2018

Student Handbook

2019

Department of
Civil & Environmental Engineering
THE UNIVERSITY OF UTAH

Vision Statement

Pursuit of excellence in preparing engineers to provide innovative solutions to the world's challenges in sustaining the environment and the infrastructure.

Mission Statement

Provide high quality education in engineering and leadership, life-long learning opportunities, and innovation for the benefit of the State of Utah and the world.

WELCOME

Ashley Arpero
Administrative Program
Coordinator

Assistant to Dr. Michael Barber. Schedules his appointments, travel, project budgets, and speakers for the Seminar series. Assists with the Industrial Advisory Board and other things as needed.

2004 MCE
801.585.7710
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Mark Bryant
Department Technician
and Safety Officer

Maintains all student labs and assists faculty with their research labs. Oversees Department-wide safety efforts, reports injuries and supervises student lab employees.

HEDCO 103
801.581.7057
bryant@civil.utah.edu

Colleen Gilman
Undergraduate Academic Advisor

Main contact for undergraduate students. Advises incoming/potential freshman and transfer students and current students to discuss program requirements. Maintains student academic records and admissions applications for undergraduate students. Provides permission codes for undergraduate students. Administers policies and procedures for the undergraduate program. Coordinates and participates in outreach events.

2012 MCE
801.581.6931
c.gilman@utah.edu

Andrea Gallegos
Administrative Program
Coordinator

Works on publications, graphic design and the website for the Department. Coordinates employment & internship opportunities for students.

andrea.gallegos@utah.edu

Tiffany Hortin
Administrative Officer

Coordinates all payroll and human resources for the Department, reviews department accounts and assists faculty with research grant proposals in processing, administration and closeout of the grants. Oversees the administrative functions of the Department.

2003 MCE
801.585.6192
t.hortin@utah.edu

Bonnie Ogden
Graduate Academic Advisor

Advisor to all civil and nuclear graduate students. She assists student from recruitment through graduation, providing exceptional customer service to help students navigate all aspects of their education.

2008 MCE
801.581.6678
bonnie.ogden@utah.edu

CVEEN Staff & Faculty

Michael Barber, P.E.
Professor & Chair

Ph.D., 1991, University of Texas at Austin. Surface Water Quality Modeling with emphasis on prediction of macrophyte growth, epiphytic algae populations, and nutrient concentrations as a result of wastewater discharges and nonpoint source loadings.

2002 MCE
801.585.7710
barber@civil.utah.edu

Steven F. Bartlett, P.E.
Associate Professor

Ph.D., 1992, Brigham Young University. Geotechnical engineering, earthquake engineering, soil dynamics, liquefaction, site characterization, instrumentation, risk assessment, soil improvement, geofoam.

2032 MCE
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Amanda Bordelon, P.E.
Assistant Professor

Ph.D., 2011, University of Illinois Urbana-Champaign. Fiber-reinforced concrete, fracture mechanics, image visualization and analysis, concrete pavement design, ultra-thin whitetopping and inlay designs, laboratory testing and materials characterization, smog eating concrete, recycled and other sustainable materials.

2038 MCE
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Ramesh Goel
Associate Professor

Ph.D., 2003, University of South Carolina. Sludge minimization, EBPR biochemical models, diversity of ammonia oxidizers and denitrifies, anaerobic ammonia oxidation, water stainability through surface water quality, estrogens and their fate in wastewater treatment processes and in sediments, microbial diversity in natural systems and in engineered systems, educational outreach to k-12 students.

2064 MCE
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Tatjana Jevremovic
Professor, Energy Solutions Endowed Chair

Ph.D., 1993, University of Tokyo, Japan. Develop computational methodologies for current and future generation of nuclear applications with emphasis on open architecture tools for rapid design/prototyping of systems that involve radiation transport phenomena including, but not limited to, nuclear energy, homeland security, medical oncology applications, advanced numerical simulations and visualization incorporating mobile technologies, and advancing nuclear engineering and science related learning and training techniques and methods worldwide.

tatjana.jevremovic@utah.edu

Steven Burian, P.E.
Professor

Ph.D., 1999, University of Alabama. Sustainable and resilient urban water infrastructure systems, including stormwater, wastewater, and water supply. Focus research areas include integrated urban water management, low-impact development, green infrastructure design, stormwater management, flood risk modeling, vulnerabilities and adaptation strategies for urban water systems, and the water-energy nexus.

2044 MCE
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Andy Hong, P.E.
Professor

Ph.D., 1988, California Institute of Technology. Biomass energy, soil/sediment remediation, produced water treatment, oil sands processing.

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hong@civil.utah.edu

Evert Lawton, P.E.
Professor

Ph.D., 1986, Washington State University. Geotechnical engineering, foundation engineering, soil improvement and stabilization, collapsible soils, geo-synthetics.

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Luis Ibarra, P.E.
Associate Professor

Ph.D., 2004, Stanford University. Structural engineering, mechanical performance of nuclear structures and components, collapse limit state, probabilistic risk assessment, seismic resilience of steel and concrete buildings, seismic behavior of bridges, and aging effects on structural performance.

2024 MCE
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ibarra@civil.utah.edu

Xiangfeng (Terry) Yang
Assistant Professor

Ph.D., University of Maryland, College Park. Dr. Yang's current research areas include evacuation planning and operation, traffic operations with connected automated vehicles, intelligent transportation system, traffic safety, network flow modeling, and unconventional intersection design.

2133 MCE
801.585.1290
x.yang@utah.edu

Xiaoyue Cathy Liu
Assistant Professor

Ph.D., 2013, University of Washington. Highway performance analysis, traffic operations, data-driven traffic network modeling, transit connectivity, smart transportation, traffic simulation, travel behavior analytics.

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801.587.8858
cathy.liu@utah.edu

Chris Pantelides, P.E., S.E.
Professor

Ph.D., 1987, University of Missouri-Rolla. Seismic design, evaluation, and rehabilitation of reinforced concrete building and bridge construction; earthquake engineering and fiber reinforced polymer composite materials.

2115 MCE
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c.pantelides@utah.edu

Abbas Rashidi
Associate Professor, Interim UNEP Director

Research: 1) Information and Sensing Technologies (IST) for Construction Engineering and Management @) Audio Signal Processing for Modeling and Analysis of Civil Infrastructure Systems 3) Video/Image Processing for 3D Reconstruction of Civil Infrastructure Systems 4) Acoustical Modeling of Construction Jobsites

2022 MCE
801.581.3155
abbas.rashidi@utah.eduu

Luther McDonald
Assistant Professor

Ph.D., 2013 Washington State University. Nuclear environmental engineering with emphasis on spent nuclear fuel reprocessing, nuclear forensics and environmental remediation of heavy metals.

1490A MEB
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Ge (Gaby) Ou
Assistant Professor

Ph.D.,2016, Purdue University. Infrastructural system performance assessment under extreme natural and man-made disasters using experimental and real world data. Quasi-static testing, hybrid simulation, and shake table testing.

2034 MCE
801.587.8031
ge.ou@utah.edu

Lawrence D. Reaveley, P.E.
Professor, Emeritus

Ph.D., 1971, University of New Mexico. Structural engineering, structural dynamics as applied to building systems with emphasis on earthquake engineering, vibration problems and seismic rehabilitation methodologies.

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Brian McPherson
Professor

Ph.D., 1996, University of Utah. General research areas include groundwater hydrology, petroleum and energy resources engineering, numerical modeling of groundwater flow and coupled processes (including coupled stress-strain-fluid flow, coupled heat flow-fluid flow, coupled reactive transport and fluid flow), multiphase relative permeability measurements and modeling. A focus research area is analysis and engineering of subsurface CO2 sequestration for greenhouse gas reduction and climate change mitigation.

2048 MCE
801.585.7961
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Christine A. Pomeroy, P.E.
Associate Professor

Ph.D., 2007, Colorado State University. Urban water infrastructure, green infrastructure, stormwater best management practices, watershed management, nonpoint source pollution, fluvial geomorphology and river mechanics.

2042 MCE
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Pedro Romero, P.E.
Associate Professor

Ph.D., 1996, Pennsylvania State University. Infrastructure stainability, testing and characterization of construction materials, mechanistic pavement design and analysis, novel construction practices and quality control methods, health monitoring and rehabilitation of civil engineering systems.

2131 MCE
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Doug Schmucker, P.E.
Associate Professor, Lecturer

Ph.D., 1996, Stanford University. Projects include assessment of existing structures, design of new facilities, development of design and/or assessment procedures, design of repairs and retrofits, and integration of practice-based education.

2113 MCE
801.587.3815
doug.schmucker@utah.edu

Jennifer Weidhaas, P.E.
Associate Professor

Ph.D., 2006, University of California at Davis. Environmental engineering, hazardous waste remediation, biological treatment of emerging contaminants, water quality and reuse, non-point source pollution, environmental microbiology, microbial source tracking, pathogen detection and fate, risk assessment

2062 MCE
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jennifer.weidhaas@utah.edu

CVEEN Associated Faculty

Ken Ament
Associate Instructor

Highest Degree: BS, 1969, Construction Management, Tennessee Technological University; Honor Graduate, 1969, U.S. Army Corps of Engineers Officer's School. Employer: President of Construction Control Corporation. Teaches: Cost Estimating and Proposal Writing.

Craig Coburn
Adjunct Associate Professor

Highest Degree: J.D., 1980, University of Utah. Employer: Shareholder in Richards Brandt Miller Nelson. Teaches: Law for Engineers (Engineering Law).

Jerod Johnson
Associate Instructor

Highest Degree: Ph.D., 2012, Civil & Environmental Engineering, University of Utah. Employer: Principal, Reaveley Engineers. Teaches: Reinforced Masonry/Timber Design.

Joshua Lenart
Associate Instructor

Ph.D., 2013, in English with a focus on Rhetoric and Writing Studies, Political Discourse Analysis, and Environmental Studies, University of Utah. Employer: College of Engineering, University of Utah. Teaching Focus: Technical Communication for Engineers, Chemical Process Safety Communications, and Land Management Policy as it relates to infrastructure and its impacts on wildlife, habitat, and land use planning.

Elizabeth Murphy
Research Assistant Professor

Ph.D., 1996, University of Utah. Application of remote sensing and geographic information systems for urban analysis. Recently, focusing on application of remote sensing for vegetation analysis, urban and peri-urban
vegetation.

Mike Russell
Associate Instructor

Highest Degree: MBA, 2012, University of Utah. Employer: Founding Partner, Russell Capital, LLC. Teaches: Project Management & Contract Administration, Project Scheduling. Interested in inspiring students to innovate and improve the way we design and build the world's infrastructure.

Graduate Degrees in Civil Engineering

Students enrolling in the Civil Engineering program should make note of the following Department and degree titles:

Department Name:	Civil & Environmental Engineering
Degree Names:	Civil & Environmental Engineering
	Nuclear Engineering

The Department of Civil & Environmental Engineering offers graduate programs leading to the Master of Science (MS) and Doctor of Philosophy (Ph.D.) degrees in Civil & Environmental Engineering. The department supports the Utah Nuclear Engineering Program that awards degrees for a Master of Science (MS), and Doctor of Philosophy (Ph.D.) in Nuclear Engineering.

Faculty areas of research include: structural engineering, earthquake engineering, environmental engineering, water resources engineering, construction materials engineering, geotechnical engineering, nuclear engineering, transportation engineering, engineering management, water, energy and infrastructure stainability engineering.

All information in this handbook and forms referenced in this document can be found on the department website, http://www.civil.utah.edu.

Admission

Admission to the graduate program is based on the applicant's academic records, Graduate Record Exam (GRE), letters of recommendation, personal statement, special aspects of the applicant's professional and educational background, and faculty availability. To apply to the department, students should reference the application information on the department website.

Applications are reviewed by faculty in the area of study which the applicant is applying for admission. Once reviewed, the application is returned to the Graduate Admissions Office with a recommendation. The University Graduate Admissions Office makes the final decision on all graduate admissions. All supporting documentation must be submitted by the dates listed below or your application may not be processed. The department deadline to apply is as follows:

December 1st – International students for Fall Semester, to be considered for Funding
January 1st - Domestic students for Fall Semester, to be considered for funding
March 1st - All students for Fall Semester, general admission
September 1st – International students for Spring Semester
October 1st – Domestic students for Spring Semester

The following minimum requirements shall be met in order to be accepted into the Department of Civil & Environmental Engineering's graduate program:

1. A bachelor degree from an accredited institution of higher learning in one of the branches of engineering or in mathematics, physics, computer science, chemistry, biology, or in a related science field.

2. A minimum grade point average (GPA) of 3.0 (out of 4.0) in the undergraduate degree. A GPA below a 3.0 will be considered on a case-by-case basis.

3. Master of Science applicants must receive a minimum combined score of 300 on the quantitative and verbal sections of the GRE. Doctor of Philosophy applicants must have a minimum of 155 on the quantitative section and a combined score of 300 on quantitative and verbal sections. Non-thesis or Engineering Management applicants who have graduated from an ABET accredited university with a B.S. degree in engineering and a GPA of 3.20 or higher are not required to take the GRE. GRE scores must be within the last five years.

4. Students who have not satisfied the entire minimum course requirements may be admitted to the graduate degree programs but are expected to complete all deficiencies with a grade of 'B' or better to be considered satisfactory. Once the student has met the prerequisite requirements, graduate coursework can be taken.

The requirements given above are minimum standards. Meeting the minimum requirements does not guarantee that an applicant will be accepted into the graduate program. Decisions regarding acceptance or rejection of any applicant are made based on the qualifications of the applicant compared to other applicants, the needs of the Department, any restrictions or restraints under which the Department is operating, and other unnamed considerations.

International Students

In addition to the general admission requirements, the Department of Civil & Environmental Engineering requires international applicants to satisfy the University of Utah's Admission's Office minimum English Proficiency scores. Minimum scores should be at least 550 on the written, 213 on the computer-based, or 80 on the internet-based Test of English as a Foreign Language (TOEFL). Applicants may also take the International English Language Testing System (IELTS) which requires a score of 6.50. The TOEFL or IELTS are not required for international students who have earned a B.S. or higher degree from an accredited university in the United States in the last two years. All international students are encouraged to take ESL 1050, Introduction to Expository Composition (for ESL Speakers), and ESL 1060, Advanced Expository Writing (for ESL Speakers).

Financial Assistance

Financial assistance is available to qualified students on a competitive basis in the form of teaching assistantships, research assistantships, graduate assistantships, University of Utah research fellowships, industry-sponsored design and research fellowships. The professor in charge of the particular research contract or grant makes decisions regarding sponsored research assistantships. If a student is interested in a teaching assistantship or research assistantship, they will need to apply to the Department by the appropriate deadline or if they are a current student they will need to contact their Advisor directly. Financial support is competitively awarded to graduate students pursuing research degrees. Those following a professional or non-thesis degree are ineligible for financial support.

Students who work for the department as a teaching assistant, research assistant, or a graduate assistant may qualify for the Tuition Benefit Program provided they meet the other requirements. Complete requirements can be found at: www.gradschool.utah.edu.

Minimum Course Requirements

The undergraduate courses listed below are course requirements for MS graduate stu-dents. Most students with a B.S. in Civil Engineering will meet these requirements. Stu-dents with B.S. degrees in other areas shall take the courses identified in the general section and for their area of emphasis. If students are deficient in any course(s) they will need to be taken during the first semester that the student has the prerequisites.

These requirements are in addition to the graduate program of study. For all descriptions, refer to the University of Utah General Catalog.

All Students Must Complete: Mathematics	
MATH 2250	Ordinary Differential Equations (along with any prerequisite)
	A Statistics Course
Sciences	
PHYS 2210	Physics for Scientists and Engineers
CHEM 1210	General Chemistry I
Basic Engineering	
CVEEN 2010	Statics
CVEEN 2140	Strength of Materials
CVEEN 3410/3415*	Hydraulics/Hydraulics Lab

*CVEEN 3415 may be waived by supervisory committee if student has three or more labs during their non-CVEEN BS degree.

Graduate Emphasis Areas in Civil Engineering also require: Environmental/Water Resources	
CVEEN 3610	Intro to Environmental Engineering/Lab
Materials/Pavements	
CVEEN 3510	Civil Engineering Materials/Lab
Structures/Geotechnical	
CVEEN 3210	Structural Load and Analysis
CVEEN 3310/3315	Geotechnical Engineering/Geotechnical Engineering Lab
CVEEN 4221	Concrete I
CVEEN 4222	Steel I
Transportation	
CVEEN 3520	Transportation Engineering

Additional undergraduate courses may be required by the supervisory committee depending on the student's area of graduate emphasis and background.

Non-Matriculated Students

Students who do not qualify for admission to The Graduate School may enroll in graduate-level classes on a non-matriculated basis. To apply as a non-matriculated student please use the form located online at www.admissions.utah.edu/apply/nondegree.

Once a student is accepted as a non-matriculated student, he/she shall contact the professor teaching the class to receive permission. Once permission is received by the professor forward the email to the graduate academic advisor and he/she will assist you in registering for the class.

Courses taken as a non-matriculated student while at the University may count towards a student's graduate program at the discretion of the student's supervisory committee. In addition, a non-matriculated student shall receive a 'B' or better grade in a course to apply that course toward his or her graduate degree. A maximum of 9 non-matriculated credit hours may be applied to a graduate degree. Grades received during non-matriculated status do not guarantee admission into a graduate program. International students on visas are not eligible for non-matriculated status.

Direct Admit Ph.D. Program

If a Ph.D. is your ultimate degree objective, we encourage exceptionally qualified B.S. students to apply to our direct admit Ph.D. option. The direct admit Ph.D. degree emphasizes scholarly research activities. If you choose to apply for this option, but your record is not strong enough to merit direct admission into the Ph.D. program, you will automatically be considered for admission to the Master's program.

Admission Requirements

• Undergraduate students with a 3.50/4.0 grade point average (GPA) and/or in the top 15% of their graduating class may be considered for direct admission into our Ph.D. program.

• GRE format: Verbal = 150, Quantitative = 166, Analytical Writing = 3.5

Note: GRE scores must have been taken within the last 5 years to be considered.

Degree Requirements

• A minimum of 30 credit hours of graded coursework is required (including a minimum of 15 credits taken in CvEEN), and a minimum of 14 credits of dissertation (CvEEN 7970).

• M.S. degree granted after completion of at least 30 hours of coursework, successful completion of the qualifying exam, and submission of one peer-reviewed first-author paper from a journal approved by the committee.

• A minimum of 2 peer-reviewed papers submitted prior to scheduling your Ph.D. defense.

• Review after 1st year for continuation on Direct Admit track.

FERPA & Umail

The Family Educational Rights and Privacy Act (FERPA) requires faculty and staff to only communicate about a student's education history and plan with the student. If you would like the Department to also communicate with another family member, spouse, or guardian, complete the FERPA release contract that is located on the Campus Information System. Official university business is conducted through the Umail system.

Student Funding

Students interested in department funding, should submit an application before the funding application deadline date specified on the website. Only admitted students are considered for funding. Students pursuing a non-thesis or non-research degree are ineligible for departmental or research funding. Graduate research assistant and

graduate assistant positions are determined by individual faculty members. Recommendations for teaching assistant positions are sent by department research groups after the application deadline.

An international student selected for a graduate teaching assistant position (GTA) will need to go through the International Teaching Assistant (ITA) clearance process administered by Graduate School. The ITA program requires all students to have taken the iBT or ILTS. Students go through the ITAP Spoken English Evaluation prior to completing the ITA orientation workshop. If students are unable to satisfactorily complete the Spoken English Evaluation and the ITA training, they will be ineligible to receive the teaching assistant position.

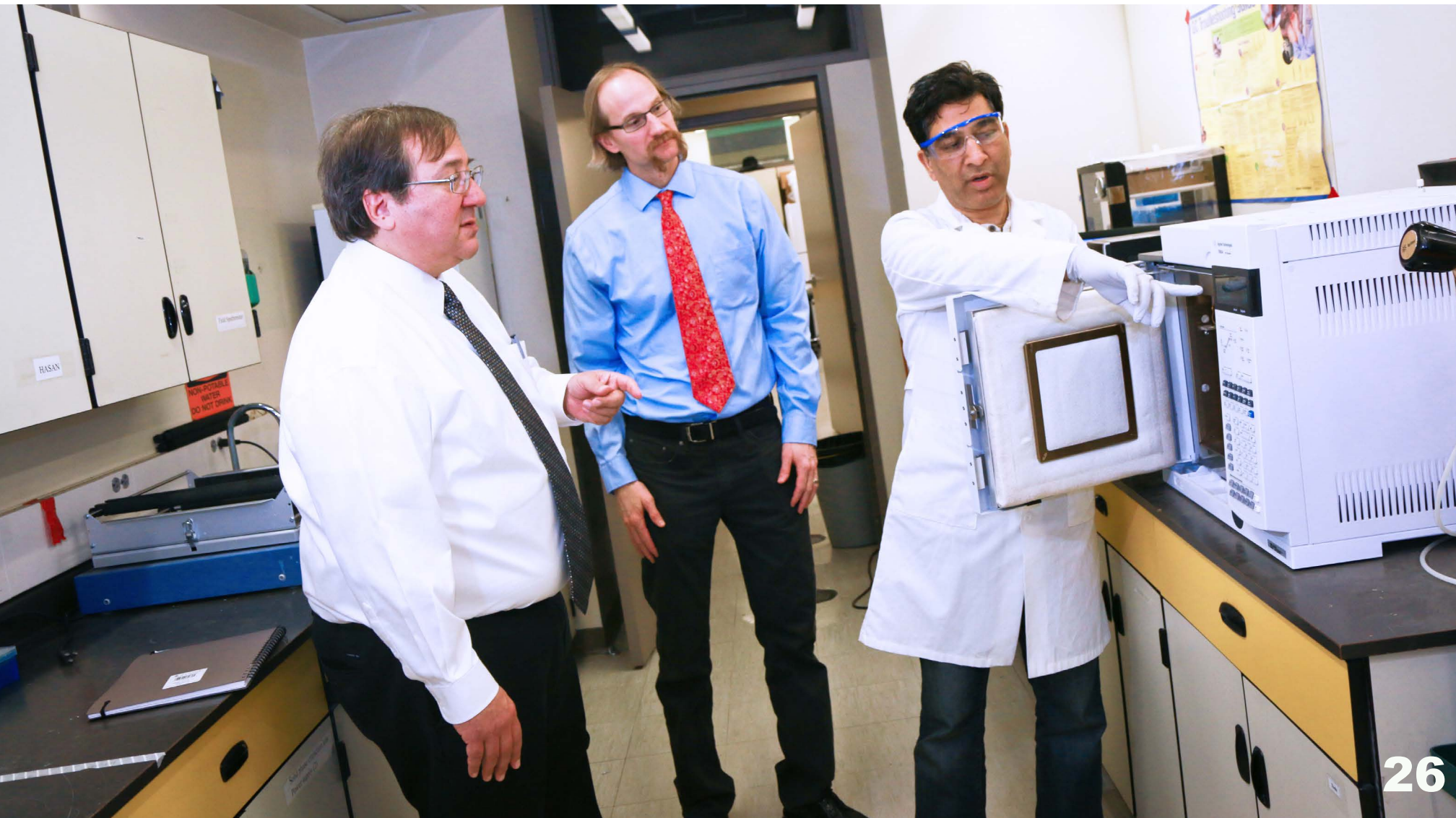
If a student is being paid through the department as a Graduate Research or Teaching Assistant, students must meet with their committee chair to complete the semi-annual Student Performance Review form and submit with the Registration Approval form for both fall and spring registration.

International Students

The U.S. Immigration and Naturalization Service (INS) has ruled that an international student on an F1 Visa may have up to three years to complete a master's degree and up to six years to complete a Ph.D. Please make sure that you complete your degree in the amount of time specified to avoid any delay in your education.

Language Proficiency

All graduate students are expected to have or develop a proficiency in both written and oral English. Any student who is found weak in communication in English, as evidenced by speech, written reports, and/or oral presentations, may be required to take additional English or speech course work. Additional language course work does not apply toward degree requirements.



Countinous Registration Requirements

Graduate School requires graduate students to be registered from the time of admission through completion of all requirements for the degree they are seeking, unless granted an official Leave of Absence (domestic students only) or Vacation Semester (international students only). This policy does not include summer registration for domestic students. All students must be continuously enrolled for a minimum of three (3) credit hours each semester (full load is considered 9 credit hours) from the time of formal admission through completion of all requirements, comprehensive exam, and thesis/dissertation (if applicable) for the degree they are seeking.

The Civil Department requires all Graduate Research Assistant (GRA) on payroll during summer semester to register for 3 credits of thesis research credits (CVEEN 6970 or 7970), unless a student is no longer tuition benefit eligible. During summer semester, the tuition benefit program allows only 3 credit hours of tuition benefit, so if students want to take a course instead of thesis or dissertation credits, contact the department graduate advisor.

Leave of Absence and Vacation Semesters

Domestic students who want to take a leave of absence for fall or spring semester must complete a Request for Leave of Absence form and have it approved by his/her supervisory committee two weeks prior to the start of the leave semester. Domestic students who wish to take summer semester off do not need to file a leave of absence. However, registering for three credits will be required for summer if a student is being paid as a Graduate Research Assistants (GRA) and tuition benefit eligible.

International students are required to be registered continuously full time in fall, spring and summer. Students who do not register for each semester will need to apply for a Vacation Semester with the help of the International Student and Scholar Office. In summer, international students can register for 3 credits of Thesis Research (CVEEN 6970 or CVEEN 7970) to be considered full time or 9 hours of coursework to meet INS regulations. Contact International Student and Scholar Services for further information and complete the necessary paperwork.

International students must file for a Vacation Semester if they are not going to register for any semester. International students taking a Vacation Semester during summer must register for Fall courses before leaving.

Anyone on department funding becomes ineligible for either a Vacation Semester or a Leave of Absence and remain on payroll. If a student does not comply with the university or department continuous enrollment policy, his/her records will be inactivated and will need to reapply for admission to the department.

Graduate Advisor and Supervisory Committee

The graduate academic advisor will assign a temporary advisor to new graduate students in their specified area of interest. The temporary advisor approves the first semester of the student's registration. Students need to set up their supervisory committee during their first semester in the program. If a student does not have their committee set up by the time of registration they will not be given the class numbers and will postpone registration.

M.S. Supervisory Committee

The supervisory committee for an M.S. student consists of three voting members. The Committee Chair of the supervisory committee (also known as Advisor) must be a CvEEN tenure track faculty member. At least one of the other two voting committee members must be a regular CvEEN faculty member. The third voting member can be from within the Department or may be outside the Department. An individual from the engineering industry may be a voting member with approval by the Director of Graduate Studies and the Graduate School.

Ph.D. Supervisory Committee

Ph.D. Supervisory Committees consist of five voting members. Three of the voting members must be a CvEEN tenure track faculty member or another approved research faculty member. Of these three, the Chair (also known as the advisor) and other members must be from the student's official area of emphasis. The fourth member is a regular faculty member from another department within the University of Utah. The fifth voting member can be from within the Department or may be outside the Department if this enhances the ability of the committee to supervise the student's work. An individual from the engineering industry may be a voting member with approval by the Director of Graduate Studies and the Graduate School.

Curriculum Development Plan

All students will need to complete a Curriculum Development Plan (CDP) during their first semester attending the University of Utah. The CDP is intended for the student and advisor to set out a plan for what courses are needed for the degree and to select a supervisory committee. For MS students, the completed and signed CDP must be submitted prior to registering for the second semester, and Ph.D. students submit prior to their third semester registration. The University does not allow graduate students to take 4000- level or lower courses for graduate credit.

Performance Review

All funded MS and Ph.D. students are required to meet with their Committee Chairperson to discuss their academic and research progress prior to registering for the next semester. Performance Reviews must be submitted to the graduate academic advisor to receive registration permission codes for Fall and Spring semesters, beginning with their second semester. The Performance Review is submitted with each fall and spring with the Registration Approval Form and Tuition Benefit Form.

Transfer of Graduate Credit, Credit Limitations

At the discretion of the student's supervisory committee, six credits of graduate coursework taken at another institution may be counted toward the MS degree.

Transfer courses cannot be used toward another degree, must have a minimum 'B' grade, and must be taken prior to admission to Civil and Environmental Engineering at the University of Utah. To receive credit, the student's advisor must submit a letter

of support to the Department to have the course(s) petitioned to the Admissions Office. If the petition is accepted students must list the course(s) on his/her Application for Admission to Candidacy form or Program of Study.

Students who attend the University of Utah as an undergraduate may have up to 6 credit hours count towards their graduate degree. The credits cannot be used to complete the requirements for the undergraduate degree. If a student took courses as an undergraduate and would like to have them count towards their degree, then he or she should complete the University's form, Undergraduate Petition for Graduate Credit. This form is located on the Graduate School website.

Grades and Probationary Status

Candidates for all graduate degrees are required to maintain a 3.0 or higher GPA in course work counted toward the degree. Candidates are also required to make forward progress towards their degree. Failure to do so will result in the student being placed on probation. Only one course (maximum of 4 credit hours) with a grade of C+ or C may be accepted for credit toward a graduate degree. If a graduate student's average GPA in courses on his/her approved CDP falls below 3.0, the student will automatically be placed on probationary status. Please see the Probation form on the Department website. Funded students will lose their ability to qualify for Tuition Benefit without a 3.0 GPA and could lose their funded position.

Applying for Graduation

All graduate students should meet with the department graduate academic advisor prior to applying for graduation. Students are required to apply for graduation through the Registrar's Office, Graduation Division. The application deadline is the same as the Admission to Candidacy and Program of Study forms: November 1 for Spring; April 1 for Summer; July1 for Fall. The application can be found on the Department website.

Master of Science

Overview

The degree of Master of Science is awarded for scholarly achievement from either a program of course work or a program of course work and research. There are two Tracks of Master of Science degree: Professional and Research.

	Professional Track		Research Track
	Engineering Management	Coursework Only	
Credit Hours + Thesis	30	30	24 + 6
Core	15	15 - 30	15 - 24
Electives	15	As Required	As Required

The Professional Track requires 30 hours of coursework. A student works with his or her advisor and committee to create a course plan that focuses on the student's area of emphasis. The Research Track has 24 hours of coursework and 6 hours of research (CVEEN 6970, Thesis Research-Masters). Research that is conducted with close supervision by the student's advisor and committee and results in a thesis that makes a contribution to the student's area of emphasis.

MS students who want to move from MS to Ph.D. should consult with their faculty advisor and department advisor.

The University of Utah allows, and the department encourages, students to use peer-reviewed journal quality articles to fulfill thesis requirements. Master's thesis typically consists of at least one journal quality article. Students pursuing this option will produce a thesis that contains the article(s) with additional explanatory material and appendices, as necessary. The student's graduate committee is responsible for evaluating their research and publications and determining if their quality merits the degree sought, regardless of the number or status of the articles. Thesis and dissertations must meet all formatting requirements and be approved by the graduate school (See "A Handbook for Theses and Dissertations," published by the Graduate School). Students must submit a preliminary review of formatting to Graduate School prior to their final defense. Students are encouraged to see the Thesis Editor as they are getting ready to defend their thesis to avoid formatting errors when submitting their final thesis.

All options allow the student to select coursework from one of two areas. The specific course work is defined for each area of study in the Category Lists on the department website. All students must take a minimum of 15 credit hours of coursework from the Core Electives and a minimum of 21 credits from within Civil courses. Research Track students may count 6 credits of research towards the 21 credit requirement. A maximum of 6 credit hours of coursework from a previous degree may be applied to the Core requirement, but they do not reduce the minimum requirement for the degree. A maximum of 3 credit hours of Independent Study (CVEEN 6930 or 7930) may be counted towards the M.S. graduate degree.

For all MS degrees, the courses listed in the CDP shall meet the requirements for the student's area of emphasis. With adequate undergraduate preparation, requirements for the MS degree can be completed within three semesters, depending on how early the student initiates a research program. **All work for the degree shall be completed within four years.**

The number of credit hours registered for research shall reflect the scope of work, not its duration. MS Thesis students will complete six credit hours of research.

Required Courses

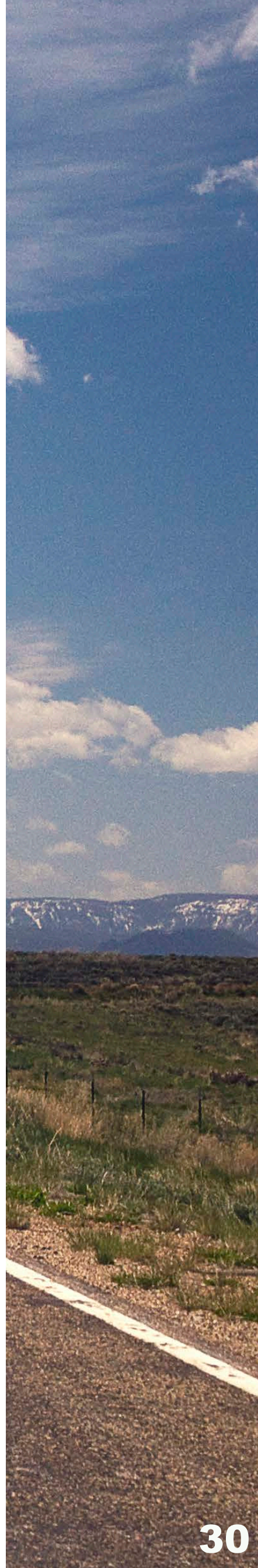
Students in each emphasis area are required to take certain courses. The courses for each area are listed below:

Environmental
CVEEN 6610, Water Chemistry
CVEEN 6650, Bioprocess Design

Transportation
CVEEN 6560, Transportation Planning

Water Resources
Coursework decided by the Supervisory Advisory Committee

Infrastructure Group
Infrastructure students take a minimum of one course in two interest areas Structures and Geotechics. The remaining 9 of 15 credits must be taken from the CORE courses.



MS Candidacy Form

To graduate a specific semester, Candidacy forms must be submitted by November 1 for Spring, April 1 for Summer and July 1 for Fall. The MS Candidacy form should meet the graduation requirements, listing all credits to be counted for the MS degree. If classes for the degree differ than those originally listed on the Curriculum Development Plan, the student attaches a typed paragraph stating which classes were replaced, the reason for the course substitution, and have the entire committee sign both the form and the attached paragraph. Submitting this form late may delay graduation.

MS Thesis Defense

In the last semester Thesis Candidates will complete the following:

1. Students must be enrolled a minimum of 3 credits the semester they defend.
2. Once the thesis is reviewed, edited, and the final version is approved by the chairperson, submit copies to the remaining committee members.
3. With input from the supervisory committee and the department advisor, schedule the public oral examination/defense a minimum of 2-3 weeks from the time the final thesis draft was given to the committee. Submit the Dissertation Announcement Form and Thesis Evaluation Form (no less than five working days before the defense).
4. Pass the oral defense with only minor correction to the thesis before the end of the registered semester. If the student has more than minor corrections, they will receive a 'fail' and be required to register for the following semester and redefend.
5. During the oral defense, members of the supervisory committee may ask the student questions related to the thesis, course work and other basic fundamentals. Committee signatures are needed on the MS Defense Form and submit to the department Academic Advisor within three working days of the final defense.
6. Students are required to defend and submit their thesis to the Thesis Editor by certain dates during the semester they are graduating. Please check the Graduate School website for a list of deadlines.

Timeline

This checklist is to be used so you will know when to complete the forms and when they are due:

1. Attend the Department Orientation Meeting. Submit the 1st Semester Registration Approval form.
2. Complete the Curriculum Development Plan (CDP) before the end of the first semester in the program. Faculty signatures on this form will create the student's Supervisory Committee. Keep a copy for faculty to review before signing future Registration Approval Forms submitted each semester.
3. As needed submit Change of Supervisory Committee Form.
4. As needed submit a Leave of Absence Form, please refer to the Continuous Enrollment section for guidelines.
5. Submit the MS Candidacy form with additional documentation if classes charged from initial Curriculum Development Plan.
6. Apply for Graduation by:

   November 1: Spring Graduation

   April 1: Summer Graduation

   July 1: Fall Graduation

For MS Thesis students, complete 7-10:

7. Schedule the thesis defense with the Supervisory Committee. Submit a final approved thesis to the Supervisory Committee at least two to three weeks before the defense. **Reminder: Students must be registered for at least 3 hours of classes the semester defended. **
8. Pass the defense examination with only minor corrections to be made, and submit the MS Defense Form to the Department Advisor within 3 business days.
9. Finalize the Master Supervisory Committee Approval & Final Reading Approval Form.
10. Submit the thesis to the Thesis Editor for formatting review. It must be formatted to meet "A Handbook for Thesis and Dissertations" (www.gradschool.utah.edu/thesis/index.php) and Preliminary Review completed prior to final defense. Once reviewed, make corrections and submit again to the Graduate School Thesis Office. See the Thesis Office website for the exact date for graduate deadlines.

Doctor of Philosophy

Overview

The degree of Doctor of Philosophy is awarded for scholarly achievement demonstrated by independent research. A Ph.D. candidate shall demonstrate general competence in the subject matter of his/her chosen field and make a significant contribution to the technology through his/her research program.

For a Ph.D. degree program the student's research and the dissertation is the most important part of the degree. The University of Utah allows, and the Department encourages, students to use quality peer-reviewed journal articles to fulfill the dissertation requirement. Dissertations typically consist of at least three journal quality articles. Students pursuing this option can produce a dissertation that contains the articles with additional explanatory material and appendices, as necessary. The student's supervisory committee is responsible for evaluating their research and publications and determining if their quality merits the degree sought, regardless of the number or status of the articles. Dissertations shall meet all formatting requirements and be approved by the Graduate School Thesis Office. The Preliminary Review with the Graduate School is required prior to the final defense. Students are encouraged to see the Thesis Editor as they are getting ready to defend their dissertation to avoid formatting errors when submitting their final draft.

The time necessary to complete the Ph.D. requirements depends largely on how soon a student initiates research and the degree to which he/she devotes his/her efforts to its pursuit. However, the candidate shall finish his/her dissertation within three years after his/her qualifying examination. **Six years is the maximum time allowable for comple-tion of a Ph.D.**

Residency

The Graduate School requires all Ph.D. students to have at least two consecutive semesters of their program to be spent in full-time academic work at the University of Utah. Nine credit hours per semester is considered full-time when fulfilling the residency requirement.

Preliminary Exam

Purpose

The purpose of the Preliminary Examination is to determine the student's overall background and qualifications to continue in the graduate program towards a degree of Doctor of Philosophy. Students should submit a tentative Curriculum Development Plan to their chairperson before the exam. The Preliminary Examination is to be taken early in the Ph.D. program so that the Supervisory Committee may change the Curriculum Development Plan to include needed background and basic courses deemed necessary, checking the student's understanding of basic principles, synthesis of knowledge, and general academic preparation to successfully pursue the Ph.D. program.

Scheduling

The Preliminary Examinations will be scheduled the Friday after fall break or spring break, or a schedule provided by the faculty. New students enrolled in the Ph.D. program must take the Preliminary Examination no later than the end of their second semester at the University of Utah. Students who completed their M.S. at the University of Utah may be required by their Supervisory Committee to take the exam no later than the end of the first semester of the Ph.D.-level study. The Preliminary Exam must be completed at least one semester prior to the Qualifying Examination. Students shall be registered for three or more credit hours during the semester of the exam.

If the required date of the Preliminary Examination passes without the examination being attempted, the student must obtain written permission from the Chair of the Department to continue attending civil engineering courses. Before the end of the second semester, the Preliminary Examination and the Curriculum Development Plans should be complete and submitted.

Procedure

The examination may be written and/or oral. The student will be told which format will be used and the general topics to be covered before the exam date. The advisor moderates the oral exam, with the Supervisory Committee. The exam shall be open to all faculty. Written examinations may be given to students in groups.

The Preliminary Examination addresses prior course work related to each student's major. In many programs, written and primary oral questions will contain material from texts and/or notes which the students have had available for study. Primary questions for an oral exam may be written and given to the student's advisor prior to the examination. Secondary (follow-up) questions are permissible in an oral examination.

Results

The Supervisory Committee shall determine one of the following results: (1) pass the student and recommend a program of study for completing the course work and for beginning preparations for the Qualifying Examination; (2) recommend a strengthening of the fundamentals in the student's chosen field and outline a course of study for this purpose in which case the examination must be retaken at a later date as determined by the Supervisory Committee: or (3) terminate the student from the Ph.D. program if they fail twice.

The results of the examination will be recorded in memo format from the group lead reported to the graduate academic advisor and committee chair, and placed in the student's departmental file. A student is considered to be a Ph.D. student upon passing the Preliminary Examination.

Coursework

For students with a MS degree, a minimum of 18 credits of coursework is required. A maximum of 3 credit hours of Independent Study (CVEEN 6930 or 7930) may be counted towards the Ph.D. graduate degree.

A minimum of 14 research credit hours for the Ph.D. dissertation (CvEEN 7970) is required of the Ph.D. degree. A student's Supervisory Committee can require more credit hours if they feel it is necessary for a student to gain knowledge on their Dissertation topic.

The student's supervisory committee is responsible for evaluating their research and publications and determining if their quality merits the degree sought, regardless of the number or status of the articles.

Qualifying Exam

The purpose of the Qualifying Examination is to determine the student's ability to conduct original and independent research. The content of the Qualifying Examination may include any or all of the following components:

A written examination
An oral examination

Additionally, the Qualifying Examination will include a Research Proposal written and presented to the supervisory committee for its consideration and approval. Once the Research Proposal and written/oral examination is passed, the student is advanced to candidacy for the Ph.D. degree and may continue the research component of the doctoral program.

Scheduling

The Preliminary Examination should be passed a minimum of one semester prior to the

Qualifying Exam. The Qualifying Examination should be passed two semesters prior to the expected final examination defense date. Students shall be registered for three or more credit hours during the semester of any exam.

Procedure

The student shall present a written research proposal to each Supervisory Committee member at least three weeks prior to the exam. This document shall be written in a scholarly manner and include a history of the problem, the proposed scope of the investigation, and a statement of the original research contribution.

The exam consists of a formal presentation by the student followed by questions from the Supervisory Committee. The Supervisory Committee determines if the candidate: (1) has sufficient ability and comprehensive knowledge to conduct the research, (2) has reviewed the literature sufficiently, (3) has proposed research which has a scope worthy of a Ph.D. degree, and which should produce an original and acceptable research contribution.

The student determines the current state of knowledge and identifies unsolved aspects of a topic to do for a research proposal. In consultation with his/her advisor, he/she selects one of the unsolved problems and develops an idea, which might lead to an acceptable solution by means of experimental and/or analytical research. The student then prepares a written proposal, which presents the research problem and a proposed approach to the solution. The proposal should be double spaced and approximately 20 typewritten pages. Additional details of literature review, methodologies, preliminary results, and others requiring additional space may be included as appendices not subject to the page limit. The student is to get the proposal to the committee members two or three weeks before the proposal defense. Ordinarily the research proposal will be organized as follows:

Abstract
2. Introduction
3. Literature Survey
4. Proposed Research Program
5. Nomenclature
6. References

All members of the student's Supervisory Committee, or in the case of necessary absences, substitutes pre-approved by the Graduate School, shall participate in the Qualifying Examination.

Results

The Supervisory Committee shall (1) approve the research proposed, (2) approve the research proposed with revisions, (3) reject the research proposed with specific reasons given and recommendations, or (4) terminate the student from the Ph.D. program. Results 1 and 2 constitute passage; results 3 and 4 constitute failure. A student is considered to be a Ph.D. Candidate upon passing the Qualifying Examination.

Program of Study

The Department suggests the Program of Study is submitted, reviewed, and signed by the Supervisory Committee at the time of the Qualifying Examination. The Graduate School requires students to submit their Program of Study, two months prior to the start of their final semester. The Program of Study must include a record of all the courses taken for the Ph.D. degree. Refer to the section on coursework for minimum requirements. A completed Program of Study form is to be submitted to the Academic Advisor:

November 1 for Spring
April 1 for Summer
July 1 for Fall

Dissertation

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

The candidate shall submit an acceptable draft of the dissertation to their advisor **at most two years after the qualifying exam.** It is assumed that the student has consulted regularly with the advisor in the course of preparing his/her dissertation so that the contents of the dissertation have already been approved.

Detailed instructions concerning the dissertation and the time schedule that shall be followed during the semester of intended completion of the Ph.D. requirements are given in the University of Utah Graduate School Handbook.

Presentation, Examination, and Defense

Students must be registered for a minimum of 3 credits the semester they defend. The student shall consult with the committee advisor to schedule the dissertation defense at least six weeks before the defense date. The student shall provide a copy of the complete dissertation to each committee member at least three weeks before the examination date. The copy given to committee members should be a clean, typed copy of the dissertation so that their comments and corrections can be incorporated into the dissertation prior to typing of the final manuscript.

The chair of the student's Supervisory Committee shall introduce the candidate and outline the defense procedure. The candidate shall then present the doctoral research findings to the Supervisory Committee and public. After the presentation, questions will be invited from all present.

As with the Preliminary and Qualifying Examinations, all Supervisory Committee members, or in cases of necessary absences, pre-approved substitute members, shall participate in the final examination.

After the open question-and-answer period, the Supervisory Committee may reconvene in a closed session.

The Supervisory Committee may:
1. Accept the Dissertation as presented, thereby declaring that the candidate has successfully defended the doctoral research and declares the defense complete with minor corrections.
2. Require modification of the Dissertation, giving conditional acceptance.
3. Modification of the Dissertation, and a second defense.

In the event of a Candidate failing a second defense, he or she shall be dismissed from Candidacy.

Advancing to Ph.D. from Completed MS degree

MS students wanting to graduate and continue the Ph.D. program should meet with the graduate academic advisor for the paperwork prior to completing the MS degree.

Timeline

This checklist is to be used so you will know when to complete forms and when they are due:

1. Attend the Department Orientation Meeting, submit the 1st, semester Registration Approval Form.
2. Complete Preliminary Examination during first two semesters. **Students need to be registered for 3 credits the semester they complete their Preliminary Exam.**
3. Complete the Curriculum Development Plan (CDP) with committee signatures by the end of the second semester. Faculty signatures on this form will create the Student's Supervisory Committee. Keep a copy for faculty to review before signing future Registration Approval Forms submitted each semester.
4. As needed, submit Change of Supervisory Committee Form.
5. As needed, submit a Leave of Absence Form, please refer to the Continuous Enrollment section for guidelines.
6. Complete the Qualifying exam and submit Ph.D. Qualifying Exam Form.. **Students need to be registered for 3 credit the semester they complete their Qualifying Exam.**
7. Submit the Ph.D. Program of Study Form with an attached paragraph documenting if classes changed from the initial Curriculum Developed Plan.
8. Apply for graduation

   November 1 for Spring

   April 1 for Summer

   July 1 for Fall
9. Follow department deadlines for scheduling the final defense, submit the Dissertation Evaluation Form at least 5 working days (1 week) prior to the scheduled final defense. This includes the required preliminary review required by Graduate School.
10. Pass the defense examination with only minor corrections to be made, and submit the Ph.D. Defense Form to the Department Advisor within 3 business
11. Finalize the Ph.D. Supervisory Committee Approval & Final Reading Approval Form.
12. Submit the thesis to the Thesis Editor for formatting review. It must be formatted to meet "A Handbook for Thesis and Dissertations" (www.gradschool.utah.edu/thesis/index.php). Once reviewed, make corrections and submit again to the Graduate School Thesis Office. See the Thesis Office website for the exact date for graduate deadlines.