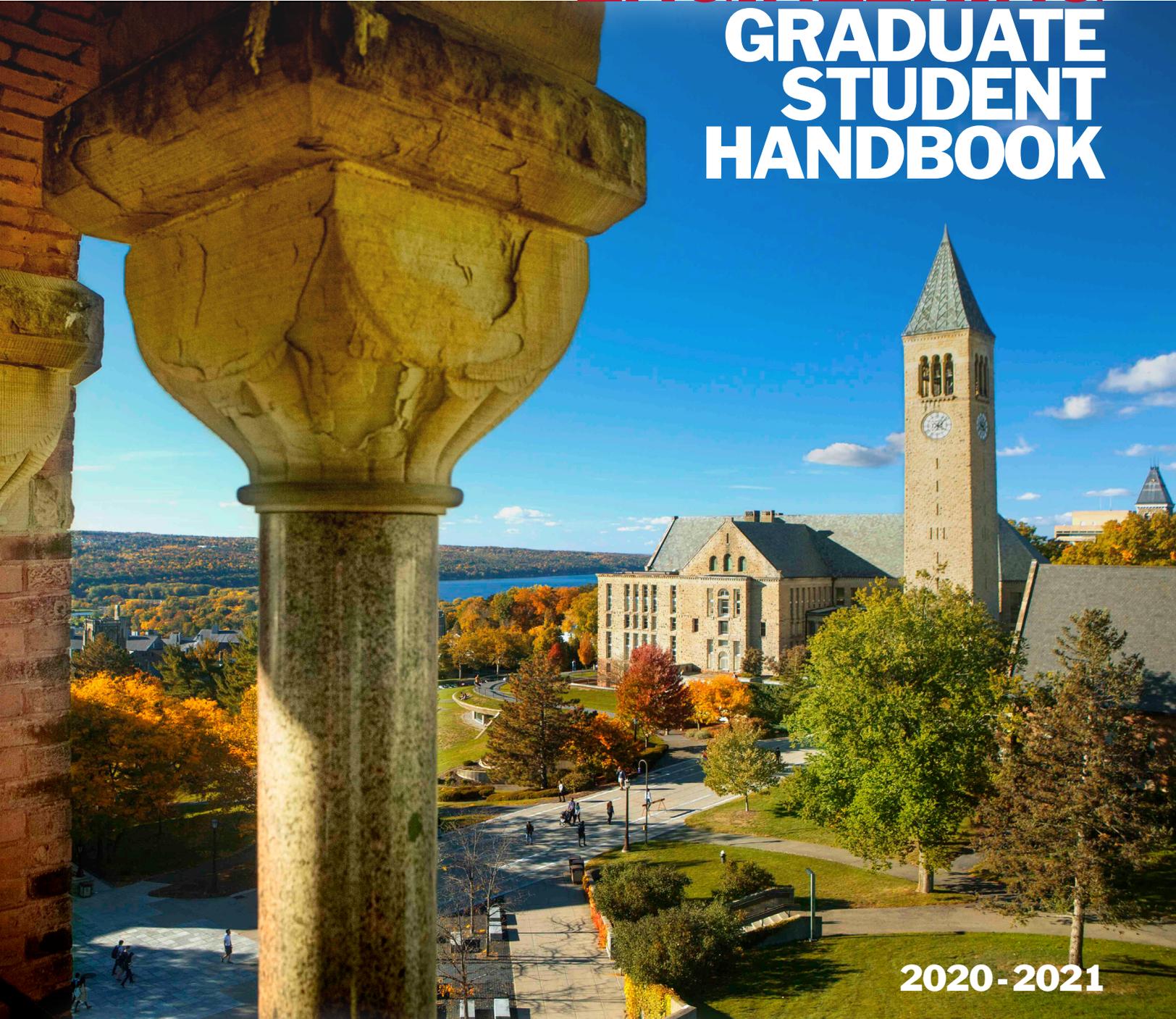


CIVIL AND ENVIRONMENTAL ENGINEERING GRADUATE STUDENT HANDBOOK



2020 - 2021

Master of Engineering Program

CornellEngineering
Civil and Environmental Engineering



The rules and regulations stated in this handbook are for information only and in no way constitute a contract between the student and Cornell University. The University reserves the right to change any regulations or requirements at any time.

It is the policy of Cornell University actively to support equality of education and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of legally prohibited discrimination involving, but not limited to, such factors as race, color, creed, religion, national or ethnic origin, sex, age, or handicap. The University is committed to the maintenance of affirmative-action programs that will assure the continuation of such equality of opportunity. Sexual harassment is an act of discrimination and, as such, will not be tolerated. Inquiries concerning the application of Title IX may be referred to Cornell's Title IX coordinator at the Office Workforce Diversity, Equity and Life Quality, 160 Day Hall, Ithaca, New York 14853-2801 (Telephone: 607-255-3976).

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SECTION 1

INTRODUCTION

Welcome to Cornell University and, in particular, to the School of Civil and Environmental Engineering. We hope your year here will be an academically rich and personally rewarding experience. This handbook has been prepared to simplify the orientation and registration process of new candidates for the Master of Engineering degree in Civil and Environmental Engineering.

1.1 The School of Civil and Environmental Engineering (CEE)

The School has a strong educational tradition and a supportive alumni network. Ranked as one of the top civil and environmental engineering departments in the United States, the School currently consists of twenty-seven active faculty members and other individuals who serve as lecturers, senior research associates, and other staff. The CEE faculty and their particular specializations are listed in Appendix A. In addition, we have several thousand alumni who hold important positions in engineering, construction, research and development, manufacturing, sales, education, consulting, and government in the U.S. and around the world.

The faculty and other individuals responsible for administering the School include:

| | |
|--|--|
| Director, School of Civil & Environ. Engr.: | Linda Nozick, 220 Hollister |
| Director of Administration: | Joe Rowe, 220 Hollister |
| Administrative Assistant: | Jeannette Little, 220 Hollister |
| Director of Graduate Studies: | Mircea D. Grigoriu, 217 Hollister Hall |
| Assistant Director of Graduate Programs: | Melissa Totman, 219 Hollister Hall |

Support Staff:

| | |
|----------------------------------|---------------------------------|
| Administrative Assistant: | Beth Korson, 220 Hollister |
| Finance Specialist: | Stacey Shirk, 220 Hollister |
| Accounts Coordinator: | Megan Keene, 220 Hollister |
| Facilities Coordinator: | Paul Charles, B56 Hollister |
| IT: | Cameron Willkens, 325 Hollister |

MEng Area Leads

Environmental and Water Resources Engineering:

Francis Vanek Hollister 307, fmv3@cornell.edu

Structural Mechanics and Materials:

Sriramya Nair Hollister 371, sn599@cornell.edu

Transportation Systems Engineering

Ricardo Daziano Hollister 305, daziano@cornell.edu

1.2 The Master of Engineering Degree in Civil & Environmental Engineering

The Master of Engineering degree is a coursework and project-oriented graduate program. It requires thirty (30) credit hours consisting of coursework in the major and supporting areas, and a project. The Master of Engineering degree is normally completed in two semesters of intensive study, but for some students a third semester may be necessary.

Master of Engineering candidates in Civil and Environmental Engineering may elect to pursue one of the following majors:

- environmental engineering (with a specialty in one of the following subject areas)
 - emerging contaminants
 - environmental and water resource systems
 - environmental processes
 - environmental fluid mechanics and hydrology
 - GIS/remote sensing/spatial modelling (new in 2020)
 - sustainable energy systems
- structural mechanics and materials
- transportation systems engineering

In addition to coursework in a chosen major or specialty, students will also take courses in one or more supporting areas. Supporting areas can be chosen from many disciplines, including any of the specialty areas within CEE, or in microbiology, historic preservation, operations research, computer science, economics, materials science, architecture, and engineering management, to name just a few.

The School of Civil and Environmental Engineering also offers a Master of Engineering degree in Engineering Management. The program is aimed at engineers who want to stay in a technical environment, but advance into managerial roles. Students learn to identify problems, analyze data, formulate models to understand these problems, and interpret the results of analyses for managerial action. A number of students in the M.Eng. program in Engineering Management elect to take courses in management offered by CEE, the Johnson Graduate School of Management, or the School of Industrial and Labor Relations. A joint Master's program in Public Administration is also available through the Cornell Institute for Public Affairs. Appendix C provides a short description of the program in Engineering Management and a list of typical electives. A separate handbook providing more details about the program is also available from the Graduate Program Coordinator.

1.2.1 Preparation

Students from all fields of engineering and the physical and natural sciences are welcome in the Master of Engineering programs offered by the CEE School. However, a student without adequate preparation may be required to take additional preparatory coursework, which will be determined by faculty in the student's chosen major. This preparatory work does not count toward the Master of Engineering graduation requirements. Any preparatory coursework that is required will be listed in a student's letter offering admission.

1.2.2 Major Program Requirements

A minimum of 30 credit hours of course and project work is required for the M.Eng. degree in Civil & Environmental Engineering. This is typically the equivalent of ten 3-credit courses. Program requirements for each major concentration are given in Appendix D.

The information provided should help you develop a coursework proposal, but we encourage you to seek guidance from your advisor and other faculty members. Your advisor will work with you to develop a program consistent with your career goals and the intent of the M.Eng. program.

SECTION 2

PLANNING and REGISTERING for the M.Eng. (CEE) PROGRAM

Enrolling in the M.Eng. program will take relatively little time for most of you. You will find the process a little more informal than undergraduate registration, with more freedom to change courses easily during the first three weeks of classes of each semester. The major steps in the process are described in the following sections.

2.1 Assignment of Advisor

You will have an advisor in your major area of concentration to help you design a program of study and generally to assist and advise you during your stay at Cornell. Advisor assignments are done within each major concentration area. You may also request to change your advisor to another faculty member within the same concentration upon permission of the faculty member whom you would like to serve as your new advisor.

2.2 Course Registration

Graduate students must register for courses online by logging into you Student Center with your NetID*. You can begin registering for classes for the **Fall term September 2, 2020**. Courses may be **added** online until **September 9, 2020**. They may be **dropped** online (without a petition) until **October 28, 2020**.

Pre-enrollment for the Spring 2021 courses begins at **December 8, 2020**.

For any additional courses to be **added** for the Spring 2021 semester after the pre-enrollment dates, you can begin registering for courses for the Spring term on **February 2, 2021**. They may be dropped online (without a petition) until **February 22, 2021**.

Any changes in your course registration after the deadlines (i.e., adds/drops, credit hour changes) requires submission of a [Course Enrollment Petition](#) to the Engineering Registrar's office within the College of Engineering. The petition must be signed by both your advisor and the instructor of the course. Please note that petitions are not automatically approved.

****NetID**: You should have received your NetID and information from Cornell Information Technologies (CIT) over the summer. If you did not, please contact the CIT Office at HelpDesk@cornell.edu. Please be sure to check your Cornell e-mail regularly.*

2.3 Planning Your M.Eng. Program

Please study the pertinent material in this handbook for both required courses and appropriate elective courses before seeing your advisor. It would be worthwhile to spend some time with the online course catalog <https://classes.cornell.edu/browse/roster/FA20> to identify possible courses for both the Fall and Spring terms (the spring roster is available here: <https://classes.cornell.edu/browse/roster/SP21>). In addition, students will want to consult the course listing in the Johnson Graduate School of Management, the School of Industrial and Labor Relations, and various other departments within engineering.

Program planning is done with the aid of the M.Eng. Proposal Form for M.Eng. students (see Appendix D). You will fill this form out with the help of your advisor, who must also sign the form showing his/her approval of your program.

A maximum of two credit hours graded on an S/U basis, such as seminar or their equivalent, may be included provided they are participatory in nature.

2.4 Approval of Your Course Program

After a “final” program of courses for the entire year is agreed upon between you and your advisor, please submit your Proposal Form to the Graduate Field Assistant via your Cornell Dropbox. The deadline for each semester are as follows:

Fall semester: **Friday, September 23 2020**

Spring semester: **Tuesday, March 2, 2021**

2.5 Filing Your Course Program

You have approximately three (3) weeks to enroll online for Fall 2020 classes. This time period allows you to sit in on an extra course or two, if you wish, for a couple of weeks to assist you in making up your mind about your exact program for the term. Course choices for the second or third semester should never be listed as TBA, a default set of courses that meet the requirements should be listed. These courses may change with approval, but a full plan should be established for advisor review at the beginning of the program.

2.6 Program Changes

Students often propose changes to their program at the start of their second semester that reflect changes in interests and/or course availability. All changes to your approved M.Eng. program must take the form of a revised proposal. Revised proposal forms must also be approved by your advisor.

It is important that any changes in your program be approved promptly because the current version of your proposal form that is on file serves as a check list for determining compliance with graduation requirements.

2.7 Petitions

Cornell University has a long-standing tradition of considering petitions from students relative to special situations or circumstances that could justify exceptions to the normal rules or requirements. Most petitions are considered by the Director of Graduate Studies. While we are not encouraging use of the petition route to get around requirements, we do want to point out the existence of this process. It gives everyone the opportunity of stating his/her case for special consideration, and therefore it is a very important part of the operational procedures for students attending Cornell University.

2.8 Financial Aid and Work Obligation

Financial aid administered by the College or School can be in the form of fellowships or half-time assistantships. If you have the latter, you will be given eight hours per week of grading-related duties. M.Eng. students typically serve as graders, hold office hours, prepare labs, etc. The faculty will make grading assignments during the first two weeks of classes.

2.9 Grade Requirements

The College requires a minimum grade point average of 2.50 for graduation from the Master of Engineering program. Students admitted on a Provisional Basis must achieve a 3.00 average during their first term in the M.Eng. program to continue in the second term. Typical graduate student grade point averages are much higher than this. At Cornell decimal grade points are assigned to grades with (+) or (-), i.e., A+ = 4.3, A = 4, A- = 3.7, B+ = 3.3, etc.

A grade of less than C- in a course will result in no credit being granted toward satisfaction of the 30-hour minimum requirement. However, these courses are included in calculating grade point averages.

2.10 Facilities

Most of the facilities for the CEE School are housed in Hollister Hall, except for the large-scale infrastructure testing labs in the Bovay Lab (Thurston Hall).

2.11 Building access.

Your ID will also open outside doors to Hollister Hall.

2.12 Job Placement

We are confident that the background you receive in your M.Eng. program will be of great assistance to you in the job market. Employers have always been enthusiastic about Cornell graduates with M.Eng. degrees.

There are two Career Services options that provide extensive assistance to students.

Cornell Career Services is part of Cornell's Division of Student and Campus Life. Their comprehensive services are in Barnes Hall and open to all students, they complement the services offered through career offices in undergraduate colleges that are tailored more to college-specific academic and career goals.

All career services assistance on campus can be found via this link: career.cornell.edu

Jennifer Micale jjm368@cornell.edu is the M.Eng. Career Services Manager located in 201 Carpenter Hall. She specifically works with M.Eng. students. Career Services offers an extensive recruitment program with many interviewers coming to campus each year. You will receive information from the Career Services Office regarding events they host throughout the academic year.

There are many routes to explore in seeking the right engineering position; the key point to remember is that you must take the initiative.

SECTION 3 PROFESSIONAL CONDUCT and SPECIAL NEEDS

3.1 Academic Integrity and Plagiarism

Absolute integrity is expected of every Cornell student in all academic undertakings. Integrity entails a firm adherence to values most essential to an academic community, including honesty with respect to the intellectual efforts of oneself and others. Both students and faculty at Cornell assume the responsibility of maintaining and furthering these values. However, a Cornell student's submission of work for academic credit indicates that the work is their own. All outside assistance should be acknowledged, and the student's academic position should be reported truthfully at all times. In addition, Cornell students have the right to expect academic integrity from each of their peers. It is plagiarism for anyone to represent another's work as their own. As stated in the University Code of Academic Integrity, "The maintenance of an atmosphere of academic honor...is the responsibility of the student and faculty..."

Gray areas sometimes exist when students study and work together. It is important that faculty make clear what is expected and that students understand what authorship citations an instructor expects. To become better acquainted with academic integrity responsibilities, each student should have a copy of the *Policy Notebook for Students, Faculty and Staff* (available in the Dean of Student's Office). Also, a copy of the "University Code of Academic Integrity" is included in the *Handbook of Engineering Students* available from the Engineering College's Office of Admissions and Undergraduate Programs located near the north entrance of Hollister Hall, or on line at <http://cuinfo.cornell.edu/aic.cfm> .

3.2 Student Disability Services

Cornell University is committed to assisting those persons with disabilities who have special needs. Please consider [registering with SDS](#) if you require an accommodation. Also, a brochure describing services for persons with disabilities may be obtained from the Office of Equal Opportunity, Cornell University, 234 Day Hall, Ithaca, New York 14853-2801.

APPENDIX A SCHOOL OF CEE FACULTY and SENIOR LECTURERS

[John D. Albertson](#)

113 Hollister Hall, [jda59](#)

Professor (Ph.D. California/Davis): hydrology, boundary layer meteorology, land-atmosphere interaction, turbulent transport process, wind energy.

[Edwin A. Cowen](#)

119 Hollister Hall, [eac20](#)

Professor (Ph.D. Stanford): environmental fluid mechanics, wave hydrodynamics, coupled air-water transfer processes, mixing and transport processes in the environment, experimental methods.

[Ricardo A. Daziano](#)

305 Hollister Hall, [ra477](#)

Associate Professor, (Ph.D. Laval, Quebec): pro-environmental preferences, sustainable travel behavior, renewable energy, environmentally-friendly energy sources.

[Peter Diamessis](#)

105 Hollister Hall, [pjd38](#)

Professor (Ph.D, California/San Diego): environmental fluid mechanics, hydrodynamics of the coastal/open ocean and lakes, turbulence modeling, hydrodynamic instability theory, spectral methods in scientific and engineering computation, high performance parallel scientific computing.

[Christopher J. Earls](#)

365 Hollister Hall, [cje23](#)

Professor (Ph.D. Minnesota): Structural stability, computational and structural mechanics, behavior and design of metal structures.

[Greeshma Gadikota](#)

117 Hollister Hall, [gg464](#)

Assistant Professor, (Ph.D. Columbia): sustainable energy and resource recovery, chemo-morphological coupling, fluid recovery and storage, designing novel chemical pathways, low carbon and negative emissions technologies, and engineering elemental cycles.

[H. \(Huaizhu\) Oliver Gao](#)

313 Hollister Hall, [hg55](#)

Professor (Ph.D. California/Davis): transportation systems analysis, transportation and environment planning, urban traffic management.

[Andrea Giometto](#)

363 Hollister Hall, [ag956](#)

Assistant Professor (Ph.D. École Polytechnique Fédérale de Lausanne (EPFL)): ecological and evolutionary dynamics of spatially-extended microbial populations using a combination of statistical and nonlinear physics methods, experiments with microbes and genetic engineering.

[Mircea D. Grigoriu](#)

363 Hollister Hall, [mdg12](#)

Professor (Ph.D. MIT): structural engineering, structural reliability, structural dynamics, random vibration, stochastic mechanics.

[April Z. Gu](#)

263 Hollister Hall, [azg4](#)

Professor (Ph.D. Washington): biotechnology for water and wastewater treatment, biological nutrient removal and recovery, biosensors for water quality monitoring, toxicogenomics-based toxicity assessment, phosphorus cycling and bioavailability of nutrients.

[Damian E. Helbling](#)

273 Hollister Hall, [deh262](#)

Assistant Professor (Ph.D. Carnegie Mellon): water quality, chemical and biological processes, transport and fate of emerging contaminants, sustainable water and wastewater treatment technologies.

[Kenneth C. Hover](#)

302A Hollister Hall, [kch7](#)

Professor (Ph.D. Cornell): concrete material properties and construction techniques, durability of construction materials.

[Qi Li](#)

107 Hollister Hall, [ql56](#)

Assistant Professor (Ph.D. Princeton): boundary layer turbulence, fluid-structure interactions, urban heat island, pollutant dispersion, urban sustainability, computational fluid dynamics.

[Jacob Mays](#)

323 Hollister Hall, [jpm452](#)

Assistant Professor (Ph.D. Northwestern): applications of stochastic optimization and statistical learning in transportation and energy systems.

[Gregory C. McLaskey](#)

369 Hollister Hall, [gcm8](#)

Assistant Professor (Ph.D. California/Berkeley): earthquake mechanics, friction and interfaces, nondestructive testing, piezoelectric sensor calibration, the method of acoustic emission, wave propagation, seismology and earthquake scaling.

[Sriramya Nair](#)

371 Hollister Hall, [sn599](#)

Assistant Professor (Ph.D. Texas/Austin): Cement-based magneto-rheological fluids, sustainable cementitious materials, 3-D printing of concrete, oil well cementing, characterization of fresh and hardened cement-based materials, micromechanics using high energy x-ray techniques.

[Linda K. Nozick](#)

311 Hollister Hall, [lkn3](#)

Professor (Ph.D. Pennsylvania): engineering management, transportation systems analysis, systems engineering.

[Thomas D. O'Rourke](#)

422 Hollister Hall, [tdo1](#)

Thomas R. Briggs Professor of Engineering (Ph.D. Illinois): earthquake engineering, geotechnical engineering and analysis, lifeline systems, soil-structure interaction, underground technologies.

[William D. Philpot](#)

453 Hollister Hall, [wdp2](#)

Professor (Ph.D. Delaware): remote sensing, digital image processing, radiative transfer.

[Patrick M. Reed](#)

211 Hollister Hall, [pmr82](#)

Joseph C. Ford Professor of Engineering (Ph.D. Illinois): environmental and water resources systems; planning and management, evolutionary computation; high-performance computing; uncertainty in decision making.

[Matthew C. Reid](#)

267 Hollister Hall, [mcr239](#)

Assistant Professor (Ph.D. Princeton): environmental biogeochemistry; coupled biological and physiochemical processes in soil-water systems; engineered ecosystems for sustainable water quality improvement.

[Ruth E. Richardson](#)

271 Hollister Hall, [rer26](#)

Associate Professor (Ph.D. California/Berkeley): microbiology, application of molecular techniques to understand microbial activities, environmental microbiology of water and soil systems, bioremediation of subsurface contaminants, fate and transport of microbial and chemical contaminants, Civil & Environmental Engineering.

[Samitha Samaranayake](#)

317 Hollister Hall, [ss3496](#)

Assistant Professor (Ph.D. California/Berkeley): transportation systems modeling and optimization, network algorithms, decision making under uncertainty, operations research.

[Jery R. Stedinger](#)

213 Hollister Hall, [jrs5](#)

Dwight C. Baum Professor of Engineering Emeritus (Ph.D. Harvard): stochastic hydrology, water resource systems operations and planning, risk analysis.

[Francis M. Vanek](#)

307 Hollister Hall, [fmv3](#)

Senior Lecturer (Ph.D. Pennsylvania): environmental impact of freight transportation, transportation energy, energy efficiency and renewable energy, green building, systems engineering process applied to commercial product development.

[Derek H. Warner](#)

373 Hollister Hall, [dhw52](#)

Associate Professor (Ph.D. Johns Hopkins): computational solid mechanics, deformation and fracture mechanisms, nanostructured materials and thin films, dynamic failure and fragmentation, massively parallel and multi-scale computing.

APPENDIX B FIVE SEMESTER M.ENG./MBA PROGRAM

What is it?

A joint venture between the College of Engineering and the Johnson Graduate School of Management (JGSM) that allows students to acquire a Master of Engineering degree and an MBA degree in 5 semesters (usually based on Fall admission to the M.Eng. program). The dual-degree program consists of 75 credit hours, 30 of which comprise the regular two-semester M.Eng. program. For those admitted to the MBA program, the JGSM allows

some (occasionally all) of these M.Eng. credits to be transferred to the MBA program, usually resulting in saving one semester's time over taking the M.Eng. and MBA degree programs separately.

What are the requirements?

Applicants must have already earned a baccalaureate degree in engineering, applied science, or equivalent from Cornell or elsewhere and be accepted for admission or presently enrolled in the M.Eng. program. **The two programs require separate application forms and review processes, and materials submitted to one program are not available to the other.** The JGSM places great emphasis on relevant work experience, and this will be taken into consideration when evaluating applications. All requirements of the Master of Engineering (CEE) program are to be completed. No credit toward the M.Eng. degree is allowed for coursework done outside Cornell. All requirements of the Master of Business Administration curriculum are to be completed. Coursework done outside Cornell normally will not be credited toward the MBA degree.

- a. If you have been admitted to or are attending the M.Eng. program, you must formally apply to the Johnson Graduate School of Management by the second semester of your M.Eng. program at the latest. You must fill out a separate JGMS application form and pay their application fee. You should also notify your M.Eng. advisor of your intention to do the MBA program so your advisor can take this into consideration when planning your M.Eng. program schedule.
- b. If you have not already done so, you must apply to take the GMAT, which is required by JGSM, using January of your M.Eng. year as your last possible test date and have the scores directed to JGSM.

If you are admitted to the JGSM, your Master of Engineering degree will be awarded when all requirements of that degree are completed (usually after 2 semesters), and the Master of Business Administration degree will be awarded when all requirements of that degree are completed (usually after 3 more semesters). The two degrees cannot be awarded simultaneously.

In general, financial aid is not awarded to those doing the MBA portion of the program except through the Knight Joint Degree Scholarship Program, which has very strict requirements. Information and an application to the Scholarship Program is available on the web at:

http://www.engineering.cornell.edu/academics/graduate/financial_aid/meng/scholarship.cfm

Questions about this Scholarship Program should be directed to the Office of Research and Graduate Studies, enr_grad@cornell.edu).

APPENDIX C

MASTERS IN PUBLIC ADMINISTRATION (M.P.A.) FROM THE CORNELL INSTITUTE FOR PUBLIC AFFAIRS (CIPA)

After the award of the M.Eng. degree, CEE M.Eng. students who aspire to a leadership or management position in formulating, implementing or evaluating public policies can benefit from a program that offers an accelerated path to a Master's in Public Administration (M.P.A.) from the Cornell Institute for Public Affairs (CIPA). CIPA offers a flexible and challenging two-year program of graduate professional studies in public affairs that prepares degree recipients for careers in public affairs, public administration, and public policy.

Concentration areas offered in CIPA include Environmental Policy; Science, Technology and Infrastructure Policy; Economic and Financial Policy; International Development; and Public and Nonprofit Management.

The two degree programs (M.Eng. and M.P.A.) have separate admission processes; so you may apply to the Accelerated M.P.A. program upon completion of your first semester in the M.Eng. program. The M.Eng. students who possess an M.Eng. can obtain the M.P.A. degree in three additional semesters. Applicants should plan on meeting with the CIPA Director of Graduate Studies to discuss which M.Eng. credits would be transferable for the MPA program.

Please contact the CIPA. Office at 607-255-8018 or cipa@cornell.edu to set up an appointment. More information is available on the CIPA website at www.cipa.cornell.edu.

APPENDIX D MAJOR PROGRAM REQUIREMENTS AND LINKS TO PROPOSAL FORMS

Environmental Engineering:

EWRE MENG Proposal form AY 20 - 21

NOTES:

The options for the program are explained on the spreadsheet along with a list of courses appropriate for each specialty area.

A student may select his or her supporting electives from engineering and non-engineering subject areas related to environmental engineering, including biology, chemistry, toxicology, law, policy, economics, operations research, computer science, engineering mathematics, systems engineering, and city and regional planning.

Credit for seminars count toward the MEng degree only if the format of the seminar is “participatory” (i.e. requires more than attendance). Students are expected to take CEE 6020 Environmental Seminar in the Fall and CEE 6021 in the Spring.

Structural Mechanics and Materials Proposal form:

STR Mechanics and Materials Proposal form AY 20 - 21

NOTES:

The students program must meet the following requirements:

- Project course CEE5071 is required during the special summer term: no exceptions.
- CEE 3720 and MAE 5700 are required courses, to be taken in fall term.
- MAE 6110 can be substituted for CEE 3720 if you plan on taking MAE 6120 in the spring term
- The 4 unspecified major area courses must be selected from:

CEE 6730: Design of Concrete Structures (Fall)

CEE 6770: Natural Hazards, Reliability, and Insurance (Fall)

CEE 6790: Time Series Data Analysis(Fall)

CEE 6725: 3D Printing Parts that Don't Break(Spring)

CEE 6750: Concrete Materials and Construction (Spring)

CEE 7740: Advanced Structural Concrete (Spring)

Typical advisor approved electives are (actual availability depends on staffing in each given semester):

FALL

CEE 5735: Mathematical Modeling of Natural & Engineered Systems

CEE 5950: Construction Planning and Operations
CEE 6000: Numerical Methods for Engineers
CEE 7710: Stochastic Problems Engineering and Science
MAE 6110: Foundations of Solid Mechanics
IMAE 6010: Foundations of Fluid Mechanics
MAE 4130: Mechanics of Composite Structures
MAE 4730: Intermediate Dynamics and Vibrations
MAE 5010: Future Energy Systems
MAE 6810: Methods of Applied Mathematics
ICS 4210: Numerical Analysis and Differential Equations

SPRING

BME 5810: Soft Tissue Biomechanics
CEE 6780: Structural Dynamics and Earthquake Engineering
CS 3220: Introduction to Scientific Computation
MAE 5130: Mechanical Properties of Thin Films
MAE 5790: Nonlinear Dynamics and Chaos
MAE 6120: Foundations of Solid Mechanics II
MAE 6160: Advanced Composite Materials
MAE 6640: Mechanics of Bone
MAE 6780: Methods of Applied Mathematics
IIMSE 6020: Elasticity, Plasticity, and Fracture
TAM 6680: Elastic Waves in Solids with Applications

Transportation Systems Engineering Proposal form:

Transportation Proposal form AY 20 - 21

NOTES:

A project of at least 3 credits is required. In some cases, specific projects may be defined whose scope justifies more than 3 credits.

Transportation Systems courses include:

CEE 5290 Heuristic Methods for Optimization
CEE 5900 Project Management
CEE 5970 Risk Analysis and Management
CEE 6620 [Urban Transportation Network Design & Anal.](#),
CEE 6640 Microeconometrics of Discrete Choice
CEE 6930 Public Systems Modeling

CEE 6065 Special Topics in Transportation can be used to pursue an independent study on a particular transportation topic if you and your advisor agree that this is appropriate. The selection of appropriate transportation core courses will depend on your background, and will be determined in discussion with your advisor.

Supporting electives should be selected from one or more related areas. Typical areas include Operations Research, Economics, City and Regional Planning, Johnson School of Management, and other areas of CEE. Some commonly chosen courses include:

AEM 4170 Decision Models for Small & Large Businesses
AEM 4320 Public Private Sector Economics Linkages
AEM 6330 Devolution, Privatization, & the New Public Management

CRP 5040 Urban Economics
CRP 5080 Intro to Geographic Information Systems
CRP 5170 Economic Development
CRP 5190 Urban Theory and Spatial Development
CRP 5520 Land Use Planning
CRP 5840 Green Cities
CRP 6090 Urban and Regional Theory
CRP 6860 Planning for Sustainable Transportation

ECON 3540 Economics of Regulation
ECON 6090 Microeconomic Theory

NBA 6410 Supply Chain Management

ORIE 5300 Optimization I
& ORIE 5310 Optimization II
ORIE 5510 Introduction to Stochastic Processes
ORIE 4580 Simulation Modeling & Analysis

Credit for seminars count toward the MEng degree only if the format of the seminar is “participatory” (i.e. requires more than attendance).

All courses should be listed whether or not they count in the MEng program. No more than 20 credits per semester (MEng and non-MEng) may be taken except by petition to the College Master of Engineering Committee.

APPENDIX E

OVERALL LISTING OF CEE COURSE INFORMATION:

For an up to date listing of all CEE courses for fall, please visit:

<https://classes.cornell.edu/browse/roster/FA20/subject/CEE>

Spring 2021 CEE courses:

<https://classes.cornell.edu/browse/roster/SP21/subject/CEE>