

CIVIL AND ENVIRONMENTAL ENGINEERING (GRADUATE FIELD)

Program Website (<https://www.engineering.cornell.edu/cee/>)

Field Description

Students in the M.S. or Ph.D. program may select one area of concentration. Each student in the Ph.D. program must take a qualifying examination by the end of their 3rd semester. Additional information on the M.S. and Ph.D. programs is available on request from the graduate field office.

The professional degree of Master of Engineering (Civil & Environmental) is intended primarily for persons who plan to practice engineering directly. Admission preference is given to applicants with an accredited United States civil engineering degree or a substantial equivalent. The professional degree requires a minimum of thirty credits of graduate-level work in the principles and practices of the field. Specific requirements include a broad-based technical background in the field, courses in design, and professional practice. Additional information may be obtained from the Assistant Director of Graduate Program at cee_grad@cornell.edu

The M.Eng. program in Engineering Management is geared towards engineers who want to stay in a technological environment, but advance to managerial roles. Through an in-depth, real-world group design project, and course content in management science, project management, decision and risk analysis, information technology, finance and accounting, and organizational behavior students gain the technical and managerial skills necessary to become effective engineering managers. They also learn managerial skills to help organize and supervise people from different cultures and backgrounds so as to maximize teamwork, creativity, and productivity, and to do so in an environment of global awareness and concern for ethical issues. Students learn to identify problems, formulate and analyze models to understand them, and interpret analysis results for managerial action. Further, they learn to navigate this process with a broad, global perspective that considers the full range of technical, economic, environmental, social and other consequences over an appropriate time horizon. While critically important to the success of engineering managers, many of these skills, the managerial and systems analysis abilities in particular, are not emphasized in traditional engineering curricula. Additional information may be obtained from the Program Coordinator at engmanagement_grad@cornell.edu

Complex Systems Engineering investigates how systems-level behavior emerges from interactions among components in both engineered and natural systems. This inherently interdisciplinary field combines mathematical modeling, nonlinear dynamics, data science, numerical simulation, optimization, and stochastic processes with domain-specific knowledge grounded in physical, chemical, and biological principles. Research in this area spans a wide range of applications, including cyber-physical systems, environmental fluids, microbial communities, renewable energy, synthetic biology, transportation systems, infrastructure, and power networks. The curriculum provides a strong foundation in mathematical modeling, with flexibility for students to tailor coursework to their specific research interests.

Environmental Processes is concerned with the protection and management of the quality of the environment for the benefit of society. Degree programs emphasize biological, chemical, and physical phenomena and engineering principles; laboratory and computational skills; and their application to the analysis of relevant problems.

Environmental Fluid Mechanics and Hydrology involves the study of fluid mechanics of the environment and the associated application to hydraulics, hydrology, coastal oceanography, and meteorology as related to the wet earth and atmosphere.

Environmental and Water Resources Systems Engineering. Research and instruction in this area address the development and application of scientific principles, economic theory, and mathematical techniques to the management and planning of public infrastructure and environmental and water resource systems. Research projects include evaluation of engineering projects, groundwater contaminant modeling and remediation optimization, statistical analysis of hydrologic processes, hydropower systems optimization, water supply systems management, water quality planning, risk analysis, river basin and groundwater systems planning and operation, ecological systems management, sustainable development and computer graphics-oriented decision support systems.

Structural Engineering includes, in addition to the conventional aspects of structural analysis and design, interests in computational mechanics, artificial intelligence, dynamics and earthquake engineering, behavior of thin steel structures, control of large-space structures, reliability, stochastic mechanics, natural disaster risk assessment and management, civil infrastructure systems, evaluation of structures and non-destructive testing, fracture mechanics, blast and impact loads, progressive collapse, and structural materials. (Note: the M.S. degree is not admitting applicants into the Structural Engineering concentration at this time.)

Transportation Systems Engineering embraces policy, planning, design, and evaluation of transport systems and the relationships among transport supply and demand, land use, and regional development. The approach is multimodal and systems oriented; it emphasizes the use of quantitative and analytical techniques of operations research and economics.

Detailed academic requirements can be located in the Graduate Study Handbook (<https://www.engineering.cornell.edu/cee/civil-environmental-engineering-ms-phd-handbook/>) (for M.S., M.S./Ph.D., and Ph.D. students).

Data and Statistics

- Research Master's Program Statistics (<https://gradschool.cornell.edu/about/program-metrics-assessments-and-outcomes/research-masters-program-statistics/?SelectGradField=27>)
- Doctoral Program Statistics (<https://gradschool.cornell.edu/about/program-metrics-assessments-and-outcomes/doctoral-program-statistics/?SelectGradField=27>)

Field Manual

- Manual (<https://www.cee.cornell.edu/cee-graduate-field-handbook/>)

Subject and Degrees

Civil and Environmental Engineering

- Civil and Environmental Engineering (M.Eng.) (Ithaca) (<https://catalog.cornell.edu/programs/civil-environmental-engineering-meng/>)
- Civil and Environmental Engineering (M.S.) (Ithaca) (<https://catalog.cornell.edu/programs/civil-environmental-engineering-ms/>)
- Civil and Environmental Engineering (M.S./Ph.D.) (Ithaca) (<https://catalog.cornell.edu/programs/civil-environmental-engineering-ms-phd/>)
- Civil and Environmental Engineering (Ph.D.) (Ithaca) (<https://catalog.cornell.edu/programs/civil-environmental-engineering-phd/>)

Engineering Management

- Engineering Management (M.Eng.) (Distance, Online, Low-residency, or Hybrid option) (<https://catalog.cornell.edu/programs/engineering-management-meng/>)
- Engineering Management (M.Eng.) (Ithaca) (<https://catalog.cornell.edu/programs/engineering-management-meng/>)

Concentrations by Subject

Civil and Environmental Engineering

- civil infrastructure systems
- environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only)
- environmental fluid mechanics and hydrology (M.S., M.S./Ph.D., Ph.D. only)
- environmental processes (M.S., M.S./Ph.D., Ph.D. only)
- structural engineering (M.Eng., Ph.D. only)
- transportation systems engineering

Engineering Management

- engineering management

Faculty

John David Albertson (<http://www.cee.cornell.edu/faculty-directory/john-d-albertson/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: civil infrastructure systems; environmental fluid mechanics and hydrology (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** environmental fluid mechanics and hydrology

C. Lindsay Anderson (<http://cals.cornell.edu/c-lindsay-anderson/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** renewable energy integration

Chloe Fanny Arson (<http://www.engineering.cornell.edu/faculty-directory/chloe-arson/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: structural engineering (M.Eng., Ph.D. only)
- **Research Interests:** Structural Engineering

David S. Bindel (<http://www.cs.cornell.edu/~bindel/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: structural engineering (M.Eng., Ph.D. only)
- **Research Interests:** mathematical analysis, application modeling and software design

Nikolaos Bouklas (<http://www.mae.cornell.edu/people/profile.cfm?netid=nb589>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: structural engineering (M.Eng., Ph.D. only)
- **Research Interests:** the fundamental study of soft materials, active materials and biomate

Natalie L. Cápiro (<http://cals.cornell.edu/natalie-capiro/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: environmental processes (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** Environmental processes that influence the fate and transport of emerging chemical contaminants in natural and engineered systems

Edwin Alfred Cowen (<http://www.cee.cornell.edu/eac20/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: environmental fluid mechanics and hydrology (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** environmental fluid mechanics

Mark R Cruvellier (<http://aap.cornell.edu/people/mark-r-cruvellier/?department=8>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: structural engineering (M.Eng., Ph.D. only)
- **Research Interests:** architectural design; structural engineering

Ricardo Alvarez Daziano (<http://www.cee.cornell.edu/faculty-directory/ricardo-daziano/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: transportation systems engineering
- **Research Interests:** microeconomics; transportation economics; sustainable energy systems

Peter J. Diamessis (<http://www.cee.cornell.edu/faculty-directory/pete-j-diamessis/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: environmental fluid mechanics and hydrology (M.S., M.S./Ph.D., Ph.D. only)

- **Research Interests:** hydrodynamics of the coastal/open ocean and lakes; turbulence; hydrodynamic and biological interactions in aquatic systems

Timur Kamil Dogan (<http://aap.cornell.edu/people/timur-dogan/?department=8>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* environmental fluid mechanics and hydrology (M.S., M.S./Ph.D., Ph.D. only); transportation systems engineering
- **Research Interests:** daylighting; energy modeling; passive climate strategies; performance driven design workflows in both urban and architectural scale

Christopher J. Earls (<http://www.cee.cornell.edu/faculty-directory/christopher-j-earls/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* civil infrastructure systems; structural engineering (M.Eng., Ph.D. only)
- **Research Interests:** computational, structural and solid mechanics; structural stability; behavior and design of metal structures

Greeshma Gadikota (<http://www.cee.cornell.edu/faculty-directory/greeshma-gadikota/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only); environmental processes (M.S., M.S./Ph.D., Ph.D. only)

Stefano Galelli (<http://galelli.cee.cornell.edu/people/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* civil infrastructure systems; environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** Environmental & Water Resource Systems Engineering

H. Oliver Gao (<http://www.engineering.cornell.edu/faculty-directory/h-oliver-gao/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* civil infrastructure systems; transportation systems engineering; Engineering Management: engineering management
- **Research Interests:** transportation systems; transportation and environment/energy

Andrea Giometto (<http://www.cee.cornell.edu/faculty-directory/andrea-giometto/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* civil infrastructure systems; environmental processes (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** environmental processes

April Gu (<http://sites.coecis.cornell.edu/gugroup/about-professor-gu/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* environmental processes (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** water quality and environmental health

Damian E. Helbling (<http://www.cee.cornell.edu/faculty-directory/damian-e-helbling/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* environmental processes (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** environmental processes

Qi Li (<http://liresearch.cee.cornell.edu/people/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* civil infrastructure systems; environmental fluid mechanics and hydrology (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** fluid dynamics, heat transfer and hydrologic processes in the built environment

Natalie M. Mahowald (<http://www.eas.cornell.edu/faculty-directory/natalie-m-mahowald/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only); environmental fluid mechanics and hydrology (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** global interactions between climate and biogeochemistry through aerosols

Andreas Malikopoulos (<http://www.cee.cornell.edu/faculty-directory/andreas-malikopoulos/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* civil infrastructure systems; transportation systems engineering
- **Research Interests:** Transportation Systems Engineering (major field), Systems Engineering (minor field)

Jacob Paul Mays (<http://www.cee.cornell.edu/faculty-directory/jacob-mays/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** EWRS and Engineering Management

Gregory C. McLaskey (<http://www.cee.cornell.edu/faculty-directory/greg-mclaskey.edu/faculty-directory/greg-mclaskey/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering:* structural engineering (M.Eng., Ph.D. only)
- **Research Interests:** Structural Engineering & Geotechnical Engineering; minor: structural mechanics

Atieh Moridi (<http://www.mae.cornell.edu/faculty-directory/atieh-moridi/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: structural engineering (M.Eng., Ph.D. only)
- **Research Interests:** advanced materials and manufacturing

Sriramya Nair (<http://www.engineering.cornell.edu/faculty-directory/sriramya-duddukuri-nair/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: structural engineering (M.Eng., Ph.D. only)
- **Research Interests:** solid mechanics and materials, structural mechanics, structural engineering, geotechnical engineering

Linda K Nozick (<http://www.cee.cornell.edu/faculty-directory/linda-k-nozick/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: civil infrastructure systems; environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only); transportation systems engineering; *Engineering Management*: engineering management
- **Research Interests:** transportation systems analysis; engineering management

Patrick M. Reed (<http://www.cee.cornell.edu/faculty-directory/patrick-michael-reed/>)

- **Campus:** Ithaca
- **Concentrations:** *Engineering Management*: engineering management; *Civil and Environmental Engineering*: environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only)

Matthew Charles Reid (<http://www.cee.cornell.edu/faculty-directory/matthew-charles-reid/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: environmental processes (M.S., M.S./Ph.D., Ph.D. only)

Ruth E Richardson (<http://www.cee.cornell.edu/rer26/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: environmental processes (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** bioenvironmental engineering; microbial bioremediation; microbial ecology; assessing viability of environmental microbes

Samitha Samaranayake (<http://cee.cornell.edu/samitha/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: civil infrastructure systems; transportation systems engineering
- **Research Interests:** analysis and control of networked cyber-physical systems with a focus on transportation and other urban infrastructure systems

Meredith Silberstein (<http://www.engineering.cornell.edu/faculty-directory/meredith-silberstein/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: structural engineering (M.Eng., Ph.D. only)
- **Research Interests:** using mechanical experiments and modeling methods in material

Vivek Srikrishnan (<http://cals.cornell.edu/vivek-srikrishnan/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** Energy Systems Operations and Planning

Scott Steinschneider (<http://cals.cornell.edu/scott-steinschneider/>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** water resource systems planning and management under hydroclimatic variability and change; uncertainty analysis in watershed modeling and the implications for decision-making; the evolution of hydrologic systems under anthropogenic impacts.

Francis Vanek (<http://www.cee.cornell.edu/faculty-directory/francis-m-vanek/>)

- **Campus:** Ithaca - (Divisional Member)
- **Concentrations:** *Engineering Management*: engineering management
- **Research Interests:** engineering management

Derek H. Warner (<http://www.atkinson.cornell.edu/about/people/fellows/view.php?NetID=dhw52>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: civil infrastructure systems; structural engineering (M.Eng., Ph.D. only)
- **Research Interests:** computational solid mechanics; deformation and fracture mechanisms; nanostructured materials and thin films; dynamic failure and fragmentation; parallel and multi-scale computing

Fengqi You (<http://www.atkinson.cornell.edu/about/people/fellows/view.php?NetID=fy86>)

- **Campus:** Ithaca
- **Concentrations:** *Civil and Environmental Engineering*: environmental and water resources systems engineering (M.S., M.S./Ph.D., Ph.D. only); environmental processes (M.S., M.S./Ph.D., Ph.D. only)
- **Research Interests:** energy systems and environmental process engineering