University of Kentucky

# CIVIL ENGINEERING GRADUATE DEGREE PROGRAM

Highlights

- Participate in research under the theme of Natural, Managed, and Disturbed Ecosystems, Natural Hazards Engineering, Intelligent Infrastructure Systems, and Resilient and Sustainable Infrastructure.

- Study under renowned faculty and licensed professional engineers with practical experience in the field.

- Specialize in areas such as construction and project management, environmental engineering, geotechnical engineering, materials, structural engineering, transportation engineering, water resources.

- Get hands–on experience with innovative projects and research.

Financial Support

The Department of Civil Engineering offers generous financial support to graduate students through various fellowships and assistantships, providing competitive stipend, full tuition and fees, student health insurance, and more.
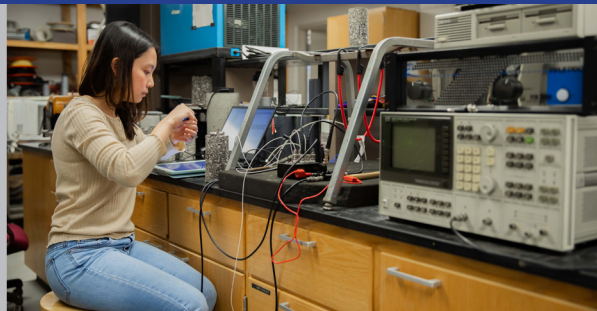
Why Study Civil Engineering At The University Of Kentucky?

- Be part of a tradition and culture of excellence at a national research institution
- Collaborate with industry partners and renowned faculty to tackle real–world challenges
- Benefit from personalized support, including career services and access to faculty mentors and state–of–the–art facilities and equipment
- Join a community of dedicated, forward–thinking engineers who are making a difference in the world

The Department of Civil Engineering at the University of Kentucky is now accepting graduate applications for the 2024–2025 academic year.

Visit **https://gradschool.uky.edu/apply** to start your application.

Contact Dr. Mei Chen, **Director of Graduate Studies**, mei.chen@uky.edu, +1 (859) 257–9262 for inquiry. Scan the QR code for program handbook.

DEPARTMENT OF CIVIL ENGINEERING
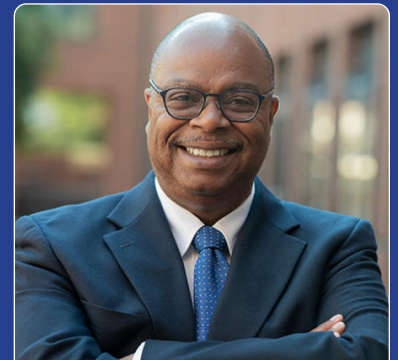
Dr. L. Sebastian Bryson, **Chair**
sebastian.bryson@uky.edu,
161 O.H. Raymond Bldg.
Lexington, KY 40506

Degree Options

Master of Science in Civil Engineering

– Requires a minimum of 30 credit hours

– Offered with both thesis and non–thesis options

Doctor of Philosophy in Civil Engineering

– A minimum of 18 course credits beyond a master's degree, &

– Successful completion and defense of a dissertation

Current Civil Engineering Faculty Research

Natural, Managed, and Disturbed Ecosystems

- Develop sustainable solutions for water and wastewater infrastructure by integrating engineering and systems analysis with stakeholder engagement.
- Study biodegradation and biotransformation of environmental pollutants, and investigate the removal efficiencies of various bioreactor systems in the laboratory for a range of organic and inorganic contaminants.
- Investigate river and watershed physics and biogeochemistry to provide knowledge and guidance for engineers to best restore and maintain rivers and their interactions with human systems.

Natural Hazards Engineering

- Investigate how earthquake waves propagate through soil and rock.
- Analyze dynamic response of naturally occurring soil and rock deposits, and dynamic response of man made structures such as earth dams and mine waste impoundments, aiming to develop designs to keep public safe.
- Landslide hazard assessment and prediction, laboratory testing of geologic materials, field instrumentation and monitoring of earth and earth-supported systems.
- Karst (sinkhole) hazard research and analysis.

Resilient and Sustainable Infrastructure

- Apply and adapt quantitative sustainable design tools such as life cycle assessment and quantitative microbial risk assessment to guide decision-making for water and sanitation infrastructure.
- Conduct sustainable design in both technologically advanced and resource-limited settings, with an emphasis on context-specific objectives and constraints.
- Perform analytical and experimental evaluation, and retrofit of concrete and steel structures using high performance materials.
- Develop implementable tools and guidance to improve construction safety and efficiency using advanced technology.
- Investigate people, process, and technology at the organization level and project level.
- Develop innovative and sustainable construction materials.
- Study people, process, and technology in construction industry, specifically, organizational change, workforce shortages, Construction 4.0 (with a focus on Digital Twins and Augmented Reality), Lean Construction, digital delivery, and process reengineering.
- Develop innovative methodologies and technologies, centered on increased resiliency and sustainability of civil and geotechnical infrastructure.
- Develop methods and tools to support transportation agencies make smart decisions on infrastructure investment.

Intelligent Infrastructure Systems
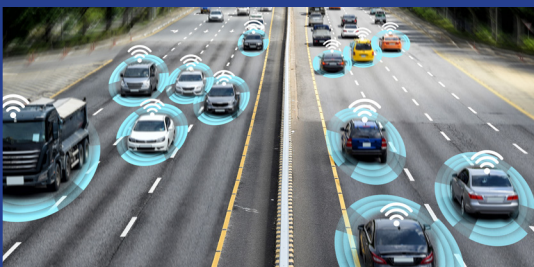
- Develop sophisticated modeling tools to forecast the effects of proposed projects, analyze new and emerging data sources to understand the effects of past projects, and combine both to advance the science of transportation forecasting in support of evidence-based policy decisions.
- Integrate advanced data analytics and emerging data sources into transportation planning, operations, and safety analysis, with a goal of improving mobility and safety of the nation's transportation system through the use of innovative data-driven approaches.