if all, or all but one, of the advisory committee vote for passing. If failure is reported, the advisory committee will recommend suggested work to be completed or other remedial measures to be taken before another examination is scheduled.

When a candidate has completed all requirements for the degree of doctor of philosophy, the office of the Vice Provost for Graduate Studies will forward the copy of the candidate’s approved dissertation to the Missouri S&T Library.

IX.E.3.a. Purpose

At the final examination, the candidate formally presents his or her doctoral research in a forum open to all members of the University community and the public at large and defends the research and conclusions against any challenge.

IX.E.3.b Scheduling

The final examination is scheduled according the procedures in the Graduate Catalog (e.g., no sooner than 12 weeks after the Comprehensive Examination).

IX.E.3.c. Examiners

The candidate’s Ph.D. Advisory Committee administers the Final Examination.
IX.E.3.d. Format

The final examination shall be open to the public through formal announcements. The student must notify the Graduate Studies office and the department’s graduate secretary at least 7 days prior to the examination. The student must provide an electronic copy of their abstract. The student will need to post fliers announcing his/her dissertation in all relevant locations. The defense will be conducted in a formal and professional manner. The chair of the student’s Advisory Committee shall introduce the candidate and outline the defense procedure. The candidate shall then present the doctoral research findings to the committee and public. After the presentation, questions will be invited from all present.

IX.E.3.e. Results

After the open question-and-answer period, the student’s Advisory Committee reconvenes in a closed session. The Committee may recommend further examination, acceptance of the research, rejection of the research, or any other course of action. In the event of failure, a second examination may be permitted. A second failure results in dismissal.

IX.F.3. Procedure for Doctor of Philosophy Candidates

All students are required to have completed admissions requirements including transcripts, GRE scores, and TOEFL, if required. Specific procedures are:

1. Completes admission requirements;
2. Passes a qualifying examination, administered by the student’s department, as early as possible;
3. Department chairmen reports the results of the qualifying examination to the Vice Provost for Graduate Studies (Graduate Form IV);
4. Consults with advisor to select an advisory committee of five members at the earliest opportunity after completion of qualifying examination. With previous graduate work at Missouri S&T this can normally be accomplished during the first semester. In all instances it should be completed not later than six weeks into the second semester.
5. The advisor, with the approval of the department chair, requests the Vice Provost for Graduate Studies to appoint an advisory committee (Graduate Form V);
6. Solicits the aid of the committee in preparing an outline of courses and research. Note: A standard format (Graduate Form VI-Ph.D.) must be followed.*
7. Submit a written proposal of the proposed research (i.e., a pre-proposal) to the members of his/her committee in NSF format, present the pre-proposal to the advisory committee to allow oral discussion and questioning.
8. After student has completed 75% of the courses on the doctoral program, the advisor requests Vice Provost for Graduate Studies to authorize the advisory committee to administer the comprehensive examination.
9. Advisory committee reports the results of the comprehensive examination to the Vice Provost for Graduate Studies (Graduate Form VII);
10. After the student passes the comprehensive examination, continuous enrollment must be maintained in accordance with Policy Memo II-20, until the degree is completed or the candidacy is canceled;
11. Within four weeks of the beginning of the last semester, the student must check with the registrar to make application for diploma;
12. The student and the advisor select the date, time, and place of the examination: Submit Dissertation Submittal and Schedule for Defense (see appendix D page D-5), and inform the graduate studies office electronically so that the final examination can be publicly announced at least one week in advance. Note: The student must be enrolled at the time of the examination.

13. Advisory committee reports results of the final examination to the Vice Provost for Graduate Studies (Graduate Form VIII) accompanied by approved copy of dissertation, “B&H (University Microfilm Inc.) Doctoral Dissertation Agreement” form, and “Survey of Earned Doctorates” form (obtain from Graduate Studies office).

14. When all requirements have been met, the Graduate Studies office forwards the approved dissertation to the Missouri S&T library; student presents one copy to the Missouri S&T library; student presents one copy to the department chair, one to the advisor, and retains a copy;

15. Board of Curators grants degree upon recommendation of graduate faculty.

*see bottom of page IX-I for guidelines on this item.

IX.G.3. Shared Doctoral Programs

Through its identification of faculty qualified to direct doctoral candidates on all four campuses, the University of Missouri provides a unique opportunity for breadth of experience in doctoral programs. Candidates admitted to doctoral status on one campus may plan, with the consent of their committee, either course work or research on another campus. Advisory committee membership may involve more than one campus, and dissertations may be pursued under the direction of an appropriate doctoral faculty member on a second campus. Residency and other routine requirements of the degree-granting campus must be followed, but as the requirements for all campuses are similar, this should provide no unusual problem. The appropriate Vice Provost for Graduate Studies should be involved in shared programs as early as possible to prevent misunderstandings and ease avoidable problems.
X. DOCTOR OF ENGINEERING

The italicized information below is from the Missouri University of Science & Technology Graduate Catalogue. Other information reflects the Missouri S&T Department of Civil, Architectural, and Environmental Engineering policy. All information is subject to change without notice.

The degree of Doctor of Engineering, like the degree of Doctor of Philosophy, represents the highest level of attainment in engineering study and practice. This degree is awarded to candidates who have pursued a broad program of study, completed an acceptable engineering internship, passed all prescribed examinations, submitted an acceptable practice-oriented dissertation, and met satisfactorily all requirements described here.

Following admission to graduate study, a student can initiate candidacy for the doctor of engineering degree by consulting with the advisor about the selection of an advisory committee. The committee should include the candidate’s major advisor plus at least four other faculty members. The committee members should be representative of the departments included in the candidate’s intended plan of study. This committee will aid the student in preparing the plan of study, which will include the course work and plans for an engineering internship, an outline project which the student plans to follow for the dissertation, and a program for completing residence requirements. Approval by the Vice Provost for Graduate Studies of the student’s plan of study will signify acceptance of the student as a candidate for the degree of doctor of engineering.

The Department of Civil, Architectural, and Environmental Engineering welcomes graduate students pursuing a Doctor of Engineering degree at Missouri University of Science & Technology via EEC and elsewhere. The Department of Civil, Architectural, and Environmental Engineering in conjunction with the student’s advisor has the option to waive the residency requirement for the Doctor of Engineering student.

For further information of the Doctor of Engineering degree, please refer to the Missouri S&T Graduate Catalogue.
APPENDIX A

A. GRADUATE FACULTY

Most of the faculty in the Dept. of CE are involved in advising graduate students, and are actively engaged in research endeavors. Students are encouraged to familiarize themselves with the research areas of individual faculty members and to talk directly with those faculty whose research interests are consistent with the student’s interests.

William P. Schonberg, P.E., Ph.D., Chair, Northwestern University, Professor of Civil Engineering and Department Chair. Armor/anti-armor, penetration mechanics, spacecraft shielding against meteoroid and orbital debris impacts, hypervelocity impact phenomena, contact/impact problems in engineering mechanics.[structures]

Hojong Biak, Ph.D., Virginia Technical University, Assistant Professor of Civil Engineering, Application of mathematical programming and simulation modeling techniques to transportation system analysis, Software development for the Decision Support System using GIS tool. [transportation]

Stuart W. Baur, Ph.D., University of Missouri – Rolla, Assistant Professor in Civil Engineering, Integrated building systems, advanced technologies in building systems, green construction, rehabilitation of historic structures, materials and methods of construction. [architectural]

Abdeldjelil Belarbi, E.I.T., Ph.D., University of Houston, Distinguished Teaching Professor of Civil Engineering. Senior Research Investigator with the Intelligent Systems Center. Design and analysis of reinforced and prestressed concrete systems, constitutive modeling of reinforced and prestressed concrete materials, continuum mechanics, characterization and performance of FRP composite structures and smart sensors/actuators as applied to civil infrastructures. [structures]

Ghulam Bham Ph.D., University of Illinois- Urbana Champaign, Assistant Professor of Civil Engineering. [transportation]

Joel G. Burken, E.I.T., Ph.D., University of Iowa, Associate Professor of Civil Engineering and Research Investigator Environmental Research Center. Environmental Engineering Research: Phytoremediation of organic contaminants and heavy metals, biological wastewater treatment, constructed wetlands, integrated remediation systems. [environmental]

Genda Chen, P.E., Ph.D., State University of New York at Buffalo, Professor of Civil Engineering. Structural dynamics, random vibration, soil-structure interaction, earthquake hazard mitigation, energy dissipation devices, health monitoring and active control of civil engineering structures. [structures]

Mark W. Fitch, E.I.T., Ph.D., University of Texas at Austin, Associate Professor of Civil Engineering. Bioremediation of recalcitrant pollutants, membrane reactors, genetically-engineered bacteria for bioremediation, constructed wetlands for metals removal. [environmental]

Yu-Ning Ge, Ph.D., University of Colorado at Boulder, Assistant Professor of Civil Engineering. Geotechnical earthquake engineering, mechanics and constitutive modeling of geomaterials, geotechnical centrifuge modeling. [geotechnical]
Roger A. LaBoube, P.E., Ph.D., University of Missouri – Rolla, Distinguished Teaching Professor of Civil Engineering. Behavior and design of cold-formed steel structures, load and resistance factor design of steel structures, design and behavior of light steel construction, behavior of bolted and welded connections, structural stability, design of plates and shells, application of building code provisions. [structures]

Ronaldo Luna, P.E., Ph.D., Georgia Institute of Technology, Professor of Civil Engineering. Soil mechanics and foundation engineering, geotechnical earthquake engineering, hazard modeling, numerical modeling and information systems. Geotechnical engineering standards for acquisition of field and laboratory data. Spatial analysis, modeling and representation of geotechnical data in 3D/2D space for use in information systems (e.g., GIS, remote sensing, data visualization, and macro/micro image processing). [geotechnical]

Cesar Mendoza, Ph.D., Colorado State University, Associate Professor of Civil Engineering. Hydrodynamics, hydraulics, environmental fluid mechanics, transport processes, sediment mechanics and mathematical modeling. [hydro-resources]

Charles D. Morris, P.E., Ph.D., University of Illinois, Associate Professor of Civil Engineering. Stochastic processes in hydrology, watershed modeling, fluid mechanics, steady and unsteady fluid flow, mathematical modeling, and statistics. [hydro-resources]

Glenn Morrison, Ph.D., University of California, Berkeley, Associate Professor of Civil Engineering. Applied research in the area of improving the environment; formation, transport, transformation, and fate of air pollutants; pollutant interactions at interfaces; measurement and control of air pollutants from indoor to regional scales. [environmental]

John J. Myers, P.E., Ph.D., University of Texas at Austin, Associate Professor of Civil Engineering. High performance concrete (HPC) behavior and durability performance (PC and RC); development of infrastructure systems and monitoring techniques, fiber-reinforced polymers (FRP) in structural repair and strengthening applications with an emphasis related to structural behavior, bond, substrate characterization, and durability performance. [structures]

David N. Richardson, P.E., Ph.D., University of Missouri-Rolla, Associate Professor of Civil Engineering. Properties of construction materials, properties of shale, pavement analysis and design. [materials]

Eric Showalter, P.E., Ph.D., Purdue University, Information technology applications in construction, green construction, environmental remediation, productivity, simulation, cost effectiveness of technology. [construction]

Leslie Sneed, P.E., Ph.D., Purdue University, Assistant Professor of Civil Engineering. Reinforced and prestressed concrete structural members and systems, structural Models and experimental methods, innovative methods of repair and strengthening of structures subjected to seismic loading or other extreme hazards, structural hazard mitigation, progressive collapse, design codes and construction specifications for structural concrete. [structures]

Richard W. Stephenson, P.E., Ph.D., Oklahoma State University, Professor of Civil Engineering. Foundation design, engineering behavior of soils, embankment dams, foundation engineering. [geotechnical]

Jeffrey Volz, P.E., Ph.D., The Pennsylvania State University, Assistant Professor of Architectural and Civil Engineering, Durability, corrosion and fatigue of prestressed and reinforced concrete, sustainability, and progressive collapse of multi-story structures. [structures]

Jianmin Wang, PhD., University of Delaware, Assistant Professor of Civil Engineering. Fate and transport of heavy metals in natural and engineered systems, biological wastewater treatment processes. [environmental]
B. OTHER FACULTY MEMBERS AVAILABLE TO SERVE ON GRADUATE COMMITTEES

Franklin Cheng, Ph.D., University of Wisconsin- Madison, Curator’s Professor Emeritus of Civil Engineering. Earthquake structural engineering, smart building structures and structural control, optimum structural design, numerical methods including finite elements for nonlinear structures, soil interaction.

Rodney W. Lentz, P.E., Ph.D., Michigan State University, Associate Professor Emeritus of Civil Engineering. Dynamic properties of highway materials, soils properties, soil improvement, soil erosion, erosion, geoenvironmental, geosynthetics. [geotechnical]

Thomas M. Petry, P.E., Ph.D., Oklahoma State University, Professor of Civil Engineering. Geotechnical Engineering, characterization of clays and their behavior, physico-chemical phenomena in soils, performance based testing of soils, stabilization of soils and chemical stabilization of clays. [geotechnical]

Shamsher Prakash, Ph.D., University of Illinois Urbana-Champaign, Professor Emeritus of Civil Engineering. Soil dynamics, earthquake effects on soil, piles, and retaining walls under dynamic loads, liquefaction of silts, prediction and performance of geotechnical engineering.

Harold W. Wagner, P.E. Construction Engineering and Management as applied to Civil Engineering design and construction projects. Professional service issues include licensure, acquisition of professional design services, service contract administration, and construction contract administration responsibilities. Construction issues include construction planning, estimating, scheduling, cost control, reporting, and dispute resolution. [construction]

Wei-Wen Yu, P.E., Ph.D., Cornell University, Curator’s Professor Emeritus of Civil Engineering, Cold-formed steel structures.
APPENDIX B

A. DEFINITIONS, DUTIES, AND RESPONSIBILITIES OF GAs AND GTAs

Graduate Teaching Assistant (GTA) – a graduate student on appointment who has taken and passed the GTA Workshop.

At the beginning of each semester, a GTA will receive from the supervising faculty member a clearly written statement outlining expectations and duties pursuant to the GTA assignment. GTAs may, on occasion, substitute for a faculty member as a guest lecturer. Their assistance is typically provided in the form of leading one or more laboratory sections or grading homework assignments. GTAs may not assign final course grades. They may, however, recommend grades for the laboratory or homework component of a course if appropriate. Faculty members are expected to provide GTAs with solutions or grading keys to all assigned work or to review and approve solutions or grading keys developed by a GTA.

Graduate Assistant (GA) – a graduate student on appointment who has not yet taken or passed the GTA Workshop.

At the beginning of each semester, a GA will receive from the supervising faculty member a clearly written statement outlining expectations and duties pursuant to the GA assignment. GAs may not present any form of instruction (lecture, lab, etc.) in lieu of a faculty member. Their assistance is typically provided in the form of grading homework assignments. GAs may not assign final course grades. They may, however, recommend grades for the homework component of a course if appropriate. Faculty members are expected to provide GAs with solutions or grading keys to all assigned work or to review and approve solutions or grading keys developed by a GA.

B. THE GTA WORKSHOP

All graduate students desiring a GTA appointment must take and pass the GTA Workshop with a grade of B or higher before they can receive such an appointment. If a graduate student does not pass the workshop, he/she may be placed on appointment as a GA for one semester only. International students may defer taking the workshop for one semester. However, they must take and pass the workshop prior to their second semester and/or appointment as a GTA. All deferments MUST BE REQUESTED IN WRITING at the time the student is put on appointment as a GA. Students on deferred status can be graders, but cannot perform any type of classroom or laboratory instruction even in a temporary or substitute capacity. All deferments expire after one semester. At that point, the graduate student must pass the GTA workshop with a B or better or go on an hourly appointment.

C. RESPONSIBILITIES OF FACULTY MEMBERS

Faculty members are expected to supervise laboratory exercises, resolve disputes, and ensure that the laboratory equipment is maintained and in working condition. The faculty will ensure that their GTAs are proficient in all the equipment and procedures required to perform each lab exercise. Faculty will ensure that the GA’s or GTA’s time on task does not, on average, exceed the allocated appointment time limit.
Missouri University of Science and Technology

Civil Engineering
Request for Qualifying Exam

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>Student Number</th>
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<tbody>
<tr>
<td>Major:</td>
<td>Date of Exam:</td>
</tr>
<tr>
<td>Advisor:</td>
<td></td>
</tr>
</tbody>
</table>

Please select one principal area of study and two secondary areas for your Qualifying Exam.

1. Construction Engineering and Management  
2. Construction Materials  
3. Environmental Engineering  
4. Geotechnical Engineering  
5. Hydro-resource engineering  
6. Structural Engineering  
7. Transportation.

Signature of Student:_________________________________________________________

Signature of Major Advisor:___________________________________________________

Qualifying Exam Committee that has been selected

1. ____________________________________    2._________________________________

3. ____________________________________    4._________________________________

Approved by Department Chair:  ____________________________________________
Missouri University of Science and Technology
Environmental Engineering
Request for Qualifying Exam

Student Name: ____________________________  Student Number: ____________________________

Major: ____________________________  Date of Exam: ____________________________

Advisor: ____________________________

1. Construction Engineering and Management
2. Construction Materials
3. Environmental Engineering
4. Geotechnical Engineering
5. Hydro-resource engineering
6. Structural Engineering
7. Transportation.

Please select one principal area of study and two secondary areas for your Qualifying Exam

1. Environmental Engineering
2. Physical/chemical water treatment
3. Biological wastewater treatment
4. Groundwater treatment
5. Inorganic environmental chemistry
6. Organic environmental chemistry
7. Analytical environmental chemistry
8. Groundwater/hydrology/contaminate transport
9. Environmental biochemistry
10. Environmental microbiology
11. Air pollution
12. Environmental law and regulations

Signature of Student: _____________________________________________________________

Signature of Major Advisor: ________________________________________________________

Qualifying Exam Committee that has been selected

1. ____________________________________  2._________________________________
2. ____________________________________  4.___________________________
3. ____________________________________  4.___________________________

Approved by Department Chair: ________________________________________________

CArE grad form PhD4
**Missouri University of Science and Technology**  
**Report on Pre-Proposal**  
**Ph.D. Candidate**

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>Student Number:</th>
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<tbody>
<tr>
<td>E-mail address:</td>
<td>Date:</td>
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<tr>
<td>Major:</td>
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</table>

The Pre-proposal by the above candidate for the degree of DOCTOR OF PHILOSOPHY/DOCTOR OF ENGINEERING has been (successfully/unsuccessfully) submitted.

______________  ______________
Signature of Candidate  
Signature of Committee Member

______________  ______________
Signature of Major Advisor  
Signature of Committee Member

______________  ______________
Signature of Committee Member  
Signature of Out-of-Dept. Committee Member

_CArE grad form PhD5_
<table>
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<tr>
<th>Student Name:</th>
<th>Student Number</th>
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<tr>
<td>Major:</td>
<td>Date of Exam:</td>
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<tr>
<td>Advisor:</td>
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The written component of the qualifying exam will be a four hour exam consisting of four topics. Following two topics will be given to all students in structural engineering.

1. Structure Analysis
2. Structure Mechanics

Students need to choose two topics from the following list. At least one of the design courses should be selected.

1. RC Design
2. Steel Design
3. Prestressed Concrete
4. Earthquake Engineering
5. Dynamics
6. Reliability
7. Structural Control
8. FEM and Modeling Techniques
9. Repair and Retrofit Principles and Methodologies

Qualifying Exam Committee that has been selected.

1. ____________________________ 2. ____________________________
3. ____________________________ 4. ____________________________
5. ____________________________

Signature of Student: ___________________________________________

Signature of Major Advisor: _______________________________________

Approved by Department Chair: ___________________________________

Qualifying Exam for Transportation Students
Prepared by Transportation Faculty

Objective: The main objective of the qualifying exam is to evaluate a student's competency of knowledge required for the transportation PhD program and recommend the student to Ph.D. candidacy.
Course Requirement: All transportation Ph.D. students will be required to pass the qualifying exam possibly during the first four semesters. Students will be strongly encouraged to take the scheduled qualifying exam at the beginning of the third semester of the Ph.D. program. They will be required to complete the following course requirements before they can take the qualifying exam:

1) two, 3XX level transportation courses,
2) two, 4XX level transportation courses, and
3) one, 3XX/4xx level course in other departments for subjects closely related to transportation studies including statistics, probability, operations research, computer programming and algorithms, etc.

In addition to the course requirements, the students need to prove their English proficiency by passing the written and oral tests administered by the English department or ELI. This will be required of all non-native English speakers unless the student can prove to be proficient in both oral and written English.

Format: The qualifying exam consists of two parts: 1) written and 2) oral exams. The qualifying exam will be prepared and administrated by the transportation faculty.

1. Written Test

Purpose: The purpose of the written test is to evaluate student’s broad understanding of course material.

Format: Written test would be scheduled on the department exam day as an open-book and open-note four-hour in-class test. The subjects to be tested in the written test include the following four areas:

1) General knowledge covering fundamental math, statistics/probability, and operations research that are widely used in transportation studies,
2) Traffic Engineering,
3) Transportation Planning, and
4) From one of the following subjects, to be selected by the student: traffic simulation, airport design, highway design, traffic signal control, network theory, statistics/probability, optimization, etc.

Problem Set Preparation: The examination will be prepared by the transportation faculty and possibly a faculty member from another area who could be the student’s future dissertation committee member. The problem set will be circulated among the transportation faculty for comments and finalized by the advisor taking into account the comments.

Grading and Result: The written test will be graded by the faculty who prepared the test, and the results will be shared with the student’s advisor. The result of the written exam will be conveyed to the candidates within two weeks of the exam, and would be one of the following two cases:

1) Pass (average score > 80%), or
2) Fail (average score < 80%).

Others: Only two attempts to pass the written exam will be allowed. If a student fails twice, the student will be asked to leave the Ph.D. program. The student, however, may be considered for a Masters degree.

2. Oral Test

Schedule: The oral test will be conducted after the student passes the written test. The oral test is required to be scheduled within the semester of the written test.
Purpose: The main purpose of the oral test is to evaluate the student’s overall knowledge of core competency areas, as well as communication and presentation skills.

Format: The student will be tested individually by the transportation faculty members plus at least one faculty member from outside the transportation group. The oral test will discuss the written exam questions, and will also include general knowledge acquired from required courses.

Result: Based upon the student’s mastery of knowledge, the faculty involved based on the oral test will make one of the following three recommendations:

1) Pass,
2) Conditional pass with a recommendation for additional class(es), or
3) Fail

Others: Only two attempts to pass the oral exam will be allowed. If a student fails twice, the student will be asked to leave the Ph.D. program. The student, however, may be considered for a Masters degree.
Thesis/Dissertation Submittal and Schedule for Defense

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>Date of Defense:</th>
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<td>PhD/MS (circle one)</td>
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<th>Student Number:</th>
<th>Major:</th>
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<table>
<thead>
<tr>
<th>Thesis Title:</th>
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<tr>
<th>Date Submitted (Must be a minimum of 14 days prior to Defense):</th>
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<tr>
<th>Committee Chair:</th>
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I, the undersigned, have inspected the thesis/dissertation by the above candidate and found that in form and content it was ready to be reviewed by the student’s Graduate Advisory Committee.

<table>
<thead>
<tr>
<th>Committee Chair:</th>
<th>Signature:</th>
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<tr>
<th>Noted: Ass’t Chair for Graduate Affairs:</th>
<th>Signature:</th>
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Copies of this form and the thesis/dissertation MUST be distributed to the members of the student’s Graduate Advisory Committee no later than 14 days prior to the Date of Defense.
FLOWCHART FOR GRADUATE STUDENTS
IN THE CIVIL, ARCHITECTURAL AND ENVIRONMENTAL ENGINEERING DEPARTMENT

M.S. Outline

1. Select advisor and thesis topic
2. Select advisory committee in consultation with advisor
   a. At least three members (including advisor)
   b. Normally one out-of-department or out of area member
3. Submit Form I – Program of Study
   a. No later than first 6 weeks of second semester
   b. MS with thesis: minimum 30 semester credit hours coursework including 6 thesis credit hours (must include 6 hours 400 level and 6 hours 490/Research)
   c. MS without thesis: minimum 30 semester credit hours of coursework (must include 9 hours of 400 level and no 490/Research)
4. Submit Form IA – Changes to Program of Study (as needed)
5. Meet regularly with your committee so that they understand and agree with your research progress.
6. Provide committee with hard copy of thesis at least 2 weeks prior to dissertation defense
   a. The earlier, the better. You should have addressed any comments/suggestions/questions from your committee BEFORE the defense.
7. Submit Department Graduate form 5 (Thesis/Dissertation Submittal and Schedule for Defense)
   a. Within 2 weeks of defense
8. Post and email announcement of thesis defense at least one week prior to examination date
9. Conduct final exam of thesis with committee and others
10. Submit Form II – results of final exam (pass/fail)
   a. All members of the advisory committee must vote and sign the document
11. Committee, advisor and advisee decide how corrections to thesis will be checked (committee, or advisor only)
12. Committee signs coversheet of thesis once satisfied with corrections
13. Submit copies of thesis
   a. One copy to Graduate Studies Office
   b. Two to Department (one for department and one for advisor)
   c. One copy to each committee member (if requested)
14. Attend graduation and move on to next step in life!

The flowchart document does not create any new policies, but simply lists existing policies set forth in the CARE Graduate Handbook.

Version November 2009
## PhD TIMELINE
### OFFICIAL PROCEDURE
Adopted by CArE Faculty, 2-22-10

<table>
<thead>
<tr>
<th>STEP</th>
<th>WHEN</th>
<th>DATE DONE</th>
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<tbody>
<tr>
<td>Select major advisor</td>
<td>Prior to first semester if possible</td>
<td></td>
</tr>
<tr>
<td>Submit CArE grad form PhD2 (Request for Qualifying Exam)</td>
<td>As early as possible but at least by the end of the second semester</td>
<td></td>
</tr>
<tr>
<td>Take Qualifying Exam</td>
<td></td>
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</tr>
<tr>
<td>Submit Form 4 (Results of QE) to CArE graduate secretary</td>
<td>Within one week of QE completion</td>
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</tr>
<tr>
<td>Select dissertation topic</td>
<td>Early as possible but by end of second semester</td>
<td></td>
</tr>
<tr>
<td>Select advisory committee: minimum of 5; normally one is out of department</td>
<td>Early as possible but by end of second semester; prior to submittal of Form 5/5A</td>
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<tr>
<td>Make out course schedule for whole program (including remedial courses)</td>
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<tr>
<td>Obtain committee approval of course of study; submit Form 5/5A (as 5) to CArE graduate secretary; Form 5/5A covers both committee and program</td>
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<tr>
<td>Submit Form 5/5A (as 5A) (Changes in Program) to CArE graduate secretary as necessary</td>
<td>As necessary</td>
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<tr>
<td>Submit Form 5/5A (as 5A) (Changes in Committee) to CArE graduate secretary as necessary</td>
<td>As necessary</td>
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<tr>
<td>Submit written description of proposed research (preproposal) to all committee members</td>
<td>No later than 12 months into PhD program</td>
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<tr>
<td>Task</td>
<td>Timeline Description</td>
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<td>----------------------------------------------------------------------</td>
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<tr>
<td>Submit <strong>CArE grad form PhD4 (Acceptance of Preproposal)</strong> to CArE</td>
<td>Prior to commencement of research</td>
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<tr>
<td>graduate secretary</td>
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<tr>
<td>Submit <strong>Request for Authorization of Comprehensive Exam form</strong> to</td>
<td>After completion of [≥75%] coursework</td>
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<tr>
<td>CArE graduate secretary</td>
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<tr>
<td>Solicit written comp questions from committee</td>
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<tr>
<td>Take Comprehensive Exam</td>
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<tr>
<td>Submit <strong>Form 6 (Results of Comprehensive Exam)</strong> to CArE graduate</td>
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<td>secretary</td>
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<tr>
<td>Make <strong>application for diploma</strong> at Registrar’s office</td>
<td>Within 4 weeks of beginning of last semester</td>
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<tr>
<td>Finish writing dissertation</td>
<td>At least 4 weeks prior to defense</td>
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</tr>
<tr>
<td>Submit hard copy <strong>dissertation first draft</strong> to major advisor</td>
<td>At least 4 weeks prior to defense</td>
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<tr>
<td>Make revisions</td>
<td></td>
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<tr>
<td>Submit hard copy <strong>dissertation second draft</strong> to major advisor if</td>
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<td>needed</td>
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<tr>
<td>Make revisions if needed</td>
<td>To be completed 2 weeks before defense</td>
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<tr>
<td>Schedule the defense: Submit <strong>CArE grad form 5</strong> (with advisor’s</td>
<td>At least 2 weeks before defense; leave sufficient time to make graduation deadline</td>
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<tr>
<td>signature) to CArE graduate secretary</td>
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<tr>
<td>Submit hard copy <strong>dissertation third draft</strong> to committee members</td>
<td>At least 2 weeks before defense</td>
<td></td>
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<tr>
<td>Make revisions if needed</td>
<td>Prior to defense</td>
<td></td>
</tr>
<tr>
<td>Post and email <strong>announcement of dissertation defense</strong> to CArE</td>
<td>At least 1 week before defense</td>
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<tr>
<td>graduate secretary</td>
<td></td>
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<tr>
<td>Submit revised hard copy <strong>dissertation fourth draft</strong> to all</td>
<td>Prior to defense</td>
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<tr>
<td>committee members</td>
<td></td>
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<tr>
<td>Hold defense</td>
<td>At least 12 weeks after passing comp exam</td>
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<td>Task</td>
<td>Timeframe</td>
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<td>----------------------------------------------------------------------</td>
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<td>Obtain all committee signatures on <strong>Form 7 (Dissertation Approval &amp; Results of Exam)</strong> (original): each member signs after each is satisfied with any thesis changes (may not be on day of defense); a committee member may sign prior to changes being made if satisfied that advisor will assure all changes are made. [Form 7 also will change/submit 490 grades to “S”]</td>
<td>At or shortly after defense</td>
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<tr>
<td>Make revisions as needed</td>
<td>Shortly after defense</td>
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<tr>
<td>Submit signed <strong>Form 7</strong> to CArE graduate secretary who will obtain CArE Ass’t. Chair of Grad Affairs signature and then submit to OGS office; also submit <strong>B&amp;H (University Microfilm, Inc.) Doctoral Dissertation Agreement form</strong> and <strong>Survey of Earned Doctorates form</strong></td>
<td>After defense corrections are approved by committee</td>
<td></td>
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<tr>
<td>Obtain committee signatures of <strong>cover sheet</strong></td>
<td>After corrections approved by comm.</td>
<td></td>
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<tr>
<td>Submit completed <strong>dissertation</strong> to OGS</td>
<td>After Form 7 submittal</td>
<td></td>
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<tr>
<td>Get <strong>dissertation copies</strong> made (good paper)-ask other non-advisor committee members preference on binding</td>
<td>After approval by OGS</td>
<td></td>
</tr>
<tr>
<td>Submit 2 <strong>dissertation copies</strong> (good paper) to CArE receptionist who will forward them to Library for binding: 1 for department and 1 for advisor (CArE Dept pays)</td>
<td>“</td>
<td></td>
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<tr>
<td>Submit 1 <strong>dissertation copy</strong> (good paper) to OGS Office who will forward it to Library for binding; Library archives it (CArE Dept pays)</td>
<td>“</td>
<td></td>
</tr>
<tr>
<td>Submit other <strong>dissertation copies</strong> (good paper) to Library for binding as necessary (student’s personal copy, other committee members, family, etc) [student pays]</td>
<td>“</td>
<td></td>
</tr>
<tr>
<td>When GSO accepts Library <strong>dissertation copy</strong>, submit on-line <strong>Scholar’s Mine form</strong></td>
<td>“</td>
<td></td>
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</tbody>
</table>

PhD Timeline 2-21-10.doc