Graduate Handbook

2019-2020 Academic Year

Department of Civil and Environmental Engineering

November 2019 Printing

Clarkson™
WALLACE H. COULTER
SCHOOL OF ENGINEERING

http://www.clarkson.edu/cee

Mission of the Department of Civil and Environmental Engineering

The mission of the Civil and Environmental Engineering Department is to educate talented and motivated men and women to become successful professionals through quality undergraduate, graduate, and professional continuing education programs that place a high priority on student access and interaction with faculty.

Objectives and Outcomes to Support the Department Mission

Objective 1: Civil (Environmental) engineering graduates apply knowledge to meet the challenges of a successful professional career.

Outcomes to Ensure Achievement of Objective**:**

Civil Engineering	Environmental Engineering
1a) Students will have the ability to identify, formulate, and solve complex engineering problems through application of the principles of mathematics (including differential equations), calculus-based physics, chemistry, geospatial representation, applied statistics, and principles of civil engineering.	1a) Students will have the ability to apply knowledge of mathematics through differential equations, probability and statistics, calculus-based physics, chemistry (including stoichiometry, equilibrium, and kinetics), earth science, biological science, and fluid mechanics, formulate material and energy balances, and analyze the fate and transport of substances in and between air, water, and soil phases
1b) Students will be experienced in, and have the ability to develop and conduct appropriate experimentation, including laboratory experimentation, to measure multiple phenomena, analyze and interpret data, and use engineering judgement to draw conclusions.	
1c) Students will have the ability to apply engineering design to produce solutions that meet specified needs for the public good[1].	
1d) Students will have the ability to apply learning strategies and modern engineering tools, to identify, formulate and design solutions for complex engineering problems.	
1e) Students will have basic proficiency in at least four of the recognized civil focus areas.	1e) Students will have basic proficiency in more than one environmental engineering focus area e.g. air, water, land or environmental health.
1f) Students will have an ability to think creatively, consider risks, make trade-offs, and use informed judgement for the public good while functioning as an individual or on a team to solve complex engineering problems and produce engineering designs.	

Objective 2: Civil (Environmental) engineering graduates exhibit good communication, teamwork, and leadership skills.

Outcomes to Ensure Achievement of Objective**:**

2a) Students will have the ability to organize effective and concise engineering reports and memos for a range of audiences. 2b) Students will have the ability to organize and deliver engineering work in formal oral presentations to a range of audiences.

2c) Students will have the ability to function effectively on diverse, multi-disciplinary teams, whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives towards engineering design solutions that meet specified needs with consideration of the public good.

Objective 3: Civil (Environmental) engineering graduates will become well-rounded citizens who rely on their engineering education to serve society with an understanding of their professional and ethical responsibilities.

Outcomes to Ensure Achievement of Objective**:**

3a) Students will have the ability to recognize and practice ethical, professional, and environmental responsibility in engineering problem solving, evaluation, and design based upon knowledge of the humanities and exposure to, and understanding of, environmental quality as well as the NSPE Code of Ethics for Professional Engineers.

3b) Students will have the ability to understand the impact of engineering solutions on, and make informed judgements that consider the public good.

Objective 4: Civil (Environmental) engineering graduates are expected to exhibit intellectual growth, continued innovation and commitment to life-long learning.

Outcomes to Ensure Achievement of Objective**:**

4a) Students will have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

[1] "The public good": In the practice of engineering consideration of public health, safety, and welfare, as well as global, national, cultural, social, environmental, and economic factors.

Table of Contents

CIVIL AND ENVIRONMENTAL ENGINNERING GRADUATE HANDBOOK PROCEDURES AND GUIDELINES

2019-2020

Introduction

The Civil and Environmental Engineering (CEE) Department is highly ranked at the graduate level by U.S. News & World Report 2019. We offer the following degrees: Master of Science (MS) that requires either (a) a written thesis based on independent research or (b) a professionally oriented special project, and a Doctor of Philosophy (Ph.D.).

All graduate students use state-of-the-art experimental and computational facilities as they focus their research on engineering problems and applied science topics. Interdisciplinary research is facilitated through the Institute for a Sustainable Environment, the Center for Air Resources Engineering and Science, and the Center for Advanced Materials Processing.

Graduate education in CEE has specialties in the following areas:

- Construction Engineering Management (MS-project option only)
- Environmental Engineering
- Infrastructure Systems and Materials (ISM)
- Water Resources Engineering

This handbook is intended to assist faculty and graduate students with operating procedures, policies, and degree requirements of the Department of Civil and Environmental Engineering.

This handbook is located digitally at:
https://www.clarkson.edu/sites/default/files/2017-10/cee-grad-handbook_0.pdf

Useful links are:

- CEE Graduate Programs:
  - https://www.clarkson.edu/graduate/civil-environmental-engineering
- Wallace H. Coulter School of Engineering (CSoE) Graduate Programs:
  - https://www.clarkson.edu/academics/graduate-professional-programs

The Clarkson University Graduate School Catalog has information and requirements regarding application procedures, admission requirements, direct Ph.D. entry, ESL requirements, transfer credit, academic standing and dismissal, and many other issues.
https://www.clarkson.edu/sites/default/files/2018-10/18-19%20GRADUATE%20CATALOG_Final%20-%20Copy.pdf

Getting Set-Up, Responsibilities and People to Know

Getting Set-Up

Paychecks. Students funded as Research or Teaching Assistants are paid on a bi-weekly basis. Students who want their checks deposited directly into a local bank should see a CEE Department Administrative Assistant about obtaining forms from the Human Resources Office.

Offices. Students funded as Research or Teaching Assistants are assigned an office and a research area (if appropriate) located in either Rowley Labs or CAMP. See your academic advisor for your assigned space. Office space is coordinated by the Chair of CEE.

Keys. Office and research lab keys can be obtained from the office of campus safety and security after submitting the key request form. The form can be obtained from the department administrative assistants in Rowley Labs 140 after completing the lab safety training with Erica Arnold. It is important to keep office and lab areas locked when unoccupied, particularly the labs for safety reasons. Lab keys cannot be issued until the student has completed the lab safety training with the Environmental Health and Safety Manager, Erica Arnold. Sessions will be conducted at the beginning of each semester as well as periodically throughout the semester. One-on-one training can also be arranged.

Mailboxes. Graduate students have a mailbox in Rowley Labs 160. Memos and notices will be put in the mailboxes. It is important that you check your mailboxes regularly to learn of important announcements. Please also note that most memos and notices will be distributed via email, so check that regularly also.

Computer Services. OIT (Office of Information Technology) supports the research and instructional computing needs of Clarkson. Most graduate students will use their own personal computers. The CEE Department uses email extensively to communicate among staff, faculty and students. Therefore, it is essential that all graduate students have an OIT account to have access to university email. New graduate students receive their PeopleSoft and email set up information as part of the admissions process.

Responsibilities of Graduate Students

All graduate students at Clarkson are required to abide by the rules and regulations of the University and Department as set forth in the Graduate Catalog (https://www.clarkson.edu/sites/default/files/2018-10/18-19%20GRADUATE%20CATALOG_Final%20-%20Copy.pdf) Clarkson Regulations, and as contained in this handbook.

To remain enrolled in the department's graduate program, a student must meet an acceptable level of performance in both course work and research. The student's research/project is directed by an advisor in the same area of technical specialty as that expressed by the student in his or her application for admission to the CEE graduate program. Periodic targets for a student's research accomplishments and the time expected for the student to achieve those accomplishments will be specified by the student's advisor. Failure to meet those targets provides a basis for dismissal from the graduate program. Grades in courses are expected to be excellent (A; 4 points) or good (B; 3 points). A minimum grade point average for graduation is 3.0. A student whose cumulative grade point average is below 3.0 is also a basis for dismissal.

Students who have received a financial award administered through the University must abide by the Departmental policy permitting the equivalent of two weeks of vacation, plus regular University holidays, during the calendar year.

- Teaching Assistants. By University policy presented in the graduate catalog (https://www.clarkson.edu/sites/default/files/2018-10/18-19%20GRADUATE%20CATALOG_Final%20-%20Copy.pdf), "instructional requirements are up to 20 hours of service per week in laboratory or other designated work for the University during the academic year, or 12 hours of service per week in the above designations during the calendar year".

- Research Assistants. By University policy, full time Research Assistants are required to work 40 hours per week for their stipend and tuition, less time spent in class, for the duration of their appointments.

For all graduate students, the Graduate School, Department Chair, and Graduate Committee must be advised in writing of a leave of absence.

All accepted foreign students for whom English is not a first language are required to take English as a Second Language placement exam upon arrival at Clarkson and complete any recommended requirements. Exceptions are granted to students who complete degree programs in the USA or a country where English is the primary spoken language (e.g., Canada, UK, and Australia) and subsequently continue their education at Clarkson. Exceptions also apply to applicants that have successfully completed an intensive English language course and received a certificate of completion.

Each acceptance by the Graduate Committee is for one-degree program only. Requests for a change in degree status (e.g., MS (thesis) to MS (project) or MS to Ph.D.) must be submitted by the student to the CEE Graduate Committee.

Students who have not completed their thesis but have satisfied all other graduation requirements including obtaining the minimum-required number of credits (30 for MS and 90 for Ph.D.) need to register for at least one credit hour each semester to maintain full-time student status.

Off-Campus students that register for one credit each semester are considered part-time students but do not have to pay health and recreation fees. Such off-campus students registered for one credit are classified as thesis continuum and must begin repaying any student loans.

People to Know

CEE has faculty program coordinators. These faculty are knowledgeable about curriculum matters and procedures associated with the graduate CEE specialties below.

- Construction Engineering Management (MS program): Erik Backus, Rowley 140A, ebackus@clarkson.edu
- Environmental Engineering, Stefan Grimberg, Rowley 204, sgrimber@clarkson.edu
- Infrastructure Systems and Materials, Steven Wojtkiewicz, Rowley 240A, swojtkie@clarkson.edu
- Water Resources Engineering, Weiming Wu, Rowley 128, wwu@clarkson.edu
- Graduate Committee Chair, Sulapha Peethamparan, Rowley 236, speetham@clarkson.edu

Key support staff-persons for graduate students are:

- CEE Administrative Assistants, Kristin Gregg/Marcy Adams, 140 Rowley, kgregg@clarkson.edu, maadams@clarkson.edu
- Graduate Coordinator, Carmen Camp, 102 Technology Advancement Ctr, ccamp@clarkson.edu
- Director of International Students and Scholars, Tess Casler, 2302 ERC, tcasler@clarkson.edu
- CSoE Graduate Coordinator, Carrie Hayes, 102 CAMP, chayes@clarkson.edu

Academic Advising

MS and Ph.D. Academic Advisor

Each graduate student is assigned an Academic Advisor upon arrival on campus to assist with Clarkson/CEE orientation and course scheduling, refer to the Graduate Advisor form listed as Appendix A. A revised submission of that form is required to change academic Advisors.

Transfer Credit

Written requests for transfer credit for courses taken at other universities must be recommended for approval by the Academic Advisor, signed by the Chair of the Graduate Committee and Department Chair and then submitted with official transcripts to the Dean of Engineering for approval using the Graduate Transfer Credit Request Form, listed as Appendix B.

Graduate credit for courses taken at Clarkson as an undergraduate must be requested on a Graduate Credit Form, Appendix C.

When enrolling in coursework, a student's academic program for each semester is updated by the departmental staff and recorded on the appropriate Degree Program Form. The form will also show all courses transferred for credit towards degree requirements.

Out-of-Department Advisor

An Out-of-Department thesis advisor must either have a courtesy appointment in the CEE Department or serve as a co-advisor with a CEE faculty member.

Ph.D. Advisory Committee

The Research Advisor recommends the membership of the Ph.D. Advisory Committee using the Graduate Committee Appointment form, listed as Appendix D, to go to the Department Chair and the Dean of Engineering for their approval. The committee should be appointed as soon as possible but within twelve months after entry into the Ph.D. program. The Advisory Committee and the Research Advisor will approve the courses required to satisfy the student's minor. This committee must consist of five members qualified to sit on such a committee, at least one of whom must be from outside the candidate's department. Normally, the Research Advisor will not act as Chair of the committee. The purpose of the committee is to provide guidance to the student for the course work and dissertation research.

Completion Certification of All Graduate Programs

The Faculty Advisor submits the Graduate Student Completion Notice, listed as Appendix E, for approval by the Advisory Committee (by project advisor for MS (Project), the Department Chair, the Dean of the School of Engineering, and the Dean of the Graduate School.

Graduate School Tuition Policy

Teaching Assistants

Departments are responsible for providing stipends to designated Teaching Assistants. Appointments are made in half-year or full year increments. The Graduate School will allocate funds to cover tuition for the credit hours taken during the term of appointment.

Research Assistants

Research Assistants on full stipends are eligible for tuition coverage by the university. See your research advisor, if you have any questions about the extent of this tuition coverage.

Partial Tuition Assistantships and Work Requirements

Partial Tuition Assistantships are available on a merit basis for those students who did not receive full assistantships. This award offers up to a 30% tuition waiver, equivalent to a 10-credit hour waiver for every 30 hours taken. There is no stipend associated with this form of scholarship.

These merit awards require up to 6 hours of CEE departmental work per week.

Admission Requirements for CEE Graduate Degrees

A BS, BE, or equivalent degree from an accredited program in Civil and Environmental Engineering or other engineering discipline or a closely related field is required. Applicants with degrees in disciplines other than engineering may be required to demonstrate proficiency through additional undergraduate coursework as determined by the departmental Graduate Committee. This may comprise an additional semester of study for which graduate credit cannot be granted.

No minimum grade point average is required for admission; however, a superior record of academic achievement is expected of all applicants.

University application procedures and other information can be found at:
http://clarkson.edu/academics/graduate

Master of Science Degree in Civil and Environmental Engineering (Except Construction Engineering Management)

Prerequisites
BS, BE, or equivalent degree from an accredited program in Civil and Environmental Engineering or other engineering discipline or a closely related field is required. Applicants with degrees in disciplines other than engineering may be required to demonstrate proficiency through additional undergraduate coursework as determined by the departmental Graduate Committee. This may comprise an additional semester of study for which graduate credit cannot be granted.

No minimum grade point average is required for admission; however, a superior record of academic achievement is expected of all applicants.

Program Degree Requirements

1. 30 total credit hours with all coursework approved at the graduate level, which must include:
    a. 18 credit hours of graduate coursework (500-600 level courses)
    b. 2 credit hours of seminar work
    c. Maximum of 10 course credit hours of transfer credit (grade of B or better).

2. Satisfactory completion of one of the following (a or b) for 10 credits.

    a. A written thesis based on independent research;
        All students must complete a thesis and defend it orally to a committee consisting of a minimum of three faculty members. The committee will be appointed by the student's advisor and approved by the graduate committee and the department chairs. After approval by the examining committee, a thesis requires signature approval by the Dean of the Graduate School, and two copies of the thesis will be deposited in the University library.

    b. An appropriate, professionally oriented special project and project supporting coursework;
        All students must complete 2-3 project related 500 or 600 CEE level courses (totaling 6-9 credit hours) from Environmental, ISM, or Water Resources. All students must also complete a Master of Science Project (totaling 1- 4 credit hours of work) under a project advisor. The project advisor will be selected through mutual agreement between the student, and the project advisor. At the completion of the project work, the student will prepare a formal report and submit it to the project advisor. When the report is approved by the advisor, the project credits will be formally granted.

3. Pass a group of core courses in one of the following professional specialties comprising a minimum of 15 credit hours: Environmental, Infrastructure Systems and Materials (ISM), or Water Resources Engineering.

4. All MS work to be completed within 5 years.

Core Courses in Professional Specialties

Professional specialties require a minimum of 15 credit hours of relevant coursework. The following core courses are required for each of the professional specialties. Additional relevant courses may be necessary to complete 15 credit hours:

1. Environmental Engineering

Faculty: *Professors Andrea Ferro, Stefan Grimberg, Thomas Holsen; Associate Professor Shane Rogers; Assistant Professor Yang Yang*

CE 579 Water and Wastewater Engineering, or satisfied by an appropriate course as an Undergraduate
CE 580 Environmental Chemistry
CE 584 Chemodynamics
CE 582 Environmental Systems OR CE 586 Industrial Ecology

And one of the following:

CE 681 Environmental Physico-Chemical Processes
CE 682 Environmental Biological Processes

Note: A course in applied statistics is also strongly recommended.

2. Infrastructure Systems and Materials (ISM)

Structures Faculty*:* *Professors John Dempsey, Sulapha Peethamparan; Associate Professor Steven Wojtkiewicz; Assistant Professors Pedro Fernández-Cabán, and Robert Thomas*
Geotechnical Faculty: *Assistant Professor Suguang Xiao*
Transportation Faculty: *Assistant Professor Behzad Behnia*

Choose four from the following list:

CE 501 Fracture Mechanics of Concrete Structures
CE 512 Structural Dynamics
CE 515 Foundations, Stability, and Retaining Structures
CE 516 Advanced Soil Mechanics
CE 520 Computational Methods of Structural Analysis
CE 521 Analysis of Advanced Composite Structures
CE 527/ME 527 Advanced Fluid Mechanics
CE 538 Finite Element Method
CE 549 Experimental Methods in Structures
CE 551 Theory of Elasticity
CE 553 Properties and Performance of Concrete Materials
CE 554 Continuum Mechanics
CE 556 Engineering Analysis
CE 563 Railroad Engineering
CE 622 Uncertainty Quantification and Optimization in Computational Mechanics
CE 631 Cement Chemistry
CE 633 Plasticity
ME 531 Computational Fluid Dynamics

3. Water Resources Engineering

Faculty*: Professor Weiming Wu, Assistant Professors Ian Knack, Tyler Smith, Abul Baki*

Choose four from the following list:

CE 527/ME 527 Advanced Fluid Mechanics
CE 554 Continuum Mechanics
CE 569 Watershed Analysis
CE 570 Stream Riparian System and Fluvial Morphology
CE 571 Computational River Dynamics
CE 572 Advanced Open Channel Hydraulics
CE 573 Sediment Transport
CE 574 Ecohydraulics
CE 575 Coastal Engineering
CE 576 Hydraulic Engineering in Cold Regions
ME 531 Computational Fluid Dynamics

Non-Traditional Professional Specialty

A student doing research in a non-traditional area of Civil and Environmental Engineering may find it beneficial to have a program of study where the majority of graduate courses would not have a CE prefix. Such students would be required however to take a minimum of two courses with CE prefixes. Classification as a student doing research in a "Non-Traditional Professional Specialty" and the student's proposed program of study requires the approval of their faculty research advisor and the CEE Graduate Committee Chair.

Students in a Non-Traditional Professional Specialty that do not have a Civil and/or Environmental Engineering Degree may be required to demonstrate proficiency through additional undergraduate coursework as determined by the departmental graduate committee. This may comprise an additional semester or more of study for which graduate credit cannot be granted.

Other Information

1. Exceptional MS students may be invited to proceed directly to the Ph.D. program without completing a MS thesis. The student's faculty advisor recommends the continuation of the student directly to the Ph.D. program by submitting a memorandum to the Graduate Committee and including a copy of the student's transcripts. Such students will be awarded the MS concurrently with the Ph.D.

2. Only under exceptional circumstances will MS (thesis) students be allowed to transfer to the MS (project) program. This transfer will require approval by the Graduate Committee Chair and the CEE department chair and will also require a detailed written justification by the student and advisor.

Master of Science Degree in Civil and Environmental Engineering (Focus in Construction Engineering Management)

Program Degree Requirements

1. 30 total credit hours with all coursework approved at the graduate level:

2. Completion of three (3) core Construction Engineering Management Courses (totaling 9 credit hours):
   CE506 Advanced Construction Engineering Management
   CE510 Sustainable Infrastructure and Building
   CE591 Special Topics in Construction Engineering Management.

3. Completion of three (3) Civil Engineering electives (totaling 9 credit hours) selected from any CE coded course at the 500 or 600 level other than CE590, CE595, CE610, CE612, and/or CE684.

4. Completion of three (3) courses (totaling 9 credit hours) offered by the Reh School of Business through their MBA program(s). Completion of a Master of Science Project (totaling 3 credit hours of work, as recorded using CE590 Graduate Project) under the oversight of the Director of the CEM Program. The CEM project advisor will be selected through mutual agreement between the Director of CEM, the student, and project advisor. At the completion of the project work, the student will prepare a formal report and submit it to the project advisor. When the report is approved by the advisor and the CEM Director, the project credits will be formally granted.

Advanced Certificate in Construction Engineering Management (CEM)

Clarkson University's professional Certificate in Construction Engineering Management program focuses on practical applications, current industry techniques and emerging trends and technology. Offered online to accommodate working professionals, the program is ideal for those in the construction industry.

To complete this certificate, you must complete the following three courses:

- CE506 Advanced Construction Engineering Management
- CE510 Sustainable Infrastructure and Building
- CE591 Special Topics in Construction Engineering Management or ES581 Special Topics in Engineering Science.

Ph.D. Degree in Civil and Environmental Engineering

Prerequisites
A MS degree from a program in Civil and Environmental Engineering or other engineering discipline is required for admission. Applicants with degrees in disciplines other than engineering may be required to demonstrate proficiency through additional undergraduate coursework as determined by the departmental Graduate Committee. This may comprise an additional semester of study for which graduate credit cannot be granted. No minimum grade point average is required for admission; however, a superior record of academic achievement is expected of all applicants.

Program Degree Requirements

1. The following are minimum requirements:
    a. 90 credit hours beyond the BS
    b. 39 credit hours of coursework
    c. 15 credit hours in the major field
    d. 9 credit hours in the minor field
    e. 6 credit hours from a department other than the one in which the student is housed (courses double listed in CE and another department do not count in these 6 credit hours)
    f. Six credit hours of seminar.

2. A maximum of 30 credit hours of transfer credit (grade of B or better).

3. All work to be completed within seven years after the candidacy procedure is completed.

4. Pass a group of core courses in one of the following professional specialties comprising a minimum of 15 credit hours: Environmental, Infrastructure Systems and Materials, or Water Resources Engineering.

Core Courses in Professional Specialties

Professional specialties require a minimum of 15 credit hours of relevant coursework. The following core courses are required for each of the professional specialties. Additional relevant courses may be necessary to complete 15 credit hours:

1. Environmental Engineering

Faculty: *Professors Andrea Ferro, Stefan Grimberg, Thomas Holsen; Associate Professor Shane Rogers; Assistant Professor Yang Yang*

CE 579 Water and Wastewater Engineering, or satisfied by an appropriate course as an Undergraduate

CE 580 Environmental Chemistry
CE 584 Chemodynamics
CE 582 Environmental Systems OR CE 586 Industrial Ecology

And one of the following:

CE 681 Environmental Physico-Chemical Processes
CE 682 Environmental Biological Processes

Note: A course in applied statistics is also strongly recommended

2. Infrastructure Systems and Materials (ISM)

Structures Faculty: *Professors John Dempsey, Sulapha Peethamparan; Associate Professor Steven Wojtkiewicz; Assistant Professors Pedro Fernández-Cabán, and Robert Thomas*
Geotechnical Faculty: *Assistant Professor Suguang Xiao*
Transportation Faculty: *Assistant Professor Behzad Behnia*

Choose five from the following list:

CE 501 Fracture Mechanics of Concrete Structures
CE 512 Structural Dynamics
CE 515 Foundations, Stability, and Retaining Structures
CE 516 Advanced Soil Mechanics
CE 520 Computational Methods of Structural Analysis
CE 521 Analysis of Advanced Composite Structures
CE 527/ME 527 Advanced Fluid Mechanics
CE 538 Finite Element Method
CE 549 Experimental Methods in Structures
CE 551 Theory of Elasticity
CE 553 Properties and Performance of Concrete Materials
CE 554 Continuum Mechanics
CE 556 Engineering Analysis
CE 563 Railroad Engineering
CE 622 Uncertainty Quantification and Optimization in Computational Mechanics
CE 631 Cement Chemistry
CE 633 Plasticity
ME 531 Computational Fluid Dynamics

3. Water Resources Engineering

Faculty*:* *Professors Weiming Wu, Assistant Professors Ian Knack, Tyler Smith, Abul Baki*

Choose five from the following list:

CE 527/ME 527 Advanced Fluid Mechanics
CE 554 Continuum Mechanics
CE 569 Watershed Analysis
CE 570 Stream Riparian System and Fluvial Morphology
CE 571 Computational River Dynamics
CE 572 Advanced Open Channel Hydraulics
CE 573 Sediment Transport
CE 574 Ecohydraulics
CE 575 Coastal Engineering
CE 576 Hydraulic Engineering in Cold Regions
ME 531 Computational Fluid Dynamics

Advisory Committee, Ph.D. Comprehensive Examination, Research Proposal, and Dissertation Defense

Additional requirements in CEE for Ph.D. students follow.

1. **Ph.D. Advisory Committee**: The Research Advisor recommends the membership of the Ph.D. Advisory Committee to the Department Chair and the Dean of Engineering for their approval. The committee must be appointed prior to the comprehensive examination. The Advisory Committee and the Research Advisor will approve the courses required to satisfy the students' minor. This committee must consist of five members qualified to sit on such a committee, at least one of which must be from outside the candidate's department. Normally, the Research Advisor will not act as Chair of the committee. The purpose of the committee is to provide guidance to the student for the course work and research.

2. **Ph.D. Comprehensive Examination**: Satisfactory completion of this examination must be done within two years of full-time study after admission to the Ph.D. program. See the graduate catalog and for information about part-time students https://www.clarkson.edu/clarkson-catalog. In CEE the Ph.D. Comprehensive Examination consists of two parts: a comprehensive examination and a research proposal defense.

   The comprehensive examination should be taken within 18 months after entry into the Ph.D. program. It will have a written portion consisting of a one-week take-home exam with access to research materials, and an oral portion to be administered by the Advisory Committee within one month after the conclusion of the written exam. In the event of failure of the written exam, the Advisory Committee may, at its discretion, elect not to administer the oral portion. The outcome of the exam is determined by a vote of the committee, with no more than one dissenting vote permitted for passage. Failure to pass the comprehensive examination twice is grounds for dismissal from the program.

   The second part of the Ph.D. Comprehensive Examination is the **Research Proposal Defense Presentation**. Within **six months** after the successful completion of the comprehensive examination or **24 months** from matriculation, the Ph.D. student must submit and orally present and defend a research proposal to the Ph.D. Advisory Committee. This presentation may be administered simultaneously with the oral portion of the comprehensive examination. Upon successful completion of the Engineering Ph.D. Candidacy Exam, the student is admitted to **Candidacy** for the Ph.D. degree. The Ph.D. Candidacy Procedure form is listed as Appendix F.

   The research proposal must:

   a) Identify a problem that is worthy of investigation,
   b) Provide background materials that demonstrate an understanding of the fundamentals related to the problem,
   c) Provide background materials that identify the current state-of-the-art in terms of understanding the problem and clearly identify current gaps or limitations in the research work already completed by others,
   d) Establish and justify the goals and objectives,

   e) Present any preliminary work to provide confidence that the problem is important and that the research is realistic,
   f) Lay out a plan for the research investigation

i) Experimental materials and methods, equipment used, design of an experimental matrix, quality control, plan for data analysis and interpretation; or
ii) General mathematical tools used, model development procedure, approach to test or verify model, application of the model, analysis and interpretation of results.
iii) Proposed timeline and major deliverables or milestones such as technical publications, draft copy of portions of the thesis, etc.

g) Summarize the expected outcomes of the research work and their contribution to the current state of the art.

3. **Defense of the Dissertation**: Refer to the reference section pertaining to Defense of the Dissertation, page 20.

Presentation and Publication Guidelines for MS Thesis and Ph.D. Dissertation

The Department of Civil and Environmental Engineering has requirements and standards for MS and Ph.D. students to ensure the timely dissemination of research results.

Presentations

All students are expected to present their research work on at least one occasion other than their defense. Either departmental seminars or presentations at research conferences would be considered appropriate forums for this presentation.

Publications

It is expected that material presented in a thesis or dissertation is of sufficient quality for publication in a peer-reviewed research journal. Research efforts of Ph.D. students should be sufficient for multiple manuscripts, while at least one is expected of MS degree recipients.

With a need to disseminate the research results, it is acceptable and encouraged to organize a thesis or dissertation around manuscripts prepared for submission to appropriate peer-reviewed journals. Dissertations comprised of several manuscripts must also include an overall introduction and conclusion to tie the material together. Additional materials required for the thesis or dissertation (detailed literature review, details of methods, presentation of raw data, etc.) can be included as additional chapters or appendices as appropriate.

When a dissertation or thesis is comprised of manuscripts prepared for a peer-reviewed journal, it is expected that the student be the primary author of these manuscripts. First authorship has important connotations; it implies not only that the student understands all aspects of the work, but also that she/he handled major facets of the research and writing tasks independently.

Document Preparation and Format for MS Thesis and PhD Dissertation

Preparation of MS Thesis and Ph.D. Dissertations:

Hard copies of this information can be obtained from the CEE Department Administrative Assistants. You may also find it via the web at https://www.clarkson.edu/completion-information

MS Thesis Defense and Submission Procedures

Thesis Defense

Each graduate student is responsible for arranging for a room and advertising the thesis defense. Committee members are normally permitted approximately two weeks to read the thesis.

The defense serves two purposes: examination on specific aspects of the thesis to establish the student's depth of understanding of the subject, and an examination on the broader field of study to determine the general level of mastery. Prior to the defense, the committee will select a Chair (who is not the Advisor) whose duties are to ensure the smooth conduct of the examination procedure. After the defense, the Chair will inform, in writing, the Department Chair and Graduate Committee Chair of the result and any special requirements pertaining to the student and/or thesis. There is no limit to the number of times a thesis may be defended, provided the longevity requirement has not been exceeded (5 years).

Submitting the MS Thesis

A thesis submitted in partial fulfillment of the requirements for the Master of Science degree will be examined by a committee of at least three Clarkson faculty appointed by the student's department. After approval by the examining committee, a thesis requires signature approval by the dean of the Graduate School, and two copies of the thesis will be deposited in the University library.

Two copies of the signed final thesis (once all corrections have been completed) are to be submitted to the Graduate School for the Dean's signature. The Department should also receive one copy of the final thesis to be kept in the departmental library. The thesis must be bound in an appropriate manner. The thesis must also be submitted to the CSoE Graduate Coordinator and to the department secretary, one CD each. The CDs should contain two files: (1) the complete thesis (title page through appendices), and (2) the title page and abstract only.

The following completed items are obtained from the CSoE Graduate Coordinator and are to be submitted with the final thesis copies:

- Degree completion notice (including laboratory clearance)
- Final degree program form
- Withdrawal form
- Termination of appointment form (if applicable)

Final Acceptance Date Prior to the Beginning of the Semester

Final copies of the thesis must be received in the Graduate School no later than the second week of classes (last day to register) or the student must register and pay tuition for one credit hour of thesis.

Ph.D. Dissertation Defense and Submission Procedures

Preparation

The Graduate School requires that the dissertation be in the format shown in the Instructions for Ph.D. Dissertation Preparation and Defense, which include the required title page and signature page, which can be found at:

https://www.clarkson.edu/completion-information

The web site below for preparing your dissertation for ProQuest contains many useful hints on preparing an acceptable dissertation. Since all dissertations are submitted to ProQuest, you should try to follow all guidelines as presented. Attention should be paid to the information regarding the Abstract.

http://www.proquest.com/products-services/dissertations/submitting-dissertation-proquest.html

Defense of the Dissertation

Each graduate student is responsible for arranging for a room and advertising of the thesis defense. Committee members are normally permitted approximately two weeks to read the thesis.

The defense serves two purposes: examination on specific aspects of the dissertation to establish the student's depth of understanding of the subject, and an examination on the broader field of study to determine the general level of mastery. After the defense, the Chair will inform, in writing, the Department Chair and Graduate Committee Chair of the result and any special requirements pertaining to the student and/or thesis. There is no limit to the number of times a dissertation may be defended, provided the longevity requirement has not been exceeded. The degree completion notice will be signed by Advisory Committee after the revision of the dissertation based on the comments.

The Ph.D. Advisory Committee shall consist of a minimum of five members. The members should include at least four Clarkson faculty of assistant professor rank or higher and possessing a Ph.D. At least one of the members must be from a department other than the candidate's major department. An external examiner from another University or an appropriate industry may also serve as one of the five committee members.

Submitting the Ph.D. Dissertation

Final completion of paperwork and an electronic copy of the accepted dissertation (on CD) must be received in the student's Graduate School office no later than 10 class days before a commencement to confer degrees to qualify a student to receive a degree at that commencement. Before final submission of the Ph.D. dissertation, each student will be responsible for submitting their dissertation for publication and paying any associated fees.

One CD and one hard copy of the dissertation is to be submitted to the Departmental office. The hard copy may be double sided. This copy of the final dissertation will be kept in the departmental library. The dissertation must also be submitted on a CD to the Graduate School. The CD should contain two files: (1) the complete dissertation (title page through appendices), and (2) the title page and abstract only. The title page and abstract will be posted on Clarkson's web site.

The dissertation must be submitted to ProQuest for publishing. The website for submission is www.etdadmin.com/clarkson. There is a set-up fee for this. When you submit in ProQuest, indicate that two copies must be sent to the Clarkson University library.

In addition to the submission of the dissertation, the Survey of Earned Doctorates must be completed. The website for this survey is https://sed-ncses.org/login.aspx
The proof page should be sent to the Graduate Coordinator.

In addition to the above, the following completed items obtained from the CSoE Graduate Coordinator must be submitted to the Graduate School:

- A degree completion notice (including lab clearance)
- Final Degree Program form
- Withdrawal form
- Terminating appointment (if applicable)

Final Acceptance Date Prior to Commencement

Final copies of the dissertation must be received in the Graduate School no later than ten class days prior to a Commencement to qualify you to receive the degree at that Commencement.

Final Acceptance Date Prior to Beginning of the Semester

Final copies of your dissertation must be received in the Graduate School no later than the second week of classes (last day to register) or the student must register and pay tuition for one credit hour of thesis.

Appendices

Appendices Listing

Appendix	Contents
A	Graduate Advisor Form
B	Graduate Transfer Credit Request Form
C	Graduate Credit Form
D	Graduate Committee Appointment Form
E	Graduate Student Completion Notice
F	Graduate Ph.D. Candidacy Procedure Form

All forms can be found online at, https://intranet.clarkson.edu/student-life/sas/forms/, once you are logged into the central authentication system (CAS).

Appendix A: Graduate Advisor Form

Print Form

Clarkson University

Coulter School of Engineering
Graduate Advisor

DATE _____

Appointment of Faculty Advisor.
Each student in an Engineering graduate program must have a primary faculty advisor. The research advisor will become the student's faculty advisor upon the selection of a research topic. A student's research advisor must be assigned no later than the beginning of the student's second semester of study for ME and MS or before the student has completed 15 credits of graduate course work for a Ph.D. Submit a revised copy of this form to change the faculty advisor

☐ **Ph.D.** ☐ **M.S.** ☐ **M.E.**

NAME: _____ **STUDENT ID:** _____

Student Degree/ PROGRAM: _____ **FACULTY ADVISOR:** _____

_____ _____

Chair, Department Graduate Committee Advisor Signature:

cc: Dept. File
CSOE File

Appendix B: Graduate Transfer Credit Request Form

Clarkson™
STUDENT ADMINISTRATIVE SERVICES

Graduate Transfer Credit / Waiver Request Form

Potsdam Campus: Box 5575, Potsdam, NY 13699-5575 | (315) 268-6513
Capital Region Campus: 80 Nott Terrace, Schenectady, NY 12308 | (518) 631-9832

Student Name: _____ **Student ID:** _____

Program of Study: _____ **Advisor:** _____

In conformance with the requirements set forth in the University Catalog, Clarkson may grant permission to transfer graduate credit toward a master's degree (up to 10 credit hours may be accepted, or with the Dean of the Graduate School's approval, a maximum of 12 credit hours from a post-baccalaureate certificate program may be accepted) or a doctoral degree (up to 30 credit hours). In order to qualify for transfer credit, the student must have passed the graduate courses with a minimum grade of B (or equivalent). See the Clarkson Catalog for more details.

TRANSFER CREDIT

External Course Information				Clarkson Equivalent Course	
College or University	Course	Credits Taken		Course	Credits Granted

In limited circumstances, a required course may be "waived with credit" through the assessment of prior undergraduate academic preparation. The total of waived plus transfer credits cannot exceed 12 credits for a master's degree, or 30 credits for a doctoral degree. See the Clarkson Catalog for more details.

COURSE WAIVERS

External Course Information				Clarkson Equivalent Course	
College or University	Course(s)	Credits Taken		Course	Credits Waived

Approvals:

Graduate Program Chair or Transfer Evaluator: _____ Date: _____

Department Chair: _____ Date: _____

SAS Use Only

☐ Official Transcript(s) on File ☐ Credit Posted (date) _____

Rev 10/2018

Appendix C: Graduate Credit Form

CLARKSON UNIVERSITY
Graduate School

Interoffice Memorandum

TO: Dean of the Student's School

FROM: _____, Chair or Executive Officer

Department of _____

Date: _____

RE: Approval for Graduate credit for courses taken as an Undergraduate Student at Clarkson.

Approval is requested for _____, _____
Student Name Student ID

To be granted credit for the following course(s):

Course Number	Course Name	Credit Hours	Grade
1.			
2.			
3.			

I certify that the above courses are in excess of those needed to meet the B.S. requirements.

_____
Signature: Dept. Chair or Exec. Office

_____
Approved by the Dean of the School

Original: SAS
Dept. & Student

Appendix D: Graduate Committee Appointment Form

Clarkson University

Print Form

Coulter School of Engineering
Graduate Committee Appointment

DATE _____

Appointment of Graduate Committee.
Each student in an Engineering graduate program completing research-based graduate degree must have a graduate committee. The graduate committee oversees the student's program of study, reviews and evaluates the student's progress, and conducts the final examination of the thesis or dissertation. Any changes in the composition of the graduate committee must be made prior to scheduling any final examination. Note: When an external member is to be appointed to a PhD graduate committee, a copy of that person's curriculum vitae must be submitted to the department chair and dean when the graduate committee is appointed. Submit a revised copy of this form to change the membership of the graduate committee.

☐ **M.S.** ☐ **Ph.D.**

NAME: _____ **STUDENT ID:** _____

DEPARTMENT/ PROGRAM: _____ **FACULTY ADVISOR:** _____

_____ _____
Committee Member: (Name/signature) Committee Member: (Name/signature)

_____ _____
Committee Member: (Name/signature) Committee Member: (Name/signature)

_____ _____
Committee Member: (Name/signature) Committee Member: (Name/signature)

_____ _____
Department Chair: (Name/signature) Chair, Department Graduate Committee: (Name/signature)

_____ _____
Dean, Coulter School of Engineering Provost (if an external committee member is included)

cc: Dept. File
CSOE File

Revised: 2/11/10

Appendix E: Graduate Student Completion Notice

Clarkson University
Graduate Student Completion Notice

Graduation Term: ☐ December (Q/S) ☐ May (S) ☐ June (Q) ☐ August (Q/S) **20** _____

Student Name: _____ **Student ID:** _____

Academic Program: _____ **Sub-plan:** _____

Credential Earned: ☐ MS* ☐ ME ☐ MBA ☐ MAT ☐ PhD ☐ DPT ☐ Advanced Certificate

***MS only - Is the student continuing on to a PhD?** ☐ Yes ☐ No (if yes, research advisor must sign in part A)

Program Type: ☐ Thesis/Dissertation or Project based (complete parts A, B)
☐ Coursework based (complete part B only)

Part A

Comprehensive Exam Pass Date: _____ **Advisor:** _____

Title of Thesis/Dissertation or Project: _____

Date of Defense/Presentation: _____ **Thesis/Dissertation or Project Credits Earned:** _____

Thesis/Dissertation Examining Committee Member Approvals:

☐ Pass ☐ Fail				☐ Pass ☐ Fail			
	Research Advisor		Date		Committee Member		Date
☐ Pass ☐ Fail				☐ Pass ☐ Fail			
	Committee Member		Date		Committee Member		Date
☐ Pass ☐ Fail				☐ Pass ☐ Fail			
	Committee Member		Date		Committee Member		Date

LABORATORY CLEARANCE[1]

The student named above has complied with all necessary laboratory clearance procedures ☐ Yes ☐ N/A
(If yes, attach the completed lab clearance form)

_____ Advisor/Program Director

_____ Date

Part B

We certify that the above named student has completed all requirements for the degree as indicated above.

_____ Department Chair/Program Director _____ Date

_____ Academic Dean/Institute Director _____ Date

_____ Dean of the Graduate School _____ Date

[1] *Any student who worked with any of the following materials must complete laboratory clearance: biohazardous materials, chemicals, compressed gases, DEA controlled substances, lasers, radioactive materials and/or radiation containing devices.*

Rev 10/2018

Appendix F: Graduate Ph.D. Candidacy Procedure Form

Print Form

Clarkson University

Coulter School of Engineering
Ph.D. Candidacy Procedure

DATE _____

Each student in a Coulter School of Engineering doctoral program must complete the candidacy procedure within two years after admission to the Ph.D. program. The specific requirements of the candidacy procedure are defined by each degree program but must include the defense of a research proposal. A student may have two attempts to pass the candidacy procedure. A student who does not complete the candidacy procedure within the time allowed could be dropped from the graduate program.

NAME: _____ **STUDENT ID:** _____

DEPARTMENT/ PROGRAM: _____ **FACULTY ADVISOR:** _____

The above named student completed the Ph.D. candidacy procedure on _____

The following examining committee has reviewed the examination results.

☐ Pass ☐ Fail

Committe Member: (Name/signature)

☐ Pass ☐ Fail

Committee Member: (Name/signature)

☐ Pass ☐ Fail

Committee Member: (Name/signature)

☐ Pass ☐ Fail

Committee Member: (Name/signature)

☐ Pass ☐ Fail

Committee Member: (Name/signature)

☐ Pass ☐ Fail

Committee Member: (Name/signature)

Chair, Department Graduate Committee (Name/signature)

Department Chair: (Name/signature)

Dean, Coulter School of Engineering: (Name/signature)

cc: Dept. File
CSOE Graduate Administrator, Box 5700)

Page Intentionally Left Blank

Page Intentionally Left Blank

Clarkson™

WALLACE H. COULTER
SCHOOL OF ENGINEERING