HANDBOOK FOR GRADUATE STUDENTS

IN

CIVIL ENGINEERING

2024-2025

DEPARTMENT OF CIVIL ENGINEERING

UNIVERSITY OF KENTUCKY

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FOREWORD

This handbook is intended to acquaint prospective, new, and continuing graduate students with the opportunities and requirements for graduate study and graduate degrees in the Department of Civil Engineering at the University of Kentucky. This handbook supplements the Graduate School Bulletin and the general University Catalog, with which students should also become familiar. For additional information, or explanation of matters that may remain unclear, please contact Dr. Mei Chen (mei.chen@uky.edu or 859.257.9262), Director of Graduate Studies. All applications for graduate study must be submitted online to the Graduate School. Detailed information can be found at gradschool.uky.edu. Students are encouraged to visit our department website (www.engr.uky.edu/ce) to learn more about program requirement and research opportunities with our faculty.

Mei Chen, PhD
Raymond-Blythe Professor
Director of Graduate Studies

SECTION 1 GENERAL PROCEDURES

1.1 Classification of Students

Currently, the Graduate School classifies students in one of two categories: Post-Baccalaureate Students, or Degree Seeking Students.

1.1.1 Post-Baccalaureate Students

Students who hold a baccalaureate degree and wish to pursue graduate study without a degree objective, and students who do not fulfill the entrance requirements of the Graduate School or of the Department, may apply for admission as Post-Baccalaureate Students. Admission to this status may be granted to an applicant who (1) demonstrates promise but has not qualified for admission to a degree program, or (2) intends not to complete a degree program. Courses taken as a post-Baccalaureate student at UK may be counted toward a graduate degree if the students wish to switch his/her status to regular admission. All such courses must be completed with a grade of "B" or better. The Director of Graduate Studies and the Dean of the Graduate School must approve all transfers of credit hours to a graduate program (see Section 2.2.2).

1.1.2 Degree Students - Conditional Admission

A student who wishes to pursue a higher degree, but who, for one or more of the reasons listed below, is temporarily ineligible for regular admission status, may be recommended to the Graduate School by the Director of Graduate Studies for admission to the degree program in Conditional Status:

- Missing transcripts or other requirements for admission, such as diplomas or certificates.
- Deficiencies of undergraduate courses in civil engineering.
- Temporary ineligibility for regular admission status because a prerequisite degree has not yet been officially awarded.
- Graduating University of Kentucky seniors lacking no more than six (6) hours for graduation; the consent of the Dean of the College of Engineering and the Dean of the Graduate School and approval of the Director of Graduate Studies is necessary. Such students may take no more than twelve (12) credit hours and must complete the undergraduate degree during the semester in which they are enrolled in Graduate School in the provisional status.

A student may remain in provisional status for a maximum of one semester or up to twelve (12) credit hours, whichever comes earlier. After this time, the student's work will be reviewed. Within 30 days into the following semester, and on recommendation of the Director of Graduate Studies, the student will be moved to regular admission status, or removed from the graduate program. A recommendation for granting provisional admission is entirely at the discretion of the Director of Graduate Studies.

1.1.3 Degree Students - University Scholars Program

The University Scholars Program in Civil Engineering is a combined BSCE-MSCE program for the most gifted and highly motivated students currently enrolled in our undergraduate program. It offers the students the opportunity and challenge of integrating their undergraduate and graduate courses of study into a single, continuous program, leading to both degrees (also see Sections 1.2 and 2.1.3).

1.1.4 Degree Students - Regular Students

Regular degree students must satisfy all requirements for admission and be accepted by the Graduate School and the Civil Engineering program.

1.2 Admissions Requirements for Degree Students

All applicants seeking admission to the Graduate programs in Civil Engineering must have an undergraduate grade point average (GPA) of at least 2.8 on a 4.0 scale from an ABET-accredited or equivalent Bachelor of Science degree in civil engineering. An applicant whose native language is other than English must score at least 80 on internet based TOEFL or 6.5 on IELTS.

Applicants who have been awarded Bachelor's degrees in fields other than civil engineering, such as physical sciences, should contact the Director of Graduate Studies for consultation prior to application. These students may be able to be admitted to the CE graduate program based on an evaluation of their background.

Graduate applicants with a non-engineering background should be aware that they may not be able to obtain a Professional Engineer (PE) license with their MSCE or PhD. Students with an undergraduate major other than Civil Engineering may also be required to take undergraduate remedial courses in consultation with their advisor and the Director of Graduate Studies.

Students seeking admission to the University Scholars Program may apply for entry to the program after completing at least 90 credit hours of the undergraduate Civil Engineering curriculum including all UK Core requirement courses. No less than 30 of these credit hours must be in CE prefix courses. The students must also have an overall undergraduate GPA no less than 3.2, and a GPA no less than 3.5 for all CE prefix courses at the time they apply for admission to the program. Students in the University Scholars Program are exempt from the GRE requirement. This program is only available to the currently enrolled undergraduates on the University of Kentucky campus.

1.3 Activities Prior to Admission

1.3.1 Information on Available Programs

Inquiries about available programs should be addressed to the Director of Graduate Studies, Department of Civil Engineering. In addition to the application forms for admission and financial aid, information on Graduate Study and Research in Civil Engineering is available to potential applicants at http://www.engr.uky.edu/ce/.

1.3.2 Test of English as a Foreign Language

An applicant whose native language is other than English must submit scores from the Test of English as a ForeignLanguage. The minimum acceptable score is at least 80 (internet based TOEFL) or 6.5 (IELTS). The At-Home Testing results are not acceptable.

1.3.3 Application for Admission

Applicants for admission as regular students who reside in the United States, must submit complete applications with accompanying materials online to the Graduate School at least one month before the beginning of the semester in which the applicant intends to begin graduate work. Applicants from outside the United States must apply by April 15 for Fall admission, and September 15 for the Spring admission. Sending the original application materials directly to the CE Department will only delay the admission process.

Applications for admission to the Graduate School as a University Scholar should also complete an additional form available from the Graduate School, which must be approved by the Director of Graduate Studies, the Associate Dean of Undergraduate Studies, and the Dean of Graduate School. The application for the University Scholars program should be submitted before entering the senior year.

Applications for admission to the Graduate School as a post-baccalaureate student should be on file in the Graduate School Admissions Office at least 30 days in advance of the registration date of the semester in which the student plans to enroll.

Post-baccalaureate students who wish to apply for a graduate program must have a minimum 3.0 grade-point average on all work attempted as post-baccalaureate students. Application to the program should be made to the Graduate School Admissions Office by the calendar deadlines. Post-baccalaureate students have one month after the start of a semester to be admitted to a degree program in the Graduate School. After this time a student must wait until the following semester. Permission to enter any graduate class as a post-baccalaureate student will be granted only if the student meets the prerequisites and if space is available.

1.3.4 Applicants with Non-CE Background

Students whose undergraduate program was not in Civil Engineering should be aware that they may also be required to take undergraduate remedial courses prior to graduating, in order to meet the minimum background expected of graduate Civil Engineers. This will be decided in consultation with the student's faculty advisor and the Director of Graduate Studies. These remedial course hours may not count towards fulfilling graduate credit hour requirements.

These include four (4) courses to be decided by the student's advisory committee or the Director of Graduate Studies. These four courses should be selected from at least three (3) of the following civil engineering areas: civil engineering materials, construction engineering and management, environmental engineering, geotechnical engineering, humanitarian engineering, hydraulics and water resources engineering, structural engineering, and transportation engineering.

Graduate students admitted under this option should also understand that satisfying the above requirements might not fulfill the Professional Engineering registration requirements in Kentucky or other states. Listed below are the minimal ABET/EAC degree requirements.

- General
  - (a) One year of a combination of college level mathematics and basic sciences (some with experimental experience) appropriate to the discipline.
  - (b) One and one-half years of engineering topics, to include engineering sciences and engineering design appropriate to the student's field of study.
  - (c) A general education component that complements the technical contents of the curriculum and is consistent with the program and institution objectives.
- Civil Engineering (in review for possible revision/expansion of requirements)
  - (a) Proficiency in mathematics through differential equations, probability and statistics, calculus-based physics, and general chemistry.
  - (b) Proficiency in a minimum of four recognized major civil engineering areas.
  - (c) Ability to conduct laboratory experiments and to critically analyze and interpret data in more than one of the recognized major civil engineering areas.
  - (d) Ability of perform civil engineering design by means of design experiences integrated throughout the professional component of the curriculum.
  - (e) Understanding of professional practice issues such as: procurement of work; bidding versus quality based selection processes; how the design professionals and the construction professionals interact to construct a project; the importance of professional licensure and continuing education; and/or other professional practice issues.

A student who completes these requirements may request a waiver from the state in which they are seeking licensure. Graduate students who complete the minimal ABET/EAC requirements and the master's degree requirements may be supported in their petition to waive the ABET/EAC degree requirement by the Department of Civil Engineering. If such a waiver petition is successful, the student will be permitted to take the Fundamentals in Engineering/Engineer in Training (FE/EIT) exam. Passing the FE/EIT exam allows the engineer-in-training to take the Professional Practice exam.

1.3.5 Application for Financial Aid

The UK Graduate School's website lists numerous financial support opportunities, and all qualified students are encouraged to apply. Information about fellowships internal to UK can be found at http://gradschool.uky.edu/fellowships. Information about external fellowships can be found at https://gradschool.uky.edu/external-funding.

The Department of Civil Engineering offers assistantships (teaching assistantship and research assistantship) and fellowships to graduate students. Subject to funding availability, they are awarded on the basis of merit and in consultation with faculty advisors, the Director of Graduate Studies, and the Department Chair.

1.4 Activities Following Admission but before Beginning of Class Work

1.4.1 Assignment of a Faculty Advisor

The Director of Graduate Studies serves as the initial advisor to each student majoring in Civil Engineering during the first semester. However, it is very important for the graduate student to work very closely with a faculty advisor in his/her area of interest as soon as possible. In consultation with the student's advisor, the student should form an advisory committee by the second semester in compliance with the Graduate School rules.

1.4.2 Program Planning

Before or immediately upon arrival on campus, all students should begin to plan their detailed programs of study in consultation with the Director of Graduate Studies and their faculty advisor. Such planning at this early stage is rather informal and subject to future modification. If a complete program cannot be worked out at this time, the courses to be taken during the first semester should be selected, while the student is working on getting the rest of the course plan approved by the student's advisor.

1.4.3 Classification and Registration

New and readmitted students register during the week prior to the start of classes. See *Schedule of Classes* from UK Registrar's website for dates and deadlines. New students are informed of the dates at the time of acceptance. Continuing students who failed to priority register as well as new and readmitted students who applied after the deadline, must late register during the first week of classes.

1.5 Activities after Enrollment

1.5.1 Proposed Program

All graduate students, in consultation with their designated faculty advisors, should prepare and obtain approval for a proposed program. This should be accomplished as early as possible in the student's program, and in no case later than the advance registration for the second semester of graduate studies. The primary purpose of this effort is to help all students precisely define their educational objectives, and to assure that they are fully aware of university and departmental degree requirements. In addition, it serves to commit the department to what it considers to be an acceptable program for each student. It should be emphasized that the academic work plan can, and often will, be changed as the student progresses.

1.5.2 Priority Registration

Priority registration is for continuing students only. Current students must priority (advance) register; failure to do so incurs a penalty for late registration. This rule applies to students in post-baccalaureate status as well as to students in degree programs. All students are assigned a registration window. Before registering, graduate students should obtain approval of the proposed schedule from their advisor. The advance registration period provides a good opportunity for periodic reevaluation of the student's program of instruction.

1.5.3 Academic Progress

All graduate students should regularly update their advisors regarding course and research progress, as well as plans for the future. Academic progress evaluation is conducted regularly. All graduate students must submit their evaluation forms in a timely manner.

1.5.4 Readmission

A student who does not enroll for a semester during an academic year must apply to the Graduate School for readmission by the stated deadline before subsequent enrollment will be permitted. A student who has been inactive for a regular semester, but who is in good academic standing and has been enrolled in a graduate program within the previous three regular semesters, may request and will be granted full readmission by the Graduate School.

A student who is admitted to a graduate program, but unable to matriculate in the specified term, may request a one-year deferment. Depending on the circumstances, the CE Department may or may not grant such a deferment.

1.5.5 Incomplete Grades

All incomplete grades must be removed from the student's record before scheduling the Final Examination and the awarding of a degree. Removal may be accomplished in two ways:

- Complete the requirements for the course and receive a letter grade, or
- Provide the Dean of the Graduate School with letters from the student's advisor or the Committee Chair and the Director of Graduate Studies, stating that the incomplete course is no longer part of the student's program.

An incomplete grade "I" will automatically be changed to a failing grade "E" if not removed or changed within a year from the date when the grade was assigned.

1.5.6 Repeat Option

A graduate student may elect to repeat a graduate course and count only the second grade as part of the graduate grade point average. The Repeat Option may only be exercised once. The student must file a Repeat Option Form through the Graduate School. The original grade does not figure into the GPA. A request to exercise the repeat option must be made prior to graduation from the program. The repeat option cannot be used to remove an “E” grade assigned as the result of an academic offense.

1.5.7 Scholastic Probation

When students have completed 12 or more semester hours of graduate coursework with a GPA of less than 3.0, they will be placed on scholastic probation and are subject to dismissal from the program. Students will have one full-term semester or the equivalent (9 hours) to remove the scholastic probation by attaining a 3.0 cumulative GPA. Students with cumulative GPA below 3.0 will not be eligible for degree.

1.5.8 Admission to Candidacy

Regular admission to a master's degree program constitutes admission to candidacy for that degree. Admission to candidacy for the PhD degree is automatically granted when the student passes the Qualifying Examination.

1.5.9 Application for Degree

To be eligible for a degree, the student must file an application at the Graduate School within 30 days before the semester in which he or she expects to graduate (15 days in the summer session). The student must file the application in the myUK portal.

1.5.10 Time Limits for Degrees

Master's Degree. Activities used to satisfy degree requirements must be completed within **eight years** preceding the proposed date of graduation. Extensions of time will be considered by the Graduate Council only upon written recommendation by the student's advisor and endorsement by the Director of Graduate Studies.

Doctoral Degree. All degree requirements for the doctorate must be completed within **five years** following the semester or summer session in which the candidate successfully completes the Qualifying Examination. In the event that all degree requirements are not met during the five-year period, degree candidates who provide evidence of the likelihood of completing the degree during an extension of time may be granted such an extension by the Graduate Council. Requests will be considered only upon written recommendation of the student's advisor and endorsed by the Director of Graduate Studies. Upon favorable review, **an extension of no more than five years** may be granted. NOTE: The Graduate School may require the student to take and pass a second Qualifying Exam.

1.6 Course Load

1.6.1 Regular Semester

A full-time student is one enrolled in nine or more semester hours of work. The maximum load permitted during any semester is 15 semester hours (16 semester hours for University Scholars).

Full-time graduate assistants (TA or RA), whose services to the University require approximately 20 hours per week, may take no more than 10 credit hours per semester. This maximum may be increased to 12 hours for students with lighter service loads upon recommendation of the Director of Graduate Studies and approval of the Dean of the Graduate School. The maximum course load for part-time graduate assistants varies with the number of working hours.

Persons holding full-time working or professional assignments, whether employed by the University or not, may take no more than six credit hours per semester. Under certain circumstances, students may petition for a waiver of this rule by submitting letters of support from their employers and academic advisors.

1.6.2 Summer Term

Summer graduate course offerings are limited, and students are encouraged to consult with their advisor about their summer course plans.

1.7 Program and Course Offerings

1.7.1 Faculty and Specialties

Faculty members of the Department specialize in a wide range of subdisciplines in civil engineering such as structural engineering, geotechnical engineering, environmental engineering, construction management, transportation, materials, and water resources. Many of them also conduct cross-cutting research in collaboration with researchers in public health, artificial intelligence, supply chain management, and public policy.

Anita Amla, Adjunct Instructor
Jacqueline Bartek, Adjunct Instructor
Gail Brion, Professor Emeritus, Environmental Engineering
L. Sebastian Bryson, CE Department Chair, Hardin-Drnevich-Huang Professor, Geotechnical Engineering
Diana Byrne, Assistant Professor, Sustainable and Humanitarian Engineering
Richard Cheeks, Part-Time Instructor, Engineering Ethics
Mei Chen, Director of Graduate Studies, Raymond-Blythe Professor, Transportation Engineering
Joseph Crabtree, Adjunct Assistant Professor, Transportation Engineering
Gabriel Dadi, W.L. Raymond & R.E. Shaver Chair Associate Professor, Construction Engineering and Project Management
Brad Davis, Associate Professor, Structural Engineering
Gregory Erhardt, Raymond-Blythe Associate Professor, Transportation Engineering
James Fox, Raymond-Blythe Professor, Water Resources
Daniel Francis, Lecturer, Geotechnical Engineering
Clark Graves, Adjunct Assistant Professor, Civil Engineering Materials
Eric Green, Adjunct Assistant Professor, Transportation
Issam Harik, Raymond-Blythe Professor, Structural Engineering
Michael Kalinski, Professor, Geotechnical Engineering
Wayne Karem, Adjunct Assistant Professor, Geotechnical Engineering
Minjae Kim, Assistant Professor, Environmental Engineering
Adam Kirk, Adjunct Assistant Professor, Transportation Engineering
Doug Kreis, Adjunct Assistant Professor, Transportation Engineering
Ying Li, Adjunct Assistant Professor, Construction Management
Kamyar Mahboub, Professor, Materials Engineering
Hala Nassereddine, Associate Professor, Construction Engineering and Project Management
Lindell Ormsbee, Earl Parker Robinson Chair Professor, Water Resources
Abheetha Peiris, Assistant Professor, Structural Engineering
Kelly Pennell, Earl Parker Robinson Chair Professor, Environmental Engineering
Jerry Rose, Professor Emeritus, Materials Engineering and Transportation Engineering
Benjamin Shinabery, Adjunct Instructor, Surveying

Reginald Souleyrette, Commonwealth Chair Professor, Transportation Engineering
Nikiforos Stamatiadis, Raymond-Blythe Professor, Transportation, Sustainable and Humanitarian Engineering
Timothy Taylor, Director of Undergraduate Studies, Terrell-McDowell Endowed Chair Professor, Construction Engineering and Project Management
Yi-Tin (Ed) Wang, Professor Emeritus, Environmental Engineering
Samantha Wright, Senior Lecturer, Computer Graphics and Transportation
Scott Yost, Associate Professor, Water Resources

1.7.2 Graduate Courses Currently Offered

The 500-level courses may be taken by graduate as well as undergraduate students. However, graduate students will be required to complete additional work, or be subjected to a tougher grading policy.

The official list of graduate courses offered by the Department can be found at the University Catalog page.

CE 506 Introduction to Lean Construction (3)
Lean Construction is an innovative production management approach to designing and building construction projects and it focuses on increasing value and reducing construction wastes. The application of Lean is growing fast in the construction industry as more organizations are integrating Lean into their operations. In this course, students will learn about the Lean Philosophy, the Lean Culture, and the origins of Lean Construction and its connection to manufacturing. Students will become familiar with the term "value" and will explore the different types of "wastes". Various Lean tools such as the Last Planner System, Pull Planning, Value Stream Mapping, Reliable Promises, Target-Value Design, and Choosing by Advantage will be explained. The course will also include a series of online game simulations to provide students with hands-on learning experiences. Prereq: CE 303 or consent of instructor.

CE 507 Construction Safety and Health (3)
This course will develop and understanding of: safety and health; cost and human impact; hazard and risk analysis; psychological facts of organizational culture and climate; design safe work procedures for the execution of particular types of work; and individual versus management level improvement in safety and health procedures in the construction process. Prereq: Engineering standing, CE 303; or graduate standing or consent of instructor.

CE 508 Design and Optimization of Construction Operations (3)
The course critically examines repetitive operations that occur from project to project and the deterministic approaches used to design and optimize their effectiveness. Scientific techniques used to field measure the efficiency of construction operations are also examined. The primary metrics used to optimization include cost,schedule, and sustainability. Prereq: CE 303, CE 381, and engineering standing.

CE 509 Control of the Construction Project (3)
This course investigates the principles and practices for the control of budget and schedule for construction projects. Topics studied include: estimating construction costs and developing a

project budget, planning construction operations and developing a project schedule, documenting and reporting of project progress and spending, and the management of change of contract amount, contract time, and contract scope of work. Prereq/coreq: CE 508, and engineering standing or consent of instructor.

CE 517 Boundary Location Principles (3)
Procedures for locating or relocating the boundaries of real property; records searching, technical aspects of field work, preparation of descriptions and survey reports, land data systems, legal aspects, special problems. Prereq: CE211 and engineering standing or consent of instructor.

CE 519 Quantitative Sustainable Design (3)
This course focuses on the application of quantitative sustainable design to engineering infrastructure and technologies. Quantitative sustainable design is a process of mechanistically linking design and operational decisions to sustainability indicators to inform decision-making. This process enables navigation of trade-offs across dimensions of sustainability (e.g., environmental, economic, social) so that design and operation can be informed by sustainability metrics. This course will focus specifically on environmental and economic impacts by using two tools - life cycle assessment (LCA) and life cycle costing (LCC) – along with uncertainty and sensitivity analyses. The main component of this course will be a design project in which students apply this process to inform the design and operation of an engineering infrastructure system or technology of interest. Prereq: Engineering standing or consent of instructor.

CE 525 Civil Engineering Applications of Geographic Information Systems (3)
This course focuses on GIS as a tool in civil engineering. The terms and concepts related to Geographic Information Systems are introduced. The management of spatial databases, particularly those related to civil engineering, is covered. Students will collect data using a global positioning system (GPS). Students will be required to use GIS ArcInfo to solve a specific individual spatial problem that they propose based on several civil engineering databases available to them. Prereq: Engineering standing and one of the following: C in CE 331, C in CE 341, or CE 471G.

CE 531 Transportation Systems Operations (3)
Analysis of transportation facilities through a diagnostic study of transportation systems with emphasis on design, capacity and safety. Engineering practice oriented toward open-ended design solutions, mostly focused on roadway designs. Prereq: C in CE 331 and engineering standing.

CE 533 Railroad Facilities Design and Analysis (3)
Principles of railroad location, construction, rehabilitation, maintenance, and operation with emphasis on trackstructure design and analysis, bridges and bridge loading, drainage considerations, track geometry effects, andoperating systems analysis. Prereq or concur: CE 471G or graduate standing or consent of instructor.

CE 534 Pavement Design, Construction and Management (3)
Design, analysis, construction, and management of flexible and rigid pavements. Stresses and strains, pavement materials, subgrade soil stabilization; bases and subbases, quality control,

drainage, pavement type selection, and pavement management. Prereq C in CE 381, prereq or concur: CE 471G, and engineering standing.

CE 539 Transportation Systems Design (3)
This course focuses on the design of urban intersections and the procedures used to evaluate the operational level of urban roadway systems. First, a review of urban intersection design principles and aspects is presented. Second, traffic signal timing techniques are reviewed, and students are required to use two software packages for evaluation of traffic operations of urban roadway systems. The focal point of the course is a group design project where solutions to accommodate all transportation modes and their issues along a corridor in Lexington are sought. Fieldwork and data collection are part of this course. Lecture: 2 hours; laboratory: 1 hour. Prereq: C in CE 331; prereq or concur: CE 531.

CE 541 Intermediate Fluid Mechanics (3)
Application of basic fluid mechanics to problems of importance to civil engineering practice. This includes flow measuring, closed conduit flow and pipe networks, open channel flow, turbomachinery (pumps), hydraulic structures, culvert flow. Prereq: CE 341, CS programming course, and engineering standing or consent of instructor (Same as BAE 541).

CE 542 Introduction to Stream Restoration (3)
Introduction to principles of fluvial geomorphology for application in restoring impaired streams. Topics will include channel formation processes (hydraulics/hydrology), stream assessment, sediment transport, in-stream structures, erosion control, habitat, and monitoring. Prereq: CE 341 (or equivalent) and engineering standing or consent of instructor (Same as BAE 532).

CE 546 Fluvial Hydraulics (3)
Rainfall physics, principles of erosion on upland areas and construction sites, stable channel design in alluvial material, mechanics of sediment transport, river mechanics, reservoir sedimentation. Prereq: CE 341 or ME 330 and engineering standing (Same as BAE 536).

CE 547 Watershed Sedimentation (3)
The course objective is to gain an understanding of watershed sedimentation including: (1) erosion and sediment transport processes in a watershed and the mechanisms by which the processes are initiated, developed, and worked towards equilibrium; (2) measurement of the sediment budget for a watershed using sediment fingerprinting and sediment loading data; and (3) prediction of sediment loading in watersheds with different human disturbances using hydrologic-based modeling tools. Specific emphasis will be placed on the use of natural carbon and nitrogen isotopic tracer measurements within sediment fingerprinting as a data-driven approach to measure sediment loading from different sources in a watershed. In order to fulfill the course objective, the instructor will use traditional classroom learning as well as field and laboratory components of the course in order that students can participate in hands-on learning. Prereq: CE 461G (Pre- or Co-requisite or equivalent). (Same as BAE 547)

CE 549 Engineering Hydraulics (3)
Analysis of flow in closed conduits and natural and artificial open channels. Design of hydraulic structures. Prereq: CE461G and engineering standing or consent of instructor. (Same as BAE545)

CE 551 Water and Wastewater Treatment Engineering (3)
This course examines the scientific and engineering aspects of water and wastewater treatment. Conventional watertreatment processes such as rapid mixing, flocculation, sedimentation, filtration, and disinfection as well as biological processes for wastewater treatment are analyzed. Sustainable alternative treatment techniques are also discussed. Prereq: C in CE 341, C in CE 351, and engineering standing or consent of instructor.

CE 553 Environmental Consequences of Energy Production (3)
This course will introduce the relationship of energy, pollution control technology, and the environment. The scientific and engineering aspects of energy production are examined and the associated environmental problemsand control technologies are discussed. Prereq: CHE 105, MA 214, and engineering standing or consent of instructor (Same as EGR 553)

CE 555 Microbial Aspects of Environmental Engineering (3)
Environmental microbiology for engineering students with emphasis on microbially mediated chemical cycles,microbial ecology, and industrial microbiology. Prereq: C in CE 351, engineering standing, graduate status or consent of instructor.

CE 559 Environmental Health and Engineering (3)
This course introduces engineering interventions to mitigate adverse impacts on public (environmental) health. Demonstrates the importance of contextualized knowledge from varied information sources to foster informed decisions amidst scientific uncertainty. Students will solve open-ended design problems using basic science, mathematics, and engineering concepts. Additionally, students will strengthen their ability to identify and engage with key stakeholders and decision makers. Prereq: Senior, engineering standing or graduate student standing in a science or engineering discipline.

CE560 Ecotoxicology (4)
This course is an introduction to the science of environmental pollution with an emphasis on fate and transport of contaminants and adverse effects on biological systems. Pollutants covered include metals, pesticides, organics, radionuclides, nanomaterials, and nutrients. The course covers physiological and toxicological effects of chemicals on natural biota, including considerations at cellular, organismal, population, community, and ecosystem levels. Topics include: absorption, distribution, bioaccumulation, and biomagnification of pollutants; biochemical and physiological mechanisms involved in stress-induced responses and stress reduction; evolution of toxicant resistance and multi-generational effects; fate and transport of contaminants; dose- response modeling; risk assessment, and environmental regulations. Prereq: CHE 105 and BIO 148 or equivalents or consent of instructor. (Same as TOX 560, PLS 560)

CE 568 GIS for Water Resources (3)
This course studies the principles, methodology, and analysis of geographic information systems and spatially referenced data unique to water resources and hydrologic modeling. Lectures will explore the latest GIS concepts, hydrologic modeling relationships, and data sources and be complemented with computer-based laboratory exercises. Prereq: BAE 437, CE 461G, or consent of instructor. (Same as BAE 538)

CE 571 Rock Mechanics (4)
Determination of the physical properties of rocks, rock mass classification, stress around mine openings, strain and displacement of the rock mass, rock reinforcement and support, stress interaction and subsidence, strata control. Lecture, three hours; laboratory, three hours per week. Prereq: EM 302, MNG 303, GLY 220, and Engineering Standing. (Same as MNG 551)

CE 579 Geotechnical Engineering (3)
Application of principles of soil mechanics and mechanics of materials to the design of retaining walls, bracing for excavations, footings, mat and pile foundations and to the analysis of the stability of earth slopes. Lecture 3 hours. Prereq: CE471G and engineering standing.

CE 581 Civil Engineering Materials - II (3)
Design, evaluation, and construction of portland cement concrete and hot mix asphalt. performance concrete and asphalt materials are covered in this course. Prereq:CE 381 and engineering standing.

CE 584 Design of Timber and Masonry Structures (3)
Current and historic design methods of buildings and their components using wood, wood products, bricks, and concrete blocks. Prereq: Courses in steel and reinforced concrete design a the senior level, or consent of instructor. (Same as ARC 584)

CE 586 Reinforced Concrete Structures (3)
Theory, analysis, and design of beams, slabs, footings, and columns as related to buildings and bridges. Ultimate strength design for flexure, shear, torsion, and combined axial and bending. Prereq: CE 482 or consent of instructor.

CE 587 Steel Structures (3)
Design of structural steel connections, beam bearing plates, column base plates, beams including lateral-torsional buckling, composite beams, and frame stability. Prereq: CE 482 or consent of instructor.

CE 589 Design of Structural Systems (3)
Building codes, design loads, computerized structural analysis and design, gravity and lateral system design, structural system descriptions and selection considerations, and structural contract documents. Prereq: C in CE 482, engineering standing orconsent of instructor.

CE 599 Topics in Civil Engineering (Subtitle required) (1-6)
A detailed investigation of a topic of current significance in civil engineering such as: design of small earth dams, man and the environment, drilling and blasting, scheduling construction operations, construction equipment and methods, traffic safety, optimum structural design, environmental impact analysis, systems analysis in civil engineering, motor vehicle noise and its control. May be repeated to a maximum of eight credits, but only four credits can be earned under the same title. A particular topic may be offered at most twice under the CE 599 number. Prereq: Variable; given when topic is identified, plus engineering standing.

CE 602 Construction Project Management (3)
Management of construction projects: planning, estimating, scheduling and control; organization; site management; material management; safety management; quality management; construction labor relations; productivity management; claims. Prereq: Engineering standing, graduate status, or consent of instructor.

CE 605 New Engineering Enterprises (3)
The course covers the theory and actual practices of organization, management and operation of engineering companies. Primary emphasis on construction companies; however, the principles apply to most service oriented engineering companies. Students will be required to do several independent exercises related to establishing an engineering company. Prereq: graduate standing in engineering or consent of instructor.

CE 608 Building Information Modeling for Construction (3)
The course focuses on advanced information systems used to control and predict project performance (cost and schedule) in construction. Building Information Modeling is examined as a systems approach of integrating design and construction for the benefit of developing construction work packages, 4D simulations, clash detection, trade coordination, and status visualization. Pre-req: CE 509 and enrollment in the Graduate School or consent of the instructor.

CE 610 Big Data and Supply Chain Analytics (3)
This course introduced the analytical skills necessary to work with large data sets, focusing on applications in the supply chain and in transportation. For the purpose of this course, Big Data is defined as "anything that doesn't fit in an Excel spreadsheet". This course is positioned at the intersection of coding skills, applied statistics and substantive expertise, teaching the practical skills needed to work with increasingly large data sets. Main topics to be covered include: fundamentals of programming and data wrangling in Python, data visualization, applied statistical modeling and interpretation, and ethical issues in data analysis, including matters of intellectual honesty. Prereq: Any introductory course in computer programming, such as CS 115, CS 221 or EGR 102; or any introductory course in statistics, such as STA 381; or instructor permission.

CE 621 Introduction to Finite Element Analysis (3)
Theoretical, conceptual, and computational aspects of the finite element method are developed. Development of the element relationships, element calculations, and assembly of the finite element equations are covered. Both one- and two-dimensional finite element problems are considered. One-dimensional problem areas include elastic deformation, heat conduction, fluid flow, electrostatics, groundwater flow, mass transport, beams on elastic foundations, etc. Two-dimensional problem areas include Poisson’s equation, viscous incompressible flow, plane elasticity, and bending of elastic plates. Prereq: MA 432G, MA 537 or consent of instructor. (Same as ME 601)

CE 631 Urban Transportation Planning (3)
A detailed review of the transportation planning process; inventory methodologies; trip generation, distribution and assignment with associated mathematical models and theories;

prediction of future travel; land and use models; modal split; developing and testing proposed systems; simulation. Prereq: CE 531 or equivalent and STA 381, or STA 681 or equivalent statistics course.

CE 633 Air Transport Engineering (3)
Planning location and design of airports, STOL ports, and heliports. Air traffic operations, performance and controlas related to facility requirements. Role of governmental agencies. Prereq: CE 531 or consent of instructor.

CE 634 Traffic Characteristics (3)
Vehicle operating characteristics; driver, pedestrian and roadway characteristics as they individually, and collectively as traffic stream characteristics, are related to the planning design and operation of highway facilities.

CE 635 Highway Safety (3)
A detailed review of the impacts of safety considerations on highway design and planning, focusing on the highway environment, its users (both vehicles and drivers) and their interactions. The role of special interest groups (truckingindustry, insurance agencies) is also examined. Prereq: CE 539 or consent of instructor.

CE 642 Open Channel Flow (3)
The study of open channel flow fundamentals and concepts. Topics include uniform flow, varied flow, steady and unsteady flow, energy dissipators, flow transitions, controls, analytical and numerical solutions in 1D and 2D applications. Prereq: CE 541 or consent of instructor. (Same as BAE 642).

CE 643 Mechanics of Sediment Transport (3)
Fundamentals of turbulence in rivers and sediment transport will be taught including recent theory, derivation of governing equations, experimental methods, modeling, and design based on sediment thresholds. Prereq: CE 341 or consent of instructor (same as BAE 643).

CE 652 Biological Processes for Water Quality Control (3)
Principles and applications of environmental biotechnology for water quality control. Process microbiology and kinetics for various water and wastewater treatment processes. Prereq: CE 351 or consent of instructor (same as BAE 652).

CE 653 Water Quality in Surface Waters (3)
Principles of surface water quality modeling and control. Analysis of dispersion, advection, natural aeration, biological oxidation and photosynthesis; their effects on the physical, chemical, and biological quality of waters in streams, lakes, reservoirs, estuaries and other surface waters. Prereq: CE 351, or consent of instructor (Same as BAE 653).

CE 655 Water Sanitation and Health (3)
Prevention of water-related diseases by appropriate supply and sanitation practices with designs applicable to small systems and rural areas of developing nations.

CE 662 Stochastic Hydrology (3)
Hydrologic random variables and probability distributions. Statistical measures, development and use of Monte Carlo simulations in the generation of precipitation fields. Statistical tests of hydrologic data. Point frequency and regional frequency analysis. Analysis of hydrologic time series. Long-term trend, harmonic analysis of periodicity, autocorrelation, spectral analysis. Correlation and regression analysis. Linear stochastic models. Introduction to stochastic processes in hydrology, real-time hydrologic forecast (Kalman filter), pattern recognition, and stochastic differential equations. Prereq: MA 214, CE 461G or equivalent. (Same as BAE 662)

CE 664 Watershed Management (3)
This course provides an overview of the scientific principles and management strategies used to effectively manage the physical, chemical, biological and social resources within a watershed so as to improve and sustain the integrity of the watershed system. The course will examine watershed management from both a scientific/engineering perspective as well as from a social science/policy perspective. Examples of effective watershed management will be drawn from cases studies in Kentucky and the United States. Students will be provided with an introduction to those spatial data sets, computer software, and methods currently used in watershed management practice. Prereq: BAE 437 or CE 461G or an equivalent course in hydrology, or consent of instructor. (Same as BAE 664)

CE 665 Water Resources Systems (3)
Application of systems analysis, mathematic modeling, and optimization in water resources management and design. Solution of engineering problems found in water supply, water quality, urban drainage, and river basin development and management by use of linear, nonlinear, and dynamic programming models. Prereq: Consent of Instructor. (Sme as BAE 665)

CE 667 Stormwater Modeling (3)
Introduction to deterministic and parametric modeling approaches for mathematically simulating stormwater runoff and quality. Emphasis on modeling concepts and model formulation. Analysis of deterministic component models and their linkage. Formulation of existing parametric models. Presentation of methods for parameter optimization and regionalization. Demonstration of linkage between the two approaches with illustrative examples. Prereq: CE 341, 461G or consent of instructor. (Same as BAE 667)

CE 671 Advanced Soil Mechanics (3)
Detailed study of soil behavior. Specific topics include soil classification and structure, strength and deformational behavior, compaction, consolidation, and stress distribution in earth masses. Prereq: CE 471G or consent of instructor.

CE 672 Landfill Design (3)
This course deals with the geotechnical aspects of the design of landfills for the disposal of municipal solid waste. Since landfill design is driven by state and federal regulations, time is taken to review these regulations. Landfills are evaluated as engineered systems consisting of multiple components. Each component is investigated individually, and methods are developed to predict and quantify the performance of these components so that appropriate materials,

design criteria, and construction methods can be selected to assure that the landfill will function with minimal environmental impact. Prereq: CE 471G. (Same as BAE 672.)

CE 673 Stability of Earth Slopes (3)
Review of shear strength principle including laboratory and field tests for shear strength and shear strength of unsaturated soils; theoretical and practical aspects of infinite slopes, block analysis, method of slices, effective and total stress analysis, analysis of unsaturated slopes, commercial software packages for slope stability analysis,
probabilistic analysis of slope stability problems, rapid drawdown, and slope failure mitigation. Prereq: CE 471G or consent of instructor.

CE 676 Groundwater and Seepage (3)
Permeability and capillary flow in soils, mathematical theory of flow through porous media. Flow through anisotropic, stratified and composite sections. Solution by flow net, conformal mapping and numerical methods. Seepage toward wells. Dewatering and drainage of soils. Prereq: CE 471G or consent of instructor.

CE 679 Geotechnical Earthquake Engineering (3)
Introduction to seismology. Dynamic and earthquake response of soils using standard analysis. Liquefaction of soils under cyclic loading. Measurements of dynamic properties of soils. Earthquake resistant design of retaining walls, foundations, slopes, and earth dams. Soil improvement methods for seismic resistant design. Current state-of-the-art techniques in geotechnical earthquake engineering. Prereq: CE 579.

CE 681 Advanced Civil Engineering Materials (3)
Fundamental aspects of mechanical behavior of civil engineering materials. Rheology and fracture of asphalt and Portland cement concrete materials. Prereq: CE 381.

CE 682 Advanced Structural Analysis (3)
Theory and application of energy principles for plane and space frames; shear wall structures; geometric and material nonlinear formulations; and nonlinear solution strategies. Solution techniques for the analysis of large complex structures. Introduction to plane stress/strain, axisymmetric and plate bending finite element analysis. Prereq: CE 482 or consent of instructor.

CE 683 Prestressed Concrete Structures (3)
Fundamental basis and underlying principles for the analysis and design of Prestressed concrete. Working stress and ultimate strength design methods, full and partial prestressing. Design for shear and torsion, deflection, crack control, and long-term effects, and prestress losses. Composite beams, slabs, short and slender columns, precast structures and their connections. Prereq: 482 and engineering standing or consent of instructor. Approved for Distance Learning.

CE 684 Beams, Plates and Shells (3)
Theory and analysis of elastic beams, plates and shells. Introduction to the underlying principles and derivation of the governing differential equations. Analytical, semi-numerical, and numerical solutions. Prereq: Graduate standing in the College of Engineering or consent of instructor.

CE 686 Advanced Reinforced Concrete Theory (3)
Background and origin of modern reinforced concrete design procedures and codes. Comparison of American andforeign methods of analysis. Review of current research and projection to anticipated future changes in design and construction practices. Prereq: C in CE 482 or consent of instructor.

CE 687 Advanced Steel Design (3)
Strength of structural steel columns, including asymmetry and slender compression elements. Flexural strength of slender plate girders. Shear strength with and without post-buckling strength. Frame stability. Steel connections. Floor vibration serviceability. Prereq: CE 587 and registered in the College of Engineering, or consent of instructor.

CE 688 Dynamics of Structures (3)
Analysis of single and multi-degree of freedom systems with emphasis on impact, blast, and earthquake loadings on structures. Analytical and numerical methods of analysis of discrete and continuous systems. Prereq: Graduate standing in the College of Engineering or consent of instructor.

CE 699 Topics in Civil Engineering (Subtitle required) (1-6)
An advanced level presentation of a topic from one of the major areas of civil engineering such as hydraulics, geotechnics, structures, transportation, surveying, or water resources. Course with a given subtitle may be offered not more than twice under this number. Prereq: Variable; given when topic identified; graduate standing.

CE 748 Master's Thesis Research (0)
Registration in CE 748 is limited to Plan A master's students who have completed all course requirements and have taken all hours of CE 768 required by the degree program. Registration in CE 748 guarantees that a student is in full-time status for the purposes of student financial aid and loan deferments. The DGS must certify that the student is working at least half-time (i.e., 20 hours per week) on the thesis. Registration in CE 748 is limited to a maximum of six semesters (not counting the summer semester).

CE 749 Dissertation Research (0)
Registration in CE 749 is limited to students who complete their degree requirements during the summer. Registration in CE 749 guarantees that a student is in full-time status for the purposes of student financial aid and loan deferments. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

CE 767 Dissertation Residency Credit for Doctoral Degree (2)
Residency credit for dissertation research after the qualifying examination. Students may register for this course in the semester of the qualifying exam. A minimum of two semesters are required as well as continuous enrollment (Fall and Spring) until the dissertation is completed and defended.

CE 768 Residence Credit for Master's Degree (1-6)
May be repeated to a maximum of 12 hours. Not counted as coursework hours, Tuition payment required.

CE 779 Advanced Geotechnical Engineering (3)
Application of the principles of soil mechanics to the design and analysis of foundations and earth structures. Prereq: CE 579, 671, or consent of instructor.

CE 790 Special Research Problems in Civil Engineering (1-6)
Individual work on some selected problems in one of the various fields of civil engineering. May be repeated to amaximum of nine credits. Prereq: Consent of the Director of Graduate Studies.

CE 791 Special Design Problems in Civil Engineering (1-6)
Individual work on some selected problems in one of the various fields of civil engineering. May be repeated to amaximum of nine credits. Prereq: Consent of the Director of Graduate Studies.

1.7.3 Core Courses

For each specialty area in Civil Engineering, there are certain civil engineering core courses which are strongly recommended for those students who are interested in that area. These courses are listed as follows:

Civil Engineering Materials

CE 534	Pavement Design, Construction and Management
CE 581	Civil Engineering Materials - II
CE 681	Advanced Civil Engineering Materials

Construction Engineering and Management

CE 506	Introduction to Lean Construction
CE 507	Construction Safety and Health
CE 508	Design and Optimization of Construction
CE 509	Control of the Construction Project
CE 608	Building Information Modeling for Construction

Environmental Engineering

CE 519	Quantitative Sustainable Design
CE 551	Water and Wastewater Treatment Engineering
CE 553	Environmental Consequences of Energy Production
CE 555	Microbial Aspects of Environmental Engineering
CE 559	Environmental Health and Engineering
CE 652	Biological Processes for Water Quality Control
CE 653	Water Quality in Surface Waters

Geotechnical Engineering

CE 579	Geotechnical Engineering
CE 671	Advanced Soil Mechanics

CE 672 Landfill Design
CE 673 Stability of Earth Slopes
CE 676 Groundwater and Seepage
CE 679 Geotechnical Earthquake Engineering
CE 779 Advanced Geotechnical Engineering

Hydraulics & Water Resources Engineering
CE 541 Intermediate Fluid Mechanics
CE 542 Introduction to Stream Restoration
CE 547 Watershed Sedimentation
CE 549 Engineering Hydraulics
CE 568 GIS Applications for Water Resources
CE 642 Open Channel Flow
CE 643 Mechanics of Sediment Transport
CE 664 Watershed Management
CE 665 Water Resources Systems

Structural Engineering
CE 586 Reinforced Concrete Structures
CE 587 Steel Structures
CE 589 Design of Structural Systems
CE 682 Advanced Structural Analysis
CE 683 Prestressed Concrete Structures
CE 684 Beams, Plates and Shells
CE 686 Advanced Reinforced Concrete Theory
CE 687 Advanced Steel Design
CE 688 Dynamics of Structures

Transportation Engineering
CE 525 Civil Engineering Applications of Geographic Information Systems
CE 531 Transportation Systems Operations
CE 533 Railroad Facilities Design and Analysis
CE 539 Transportation Systems Design
CE 610 Big Data and Supply Chain Analytics
CE 631 Urban Transportation Planning
CE 633 Air Transport Engineering
CE 634 Traffic Characteristics
CE 635 Highway Safety

1.8 Course Scheduling

Most of the graduate courses in Civil Engineering are not offered every semester. Some are offered once a year and others once every two years. A student who does not take a course when it is offered may not have the opportunity to take that course later. This dilemma can be overcome by carefully planning the program well in advance. Students' course plan should be made in consultation with their faculty advisor or the Director of Graduate Studies.

1.9 Graduate Student Fellowships

Civil Engineering graduate students may qualify for several types of fellowships as described below. All fellowship holders must register as full-time graduate students. All fellowships normally carry with them partial or full tuition support. Students fully supported by fellowships are not permitted to work outside the University.

1.9.1 Department Fellowships

CSX, Durr, Garver, Nichols, Raymond-Terrell, Vaughn-Melton, Walker, Dean Fellowships, and Lauderdale Fellowships. These fellowships are highly competitive, and they are intended to support Graduate Students, preferably outstanding PhD students. These Fellowships may be renewed on an annual basis. To be considered for one of these CE Graduate Fellowships, the student must be nominated by his/her faculty advisor.

1.9.2 College of Engineering Fellowships

Varying types of graduate student aid are available from the college of engineering. Contact Ms. Monica Mehanna (monica.mehanna@uky.edu) regarding college-wide funding for engineering graduate students.

1.9.3 Graduate School Fellowships

Various types of fellowships are also available from the Graduate School of the University of Kentucky. Information can be found at http://gradschool.uky.edu/fellowships-0.

1.10 Special Fellowships and Scholarships

Graduate Assistantships are available at the Kentucky Water Resources Research Institute through an Interdisciplinary Program in Environmental Systems. The students are encouraged to contact the Kentucky Water Resources Research Institute.

SECTION 2 MASTER'S PROGRAM

2.1 Program Options

The Master of Science in Civil Engineering (MSCE) program offers students a wide variety of program options for advanced study. It can accommodate students continuing directly from an undergraduate degree program, as well as experienced practitioners. Students can choose to follow broadly diversified programs encompassing several areas of Civil Engineering, or they can focus on one area and pursue it in considerable depth. MSCE study programs can be set up to permit emphasis on practical design and construction applications, or to follow theoretical or experimental research topics to the frontiers of present knowledge. Students admitted into the UK MSCE have two options for completing a Master of Science in Civil Engineering (MSCE) degree. These options are as follows.

2.1.1 MSCE Program Plan-A (24 Hour Plus a Thesis)

For the Master of Science in Civil Engineering (MSCE) degree Plan A, a minimum of 24 credit hours of graduate course work and a thesis are required to fulfill degree requirements. While working on their theses, students may register for a total of 6 credit hours of CE 768, but it is not mandatory. Independent work taken as CE 790 or CE 791 may not count as credit towards thesis research work. At least 12 credit hours must be at the 600 or 700 levels, and 2/3 of the coursework must be in CE prefix courses. A member of the Graduate Faculty must actively supervise the Thesis. All graduate students are strongly encouraged to consult with their academic advisors regarding their degree plan options during their first semester at UK.

2.1.2 MSCE Program Plan-B (30 Hour Non-Thesis Option)

For the Master of Science in Civil Engineering (MSCE) degree Plan B, a minimum of 30 credit hours of graduate course work are required, including at least 3 credit hours of independent work. The requirement for independent work may be satisfied by either taking an approved curriculum of courses which contain integral independent study components totaling a minimum of 3 credit hours, or by completing at least three credit hours of CE 790 or CE 791.

Option B1: Students choosing this non-thesis option will have to complete a minimum of 30 credit hours of graduate course work, including three hours of CE 790 or CE 791. At least 15 credit hours must be at the 600 or 700 levels, and 2/3 of the coursework must be CE classes.

Option B2: Students choosing this non-thesis option will have to complete a minimum of 30 credit hours of graduate course work. These courses must have at least three hours of embedded independent study hours in total. The list of such courses is shown in the exhibit below. At least 15 credit hours must be at the 600 or 700 levels, and 2/3 of the coursework must be in CE prefix courses.

List of Graduate-Level Courses with Independent Work Component

Course	Independent Work Component
CE 508	0.5 hour
CE 509	0.5 hour
CE 608	1.0 hour
CE 517	1.0 hour
CE 519	1.0 hour
CE 531	0.5 hour
CE 533	0.5 hour
CE 534	1.0 hour
CE 539	1.0 hour
CE 610	1.0 hour
CE 631	1.0 hour
CE 633	1.0 hour
CE 634	1.0 hour
CE 635	1.0 hour
CE 541	0.5 hour
CE 542	0.5 hour
CE 546	0.5 hour
CE 547	0.5 hour
CE 549	1.0 hour
CE 641	0.5 hour
CE 642	0.5 hour
CE 643	0.5 hour

Course	Independent Work Component
CE 551	0.5 hour
CE 553	0.5 hour
CE 555	1.0 hour
CE 653	0.5 hour
CE 655	1.0 hour
CE 560	0.5 hour
CE 660	0.5 hour
CE 662	0.5 hour
CE 665	1.0 hour
CE 667	1.0 hour
CE 579	1.0 hour
CE 671	0.5 hour
CE 672	1.0 hour
CE 679	0.5 hour
CE 779	1.0 hour
CE 581	1.0 hour
CE 589	1.0 hour
CE 682	0.5 hour
CE 683	1.0 hour
CE 684	1.0 hour
CE 686	1.0 hour
CE 687	1.0 hour
CE 688	1.0 hour

Students who wish to complete the independent work requirement by choosing from an approved curriculum of courses containing integrated independent study components, shall present a plan of study which satisfies this requirement, and all other Graduate School requirements, to the Director of Graduate Studies for approval no later than the end of the first semester of graduate studies. The requirement for all independent work must be satisfied under the direction of one faculty member (for students choosing a CE 790 or CE 791), or several faculty members (for students following an approved curriculum of courses). The student's advisor(s) shall assign, monitor, and evaluate the student's work as part of the specific course.

2.1.3 University Scholars Combined BS-MS Program

Students in the University Scholars Program (USP) may follow any of the MSCE options listed in this section for the regular MSCE program. However, students in the University Scholars Program are allowed to "double count" up to nine (9) hours of their 500-level courses from their

undergraduate BSCE classes at UK toward their MSCE. The USP students must apply to this program at least one semester prior to taking the first "double count" course. The USP application forms are available at https://gradschool.uky.edu/university-scholars-program and the students must file an amended study plan to report a change of "double count" courses if their schedules change.

2.2 Residence Requirements

2.2.1 On-Campus Residence

A minimum of 21 semester hours must be earned while in residence on the Lexington campus of the University of Kentucky.

2.2.2 Transfer of Credits

With the approval of the Director of Graduate Studies and the Dean of the Graduate School, a student may transfer up to nine (9) semester hours of graduate credits, provided that the grades earned were A or B. Such credits may be earned (1) as a student in another graduate program at the University of Kentucky or (2) as a graduate student at another accredited graduate school. All coursework credits taken at University of Kentucky as a post-baccalaureate student can be transferred into our graduate program. Consult the Director of Graduate Studies for the latest policy.

In no case will the independent work, research, Thesis, or Dissertation credit hours completed as a part of degree requirements for one program be considered to satisfy requirements of a subsequent Master's program.

2.3 Course Requirements

No 800- or 900-level courses, or the courses offered by the Civil Engineering Department which are numbered below 500, may be credited toward the MSCE degree. Candidates for the MSCE degree may credit the following toward degree requirements:

- Any 500-, 600-, or 700-level course; and
- Any 400G-level course offered by a department other than Civil Engineering.
- 800- or 900-level course approved by the Graduate School with special request.

For any CE 500-level course to count toward Master's degree, the student must inform the instructor that he or she is taking this course as a graduate student.

In addition, at least two-thirds of the minimum requirements for the master's degree must be in regular courses.

At least two-thirds of the minimum coursework (i.e., regular courses and not including independent work or residency credit hours) requirements for the MSCE degree must be completed in CE prefix courses. The Dean of the Graduate School may waive this requirement upon recommendation of the Director of Graduate Studies.

2.4 Thesis Requirements

Plan A MSCE graduate students may register up to 6 credit hours of CE768 for their Thesis work. Students who have completed all their course requirements and have taken all credit hours of CE768 and are working on their MSCE Thesis for at least 20 hours per week may register for "0 credit hour" of CE 748 each semester for a maximum of six semesters. This would keep the student registered full-time for student loan deferment as well as student visa purposes.

The Thesis must be developed under the direction of a full member or associate member of the Graduate Faculty. Before beginning work, an Independent Graduate Work Initiation Form must be filled out and filed with the Director of Graduate Studies. The finished thesis must be approved by the Thesis director, the Director of Graduate Studies, the examining committee, and the Graduate School, and must be in conformity with instructions prepared by the Graduate School.

2.5 Independent Work Courses - CE 790 and CE 791

CE 790, "Special Research Problems in Civil Engineering", and CE 791, "Special Design Problems in Civil Engineering", may each be taken for up to 6 credit hours in a semester, and may be repeated to a total of 9 credit hours each. However, only three (3) hours of CE 790 or 791 may be counted toward a Plan-B MSCE degree. Prior to registering for such a course, the student must obtain the approval of the faculty advisor and of the Director of Graduate Studies by filing an Independent Graduate Work Initiation Form with the Director of Graduate Studies.

2.6 Final Examination

All students must pass a Final Examination as specified by the rules of the Graduate School. The overall graduate GPA must be 3.00 or better to sit for the exam. The MSCE Final Exam may include written and oral components. The content and style of the Final Exam, and the evaluation of the student's performance, are the responsibility of a Graduate Faculty Committee appointed by the Dean of the Graduate School. The committee consists of at least three faculty members. All committee members must be members of the UK graduate faculty, and at least one must be a full member of the graduate faculty. Students are encouraged to consult their advisors regarding the content and format of the exam.

- For students following Plan A (24-hour coursework and 6-hour thesis), the Final Examination is typically an oral defense of the thesis.

- For students following Plan B1 (27-hour coursework and 3-hour CE790 or CE791), the Final Examination is typically an oral defense of the research project in CE790 or the design project in CE791.

- For students following Plan B2 (30-hour coursework), the Final Examination is either oral or written and is decided and administered by the Graduate Faculty Committee Chair in collaboration with the Committee Members. For the oral exam, the student is expected to present the independent study components in the courses and answer questions related

to any aspect of their degree. The written exam consists of problems selected from the courses deemed pertinent to the student's field of study.

The Final Examination must be scheduled with the Graduate School at least two weeks prior to the date of the Examination. The Final Examination is given no earlier than the beginning of the semester in which the degree is to be awarded and no later than eight days before the last day of classes of that semester. The committee may pass or fail the student by a majority vote. In case of a tie vote, the student fails. In the event of failure, the committee may recommend to the Graduate School the conditions under which a second Examination may be administered. In so far as it is practicable, the same examining committee shall give the second exam. A third Examination is not permitted.

To be eligible to receive a degree, students must submit a separate online "Application for Degree" form via myUK portal by the deadline specified in the Graduate School calendar.

2.6.1 For Thesis MSCE Option (Plan A)

Following are the steps to take in preparing for the Final Examination:

- Submit Thesis to the advisor and the Director of Graduate Studies in final draft form, and request that they certify it to the Graduate School as satisfying all the Graduate School requirements except for pagination.
- File an online request for scheduling the MSCE Final Exam. The request must be made at least two weeks prior to the anticipated date of the Examination. Pay particular attention to the Graduate School deadlines.
- Submit the Thesis to the examining committee at least one week prior to the Final Examination.
- Take the Final Examination.
- Modify the Thesis as required by the examining committee.
- Submit the Thesis in final form to the Graduate School by the required date.

2.6.2 For Non-Thesis MSCE Option (Plan B)

Below are the steps to take in preparing for the Final Examination for students following Plan B.

- File an online request for scheduling the MSCE Final Exam. The request must be made at least three weeks prior to the anticipated date of the Examination. Pay particular attention to the Graduate School deadlines.
- Submit report(s) resulting from independent work courses (e.g., CE 790 or CE 791) to the faculty advisor, the Director of Graduate Studies, and the examining committee at least one week prior to the date of the Final Examination. If the degree is a "Plan-B MSCE - course-only" option, the student must properly document the list of classes with imbedded independent hours totaling a minimum of three hours.
- Take the Final Examination.

2.7 Graduation Fees

There are no graduation fees. However, if a thesis is being submitted, a thesis fee must be paid in accordance with the Graduate School policy.

2.8 Concurrent Degree Programs

Concurrent enrollment for degree purposes in more than one graduate program is permitted only with the approval of the student's graduate adviser(s), all program DGSs involved, and the Dean of the Graduate School. No more than nine (9) hours of coursework may be common to concurrent degree programs.

2.9 Certificate Programs

CE graduate students may pursue a graduate certificate by completing an integrated group of additional coursesthat is designed to have a very clear and focused academic topic or competency as its subject area. Information regarding graduate certificates can be found at https://engr.uky.edu/students/graduate-studies/degree-programs-and-certificates.

SECTION 3 THE DOCTOR OF PHILOSOPHY PROGRAM

3.1 Course Requirements

There is no minimum number of credit hours for the Doctor of Philosophy (PhD) degree. The number of courses required varies, depending on the background of the student and the topic of the student's research. PhD students are required to complete 36 hours of coursework beyond a Bachelor's degree to meet residency requirements. PhD students with a Master's degree typically receive 18 hours of coursework credit toward the 36 hour requirements. Generally, at least one year of full-time course work (or equivalent) at University of Kentucky beyond a Master's degree will be required before the student is allowed to take the Qualifying Examination.

3.2 Major Professor

A Major Professor, heading an Advisory Committee, guides the student's PhD work. The purpose of this committee is to give continuity of direction and counsel, and provide intellectual stimulation, from the earliest days of residence through the completion of the doctorate.

The Director of Graduate Studies, or the DGS's designee, may serve as a temporary advisor to a beginning graduate student. The Director of Graduate studies, or the DGS's designee performs advisory functions until the Major Professor and the Advisory Committee are appointed, normally by the end of the first semester. The Major Professor then assumes primary advisory functions and chairs the Advisory Committee. The Major Professor serves as the Dissertation Director. The Advisory Committee provides advice to the student and sets specific course and research requirements (within the applicable rules), which the student must meet in pursuit of a doctoral degree. With the consent of the faculty members involved, the student must file an online request to the UK Graduate School to form the committee. The Dean of the Graduate School, upon the advice of the Director of Graduate Studies, appoints the Major Professor and Advisory Committee.

3.3 Advisory Committee

The Advisory Committee has a core of four members. In the Civil Engineering Department this core normally consists of the Major Professor as Chair, one or two other members from the CE Department, and at least one faculty from outside of the CE Department. All members of the core must be members of the Graduate Faculty of the University of Kentucky and three (including the Major Professor) must possess full Graduate Faculty status. Additional faculty members may serve as members of the Advisory Committee. The core of the Advisory Committee must be kept at its full complement throughout the graduate career of the individual student. Thus, in the event of a vacancy on the Committee (occasioned by resignation, faculty leave, or inability to serve), an appropriate replacement must be made prior to the making of any Committee decision.

All decisions of the Advisory Committee are by majority vote of appointed Graduate Faculty members. Advisory Committee decisions must be reported promptly to the Director of Graduate Studies who will be responsible for transmitting them to the Dean of the Graduate School.

In addition to advising and program course and research planning, the Advisory Committee administers the Qualifying Examination, supervises the preparation of the Dissertation, and serves as the Examining Committee that administers the Final Examination and approves the Dissertation.

3.4 Changes in Membership of Advisory Committee

While the composition of the Advisory Committee should be relatively stable over its lifetime, changes may occur.

3.4.1 Changes in Students Interest or Emphasis

Given the early date of selection of the advisory committee, students may wish to change the Major Professor or any other member of the Advisory Committee. Such action requires consultation among the student, the Major Professor, the affected faculty members, and the Director of Graduate Studies. If the advisory committee has been formally appointed, the approval of the Dean of the Graduate School is also necessary.

3.4.2 Faculty Resignations from the Committee

Faculty members who find that they are making little contribution, or who develop other priorities, may resign from the advisory committee. In such cases, the student, in consultation with the Major Professor and the Director of Graduate Studies, may suggest a replacement. A new committee form must be filed online with the Graduate School by the student.

3.4.3 Faculty Turnover and Leave

In the event that a faculty member resigns from the University or goes on leave, the position on the advisory committee must be filled by an appropriate replacement. In such a case, a new committee form must be filed online with the Graduate School by the student. Should a faculty member's temporary leave fall between essential meetings of the advisory committee, replacement is not necessary. Also, special arrangements can be made for a committee member on-leave, particularly the Chair, to conduct some of the duties remotely; replacement is not necessary if such arrangements can be made.

3.5 Language Requirements

There is no foreign language requirement.

3.6 Qualifying Examination

The Graduate School requires that all PhD students take a Qualifying Examination in order to verify that they have sufficient understanding of, and competence in, their fields to become candidates for the degree. This Examination is prepared and administered by the student's Advisory Committee. The exam is taken after the Committee feels that the student has completed all necessary course work and is ready to devote his/her full effort to the Dissertation. The request to schedule the Qualifying Examination should be submitted online at least two weeks prior to the date of the examination.

The Qualifying Examination usually consists of both written and oral parts. The written part is usually scheduled first and administered by each member of the Advisory Committee individually. This is followed by an oral part in which all members participate at the same time. The committee makes the pass or failure decision by a majority vote. A tie vote means failure. The Director of Graduate Studies must report the results of the Examination to the Graduate School within ten days of its conclusion. If the result is failure, the Committee determines the conditions to be met before another Examination may be given. The minimum time between Examinations is four months. A second Examination must be taken within one year after taking the first Qualifying Examination. A third Examination is not permitted.

3.7 Residence Requirement

3.7.1 Pre-Qualifying Examination

The purpose of a Pre-Qualifying Examination residency requirement is to encourage doctoral students to experience contact with the academic community: colleagues, libraries, laboratories, on-going programs of research and inquiry, and the intellectual environment that characterizes a university. Such experience is generally as important as formal class work in the process of intellectual development. While the residency requirement is, by necessity, given in terms of full or part-time enrollment, the intent of the requirement is to ensure that the student becomes fully involved in a scholarly campus life. Generally, full-time course work for one academic year (18 hours) or equivalent is the minimum post-Master's course requirement for CE PhD students prior to their Qualifying Exam.

3.7.2 Post-Qualifying Examination

After passing the qualifying exam, a PhD student must enroll for 2 hours of CE 767 Dissertation Residency Credit. Specifically,

- A student must remain continuously enrolled in CE 767 every Fall and Spring semester until the Dissertation is defended.
- A student must complete a minimum of two semesters of CE 767 before he/she can graduate.
- The semester of the qualifying exam may count toward the post-qualifying residency requirement.
- If formal Request to Schedule the Qualifying Exam is submitted within the first six weeks of the semester, the exam can then be taken at any time during the semester.

3.8 The Dissertation

Each student must present a Dissertation, which is the result of his/her original research. The Major Professor is the primary source of guidance in the planning and preparation of the Dissertation. However, other members of the Advisory Committee should be involved in the process as well. It is the responsibility of the Advisory Committee to make suggestions for any revisions needed before the final version is submitted to the Graduate school. The style and form of the Dissertation must be in conformance with the instructions prepared by the Graduate School. For specific instructions regarding the format of the Dissertation, the student should

follow the instructions prepared by the Graduate School at https://gradschool.uky.edu/thesis-dissertation-preparation.

3.9 Graduation Fees

There are no graduation fees. Each graduating doctoral student will pay Dissertation fees. Follow the instructions of the Graduate School on making the payment.

3.10 Final Examination

3.10.1 Composition of Committee

The Final Examination includes a defense of the Dissertation and may be as comprehensive in the major and minor areas as the Advisory Committee chooses to make it. Prior to the Final Exam, the Committee is augmented with an outside examiner, who is appointed by the Dean of the Graduate School. The Dean of the Graduate School and the President of the University are ex-officio members of all Final Examination committees.

3.10.2 Scheduling of Examination

The PhD Final Examination is a public event, and its scheduling is published and announced beforehand by UK. Any member of the UK community may attend.

At least four weeks prior to the Final Examination, and following the distribution, by the Major Professor, of the Dissertation to the members of the Advisory Committee, the student files online the intent to schedule the Final Exam. Then, the Graduate Dean appoints an outside examiner as a core member of the Advisory Committee. The Graduate School will designate the specific time and date of the Final Examination at least two weeks prior to the actual Examination. All members of the Committee except the outside examiner will have had an opportunity to suggest revisions to the Dissertation prior to signing the Dissertation Approval Form. Dissertation revisions must be completed as soon as possible.

The Dissertation Approval Form, along with a typewritten copy of the Dissertation, must be presented to the Graduate School before the Final Examination can be scheduled. The draft of the Dissertation submitted must be complete in content, including all footnotes, tables, figures, and appendices. A full bibliography or set of references must be included as must a title page and abstract. A similar copy must be presented to the outside examiner as soon as the person is appointed.

The Final Examination should be scheduled only during time periods consistent with academic semesters (including the summer term). The Examination must be completed, and the results reported, no later than eight days before the last day of classes of the semester in which the student intends to receive the degree.

3.10.3 Procedure

The Final Examination is usually primarily oral, and may last two to four hours, or more. In addition to defending the completed Dissertation, the student is expected to demonstrate an understanding of the discipline of which the Dissertation is a part, an understanding of the

context of the Dissertation, and general and specific knowledge of the field of Civil Engineering, its sub-areas, its history, its scientific and mathematical foundations, and its role in society.

Members of the Committee will report the outcome of the Final Examination to the Graduate School immediately upon its completion. In all decisions the majority opinion of the Graduate Faculty members of the Examining Committee prevails. If the Examining Committee is evenly divided, the candidate fails.

In the event of failure, the Examining Committee recommends to the Dean of the Graduate School conditions underwhich the candidate may be re-examined; that is if a re-examination is deemed appropriate. When conditions set by the Dean have been met, the candidate may be re-examined. Should any vacancies on the committee occur between the two examinations, the Dean of the Graduate School will appoint replacement members. A third Examination is not permitted.

3.11 Submission of Dissertation

After the Final Examination is passed, the final copy of the Dissertation is prepared and then submitted to the Graduate School along with the signatures of the Major Professor and the Director of Graduate Studies. The Dissertation in its final electronic form must be received in the Graduate School within sixty (60) days of the Final Examination. Failure to submit the dissertation within 60 days may result in the student having to be re-examined. For students planning to graduate in the semester in which the Final Examinations are taken, the Dissertation must be presented and accepted by the Graduate School by the last day of that semester.

SECTION 4 GUIDELINES FOR ASSISTANTSHIPS

4.1 Type of Assistantships

Graduate students receiving remuneration through the Department for services rendered are formally classified either as Teaching Assistants (TA), Research Assistants (RA), or Graduate Assistants (GA), depending on the source of the funds and duties and responsibilities. A Graduate Assistant may take on a combination of teaching and research assignments.

A full-time TA/GA/RA offer includes tuition, monthly stipend, and student health insurance for the period of appointment.

4.2 Responsibilities

The Director of Graduate Studies makes personnel decisions regarding Teaching Assistants. The principal investigator of the research project makes those decisions regarding Research Assistants. The Chair of the Department must approve all such personnel decisions before they can take effect. Only the Chair of the Department may waive the provisions of these guidelines in individual circumstances.

4.3 Period of Appointment

4.3.1 Assistantships

When financial projections permit, the appointment period for Assistants may encompass a 9-month period beginning August 15 and ending May 15 of the following year. Alternatively, appointments may be made for 4.5 months beginning August 15 and ending December 31 for the fall semester or beginning January 1 and ending May 15 for the spring semester. In no event will the appointment period exceed nine months.

Summer appointments may be made on a case-by-case basis. Such appointments must be coordinated with the DGS in advance of summer sessions.

All TA, GA and RA positions are subject to a screening process, which includes an orientation. Failure to successfully complete this process, particularly the TA screening, could result in termination of support. All Assistants must make themselves available for attending various orientation/training sessions which are conducted by the Graduate School, College of Engineering, and the CE Department during the 2-week period before the beginning of classes. Failure to attend these sessions may result in termination of financial support.

4.3.2 Absences

With the exception of legal holidays, all Assistants are expected to provide service throughout the periods of their appointments. Absences during these periods require notification of and approval by the faculty supervisor and the Director of Graduate Studies.

4.4 Service Load

Under UK rules, a full-time appointment is 20 hours/week, and a part-time appointment is 10 hours/week. Full-time student Assistants should not participate in any form of employment, both on and off campus, unless approved by the Director of Graduate Studies and/or the Graduate School. Failure to comply with this rule will result in the termination of their UK financial support.

All graduate students holding a TA/GA/RA appointment must be registered as full-time students.

The service load of all assistants must be in accord with Graduate School limitations based on the amount of coursework being simultaneously undertaken. A full-time TA/GA/RA working 20 hours per week should not take more than 10 hours of coursework. This maximum may be increased to 12 hours for students with lighter service loads.

4.5 Selection and Appointment of TA and RA

4.5.1 Application for Assistantships

Any graduate student may apply for an assistantship (TA or RA) by contacting the Director of Graduate Studies. Students are strongly encouraged to contact faculty members to explore research mentorship opportunities.

4.5.2 Appointment Criteria

All TA and RA positions are very competitive, and students are selected based upon their qualifications and a matching interest in the CE Department. All students appointed to these positions must maintain a minimum GPA of 3.0 and make satisfactory progress toward their degrees. Additionally, the following special criteria may be applied in ranking the students.

(1) Students who have been employed on sponsored research projects that terminated before they could reasonably have been expected to complete the work for their degrees will be given priority.
(2) Students who have been selected by faculty members for work on sponsored projects for which funding has not yet been received, though it may reasonably be expected to begin during the academic year.
(3) Graduate students already in the UK CE Department and identified as planning to obtain PhD degrees there, in order of apparent academic merit and promise.
(4) External applicants for our PhD program, in order of apparent academic merit and promise, but with exceptions, which may be necessary to keep a balance amongst the departmental programs.
(5) All others, in order of apparent academic merit and promise.

The Director of Graduate Studies along with the Chair's advisory committee will apply these criteria and make necessary judgments. Final approval of all appointments rests with the Department Chair.

4.6 Renewal and Termination of Appointments

4.6.1 Renewal of Appointment for Assistants

Assistantships will not be automatically renewed beyond the period of appointment. The criteria and priorities for renewal will be the same as those for new appointments (see Section 4.5.2 above), with the addition of satisfactory performance in their assigned duties. Efforts will be made to continue to support students whose service and academic records have been satisfactory. **HOWEVER, RENEWAL OF ANASSISTANTSHIP CANNOT BE GUARANTEED BEYOND THE INITIAL PERIOD FOR WHICH IT WAS GRANTED**.

Assistantships will not be renewed if academic progress or job performance is unsatisfactory. Appointments cannot be renewed beyond the end of the academic term in which all degree requirements have been satisfied. Appointments cannot be renewed if funding is unavailable. Appointments will not be renewed beyond the maximum periods stated in Section 4.6.2.

4.6.2 Maximum Periods of Appointment

The maximum periods of appointment a student can hold are listed below:

Teaching/Graduate Assistants working toward PhD degrees: 8 semesters, including any time spent as an Assistant before entering the PhD dissertation research stage.

Teaching/Graduate Assistants working toward the MSCE degree: 4 semesters.

Research Assistants on extramural supported projects working toward PhD degrees: 10 semesters, including any time spent as an Assistant before entering the PhD dissertation research stage.

Research Assistants on extramural supported projects working toward the MSCE degree: 4 semesters.

These limits are imposed to conserve scarce financial resources, and to ensure that students will endeavor to make reasonable progress toward their degrees. They may be waived upon request of the student's Advisor, and with the approval of the Director of Graduate Studies and the Department Chair.

4.7 Multiple Sources of Financial Aid/Employment

A student may simultaneously receive financial aid from multiple sources with the following exceptions:

- Students on traineeships or other externally funded programs where funds are available to pay tuition are not eligible for tuition scholarships.
- Students may not receive funds granted for the express purpose of paying tuition, fees, books, supplies, etc. from more than one source.
- Students may not receive support from multiple sources if one of those sources restricts or prevents receipt of support from other sources.

Students will not be permitted to engage in overload employment that unduly restricts or prevents satisfactory academic development or service to the University. An assistantship will generally not be awarded to an individual who has adequate support from other sources unless there are no other qualified applicants for a critical position, and/or the individual has particularly unique qualifications.

4.8 Parking Privileges

Graduate students are automatically eligible for "C" parking permits. Application for "E" permits by Teaching Assistants, Research Assistants, and Graduate Assistants are accepted only upon additional certification by the Chair of the department.

4.9 Holidays, Vacations, and Sick Leave

Assistants are not required to work during legal holidays. However, since they are classified as temporary employees of the University, they are not eligible to receive vacations or sick leave with pay.

4.10 University Health Service and Student Health Insurance

Full-time graduate students who have paid the health fee have access to the University Health Service (Student Health). Part-time and zero or two-credit hour students may access the University Health Service by voluntarily paying a health fee or by being seen on a fee-for-service basis. Health insurance coverage is provided to all enrolled and degree-seeking graduate students with full-time Teaching, Research, or Graduate Assistantships, full-time Fellowship recipients, or a combination of these positions.

APPENDIX CE Graduate Programs: Learning Outcomes

MSCE Program: Mission Statement

The mission of the University of Kentucky, Department of Civil Engineering Graduate Studies MSCE Program is to:

(1) Provide opportunities for education, research, and service in a scholarly environment to the Commonwealth, the United States, and the global community;
(2) Prepare our students for successful scholarly endeavors; and
(3) Prepare our students for successful professional careers.

MSCE Program: Objectives

The objective of our M.S. program is to produce graduates who possess:

(1) In-depth knowledge of at least one area of civil engineering;
(2) The ability to successfully complete independent work; and
(3) The ability to communicate the results of their work.

MSCE Program: Student Learning Outcomes

1. A mastery of at least one specialization area of civil engineering.
    a. Evidence
        i. Specialization Courses
        ii. Projects/Papers
        iii. MSCE Final Exam

2. The ability to perform independent research through coursework or research project.
    a. Evidence
        i. MSCE Project/Thesis
        ii. MSCE Final Exam

3. The ability to communicate the results of their work.
    a. Evidence
        i. Publications, Presentations, Patents, Awards
        ii. MSCE Final Exam

PhD Program: Mission Statement

The mission of the University of Kentucky, Department of Civil Engineering Graduate Studies PhD Program is to:

(1) Provide opportunities for education, research, and service in a scholarly environment to the Commonwealth, the United States, and the global community;
(2) prepare our students for successful scholarly endeavors; and
(3) prepare our students for successful professional careers.

PhD Program: Objectives

The objective of our PhD program is to produce graduates who possess:

(1) the ability to plan, conduct, complete, and disseminate original research that advances the state of knowledge; and
(2) the ability to communicate the results of their work through teaching, oral presentation, or publication at an authoritative level.

PhD Program: Student Learning Outcomes

1. A mastery of at least one specialization area of civil engineering.
    a. Evidence
        i. PhD Specialization Coursework
        ii. Projects/Papers
        iii. PhD Qualifying Exam
        iv. PhD Final Exam

2. The ability to perform creative and independent research.
    a. Evidence
        i. PhD Qualifying Exam
        ii. PhD Research Proposal
        iii. Dissertation
        iv. PhD Final Exam

3. The ability to communicate the results of their work.
    b. Evidence
        i. Publications, Presentations Patents, Awards
        ii. PhD Final Exam