Civil and Environmental Engineering
Graduate Program

Program Information Manual for Graduate Students

Academic Year
2021-2022
Preface

This manual is intended to augment the sections of the Graduate School Bulletin dealing with academic policies and procedures and degree requirements. The student is strongly urged to read the Graduate School Bulletin carefully since all the vital information is not repeated herein. It is the student's responsibility to be aware of the current requirements of the Graduate School. Graduate School Policies and Procedures can be found using the following link: http://gsnb.rutgers.edu/academics/graduate-school%E2%80%93new-brunswick-policies-and-procedures

This Manual also constitutes part of the Program Bylaws.
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SECTION I: Master of Science

A) Degree Options

The Master of Science degree requires the completion of at least 30 credits under two options:

Option A: Requires a minimum of 24 credits of coursework plus a 6 credit thesis and a public oral defense of thesis.

Option B: Requires a minimum of 27 credits of coursework plus a 3 credit special project, and a final oral examination.¹

Students are free to choose between Options A and B, except graduate assistants, who are required to take Option A. The students choose a program of study outlined in Section III.

B) General Course Credit Requirements

Students must satisfy the following credit requirements toward the M.S. degree:

1. At least 18 credits of graduate courses must be taken from the Department of Civil and Environmental Engineering.
2. No credit in 300-level courses may be used toward the M.S. degree.
3. No more than 6 credits of 400-level Civil and Environmental engineering courses may be used toward the M.S. degree². Special Problems in Civil Engineering and Co-op courses cannot be used toward the MS Degree.
4. No more than 3 credits of either Advanced Topics In Civil Engineering (180:601 or 180:602) or Advanced Topics in Environmental Engineering (180:611 or 180:612) may be used toward the M.S. degree.
5. 180:701 and 180:702 can be used only for thesis research. These credits will not count toward coursework requirements.
6. At least two semesters (N credit prefix) of Seminar in Civil and Environmental Engineering (180:691, 180:692)

¹ As per the Graduate School's requirement, he/she must demonstrate that he/she has the ability to write a creditable report as part of a regular course

² Courses approved by graduate director
C) **Scholastic Standing**
Candidates for the M.S. degree shall have a GPA of 3.0 or better in their coursework. No more than 6 credits bearing the grade of C or C+ may be used to meet the requirements for the M.S. degree. His/her advisor monitors the student’s academic performance. The students may be recommended for dismissal from the Graduate School by action of the graduate faculty.

D) **M.S. Committee**
The student's graduate committee will normally consist of three graduate program faculty members. The student's advisor will serve as chairperson. The graduate director upon the recommendation of the student’s advisor will appoint members to the student’s committee. The advisor will consult with the student on this matter. The graduate director in consultation with the advisor and the student will make any subsequent changes of committee members.

**Option A:** The committee will be appointed during the term in which the student commences his/her thesis research. Before embarking on the research, the student will submit a short proposal of the thesis work to his/her committee. The committee will be responsible for supervising the thesis research and conducting the public oral defense of thesis.

**Option B:** The committee will be appointed at the start of the semester in which the student will take his/her final oral examination. The student will work on a 3-credit project with his/her advisor and submit a scholarly report. The final oral examination is based on the work done in the project. The committee will be responsible for conducting the final oral examination.

E) **Final Oral Examination**
The final oral examination will be conducted by the student's committee near the end of the student's final term of work. The examination will consist of an oral presentation of the thesis or project report.

The student must bring with him/her the form *Application for Admission to Candidacy for Degree of M.S.* to the examination. The form must have been previously filed with the Graduate School early in the semester in which the student expects to take the examination. After the examination, the student will return the properly signed form to the Graduate School. One dissenting vote is allowed to pass a candidate for the degree. Students who fail the final examination will be given the opportunity to retake the examination for a second and final time within one year of the first attempt.
F) Continuing to the Ph.D. Program

Students who completed the department's M.S. degree requirements and are interested in continuing to the doctoral program should file an application with the graduate director. The application should include a description of the research topic. Normally, the student is expected to have a grade point average of at least 3.5 in the M.S. coursework and must be recommended by the M.S. committee members. It is also required that the student have a faculty member who agrees to supervise the student's doctoral research. The student's M.S. committee will review the application and make a recommendation in writing to the graduate director for approval.

G) Time Limits

The normal maximum is three years after the first registration in the Graduate School. Part-time students will be allowed, without petitioning, a normal maximum of five years. Students requiring an extension beyond the normal time limits must petition, through the graduate director, to the Executive Council of the Graduate School on an appropriate form available from the Graduate School. The extension will be granted provided that the petition is supported by the student's satisfactory progress in his/her work and other valid reasons.
SECTION II: Doctor of Philosophy

The graduate program in civil and environmental engineering offers the degree Doctor of Philosophy that requires at least 48 credits of coursework and at least 24 credits of thesis research. The doctoral program is arranged in the following two phases.

Phase 1: The student pursues courses of study and successfully completes a qualifying examination.

Phase 2: The student primarily pursues courses of research and presents results in an acceptable dissertation.

A) General Course Credit Requirements

Students must satisfy the following credit requirements toward the Ph.D. degree.

1. At least 48 credits of coursework, which may include M.S. degree coursework, plus at least 24 credits of thesis research.
2. At least 30 credits of coursework must be taken from the Department of Civil and Environmental Engineering or 15 credits if entering with 24 transfer credits.
3. No more than 6 credits of either Advanced Topics in Civil Engineering (180:601 or 180:602) or Advanced Topics in Environmental Engineering (180:611 or 180:612).
4. No credit in 300-level courses and no more than 9 credits in 400-level courses may be used toward the 48 credits of required coursework.
5. At least 18 credits must be in courses within his/her major area of discipline.
6. At least four semesters (N credit prefix) of Seminar in Civil and Environmental Engineering (180:691, 180:692).
7. At least 6 credits in the area of mathematics, numerical methods and statistics are required. Suggested courses in Applied Mathematics and Statistics are as follows:

**Applied Mathematics**

198:510 Numerical Analysis
642:516 Applied Partial Differential Equations
642:527,528 Methods of Applied Mathematics
642:550 Linear Algebra and Applications
642:573 Numerical Analysis
642:574 Numerical Analysis
642:575 Numerical Solutions of Partial Differential Equations
642:577,578 Selected Mathematical Topics in System Theory
642:581 Applied Graph Theory
**Statistics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Graduate Level</th>
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<tbody>
<tr>
<td>960:401</td>
<td>Basic Statistics for Research</td>
<td>(G3)</td>
</tr>
<tr>
<td>960:463</td>
<td>Regression Methods</td>
<td>(G3)</td>
</tr>
<tr>
<td>960:467</td>
<td>Applied Multivariate Analysis</td>
<td>(G3)</td>
</tr>
<tr>
<td>960:476</td>
<td>Introduction to Sampling</td>
<td>(G3)</td>
</tr>
<tr>
<td>960:484</td>
<td>Basic Applied Statistics</td>
<td>(G3)</td>
</tr>
<tr>
<td>960:486</td>
<td>Interpretation of Data</td>
<td>(G3)</td>
</tr>
<tr>
<td>960:490</td>
<td>Introduction to Experimental Design</td>
<td>(G3)</td>
</tr>
<tr>
<td>960:501</td>
<td>Statistical Theory for Research</td>
<td></td>
</tr>
<tr>
<td>960:502</td>
<td>Statistical Theory for Research</td>
<td></td>
</tr>
<tr>
<td>960:555</td>
<td>Nonparametric Statistics</td>
<td></td>
</tr>
<tr>
<td>960:563</td>
<td>Regression Analysis</td>
<td></td>
</tr>
<tr>
<td>960:590</td>
<td>Design of Experiments</td>
<td></td>
</tr>
<tr>
<td>960:654</td>
<td>Stochastic Processes</td>
<td></td>
</tr>
</tbody>
</table>

**B) Scholastic Standing**

Students enrolled in the Ph.D. program are expected to have a GPA of 3.5 or better in their coursework. No more than 9 credits bearing the grade of C or C+ may be used to meet the requirements for the Ph.D. degree. His/her advisor monitors the student’s academic performance. The students may be recommended for dismissal from the Graduate School by action of the faculty of the graduate program.

**C) Admission To Ph.D. Candidacy**

The student becomes a Ph.D. candidate upon passing a qualifying examination. He/she is strongly urged to take the qualifying examination as soon possible, but no later than two academic semesters after completion of his/her M.S. course requirements. The Ph. D. candidacy examination is composed of a written (qualifying) examination followed by an oral (proposal) examination.

1. **Written Examination (Qualifying Exam):** This examination is suggested to be taken by the student no later than two academic semesters after completion of his/her M.S. course requirements and will normally be offered twice during the academic year (last Monday of October and March). The student who intends to take the examination must inform the Graduate Director at least one month before the examination date.

The **written** examination consists of a 3-hour closed book written examination offered by the committee. An oral examination may be required from the committee member depending on the results of the written examination. The examination is given by a committee made up of at least two faculty members from the student’s area of major study and at least one from an area other than the student’s major area, all from CEE graduate program. The graduate director in consultation with the student’s advisor appoints the committee. Students are encouraged to consult with
the committee members on the subject area of their examinations. Students are permitted to take one re-examination within the time period of no later than one semester after the first examination.

2. **Oral Examination (Proposal):** The student will submit a short thesis proposal to his/her Ph.D. committee one week prior to the oral examination. The student must bring with him/her the form “Application for Admission to Candidacy for the Degree of Doctor of Philosophy” obtainable from the Graduate School. The examination will cover the proposed research. One dissenting vote is allowed to pass the student in his/her oral examination. After the examination, the student will return the candidacy form, properly signed by the committee, to the Graduate School. Approval of this form represents admission to Ph.D. candidacy. Students are permitted one re-examination after the initial oral examination based on the committee’s recommendation.

D) **Ph.D. Committee**

The graduate director, in consultation with the student’s advisor, during the time interval between the written and oral qualifying examinations, will appoint the student’s Ph.D. committee. The committee will be responsible for conducting the oral qualifying examination, for supervising the thesis research, and conducting the public thesis defense.

The committee will consist of at least four faculty members, with the student's advisor as chairperson. At least one of the committee members will be from outside of the program of civil and environmental engineering. A majority of the committee members must be chosen from within the program.

E) **Public Defense Ph.D. Thesis Defense**

This public examination covers the student's Ph.D. research work and thesis. His/her Ph.D. committee will conduct it. One dissenting vote is allowed to pass the student for the degree. At the time of the examination, it is the responsibility of the candidate to retrieve from the Office of the Graduate School his/her candidacy application (on which the results of the qualifying examination appear) and submit it to the chairperson of his/her committee. The student must return this form properly signed by the committee to the Graduate School along with the required original copy of his/her thesis and other materials (see the Graduate School catalog).

In order to prepare and distribute appropriate announcements, the graduate director must be informed of the thesis title, the date, and time of the thesis defense at least ten days in advance by the chairperson of the committee.
F) Time Limits
The normal maximum for a student entering the program with a B.S. degree is seven years after the first registration in the Graduate School. The normal maximum for a student entering the program with a M.S. degree is six years after the first registration in the Graduate School. Part-time students will be allowed, by petitioning the Graduate School, a time extension of one to three years beyond the normal limits given above.

Students requiring an extension beyond the normal time limits must petition the graduate director and the Executive Council of the Graduate School on an appropriate form available from the Graduate School. The extension will be granted provided that the petition is supported by the student's satisfactory progress in his/her work and other valid reasons.

G) Guidelines on thesis/dissertation time requirements

As a general rule, material should be submitted by the student at least two weeks before an examination or other deadlines and at least two weeks (but not more than four weeks) should be allowed the faculty member for informing students of the assessment. This may vary with the nature of the discipline and would of course have to be adjusted for exceptional circumstances. Exceptions, to be determined by each graduate program, might include end-of-semester “crunch”, faculty members in the field without good access to the internet, and medical incapacity.

It is strongly recommended that one-year minimum be maintained between proposal presentation and final defense. The waiver of one-year minimum need be initiated by the Ph.D. advisor and approved by Graduate Director.
SECTION III: Programs of Study

The Department of Civil and Environmental Engineering offers the following specialties: (a) Construction Engineering, (b) Geotechnical Engineering, (c) Structures, (d) Transportation, (e) Water Resources and Environmental Engineering. In addition, The Department is offering in collaboration with other graduate programs two graduate certificate programs in (a) Engineering Geophysics and (b) Transportation Studies.

A) Specialty Requirements
Students in the M.S. and Ph.D. programs are required to choose a specialty. For each specialty in the graduate program the student is required to take:

M.S. • At least four departmental courses in their area of specialty
• At least two departmental electives outside of their specialty

Ph.D. • At least 18 credits must be in courses within major area of discipline

Students interested in taking course outside of the department are strongly encouraged to consult the list of suggested courses listed in Section III-C of this manual.

B) Departmental Courses Listed by Specialties

Construction Engineering
180:516 Advanced Structural Design (3)
180:541 Advanced Reinforced Concrete (3)
180:512 Advanced Concrete Technology (3)
180:545 Advanced Construction Engineering Management (3)
180:546 Advanced Construction Engineering Management II (3)
180:548 Infrastructure Management System (3)
180:554 Sustainable Transportation Infrastructure (3)
180:561 Advanced Water Supply and Sewerage (3)
180:562 Design of Water and Wastewater Treatment (3)
180:572 Soils Engineering (3)
180:577 Advanced Foundation Engineering (3)
180:550 Building Information Modeling
180:556 Methods/Models of Resilient Building and Infrastructure (3)

Geotechnical Engineering
180:535 Mechanistic Pavement Design (3)
180:548 Infrastructure Management System (3)
180:549 Advanced Pavement Material and Modeling (3)
180:570 Sustainability in Geo-Environmental Engineering (3)
180:571 Advanced Soil Mechanics (3)
180:572 Soils Engineering (3)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>180:573</td>
<td>Excavation Retaining Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>180:574</td>
<td>Groundwater Engineering I</td>
<td>(3)</td>
</tr>
<tr>
<td>180:575</td>
<td>Theoretical Soils Mechanics</td>
<td>(3)</td>
</tr>
<tr>
<td>180:576</td>
<td>Groundwater Engineering II</td>
<td>(3)</td>
</tr>
<tr>
<td>180:577</td>
<td>Advanced Foundation Engineering</td>
<td>(3)</td>
</tr>
<tr>
<td>180:578</td>
<td>Soil Dynamics</td>
<td>(3)</td>
</tr>
<tr>
<td>180:579</td>
<td>Environmental Management of Maritime Infrastructure</td>
<td>(3)</td>
</tr>
<tr>
<td>180:580</td>
<td>Engineering Rock Mechanics</td>
<td>(3)</td>
</tr>
<tr>
<td>180:581</td>
<td>Physiochemical Properties and Stabilization of Soils</td>
<td>(3)</td>
</tr>
<tr>
<td>180:582</td>
<td>Dynamic Soil Structure Interaction and Earthquake Eng</td>
<td>(3)</td>
</tr>
<tr>
<td>180:584</td>
<td>Geosynthetics in Sustainable Geoenvironmental Eng</td>
<td>(3)</td>
</tr>
</tbody>
</table>

**Structures**

*Students in structures are required to take 180:516 and 180:541 first when the courses were offered*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>180:512</td>
<td>Advanced Concrete Technology</td>
<td>(3)</td>
</tr>
<tr>
<td>180:514</td>
<td>Composite Materials in Civil Engineering</td>
<td>(3)</td>
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<tr>
<td>180:515</td>
<td>Structural Analysis</td>
<td>(3)</td>
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<tr>
<td>180:516</td>
<td>Advanced Structural Design</td>
<td>(3)</td>
</tr>
<tr>
<td>180:517</td>
<td>Structural Dynamics</td>
<td>(3)</td>
</tr>
<tr>
<td>180:518</td>
<td>Design for Lateral Loads</td>
<td>(3)</td>
</tr>
<tr>
<td>180:519</td>
<td>Advanced Structural Analysis</td>
<td>(3)</td>
</tr>
<tr>
<td>180:521</td>
<td>Fatigue and Fracture of Structures</td>
<td>(3)</td>
</tr>
<tr>
<td>180:522</td>
<td>Finite Element Methods in Civil Engineering</td>
<td>(3)</td>
</tr>
<tr>
<td>180:524</td>
<td>Bridge Design I</td>
<td>(3)</td>
</tr>
<tr>
<td>180:525</td>
<td>Structural Reliability</td>
<td>(3)</td>
</tr>
<tr>
<td>180:527</td>
<td>Bridge Design II</td>
<td>(3)</td>
</tr>
<tr>
<td>180:541</td>
<td>Advanced Reinforced Concrete</td>
<td>(3)</td>
</tr>
<tr>
<td>180:542</td>
<td>Advanced Reinforced Concrete II</td>
<td>(3)</td>
</tr>
<tr>
<td>180:544</td>
<td>Prestressed Concrete</td>
<td>(3)</td>
</tr>
<tr>
<td>180:553</td>
<td>Bending and Buckling of Plates and Shells</td>
<td>(3)</td>
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**Transportation**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>180:530</td>
<td>Maritime Transportation</td>
<td>(3)</td>
</tr>
<tr>
<td>180:531</td>
<td>Traffic Engineering</td>
<td>(3)</td>
</tr>
<tr>
<td>180:532</td>
<td>Transportation Planning</td>
<td>(3)</td>
</tr>
<tr>
<td>180:533</td>
<td>Traffic Operations</td>
<td>(3)</td>
</tr>
<tr>
<td>180:534</td>
<td>Design of Transportation Facilities</td>
<td>(3)</td>
</tr>
<tr>
<td>180:536</td>
<td>Transportation Systems Analysis</td>
<td>(3)</td>
</tr>
<tr>
<td>180:537</td>
<td>Intelligent Transportation Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>180:538</td>
<td>Freight Transportation Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>180:548</td>
<td>Infrastructure Management System</td>
<td>(3)</td>
</tr>
<tr>
<td>180:551</td>
<td>Railroad Transportation System</td>
<td>(3)</td>
</tr>
<tr>
<td>180:552</td>
<td>Engineering Risk Analy. in Multimodal Transp. Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>180:554</td>
<td>Sustainable Transportation Infrastructure</td>
<td>(3)</td>
</tr>
<tr>
<td>180:555</td>
<td>Railway Track Engineering and Safety</td>
<td>(3)</td>
</tr>
<tr>
<td>180:557</td>
<td>Railway Data Analytics</td>
<td>(3)</td>
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</tbody>
</table>
180:579 Environmental Management of Maritime Infrastructure (3)

**Water Resources and Environmental Engineering**
180:560 Air Quality Management
180:561 Advanced Water Supply and Sewerage (3)
180:562 Design of Water and Wastewater Treatment (3)
180:563 Advanced Hydrology (3)
180:564 Unit Processes in Environmental Engineering (3)
180:565 Biogeochemical Engineering (3)
180:566 Sediment Transport (3)
180:567 Analysis of Receiving Water Quality (3)
180:568 Thermal Effects of Receiving Waters (3)
180:569 Environmental Informatics (3)
180:570 Sustainability in Geo-environmental Engineering (3)
180:574 Groundwater Engineering I (3)
180:576 Groundwater Engineering II (3)
180:579 Environmental Management of Maritime Infrastructure (3)
180:586 Advanced Fluid Mechanics (3)
180:588 Theory of Hydraulic Models (3)
180:590 Coastal Engineering (3)
180:591 Sustainable Environmental Biotechnology (3)
180:592 Green Infrastructure for Water Management (3)

C) Suggested Courses Outside of the Department*

**Computer Sciences**
198:510 Numerical Analysis (3)
198:521 Linear Programming (3)
198:527 Computer Methods for Partial Differential Equations (3)

**Ecology and Evolution**
215:506 Estuarine Ecology (4)

**Environmental Sciences**
375:509 Groundwater Pollution (3)
375:525 Principles of Solid Waste Management & Treatment (3)
375:530 Hazardous Waste Management (3)
375:531 Biological Waste Treatment (3)
375:533 Water Law (3)
375:541 Environmental Models (3)

**Geological Sciences**
460:408 Geomorphology (3)
460:516 Advanced Structural Geology (3)
460:555 Geophysics I (3)
460:556 Geophysics II (3)

**Industrial Relations and Human Resources**
545:610 Selected Problems in Industrial Relations (3)

**Industrial and Systems Engineering**
- 540:510 Deterministic Models in Industrial Engineering (3)
- 540:515 Stochastic Models in Industrial Engineering (3)
- 540:522 Operations Research (3)
- 540:530 Forecasting and Time Series Analysis (3)
- 540:535 Graph Theory & Networks in Industrial Engineering and Operations Research (3)
- 540:575 Advanced Engineering Economics (3)

**Labor and Industrial Relations**
- 578:521 New Directions In Collective Bargaining

**Applied Mathematics**
- 642:516 Applied Partial Differential Equations (1)
- 642:527,528 Methods of Applied Mathematics (3)
- 642:550 Linear Algebra and Applications (3)
- 642:573,574 Numerical Analysis (3)
- 642:575 Numerical Solutions of Partial Differential Equations (3)
- 642:588 Introduction to Mathematical Techniques in Operations Research (3)

**Mechanical and Aerospace Engineering**
- 650:529 Random Vibration (3)
- 650:550 Advanced Mechanics of Materials (3)
- 650:540 Fluid Mechanics (3)
- 650:571 Introduction to Mechanics of Continua (3)
- 650:572 Theory of Elasticity (3)
- 650:573 Theory of Plasticity and Applications (3)
- 650:577 Mechanics of Composite Materials (3)
- 650:585 Fracture Mechanics (3)
- 650:588 Stress Waves in Solids (3)

**Mechanics**
- 654:583 Advanced Theory of Elasticity (3)

**Oceanography**
- 712:501 Physical Oceanography
- 712:615 Geophysical Data Analysis

**Statistics**
- 960:401 Basic Statistics for Research (G3)
- 960:463 Regression Analysis (G3)
- 960:563 Regression Analysis (3)
- 960:580 Basic Probability (3)
- 960:582 Introduction to Methods and Theory of Probability (3)
*students interested in taking a course not on the above list of suggested courses should get approval of their advisor and the graduate director.

SECTION IV: Academic Advisors

At the beginning of the first term of study, each newly admitted graduate student would be assigned a provisional academic advisor who is chosen with respect to the student’s area of specialization.

The student is expected to contact the faculty members in his/her area of specialization and discuss possible topics for either a thesis or special project. This should be done for the M.S. student during the second semester and for the Ph.D. student prior to taking the qualifying examinations. The student should seek a faculty member who agrees to guide his/her thesis or special project. He/she then informs the graduate director, who will then appoint the faculty member as the student’s advisor.

Subsequent changes of advisor may be made when special conditions arise. In such cases, the student must discuss the problem with his/her current advisor and the graduate director for a solution. However, students should be aware that such changes might create practical problems, such as loss of time and efforts and possible loss of support for graduate assistants. The student must file a “change of advisor” form with the graduate director.

SECTION V: Thesis

The following provisions apply to both M.S. and Ph.D. theses. The deadlines for submission of the first draft should be:

1) February 15th for May graduation  
2) April 15th for October graduation  
3) November 1st for January graduation

Prior to the deadlines, the candidate should submit copies of the first draft to his/her advisor for distribution to the committee members. Three copies (four copies for the Ph.D. candidate) of the final draft that conform to the instructions
given in the pamphlet “Style Guide for Thesis and Dissertation Preparation”, available from the Office of the Graduate School, should be submitted to the advisor prior to setting a date for the public thesis defense.

After the thesis defense the student may be required to make modification to his/her final draft. The student then submits the thesis to the graduate school, the Department, and advisor. The Graduate School requires that photocopies be made on bonded paper. A biographical sketch, a thesis abstract not exceeding 350 words, and approval by the advisor is required by the Graduate School.

The announcement for the final examination is the responsibility of the graduate director and will be made at the request of the advisor and in consultation with all members of the committee.

Expenses for thesis preparation, including the cost of drawings, photographs, reproductions, and printing, are the sole responsibility of the student.

The advisor in consultation with the student will decide the manner or format of publication of the thesis or research results.

SECTION VI: Seminars

Since the departmental seminars are the vehicles by which the faculty and graduate students are exposed to the research activities, within and outside of the departments, M.S. students are required to complete at least two semesters and Ph.D. students at least four semesters of seminars. (180:691 or 780:692, N credit prefix).

SECTION VII: Transfer of Credits

Students will be allowed to transfer no more than 12 credits toward the M.S. degree and no more than 24 credits toward the Ph.D. degree. The transferred credits must satisfy the requirements set forth in Sections I &II. No more than 6 online graduate credits may be transferred to the MS degree. Students who are already in the program and want to take a graduate course at another school, should get the approval of their advisor and the graduate director.

SECTION VIII: Non-Civil Engineering Graduates

Graduate applicants with a bachelor degree in engineering other than civil engineering should take the required basic civil engineering courses and additional undergraduate courses in their area of specialization. The following courses are required for each area of specialization:
Structural engineering
2. Soil Mechanics (180:372)
3. Fluid Mechanics (180:387)
4. Structural Analysis I (180:318)
5. Steel Design (180:320)
6. Reinforced Concrete (180:411)
7. Foundation Engineering (180:473)

Environmental engineering
2. Fluid mechanics (180:387)
3. Soil Mechanics (180:372)
4. Water and Wastewater Engineering (180:429)

Transportation engineering
1. Mechanics of solids (180:243), or Fluid mechanics (180:387), or Soil mechanics (180:372)
2. Transportation Engineering (180:364) or Transportation Planning (180:430)

Construction engineering and management
1. Mechanics of solids (180:243), or Fluid mechanics (180:387), or Soil mechanics (180:372)
2. Construction Engineering (180:305)
3. Construction Engineering Management (180:406)

Geotechnical engineering
2. Soil Mechanics (180:372)
3. Fluid Mechanics (180:387)
4. Foundation Engineering (180:473)

These requirements must be met early in the students’ curriculum because many are pre-requisites for graduate courses. The student need to earn grades of B or better in the listed courses.

SECTION IX: Appeal and Grievance

A student should first discuss his/her grievance with their advisor. If the matter cannot be resolved the student may appeal to the graduate director. The graduate director shall consult with all parties involved and propose a resolution. If this is not successful, the matter shall be referred to the program faculty. Although the program faculty’s decision shall normally be final, the student may further appeal to the Dean of the Graduate School.
Contact Information

Graduate Program Director
Dr. Hao Wang---- hwang.cee@rutgers.edu

Graduate Program Administrative Assistant
Gina Cullari---- gcullari@soe.rutgers.edu

Construction Engineering and Management
Dr. Jie Gong------ jiegong.cee@soe.rutgers.edu
Dr. Meiyin Liu------ meiyin.liu@rutgers.edu

Water Resources and Environmental Engineering
Dr. Nicole Fahrenfeld--- nfahrenf@soe.rutgers.edu
Dr. Qizhong Guo---- qguo@ soe.rutgers.edu
Dr. Monica Mazurek---- mmazurek@soe.rutgers.edu
Dr. Roger Wang---- rq.wang@rutgers.edu

Geotechnical Engineering
Dr. Nenad Gucunski---- gucunski@soe.rutgers.edu
Dr. Ali Maher---- mmaher@soe.rutgers.edu
Dr. Hao Wang---- hwang.cee@rutgers.edu

Transportation
Dr. Hao Wang---- hwang.cee@rutgers.edu
Dr. Jing (Peter) Jin---- peter.j.jin@soe.rutgers.edu
Dr. Xiang Liu---- xiang.liu@soe.rutgers.edu

Structural Engineering
Dr. P.N. Balaguru---- balaguru@soe.rutgers.edu
Dr. Frank Moon -- franklin.moon@soe.rutgers.edu
Dr. Husam Najm---- hnajm@soe.rutgers.edu
Dr. Hani Nassif---- nassif@soe.rutgers.edu
Dr. Yook-Kong Yong---- yyong@soe.rutgers.edu
## Degree Checklist
### Master of Science

**Field:**__________________________  **Advisor:**__________________________

**Degree Option:**  
- Thesis*(24 course credits)  
- Special Project (27 course credits)

**Courses** (at least 18 credits from Civil and Environmental, 4 courses must be from area of specialty)

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**Departmental Electives** (at least 2 courses outside of the area of specialty)

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**Graduate Seminar** (Must take 2 semesters)

1st Semester:______________________  2nd Semester:______________________

**Research Credits***(must have 6)  **Special Project** (3 credits)

___ ___ ___ ___ ___ ___
**Degree Checklist**  
**PhD**

Field: ____________________  
Advisor: ________________  
Pre-Qual: ________________  
Proposal: ________________

**Courses-48 credits** (at least 30 credits from Civil and Environmental, 18 credits **must** be within field)

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**Math/Numerical Methods/Statistics** (at least 6 credits)

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**Research Credits** (Must have 24)

__  __  __  __  __  __  __  __  __  __  __  __

**Graduate Seminar** (Must take 4 semesters)  
___  ___  ___  ___
Quick Reference Tips

- All Master students MUST take 2 semesters of seminars
- All PhD students MUST take 4 semesters of seminars
- Special Project credits are NOT the same as Research Credits
- GA/TA/Fellowship credits do NOT count as Research Credits, you must register for research credits separately
- When writing your thesis/dissertation please refer to the Graduate School's style guide. They are particular about formatting.
- When planning your presentations for both MS and PhD, please remember to inform Gina.
- Keep in mind the deadline dates issued by the Graduate School for candidacy forms, thesis/dissertation submissions and diploma applications. [http://gsnb.rutgers.edu/academics/checklist-phd-degree](http://gsnb.rutgers.edu/academics/checklist-phd-degree)
- Most importantly, don't forget we are here to help and make your path toward your degree go as smoothly as possible. Please contact us with any questions or concerns.
- **MS Special Project:** you need to make a presentation of your project to a 3-member committee. Select committee members in coordination with your advisor and provide them with a copy of your special project at least seven (7) days before your presentation.
- **MS Thesis:** you need to make a presentation of your thesis to a 3-member committee. Select committee member in coordination with your advisor and provide them with a copy of your thesis at least 10 days before your presentation.
- **PhD Dissertation:** you need to make a dissertation defense to a 4-member committee. Select committee members in coordination with your advisor and provide them with a copy of your dissertation at least two weeks before your presentation.
Our Graduate Faculty

Dr. Perumalsamy N. Balaguru received his PhD from The University of Illinois-Chicago. His areas of research include concrete structural systems; composite materials; construction management.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 322C. He can be reached via email at balaguru@soe.rutgers.edu or via telephone at 848-445-2877.

Dr. Nicole Fahrenfeld received her PhD from Virginia Tech. Her areas of research lie at the interface of environmental chemistry and environmental microbiology to promote water quality and sustainability, with applications in natural and engineered systems.

Her office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 328D. She can be reached via email nfahrenf@rutgers.edu or via telephone at 848-445-8416.

Dr. Jie Gong received his PhD from the University of Texas at Austin. His areas of research include building information modeling, remote sensing for highway asset management, visual sensing and computing for construction process visualization and analysis.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 420D. He can be reached via email at jg931@soe.rutgers.edu or via telephone at 848-445-2881.

Dr. Nenad Gucunski received his PhD from The University of Michigan. His areas of research include soil-structure interaction; nondestructive testing; numerical methods; soil and structural dynamics; earthquake engineering.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 420C and 304C (chair office). He can be reached via email at gucunski@soe.rutgers.edu or via telephone at 848-445-0261.

Dr. Qizhong (George) Guo received his PhD from The University of Minnesota. He also holds a Professional Engineer’s license. His areas of research include environmental hydraulics; water quality modeling; environmental, coastal, urban and cold regions applications; sediment transport.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 328F. He can be reached via email at qguo@soe.rutgers.edu or via telephone at 848-445-2983.
Dr. Jing (Peter) Jin received his PhD from The University of Wisconsin-Madison. His areas of research include Transportation Engineering, Intelligent Transportation Systems, Traffic Operations, Traffic Sensing, Traffic Flow theory and Network Modeling, Urban Data Analytics, Traffic operations and management.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 420F. He can be reached via email at peter.j.jin@rutgers.edu or via telephone at 848-445-8563.

Dr. Xiang Liu received his PhD from The University of Illinois at Urbana-Champaign. His areas of research include Hazardous Materials Transportation Risk Analysis, Statistical Modeling of Train Safety, Economic Analysis of Railway Infrastructure Investment.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 428D. He can be reached via email at xiang.liu@rutgers.edu or via telephone at 848-445-2868.

Dr. Meiyin Liu received his PhD from the University of Michigan. Her areas of research include construction management; computer vision; and ergonomic risk assessment for construction workers.

Her office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 420E. She can be reached via email at meiyin.liu@rutgers.edu or via telephone at 848-445-2880.

Dr. Ali Maher received his PhD from The University of Michigan. He also holds a Professional Engineer’s license. His areas of research include soil/site improvement; soil composite materials; geosynthetics; environmental geotechnology; soil dynamics.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 328G and the CAIT Building on Busch Campus, Room 211E. He can be reached via email at m Maher@soe.rutgers.edu or via telephone at 848-445-2951.

Dr. Monica Mazurek received her PhD from The University of California-Los Angeles. Her areas of research include air quality engineering; organic geochemistry; analytical chemistry for environmental systems; sustainability systems engineering.

Her office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 322F. She can be reached via email at mmazurek@soe.rutgers.edu or via telephone at 848-445-2871.
Dr. Frank Moon received her PhD from Georgia Institute of Technology. Her areas of research include sensing technologies, structural identification, structural health monitoring, numerical modeling, and estimation of service life.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 428F. He can be reached via email at franklin.moon@rutgers.edu or via telephone at 848-445-2870.

Dr. Husam Najm received his PhD from The University of Michigan. Dr. Najm holds both a Professional Engineer’s and Structural Engineer’s license. His areas of research include structural system design; bridge design; concrete materials.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 424G. He can be reached via email at hnajm@soe.rutgers.edu or via telephone at 848-445-7980.

Dr. Hani Nassif received his PhD from The University of Michigan. He also holds a Professional Engineer’s license. His areas of research include reliability analysis; design, analysis, and field testing of bridges; advanced high-performance materials; structural modeling and analysis.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 322E. He can be reached via email at nassif@soe.rutgers.edu or via telephone at 848-445-4414.

Dr. Hao Wang received his PhD from The University of Illinois at Urbana-Champaign. His areas of research include sustainable infrastructure material and system, computational modeling and mechanics; highway and airport pavement; and life-cycle analysis and assessment.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 428E. He can be reached via email at hwang.cee@rutgers.edu or via telephone at 848-445-2874.

Dr. Roger Wang received his PhD from Massachusetts Institute of Technology. His areas of research include developing numerical models to connect big data and decision-making in civil and environmental engineering systems, such as data-model Interface and model-based decision making.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 328E. He can be reached via email at rg.wang@rutgers.edu or via telephone at 848-445-4288.
Dr. Yook-Kong Yong received his PhD from Princeton University. His areas of research include crystal plates; structural behavior and mechanics; finite element analysis; structural dynamics; computational mechanics.

His office is located in Richard Weeks Hall of Engineering on Busch Campus, Room 322D. He can be reached via email at yyong@soe.rutgers.edu or via telephone at 848-445-3219.
Our Adjunct Members of the Graduate Faculty

**Dr. Robert Miskewitz** received his PhD from Stevens Institute of Technology. His areas of research include contaminated sediment management and surface water quality.

**Dr. Sougata Roy** received his PhD from Lehigh University. His areas of research include Structural Engineering with emphasis on fatigue fracture of steel structures.