

CornellEngineering

Civil and Environmental Engineering



CIVIL ENGINEERING **UNDERGRADUATE HANDBOOK**



Civil and Environmental Engineering
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APPENDICIES

- A. Professional Engineering Licensing Information
- B. American Society of Civil Engineers (ASCE) Code of Ethics

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 requirement at any time.

It is the policy of Cornell University to actively support equality of educational 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 maintenance of affirmative action programs that will assure the continuation of such equal 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 (see <http://hr.cornell.edu/diversity/reporting/> or contact the Office of Workforce Policy and Labor Relations, 391 Pine Tree Road, Ithaca, NY 14850; Phone (607) 254-7232; email equalopportunity@cornell.edu) Assistance is also available through the [Diversity Programs Office](#) of the College of Engineering in 146 Olin Hall, Phone: 607-255-6403.

Cornell University is committed to assisting those persons with disabilities who have special needs. Information for accommodations for faculty, staff, students, and visitors may be found at www.cornell.edu/diversity .

Note: Handbook Cover designed by Robert Kurcoba

I. Introduction

Welcome to the School of Civil and Environmental Engineering (CEE) at Cornell. The intent of this handbook is to introduce you to the School, the faculty, and our undergraduate academic programs and activities in CEE. We hope that your undergraduate years in our School will be rich and rewarding both academically and personally.

Educational Objectives

The School of Civil and Environmental Engineering at Cornell University is dedicated to providing the highest quality broad-based technical, scientific, and liberal education. We create and maintain an outstanding educational program in a climate that fosters diverse skills designed for professional success.

Our **objectives** are to prepare our students for:

- Excellence in engineering decision-making and design,
- Leadership careers in engineering practice,
- Graduate professional engineering education,
- Advanced study and research in engineering, and
- Diverse, alternative career choices.

Our graduates will bring the following **outcomes** to the organizations that they join:

1. Understanding of engineering fundamentals and their application to the solution of problems,
2. Completion of a broad-based curriculum rich in liberal studies intended to raise awareness of cultural contexts and societal issues,
3. Creation of sound designs subject to uncertainty and to multiple societal and engineering constraints,
4. Experience with the process of research inquiry,
5. Demonstrated skill at learning in an atmosphere with a high level of information input,
6. Project management skills and an aptitude for management of multiple tasks,
7. Creative, independent thinking and a tolerance for ambiguity,
8. Communication skills, both written and oral,
9. A capacity for leadership, inclusiveness, and teamwork,
10. Professionalism, including ethics,
11. A desire to provide service to society, and
12. An understanding of the contemporary dynamism of the CEE profession and of the need for continued scholarship.

Civil and Environmental Engineering as a Profession

The field of civil and environmental engineering is a people-serving profession. Civil and environmental engineers plan, design, construct, and operate facilities that are used every day – buildings, bridges and space stations, water purification and distribution systems, highways, tunnels, airports, rapid transit systems, dams and electrical generating stations, and other constructed facilities. They analyze land, water, air, and pollution problems; develop designs for pollution and hazardous waste control facilities; and oversee the construction and operation of those facilities. They participate in city planning, in efforts to overcome infrastructure deterioration, in the development of water resource systems, and in the design and operation of other systems fundamental to the quality of life and the preservation of the quality of the environment. A personal reward for civil and environmental engineers is the satisfaction gained from creating enduring constructed facilities that provide communities with places to live, work, and play. Civil and environmental engineers are also concerned with sensing and interpreting the environment using satellite and aircraft imaging. As a profession, civil and environmental engineers must help meet the basic needs of society through economical, safe, aesthetically appealing, sustainable and environmentally sound solutions.

History of Civil and Environmental Engineering at Cornell University

Civil engineering has had a long and distinguished history at Cornell. Cornell's first class of engineers graduated in 1869, was all civil engineers. The first Ph.D. was awarded at Cornell in 1870 and was in Civil Engineering. The first woman to receive a civil engineering degree at Cornell was Nora Stanton Blatch 1905; her grandmother was Elizabeth Cady Stanton and her mother was Harriot Stanton Blatch, both leaders in the Women's Rights Movement and in the struggle for women's suffrage. Nora Blatch became the first woman member of the American Society of Civil Engineers (ASCE), the national professional engineering society formed in 1852.

The School changed its name to "Civil and Environmental Engineering" in the early 1970's, to emphasize the coverage of environmental engineering, traditionally a subject area within civil engineering. Currently the School offers two ABET accredited BS degree programs: Civil Engineering and Environmental Engineering. The School is ranked as one of the top civil and environmental engineering departments in the United States. Our alumni hold key positions in engineering, construction, research and development, government, manufacturing, sales, education, and other areas across the U.S. and in foreign countries.

School Administration

Director of Civil and Environmental Engineering:	Professor Linda K. Nozick
Executive Assistant:	Jeannette Little 220 Hollister 607 255-3690
Associate Director for Undergraduate Programs:	Professor William D. Philpot
Undergraduate Major Coordinator:	Nadine Porter 221 Hollister 607 255-3412
Director of Graduate Studies and Chair, Master of Engineering Program	Professor James J. Jenkins
Chair, Master of Engineering Management Program:	Professor Patrick M. Reed
Graduate Program Coordinator:	Tania Sharpsteen 219 Hollister 607 255-7560

Main Office Contacts:

Administrative Assistant:	Carl Cornell	220 Hollister	607 255-3438
Director of Administration:	Joe Rowe	220 Hollister	607 255-0549
Finance Specialist	Christina Dovi	220 Hollister	607-255-3684

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www.cee.cornell.edu

SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING

Faculty and Teaching Staff Listing by *Mission Area* and *concentration* for 2015-16
Many faculty members participate in more than one concentration



Linda K. Nozick, Director

William D. Philpot, Associate Director

Environmental Processes

James J. Bisogni⁴
Richard I. Dick⁴
James M. Gossett
Damian Helbling
Leonard W. Lion
Ruth E. Richardson
Monroe Weber-Shirk¹

Environmental Fluid Mechanics & Hydrology

John D. Albertson
Wilfried H. Brutsaert⁴
Edwin A. Cowen
Peter Diamessis
James T. Jenkins
Philip L-F. Liu
Patrick M. Reed

Environmental & Water Resource Systems Engineering

John D. Albertson
Douglas A. Haith³
Daniel P. Loucks⁴
William D. Philpot
Patrick M. Reed
Christine A. Shoemaker
Jery R. Stedinger

Engineering Management

Paul G. Carr²
Huaizhu Gao
Mircea D. Grigoriu
Kenneth C. Hover
Linda K. Nozick
Patrick M. Reed
Richard E. Schuler⁴
Christine A. Shoemaker
Jery R. Stedinger
Mark A. Turnquist⁴
Francis M. Vanek¹

Transportation Systems Engineering

Ricardo A. Daziano
Huaizhu Gao
Arnim H. Meyburg⁴
Linda K. Nozick
Samitha Samaranayake⁵
Mark A. Turnquist⁴

Remote Sensing William D. Philpot

Geotechnical Engineering

James T. Jenkins
Thomas D. O'Rourke
Harry E. Stewart
Charles H. Trautmann²

Structural Engineering

John F. Abel⁴
Christopher Earls
Kifle G. Gebremedhin³
Mircea D. Grigoriu
Kenneth C. Hover
Anthony R. Ingraffea⁴
Gregory C. McLaskey
Teoman Peköz⁴
Derek Warner

¹ Sr. Lecturer & Research
Assoc.

² Adjunct Faculty Member

³ Primary Appointment BEE

⁴ Emeritus Faculty

⁵ Arrives January 2016

SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING
FACULTY RESEARCH INTERESTS AND CONTACT INFORMATION

John D. Albertson

113 Hollister Hall, [jda59](#)

Professor (Ph.D. California/Davis): Hydrology, Boundary Layer Meteorology, Land-Atmosphere Interaction, Turbulent transport process, Wind energy.

Paul G. Carr

315 Hollister Hall, [pgc3](#)

Adjunct Associate Professor (Ph.D. Virginia Tech): construction engineering and management.

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, [rad77](#)

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

Peter Diamessis

105 Hollister Hall, [pjd38](#)

Associate 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

Huaizhu Gao

313 Hollister Hall, [hg55](#)

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

James M. Gossett

319 Hollister Hall, [jmg18](#)

Professor (Ph.D. Stanford): environmental engineering, water and waste treatment, microbiological phenomena and processes, treatment of contaminated groundwater.

Mircea D. Grigoriu

363 Hollister Hall, [mdg12](#)

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

Damian E. Helbling

324 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.

James T. Jenkins

117 Hollister Hall, [jtj2](#)

Walter S. Carpenter, Jr. Professor of Engineering (Ph.D. Johns Hopkins): particle and multi-phase flows, soil mechanics.

Leonard W. Lion

263 Hollister Hall, [lwl3](#)

Professor (Ph.D. Stanford): environmental engineering, aquatic chemistry, biogeochemical fate of toxic pollutants, interfacial reactions of pollutants in aqueous systems.

Philip L-F. Liu

107 Hollister Hall, [pll3](#)

Class of 1912 Professor in Engineering (Sc.D. MIT): fluid mechanics, wave hydrodynamics, coastal engineering, and numerical methods.

Daniel P. Loucks

403 Hollister Hall, [dpl3](#)

Professor Emeritus (Ph.D. Cornell): water resource and environmental management systems, interactive multimedia modeling.

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.

Linda K. Nozick

311 Hollister Hall, [lkn3](#)

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

Thomas D. O'Rourke

273 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](#)

Professor (Ph.D. Illinois): Environmental and water resources systems; multiobjective planning and management, evolutionary computation; high-performance computing; uncertainty in decision making.

Ruth E. Richardson

317 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.

Christine A. Shoemaker

210 Hollister Hall, [cas12](#)

Joseph P. Ripley Professor of Engineering (Ph.D. Southern California): modeling groundwater contamination and remediation, pesticide source reduction, optimization algorithms, supercomputing.

Jery R. Stedinger

213 Hollister Hall, [jrs5](#)

Professor (Ph.D. Harvard): stochastic hydrology, water resource systems operations and planning, risk analysis.

Harry E. Stewart

271 Hollister Hall, [hes1](#)

Associate Professor (Ph.D. Massachusetts): geotechnical engineering, dynamic behavior of soils, instrumentation.

Francis M. Vanek

307 Hollister Hall, [fmv3](#)

Senior Lecturer and Research Associate (PhD. 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.

Monroe Weber-Shirk

265 Hollister Hall, [mw24](#)

Senior Lecturer & Research Associate (Ph.D. Cornell): environmental engineering, hydraulics, slow sand filtration, LabVIEW data acquisitions/control.

II. The Undergraduate Overview in Civil and Environmental Engineering

The School of Civil and Environmental Engineering (CEE) offers two undergraduate majors, Civil and Environmental. Graduates from the Civil Major earn a Bachelor of Science (B.S.) bearing the title "Civil Engineering"; the Civil Engineering degree major requires a minimum of 125 academic credit hours. The major in Environmental Engineering is offered jointly by faculty members in CEE and faculty in Biological and Environmental Engineering (BEE). Graduates from the Environmental Major earn a Bachelor of Science (B.S.) bearing the title "Environmental Engineering". The Environmental Engineering degree major requires a minimum of 125 academic credit hours. *This handbook deals only with the Civil Engineering Major.* Both degree programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). Accreditation means, among other things, degree recipients are automatically eligible to take the first part of the examination for professional registration and to be credited with 8 years of Education/Experience towards the total of 12 years needed for full registration (see the section on [Professional Registration](#) and [Appendix B](#)).

Within the broad-based Civil Engineering Major, students may undertake either a general civil engineering curriculum or may focus on civil infrastructure engineering (structural and/or geotechnical), fluid mechanics/hydrology, water resource systems, environmental engineering, or transportation. The Civil Major is summarized in the tables and flow chart in [Section III](#), while samples of possible program foci within the Civil Major are similarly presented in [Section IV](#).

Affiliation Requirements for the Civil Major

The requirements for affiliation with the Civil Major are as follows.

- (1) Have a cumulative GPA of at least 2.0,
- (2) Have a GPA of at least 2.0 in all engineering and science courses,
- (3) Receive a grade of at least C in ENGRD 2020

College of Engineering Requirements

A number of curriculum requirements are set by the College of Engineering. These include Approved Electives, Technical Communications, and the Liberal Studies Distribution requirement. Not discussed in this handbook are the additional common College requirements usually taken before affiliation such as mathematics, physics, chemistry, and freshman writing seminars. See [Courses of Study](#) or [The Engineering Undergraduate Handbook](#) for details on these requirements.

Approved Electives

Approved Electives totaling at least six credits are required. An Approved Elective is a course selected by the student and accepted by the student's advisor. Approved Electives should be an appropriate part of an educational plan or objective. This constraint allows flexibility for individual goals while maintaining a coordinated, challenging program. Advisors generally accept as Approved Electives: Engineering Distribution courses; courses stressing oral or written communication; upper-division engineering courses; advanced courses in math and the biological and physical sciences; and courses in management, business, economics, languages, humanities, and social sciences. Selection of Approved Electives is an important matter that needs to be discussed by students and their advisors. (Please note that six credits of Advisor Approved Electives will be allowed from ROTC courses at level 3000 or above.)

Technical Communications

Students must complete a course in Technical Communications.

CEE students may choose from one of these options:

1. Take one of these offered courses:

- a. ENGRC 3500 Engineering Communications*
- b. ENGRC 3020 Project Team Communications: Practicum in Technical Writing
- c. ENGRC 3350 Communications for Engineering Managers*
- d. ENGRC 3340 Independent Study in Engineering Communications

2. The Writing Intensive Coop. An opportunity to combine work and academics. Some co-op students do a significant amount of writing on the job; under certain circumstances, this writing will satisfy the technical-writing requirement. **

3. Take an officially designated Writing-Intensive engineering course:

- a. AEP/ENGRD 2640 Computer Instrumentation Design
- b. BEE 4530 Computer-Aided Engineering: Applications for Biomedical Processes
- c. BEE 4590 Biosensors and Bioanalytical Techniques
- d. BEE 4730 Watershed Engineering
- e. BEE 4890 Entrepreneurial Management for Engineers
- f. MAE 4272 Fluids/Heat Transfer Laboratory

4. COMM 3030 Organizational Writing or COMM 3020 Science Writing for the Media

5. ENGRC 3023 Writing Intensive Opportunity: Practicum in Technical Writing (a 1 credit attachment to an engineering course that is not one of the officially designated writing-intensive courses.

6. Petition: Occasionally, a student will be doing a significant amount and variety of technical writing elsewhere in the College of Engineering. It may be appropriate to petition the CCGB Subcommittee on Technical writing for permission to use this forthcoming (not past) writing to meet the technical writing requirement.

**Also a Liberal Studies Course in the Communications Engineering (CE) Category.*

Students who use their Technical Communications course to fulfill another requirement (liberal studies, major approved elective, etc.) must take an additional Advisor Approved Elective.

Special Cases: Students may also petition to meet the Technical Communications requirement through their Co-op experience (see page 11. This must be arranged beforehand, on an individual basis through the Director of the Engineering Communications Program. In this case there is no additional credit given, just a notation on the transcript. Student's using Co-op to meet the Technical Communications may have to take an additional Advisor Approved Elective to meet minimum credit requirements for graduation.

For questions or an appointment to discuss options, please contact Rick Evans, the ECP Director at rae27@cornell.edu .

Liberal Studies Distribution

Global and diverse societies require that engineers have an awareness of historical patterns, an appreciation for different cultures, professional ethics, the ability to work in multi-faceted groups, and superior communications skills. Cornell has a rich curriculum in the humanities, arts, and social sciences, enabling every engineering student to obtain a true liberal education. A minimum of six courses (totaling at least 18 credits) is required, and they should be chosen with as much care and foresight as courses from technical areas. Liberal Studies courses are distributed among seven groups: Cultural Analysis (CA), Historical Analysis (HA), Literature and the Arts (LA), Knowledge Cognition, and Moral Reasoning (KCM), Social and Behavioral Analysis (SBA), Foreign Language (FL), and Communications in Engineering (CE). The six courses must be chosen from at least three of the seven groups and at least two of the six courses must be at the 2000-level or higher. Only one course can be chosen from the CE category. The groups are described below.

Cultural Analysis (CA)

Courses in this area study human life in particular cultural contexts through interpretive analysis of individual behavior, discourse, and social practice. Topics include belief systems (science, medicine, religion), expressive arts and symbolic behavior (visual arts, performance, poetry, myth, narrative, ritual), identity (nationality, race, ethnicity, gender, sexuality), social groups and institutions (family, market, community), power and politics (states, colonialism, inequality).

Historical Analysis (HA)

Courses in this group interpret continuities and changes – political, social, economic, diplomatic, religious, intellectual, artistic, scientific – through time. The focus may be on groups of people, dominant or subaltern, a specific country or region, an event, a process, or a time period.

Literature and the Arts (LA)

Courses in this area explore literature and the arts in two different but related ways. Some courses focus on the critical study of artworks and on their history, aesthetics, and theory. These courses develop skills of reading, observing, and hearing, and encourage reflection on such experiences; many investigate the interplay among individual achievement, artistic tradition, and historical context. Other courses are devoted to the production and performance of artworks (in creative writing, performing arts, and media such as film and video). These courses emphasize the interaction among technical mastery, cognitive knowledge and creative imagination.

Knowledge, Cognition, and Moral Reasoning (KCM)

Courses in this area investigate the basis of human knowledge in its broadest sense, ranging from cognitive faculties shared by humans and animals such as perception, to abstract reasoning, to the ability to form and justify moral judgments. Courses investigating the sources, structure, and limits of cognition may use the methodologies of science, cognitive psychology, linguistics, or philosophy. Courses focusing on moral reasoning explore ways of reflecting on ethical questions that concern the nature of justice, the good life, or human values in general.

Social and Behavioral Analysis (SBA)

Courses in this area examine human life in its social context through the use of social-scientific methods, often including hypothesis testing, scientific sampling techniques, and statistical analysis. Topics studied range from the thoughts, feelings, beliefs, and attitudes of individuals to interpersonal relations between individuals (e.g. in friendship, love, conflict) to larger social organizations (e.g. the family, society, religious or educational or civic institutions, the economy, government) to the

relationships and conflicts among groups or individuals (e.g. discrimination, inequality, prejudice, stigmas, conflict resolution).

Foreign Languages (not literature courses)

Courses in this area teach language skills, inclusive of reading, writing, listening, and spoken non-English languages, at beginning to advanced levels.

Communication in Engineering (CE)

Courses in this area explore communication as a way of acting in the world. The primary aim is to provide students with the opportunity to practice performing a range of engineering-related communication skills within specific genres (e.g. proposals, reports, and journal articles, oral presentations, etc.). Each of these genres potentially engages a wide variety of audiences and, depending on the particulars of context, each may have multiple purposes. The secondary aim is to enable students to be aware of the choices they make as communicators and to be able to articulate a rationale for those choices. (Only one course will be allowed to be counted in this category.)

Courses approved as Liberal Studies by the College of Arts and Sciences and the College of Agricultural and Life Sciences are marked in the Courses of Study with the appropriate acronym (CA, CE, HA, LA, KCM, or SBA). Additional courses that have been reviewed by the College of Engineering and been either approved or determined to be unacceptable can be viewed at <http://www.cs.cornell.edu/gries/ccgb/>.

Special Academic Programs

Co-op Program

The CEE School encourages participation in the Engineering College's Cooperative Education Program. A cumulative GPA of 2.7 or better and a declared major by the end of the sophomore year are required to participate in the Engineering Co-op Program. Students must also have junior status prior to the first work term. Prospective Co-op students are interviewed by representatives of participating companies and select their work assignments from among the offers they receive. Students who join the program generally take their fifth-semester courses at Cornell during the summer following their sophomore year and begin their first Co-op work assignment in the fall. They return to complete semester six (the second half of the junior year) with their classmates, and then complete a second work assignment with the same company during the following summer. Co-op students return to campus for their senior year and graduate with their classmates. Co-op students are encouraged to keep in contact with the School while on work assignments. The Co-op Office is located in 201 Carpenter Hall; Phone: (607) 255-3512; Email: engr_coop@cornell.edu; <http://www.engineering.cornell.edu/coop>.

Honors Program

The honors program in Civil Engineering consists of at least nine credits beyond the minimum required for graduation. These nine credits shall be drawn from one or more of the following components (with no fewer than two credits in any selected component):

1. A significant research experience or honors project under the direct supervision of a CEE faculty member using CEE 4000: Senior Honors Thesis (1–6 credits per semester). A significant written report or senior

honors thesis must be submitted as part of this component. Letter grade only.

2. A significant teaching experience under the direct supervision of a faculty member using a regularly recognized course in the College of Engineering (i.e., CEE 4010: Undergraduate Teaching in CEE [1–3 credits per semester]).
3. Advanced or graduate courses at the 5000 level or above.

No research, independent study, or teaching for which the student is paid may be counted toward the honors program.

Eligibility: students must enter with and maintain a cumulative GPA equal or greater than 3.50.

Application: students must apply no later than the beginning of the first semester of their senior year but are encouraged to apply as early as the first semester of their junior year. All honors program students must be in the program for at least two semesters before graduation.

Each applicant to the Civil Engineering Honors Program must have a faculty advisor or faculty member to supervise the student's individual program. (This need not be the student's faculty advisor.) Applications can be obtained from Hollister 221. Each program must be approved by the CEE Curriculum Committee, although the committee may delegate approval authority to the Associate Director for all but unusual proposals.

Students successfully completing the Civil Engineering Honors Program will be awarded their diplomas *with Honors in Civil Engineering*.

Minors in Engineering

In 1999, the College instituted minors in engineering. These minors, sponsored by participating departments, promote interdisciplinary study in engineering. CEE students are eligible to receive minors in

- Aerospace Engineering (MAE)
- Applied Mathematics (MAE)
- Biological Engineering (BEE)
- Biomedical Engineering (BME)
- Business for Engineering Students (AEM)
- Computer Science (CS)
- Electrical and Computer Engineering (ECE)
- Engineering Management (CEE)
- Engineering Statistics (ORIE)
- Environmental Engineering (BEE/CEE)
- Game Design (CS)
- Industrial Systems & Information Science Technology (ORIE)
- Information Science (CS)
- Materials Science and Engineering (MSE)
- Mechanical Engineering (MAE)
- Operations Research & Mgmt Science (ORIE)
- Science of Earth Systems (SES)
- Sustainable Energy Systems (BEE/CBE/SES/MAE)

Each Minor requires a minimum of eighteen credits of coursework and specifies required course(s) and a choice of elective courses. Each department administers its own minor(s) and specific information regarding course work is available from individual departmental undergraduate major offices, from Engineering Advising, or in [*The Engineering Undergraduate Handbook*](#).

When the minor requirements are completed and certified by the offering department, a notation is made on the student's transcript.

Minor in Engineering Management

This minor focuses on giving engineering students a basic understanding of engineering economics, accounting, statistics, project management methods, and analysis tools necessary to manage technical operations and projects effectively. The minor provides an important set of collateral skills for students in any engineering discipline. Students in all Majors may participate in this minor. Civil students may not use courses simultaneously to satisfy a requirement for the minor and as a major approved elective or a design elective. Students must receive a grade of C or better in each course in the minor.

Requirements

At least six (6) courses (minimum of 18 credits), chosen as follows:

Required Courses (3)

CEE 3230 Engineering Economics and Management	(S,3)
or OR&IE 4150 Economic Analysis of Engineering Systems	(S,4)
 OR&IE 3150 ¹ Financial and Managerial Accounting	 (F,W,Su, 4)
 CEE 3040 ² Uncertainty Analysis in Engineering	 (F,4)
or ENGRD 2700 Basic Engineering Probability and Statistics	(F,S,Su,3)
or ECE 3100 Introduction to Probability and Inference for Random Signals and Systems	 (F,4)

Additional Courses—Choose any three³

ENGRG 3600 Ethical issues in Engineering Practice	(S, 3)
CEE 5930 ⁴ Engineering Mgmt. Methods	(F,4)
CEE 5950 Construction Planning and Operations	(F,3)
CEE 5970 Risk Analysis and Management	(S,3)
CEE 5980 Introduction to Decision Analysis	(F, 3)
NBA 5070 Entrepreneurship for Scientists and Engineers	(F,S,3)
or MAE/ENGRG 4610/OR&IE 4152 Entrepreneurship for Engineers	(F,3)
or BEE 4890 Entrepreneurial Management for Engineers	(F,4)

¹ ORIE students must substitute NCC 5560 or NBA 5000 for ORIE 3150

² MAE 3100 cannot be substituted for CEE 3040.

³ Other courses approved by petition in advance.

⁴ This course is not accepted for ORIE students.

Minor in Environmental Engineering

A fundamental challenge for the engineering profession is development of a sustainable society and environmentally responsible industry and agriculture reflecting an integration of economic and environmental objectives. We are called upon to be trustees and managers of our nation's resources, the air in our cities, and water in our aquifers, streams, estuaries, and coastal areas. This minor encourages engineering students to learn about the scientific, engineering, and economic foundations of environmental engineering so that they are better able to address environmental management issues. Students in all majors except Environmental Engineering may participate in this minor. Civil students may not use courses simultaneously to satisfy a requirement for the minor and as a major approved elective or a design elective.

Requirements

At least six (6) courses (minimum of 18 credits), chosen from the following group listings, with at least one (1) course from each group.

Group A. Environmental Engineering Processes

BEE/ENGRD 2510 Engineering for a Sustainable Society	(F,3)
BEE 4010 Renewable Energy Systems	(S,3)
BEE 4760 Solid Waste Engineering	(S,3)
BEE/EAS 4800 Our Changing Atmosphere: Global Change and Atmospheric Chemistry	(F,3)
BEE 4870 Sustainable Bioenergy Systems	(F,3)
CEE 3510 Environmental Quality Engineering	(S,3)
CEE 4510 Microbiology for Environmental Engineering	(F,3)
CEE 4530 Laboratory Research in Environmental Engineering	(S,3)
CEE 4540 Sustainable Municipal Drinking Water Treatment	(F,3)
CEE 4550 AguaClara: Sustainable Water Supply Project	(F,S,3)
CEE 6530 Water Chemistry for Environmental Engineering	(F,3)
CEE 6560 Physical/Chemical Processes	(F,3)
CEE 6570 Biological Processes	(S,3)
ENGRI 1130 Sustainable Design for Appledore Island	(S,3)
(May count only if taken before the junior year)	

Group B. Environmental Systems

BEE 4750 Environmental Systems Analysis	(F,3)
BEE 4880 Applied Modeling and Simulation for Renewable Energy Systems	(S,3)
CEE 4650 Transportation, Energy, and Environmental Systems for Sustainable Development	(S,3)
CEE 5970 Risk Analysis and Management	(S,3)
ChemE 6660 Analysis of Sustainable Energy Systems	(F,3)

Group C. Hydraulics, Hydrology, and Environmental Fluid Mechanics

BEE 3710 Physical Hydrology for Ecosystems	(S,3)
BEE 4270 Water Measurement and Analysis Methods	(F,3)
BEE/EAS 4710 Introduction to Groundwater	(S,3)
BEE 4730 Watershed Engineering	(F,4)
BEE 4740 Water and Landscape Engineering Applications	(S,3)
CEE 3310 Fluid Mechanics	(F,4)
(CHEME 3230 or M&AE 3230 may be substituted for CEE 3310)	

CEE 4370	Experimental Methods in Fluid Dynamics	(S,3)
CEE 6310	Computational Simulation of Flow & Transport in the Environment	(S,3)
CEE 6550	Transport Mixing and Transformation in the Environment	(F,3)

Academic Standards

At least C- in each course in the minor and a GPA > 2.0 in all courses in the minor.

Other Special Programs

Please consult *The Engineering Undergraduate Handbook* for information on the following additional special programs: the Independent Major, Double Majors, Dual Degree, Study Abroad, and the Undergraduate Research Program.

Civil students interested in pursuing a *double major with Environmental Engineering* must have a program plan that reflects distinct thrusts in the two areas. Among the five courses used for Design and Major-approved Electives, the five used for the EnvE degree should include four courses not used for the core program or Design and Major-approved elective for the Civil degree program, and vice versa. The extra courses may be used as advisor approved electives. If interested please complete the double major form available in Engineering Advising (167 Olin Hall) or at the undergraduate coordinator's office, HLS 221.

For information about a *Minor in Architecture* contact: Heidi Ingram Berrettini, Undergraduate Program Coordinator, College of Architecture, Art, and Planning, in 139 Sibley Hall; Tel: (607) 255-5237; Email: heidi.ingram@cornell.edu.

Link: <http://aap.cornell.edu/academics/architecture/undergraduate/minor>.

Information on the **Exchange Program with the Universidad de Cantabria** in Santander, Spain is available at <http://www.engineering.cornell.edu/cee/academics/undergraduate/exchange.cfm>

For information on other programs see:

http://www.engineering.cornell.edu/academics/undergraduate/special_programs/abroad/programs/index.cfm

III. The Civil Engineering Major

The information on the availability of courses and semester in which they are offered that is mentioned in this section is based on information available as this Handbook goes to press. However, this information is subject to change for reasons beyond our control such as course enrollments; scheduling conflicts; and decisions by other departments to change, offer, or not offer courses. Other sources include:

The CE Major description on the CEE web page:

https://www.cee.cornell.edu/cee/academics/undergraduate/civil_engineering.cfm

The Courses of Study 2015-16, a full catalog of Cornell's academic programs,
<http://courses.cornell.edu/index.php>.

The courses of study includes course descriptions for the entire University
<http://courses.cornell.edu/content.php?catoid=26&navoid=6782>

Course, time&room rosters and exam schedules

<https://classes.cornell.edu/browse/roster/FA15>

<http://registrar.sas.cornell.edu/Sched/exams.html>

A roster of courses offered by CEE are available on the CEE web site at
<http://www.engineering.cornell.edu/cee/academics/courses/index.cfm>

Engineering Distribution Courses

Students planning to enter the broad-based Major of Civil Engineering are required to take ENGRD 2020, *Statics and Mechanics of Solids* (F,S,4), either before or during the sophomore year. Students are strongly advised to take ENGRD 2020 no later than the Fall semester of sophomore year because, in the spring semester, students will usually take CEE 3710 and/or MAE 2030, both of which have ENGRD 2020 as a prerequisite.

A student must also take a second Engineering Distribution course. The following recommendations are made based on area of interest:

- Civil Infrastructure, Structural Engineering, and Civil Engineering Materials
ENGRD/MSE 2610 Mechanical Properties of Materials (F,3)
- Hydraulics / Hydrology / Water Resources
ENGRD/MAE 2210 Thermodynamics (F, Su,3)
- Transportation
ENGRD/CS 2110 Object-Oriented Programming & Data Structures (F,S,Su,3)
- Environmental
ENGRD/BEE 2510, Engineers for a Sustainable Society (F,3)
- For all interests
ENGRD/CEE 3200 Engineering Computation (S,3)

Core Courses for the Civil Major

Required Major Core Courses:

CEE 4780	Structural Dynamics and Earthquake Engineering	(S,3)
<i>or</i>		
MAE 2030	Dynamics	(S, 3)
ENGRD/CEE 3200 ¹	Engineering Computation	(S,3)
CEE 3040 ³	Uncertainty Analysis in Engineering	(F,4)
CEE 3230	Engineering Economics and Management	(S, 3)
CEE 3310	Fluid Mechanics	(F,Su,4)
CEE 3410	Introduction to Geotechnical Engineering	(F,4)
CEE 3510	Environmental Quality Engineering	(S, 3)
CEE 3610	Introduction to Transportation Engineering	(S, Su,3)
CEE 3710	Structural Modeling and Behavior	(S,4)
ENGRC XXXX ²	Technical Communications	(F,S,Su,3)

¹ Students using this course as an Engineering Distribution Course must take an additional Major-Approved Elective. A course may not count as both a distribution course and a core course.

² Please see page 9 for a listing of appropriate [Technical Communications courses](#). Students meeting the Technical Communications requirement with a course that fulfills another requirement must take another Advisor-Approved Elective.

³ ENGRD 2700 (F,S,Su,3) will be accepted (by petition to CEE) as a substitute for CEE 3040 if taken prior to affiliation with the CEE major or if necessary due to scheduling conflicts caused by Co-op or Study Abroad programs.

Exceptions

Students may substitute CEE 3720 or CEE 4710 for either CEE 3510 or CEE 3610, if they also complete either CEE 4730 or CEE 4740. However, CEE 3720 or CEE 4710 will then count as a Core Course only and not as a CEE Design course or Major-Approved Elective.

Design Courses and Major-Approved Electives for the Civil Major

Students must take a total of five courses from the following lists of electives. At least three of these courses must be CEE Design Courses (designated by an asterisk), one of which must be a "capstone" course (designated by **bold** type).

* BEE 4730 Watershed Engineering	(F,4)
BEE 4750 Environmental System Analysis	(F,3)
* BEE 4760 Solid Waste Engineering	(S,3)
CEE 3720 Intermediate Solid Mechanics	(F,Su,4)
* CEE 4110 Remote Sensing for Environmental Resource Inventory	(F,3)
CEE 4320 Hydrology	(F,3)
* CEE 4350 Coastal Engineering	(S,4)
CEE 4370 Experimental Methods in Fluid Dynamics (Next Offered 2016-2017)	(S,3)
* CEE 4400 Foundation Engineering	(F,3)
* CEE 4410 Retaining Structures and Slopes	(S,3)
CEE 4450 Soil Dynamics and Geotechnical Earthquake Engineering	(S,3)
CEE 4510 Microbiology for Environmental Engineering	(F,3)
CEE 4530 Laboratory Research in Environmental Engineering	(S,3)
* CEE 4540 Sustainable Municipal Drinking Water Treatment	(F,3)
* CEE 4550 AguaClara: Sustainable Water Supply Project	(F, S, 3)
* CEE 4630 Future Transportation Technologies and Systems	(F,3)
* CEE 4640 Transportation Systems Design	(S,3)
CEE 4710 Fundamentals of Structural Mechanics (Next Offered 2016-2017)	(F,3)
* CEE 4730 Design of Concrete Structures	(F,4)
* CEE 4740 Introduction to the Behavior of Metal Structures	(S,4)
* CEE 4750 Concrete Materials and Construction	(S,3)
CEE 4780 Structural Dynamics and Earthquake Engineering	(S,3)
* CEE/BEE 4810 LRFD-Based Engineering of Wood Structures	(S,3)
CEE 5240 Model Based Systems Engineering	(F,3)
CEE 5930 Engineering Management Methods	(F,4)
CEE 5950 Construction Planning and Operations	(F,3)
CEE 5970 Risk Analysis and Management	(S,3)
CEE 5980 Introduction to Decision Analysis	(F,3)
CEE 6100 Remote Sensing Fundamentals	(F,3)
* CEE 6370 Experimental Methods in Fluid Dynamics (Next Offered 2016-2017)	(S,4)
CEE 6550 Transport, Mixing, and Transformation in the Environment	(F,3)
CEE 6570 Biological Processes	(S,3)
CEE 6640 Microeconometrics of Discrete Choice	(F,3)
CHEME 6610 Air Pollution Control	(S,3)
EAS 4570 Atmospheric Air Pollution (Next Offered 2016-2017)	(F,3)
EAS/MAE 6480 Air Quality and Atmospheric Chemistry (Next Offered 2016-2017)	(F,3)
ORIE 3310 Optimization II	(S,Su,4)

Not offered for the next two years

* CEE 4060 Civil Infrastructure Systems	(S,3)
* CEE 4440 Environmental Site and Remediation Engineering	(S,3)
* CEE 4650 Transportation, Energy and Environment Systems for Sustainable Development	(S,3)
CEE 4720 Introduction to the Finite Element Method	(F,3)
* CEE 4920 Engineers for a Sustainable World	(F,3)
CEE 5290 Heuristic Methods for Optimization	(F,3)
CEE 6310 Computational Simulation of Flow and Transport in the Environment	(S,3)
CEE 6230 Environmental Quality Systems Engineering	(F,3)
CEE 6330 Flow in Porous Media and Groundwater	(S,3)
ORIE 4330 Discrete Models	(F,4)

In addition, in consultation with their advisors, students may petition for other upper level (≥ 4000) CEE courses to be considered to meet the Design or Major-Approved Electives. Students are also able to petition for other courses outside the major to count towards a Major-Approved Elective if it is a technical course, which has either a technical prerequisite beyond the common curriculum, or an advanced standing (4000 level or above and is limited to Juniors or above).

Additional Science Requirement

Students must complete an additional science course. The requirement for “one additional area of basic science” reflects ASCE’s intent that civil engineering graduates develop greater breadth in the basic sciences beyond the technical core subjects of physics and chemistry. Some possible additional areas of study include biology, ecology, geology, geomorphology, and geo-spatial representation – areas of significant interest and increasing importance for civil engineers. This requirement can be met in one of several ways:

- using credit for AP Biology,
- taking an approved science course as an Advisor-Approved Elective
- using a science course as the replacement when a CE core curriculum course (ENGRD 3200) to meet the 2nd distribution requirement..
- taking an approved science course as an additional course.

A list of approved science courses appears below. Students may also petition to have other courses approved.

BiOG 1440 Comparative Physiology	(F, S, Su,3)
BIOMG 1350 Cell and Developmental Biology	(F, S, Su,3)
BIOEE 1610 Ecology and the Environment	(F, S, Su, 3-4)
EAS 1540 Introductory Oceanography	(F, S, 3)
EAS 2200 The Earth System	(F, S, 4)
EAS 3030 Introduction to Biogeochemistry	(F, 4)
EAS 3050 Climate Dynamics	(F, 3)
EAS 3410 Atmospheric Thermodynamics and Hydrostatics	(F, 3)
EAS 3420 Atmospheric Dynamics	(S, 3)
EAS 3530 Physical Oceanography	(F, 3)

On the next page is a flow chart illustrating the broad-based Civil Major. Please be aware that the flow charts are meant to depict **a typical way of arranging curriculum rather than a strictly rigid sequence of courses**. There are many valid ways for students to work out their course sequence in consultation with their faculty advisor or the Associate Director of CEE. A number of suggested possible programs for focused study within the Civil Major are presented in section IV along with their respective flow charts.

Civil Engineering Major (CE)

^aMust take one additional basic science course. This course may simultaneously satisfy another requirement such as advisor approved elective. Courses meeting that requirement are: BIOG 1440, BIOEE 1610, BIOMG 1350, EAS 2200, 3030, 3050, 3410, 3420, and 3530.

^bENGRD 2610 is strongly recommended for Infrastructure, ENGRD 2110 for transportation, and ENGRD 2210 for Fluid Mechanics/Hydrology/Water Resources.

^cMay substitute CHEM 2080 or CHEM 1570 for PHYS 2214.

^dStudents taking ENGRD 3200 or CEE 3040 as the 2nd distribution course must take an additional Major-approved elective.

^eMAE 2030 (S) may be taken in the second year; CEE 4780 (S) should not be taken until the third or fourth year. Note that MATH 2940 is a co-requisite for CEE 4780.

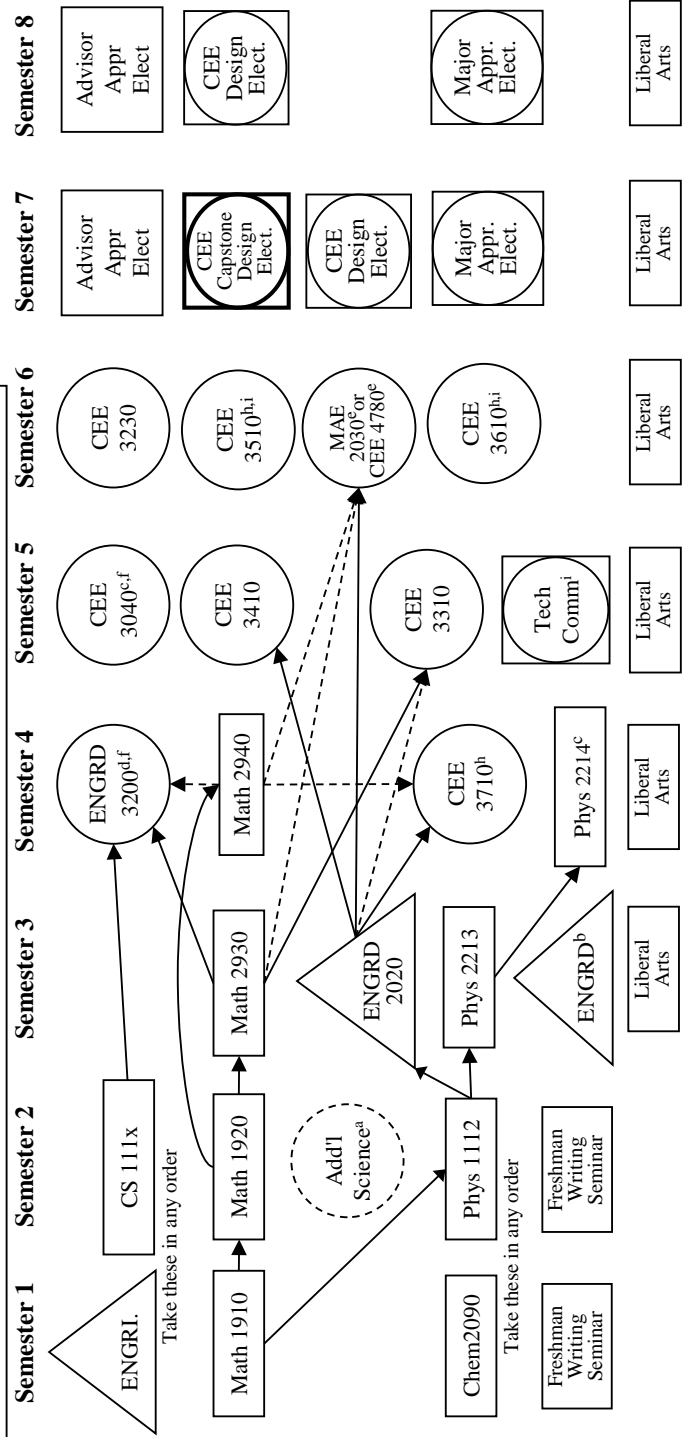
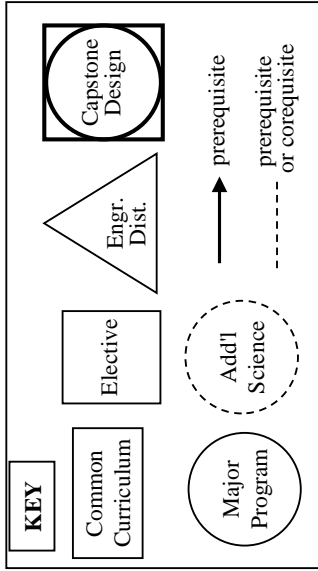
^fENGRD 3200 (S) may be taken in semesters 4 or 6

^gENGRD 2700 may be accepted (by petition) to substitute for CEE 3040 if taken prior to affiliation in the Major or if necessary because of scheduling conflicts.

^hStudents may take 3510, 3610 or 3710 in Semester 4, depending on their interests.

ⁱMay substitute CEE 3720 or CEE 4710 for either CEE 3510 or CEE 3610 if one takes either CEE 4730 or 4740. However, CEE 3720 or CEE 4710 then count as a Core Course only and not as one of the five CEE Design Courses or Major-Approved Electives.

^jIf the technical communication requirement is met with a course that fulfills another requirement, then and additional advisor approved elective is required.



IV. Suggestions for Program Focused Study within the Civil Major

While it is not necessary to do so, many students choose to emphasize one or two of the different areas within the Civil Major. The following is a guide for those students who wish to focus on a particular area within the general major of civil engineering. **The flow charts presented are meant to be *sample curricula* rather than strictly defined sequences of courses.** Students have great flexibility in working out their focus with their faculty advisor. Please know that neither the School nor the College formally recognizes these focuses.

Focus on Civil Infrastructure

This area encompasses geotechnical engineering, structural engineering, and materials. An additional topic that contributes to this area is construction management. Students interested in this area often take:

ENGRI 1120 Earthquake!	(S,3)
or	
ENGRI 1160 Modern Structures (first year students should take this course)	(F,3)
ENGRD 2610 Mechanical Properties of Materials (Recommended Engineering Distribution)	(F,3)

Suggested Design and Major-Approved Electives (Design courses are designated by an asterisk; Capstone Design courses are shown in **bold** type.)

CEE 3720 Intermediate Solid Mechanics	(F,4)
* CEE 4350 Coastal Engineering	(S,4)
* CEE 4400 Foundation Engineering	(F,3)
* CEE 4410 Retaining Structures and Slopes	(S,3)
CEE 4710 Fundamentals of Structural Mechanics (Next Offered 2016-2017)	(F,Su,3)
* CEE 4730 Design of Concrete Structures	(F,4)
* CEE 4740 Introduction to the Behavior of Metal Structures	(S,4)
* CEE 4750 Concrete Materials and Construction	(S,3)
CEE 4780 Structural Dynamics and Earthquake Engineering	(S,3)
* CEE 4810 LRFD-Based Engineering of Wood Structures	(S,3)
CEE 5950 Construction Planning and Operations	(F,3)

Not offered for the next two years

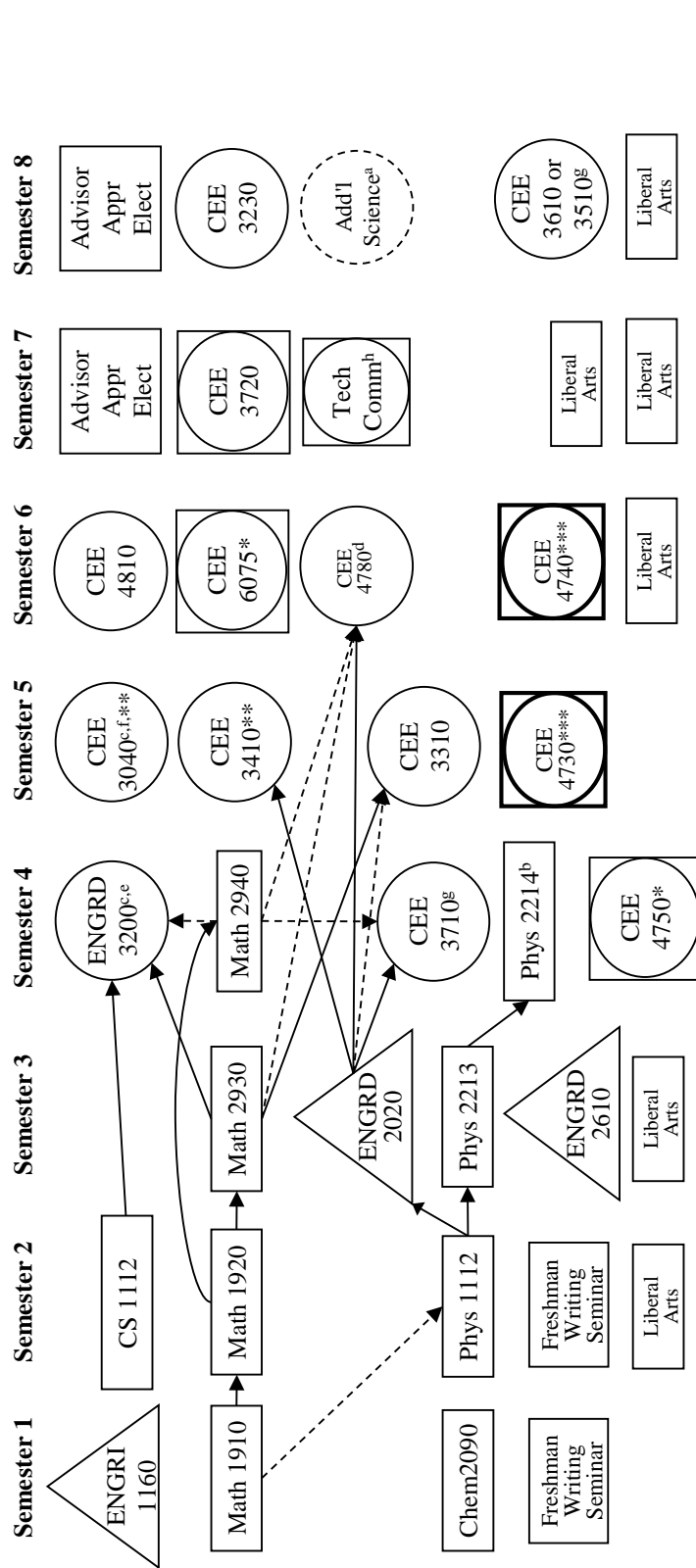
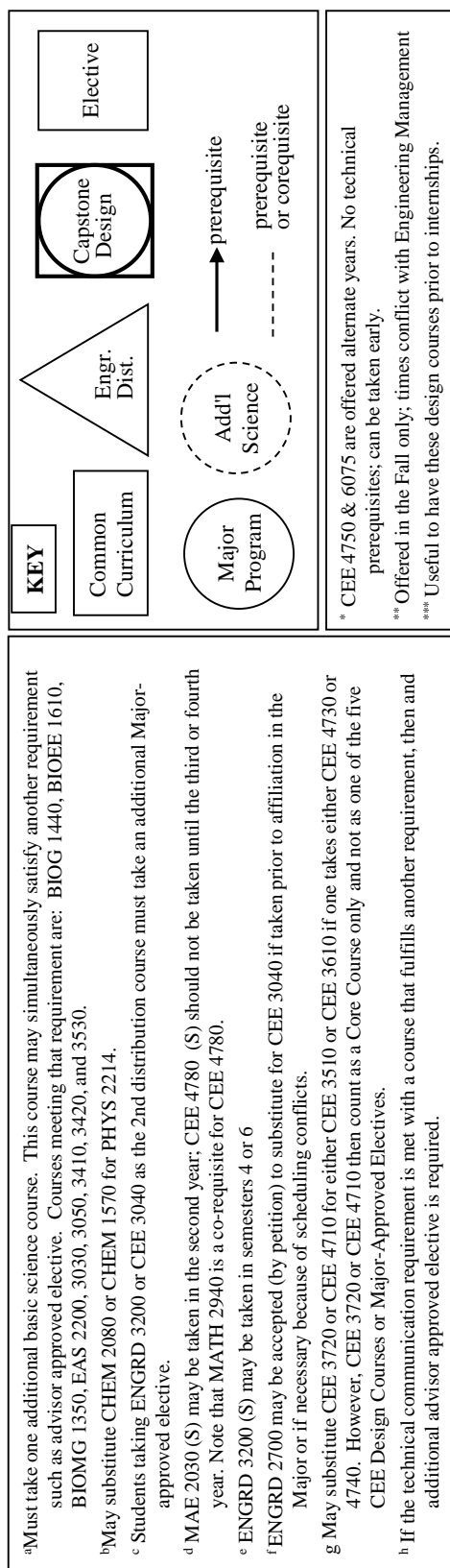
* CEE 4060 Civil Infrastructure Systems	(S,3)
* CEE 4440 Environmental Site and Remediation Engineering	(S,3)
CEE 4720 Introduction to the Finite Element Method	(F,3)

(Note that students may substitute CEE 3720 or CEE 4710 for either CEE 3510 or CEE 3610, if they also complete either CEE 4730 or CEE 4740. However, CEE 3720 or CEE 4710 then counts as a Core Course only and not as a CEE Design Course or Major-Approved Elective.)

A flow chart showing a sample focus in **civil infrastructure** is given on the following page. Please be aware that the flow chart is meant to depict a typical way of arranging curriculum rather than a strictly rigid sequence of courses. There are many valid ways for students to work out their course sequence in consultation with their faculty advisor or the Associate Director of CEE.

Suggested course selections

Civil Infrastructure Focus



Focus on Fluid Mechanics, Hydrology, and Water Resources

Students with a strong interest in fluid mechanics, hydrology and water resources may take a diverse set of courses in that area while meeting the requirements for the degree in Civil Engineering. Students with a primary interest in Environmental Engineering may want to consider a similar path within the Environmental Engineering Major

Design and Major-Approved Elective courses that can be incorporated in a broad-based Civil Major are listed below. For example, CEE 3310 *Fluid Mechanics* and CEE 3510 *Environmental Quality Engineering* are core courses to which can be added BEE 4750 *Environmental Systems Analysis*, which provide introductions to hydraulics and environmental systems topics. Interested students should consider courses on the following list and one of which must be a "capstone" course (designated by **bold type**) (Design Courses are designated by an asterisk):

Suggested Design and Major-Approved Electives (Design courses are designated by an asterisk; Capstone Design courses are shown in **bold type**.)

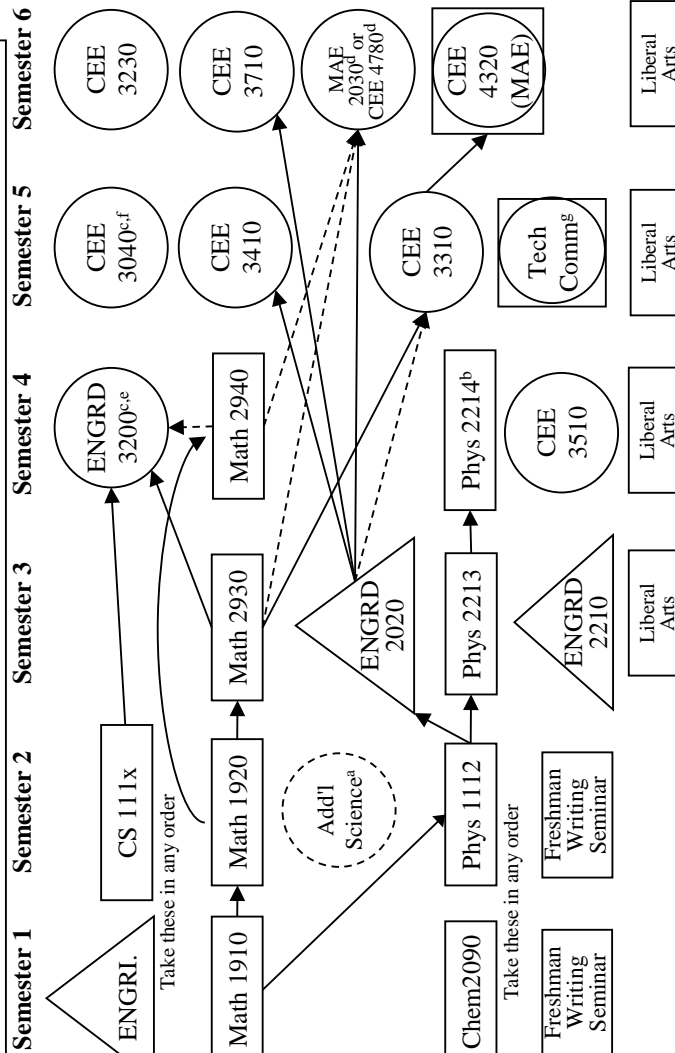
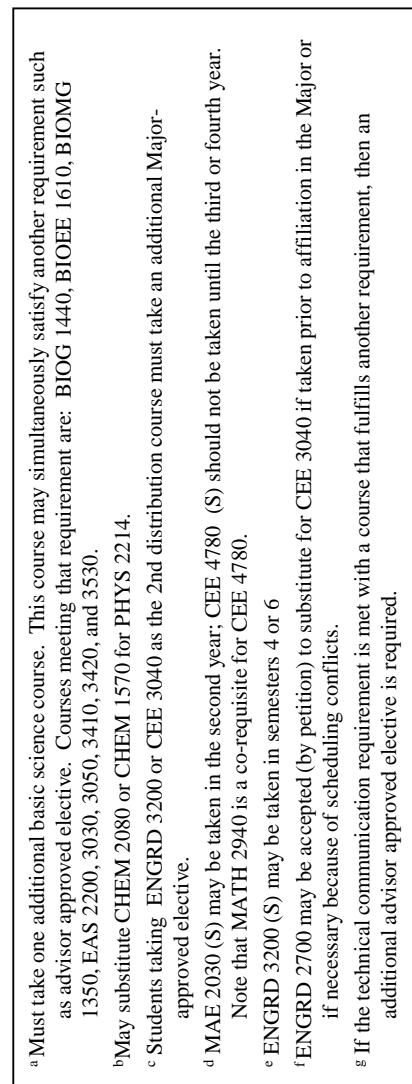
CEE 4320 Hydrology	(F,3)
* CEE 4350 Coastal Engineering	(S,4)
CEE 4370 Experimental Methods in Fluid Dynamics (Next Offered 2016-2017)	(S,3)
CEE 5970 Risk Analysis and Management	(S,3)
CEE 6100 Remote Sensing Fundamentals	(F,3)
* CEE 6370 Experimental Methods in Fluid Dynamics (Next Offered 2016-2017)	(S,4)
CEE 6550 Transport, Mixing, and Transformation in the Environment	(F,3)
* BEE 4730 Watershed Engineering	(F,3)
BEE 4750 Environmental Systems Analysis	(F,3)
* BEE 4760 Solid Waste Engineering	(S,3)

Not offered for the next two years

* CEE 4440 Environmental Site and Remediation Engineering	(S,3)
CEE 6230 Environmental Quality Systems Engineering	(F,3)

A flow chart showing a sample focus in **fluid mechanics, hydrology, and water resource systems engineering** is given on the following page. Please be aware that the flow chart is meant to depict a typical way of arranging curriculum rather than a strictly rigid sequence of courses.

Suggested course selections



Focus on Transportation

This area emphasizes a systems approach to design and operation of transportation networks and services. Students interested in transportation systems engineering are encouraged to take CEE 3610 in the spring of their sophomore year, if possible. However if CEE 3610 is not taken until the junior year, it is still possible to focus on transportation.

Selected Design Electives

Students interested in transportation typically satisfy their Design Elective requirements by taking three of the following four courses. The requirement for a “capstone” course” (designated by **Bold** type) can be satisfied by taking CEE 4640.

- * CEE 4630 Transportation and Information Technology (F,3)
- * **CEE 4640 Transportation Systems Design** (S,3)

Selected Major-Approved Electives

Any of the design courses listed above can also be used to fulfill Major-Approved Elective requirements, if not used for Design requirements. In addition, several other courses are commonly used as major-approved electives, including:

- CEE 5930 Engineering Management Methods (F,4)
- CEE 5950 Construction Planning and Operations (F,3)
- CEE 5970 Risk Analysis and Management (S,3)
- CEE 6100 Remote Sensing Fundamentals (F,3)

Not offered for the next two years

- * CEE 4060 Civil Infrastructure Systems (S,3)
- * **CEE 4650 Transportation, Energy, and Environment Systems
for Sustainable Development** (S,3)
- CEE 5290 Heuristic Methods of Optimization (S,3)

Many courses from Operations Research & Industrial Engineering can also be used as Major-Approved Electives (by petition). Selection should be done in consultation with your advisor and get the approval of the Undergraduate Director.

Other Electives

Additional electives that can be very useful to students interested in transportation engineering include courses in City and Regional Planning or Economics. Some of these courses may be used to fulfill Liberal Studies requirements.

A flow chart showing a sample focus in **transportation** is given on the following page. Please be aware that the flow chart is meant to depict a typical way of arranging curriculum rather than a strictly rigid sequence of courses. There are many valid ways for students to work out their course sequence in consultation with their faculty advisor or the Associate Director of CEE.

Suggested course selections

Transportation Focus

^a Must take one additional basic science course. This course may simultaneously satisfy another requirement such as advisor approved elective. Courses meeting that requirement are: BIOG 1440, BIOEE 1610, BIOMG 1350, EAS 2200, 3030, 3050, 3410, 3420, and 3530.

^b May substitute CHEM 2080 or CHEM 1570 for PHYS 2214.

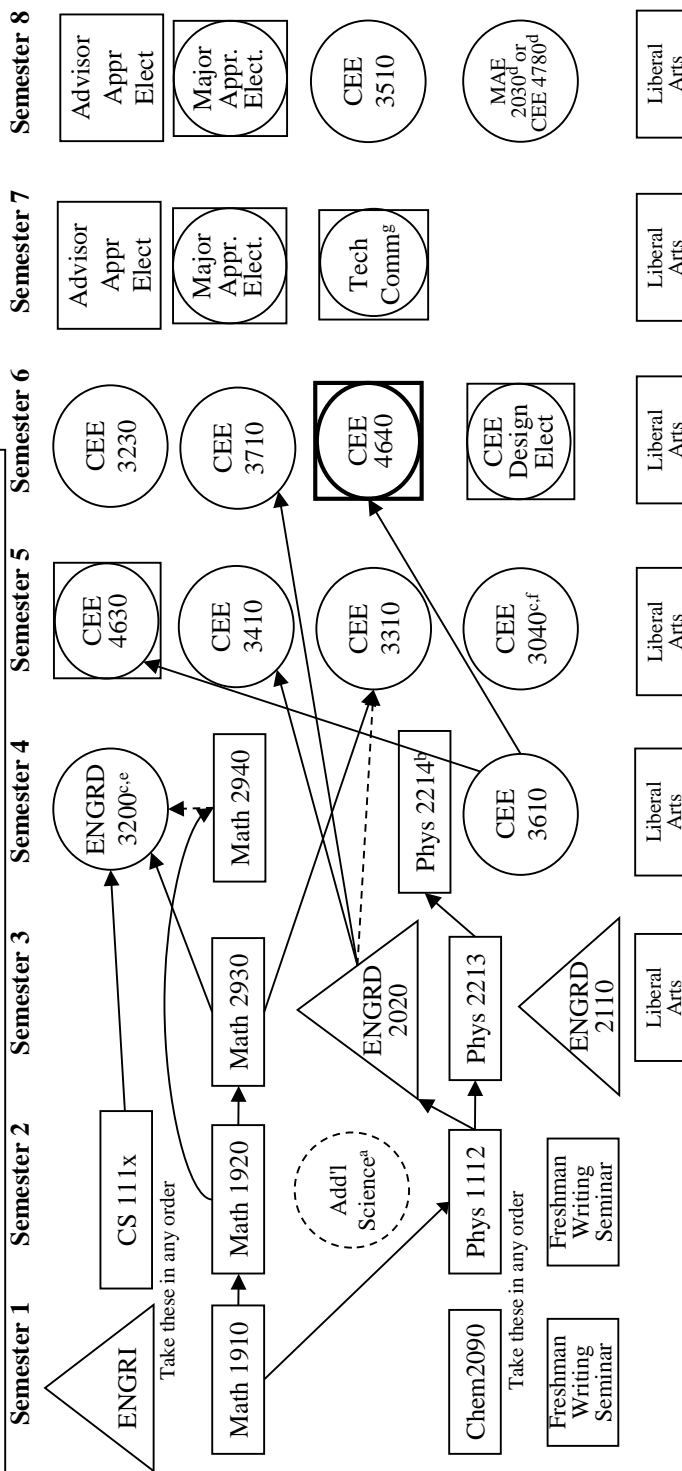
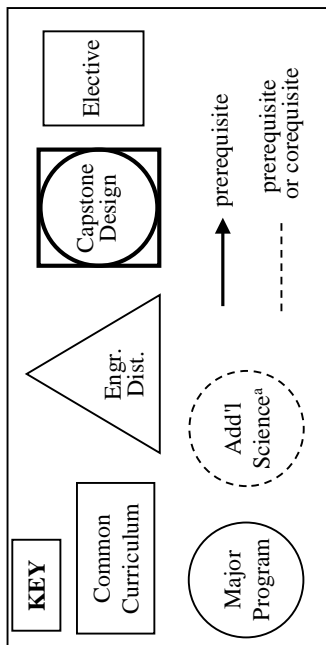
^c Students taking ENGRD 3200 or CEE 3040 as the 2nd distribution course must take an additional Major-approved elective.

^d MAE 2030 (S) may be taken in the second year; CEE 4780 (S) should not be taken until the third or fourth year. Note that MATH 2940 is a co-requisite for CEE 4780.

^e ENGRD 3200 (S) may be taken in semesters 4 or 6

^f ENGRD 2700 may be accepted (by petition) to substitute for CEE 3040 if taken prior to affiliation in the Major or if necessary because of scheduling conflicts.

^g If the technical communication requirement is met with a course that fulfills another requirement, then and additional advisor approved elective is required.



Focus on Environment

A separate major leading to a B.S. degree in Environmental Engineering exists for students with a strong interest and commitment to that field; however, students in the general Civil major can still take a diverse set of courses related to the environmental engineering and other fields.

Design and Major-Approved Elective courses that can be incorporated in a broad-based Civil Major to create an Environmental Engineering focus are listed below. For example, CEE 3310 *Fluid Mechanics* and CEE 3510 *Environmental Quality Engineering* are core courses to which can be added CEE 4540 *Sustainable Municipal Drinking Water Treatment*, and CEE 4920 *Engineering for a Sustainable World*, CEE 5970 *Risk Analysis and Management*, as well as other courses that provide introductions to water treatment systems and environmental management topics. Interested students should consider courses on the following list and one of which must be a "capstone" course (designated by **bold type**) (Design Courses are designated by an (*) asterisk):

Suggested Design and Major-Approved Electives (Design courses are designated by an asterisk; Capstone Design courses are shown in **bold type**.)

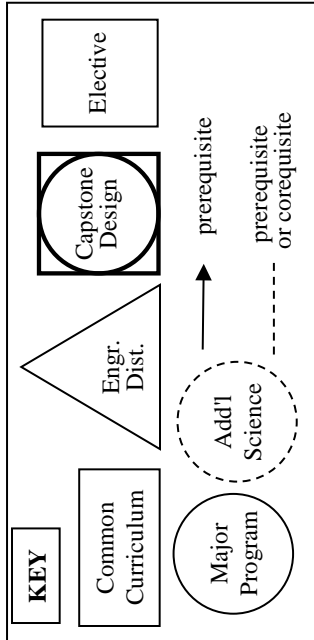
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|---|---------|
| * CEE 4110 Remote Sensing for Env Resource Inventory | (F,3) |
| CEE 4510 Microbiology for Environmental Engineering | (F,3) |
| CEE 4530 Laboratory Research in Environmental Engineering | (S,3) |
| * CEE 4540 Sustainable Municipal Drinking Water Treatment | (F,3) |
| * CEE 4550 AguaClara Sustainable Water Supply Project | (F,S,3) |
| CEE 5970 Risk Analysis and Management | (S,3) |
| CEE 6100 Remote Sensing Fundamentals | (F,3) |
| CEE 6530 Water Chemistry for Environmental Engineering | (F,3) |
| CEE 6550 Transport, Mixing, and Transformation in the Environment | (F,3) |
| CEE 6560 Physical/Chemical Processes | (F,3) |
| CEE 6570 Biological Processes | (S,3) |
| CHEME 6610 Air Pollution Control | (S,3) |
| * BEE 4730 Watershed Engineering | (F,4) |
| * BEE 4760 Solid Waste Engineering | (S,3) |
| EAS 4570 Atmospheric Air Pollution (Next Offered 2016-2017) | (F,3) |
| EAS/MAE 6480 Air Quality and Atmospheric Chemistry (Next Offered 2016-17) | (F,3) |

Not offered for the next two years

- | | |
|---|-------|
| * CEE 4440 Environmental Site and Remediation Engineering | (S,3) |
| * CEE 4920 Engineers for a Sustainable World | (F,3) |
| CEE 6230 Environmental Quality Systems Engineering | (F,3) |
| CEE 6580 Biodegradation and Biocatalysis | (S,3) |

A flow chart showing a sample program emphasizing environmental engineering is given on the following page. Please be aware that the flow chart is meant to depict a possible way of arranging curriculum rather than a strictly rigid sequence of courses. There are many valid ways for students to work out their course sequence in consultation with their faculty advisor or the Associate Director of CEE.

Environmental Focus



^a CS 1112 is recommended

^b May substitute CHEM 2080 or CHEM 1570 for PHYS 2214.

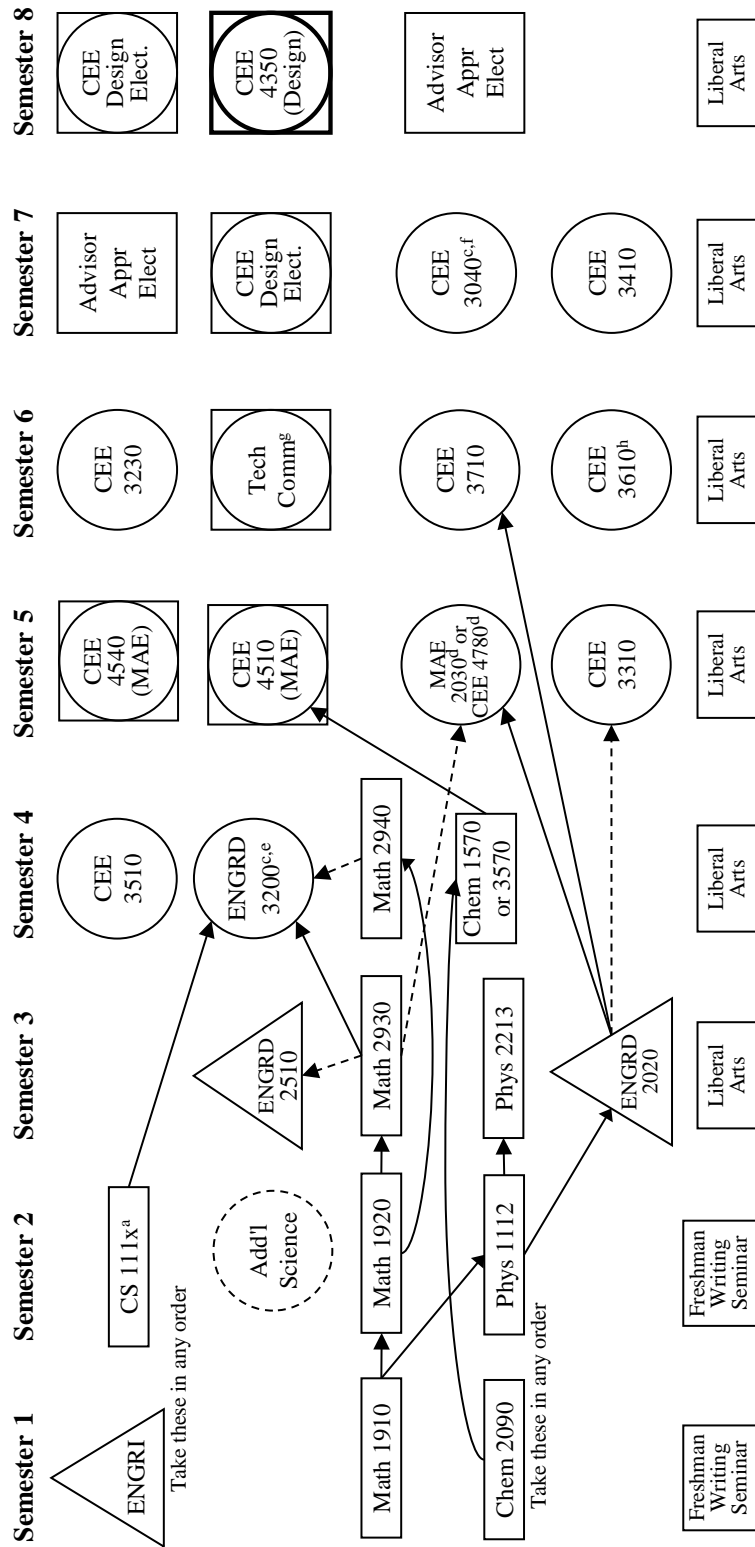
^c Students taking ENGRD 3200 or CEE 3040 as the 2nd distribution course must take an additional Major-approved elective.

^d MAE 2030 (S) may be taken in the second year; CEE 4780 (S) should not be taken until the third or fourth year. Note that MATH 2940 is a co-requisite for CEE 4780.

^e ENGRD 3200 (S) may be taken in semesters 4 or 6

^f ENGRD 2700 may be accepted (by petition) to substitute for CEE 3040 if taken prior to affiliation in the Major or if necessary because of scheduling conflicts.

^g If the technical communication requirement is met with a course that fulfills another requirement, then an additional advisor approved elective is required.



V. Academic Policies and Procedures

The Associate Director for the School of Civil and Environmental Engineering, Prof. William D. Philpot (in 221 Hollister Hall) is responsible for the administration of the undergraduate curriculum. His office coordinates the assignment of advisors, registration procedures, transfer credit awards, action on internal petitions, academic actions for affiliated students, and auditing of records for graduation. The Associate Director is assisted by an Undergraduate Major Coordinator, Mrs. Nadine Porter, also in 221 Hollister.

More detailed information on the policies and procedures of the University and of the College of Engineering may be found in the [Courses of Study](#), and in [The Engineering Undergraduate Handbook](#), available from the College of Engineering Advising Office, 167 Olin Hall.

Advising

Students who affiliate with CEE will have a CEE faculty advisor. A student's advisor is available for assistance with course pre-registration, answering questions, and for helping him/her find assistance. *The signature of the assigned advisor is required on the forms for course selections, course changes, S/U grading options, and petitions.* In an emergency, if the student's advisor is not available, the Associate Director or Director can act as a substitute. A student is required to make every effort to meet with his/her advisor as early as possible during the pre-enrollment period.

Good-Standing Status

Undergraduates in the School of Civil and Environmental Engineering are in *Good Standing* if they are making acceptable progress toward completion of the requirements for graduation. Acceptable progress in CEE is defined as meeting the following requirements:

- a) Semester GPA ≥ 2.0
- b) Cumulative GPA ≥ 2.0
- c) *A term GPA ≥ 2.0 in Core Courses, Design Courses, Major-approved Electives, and Engineering Distribution Courses (Tech GPA).
- d) **No failing grades**
- e) Passing at least 12 credit hours each semester.
- f) * Cumulatively no more than one grade below C- in required Core courses, Design courses, Major approved electives, and Engineering distribution courses.

*Grade(s) below C- in these courses beyond the first will require that the course(s) so graded be repeated. (The College of Engineering also requires that each course in the required mathematics sequence - 1910, 1920, 2930, 2940 - be passed with a grade of C- or better.)

Students who fail to maintain good-standing status may be warned, required to take a leave of absence for one or more terms, or required to withdraw. The specific action in each case is based upon the pertinent circumstances as well as the student's previous academic record.

CEE's policy about academic action procedures provides for two separate reviews of the student's record by the School's Academic Standards, Petitions and Credits Committee (ASPAC). The first review is to identify those students who have not made satisfactory progress during the term and

second is to assign academic actions when deemed appropriate. Students who receive actions are notified by letter sent to both their home and email addresses. This letter includes a request for information about possible extenuating circumstances and an invitation to appeal the committee's action. Appeals must be in writing. If an appeal is made, ASPAC will review the appeal and decide whether to reconsider its decision.

Petitions

Cornell University has a tradition of considering petitions from students relative to special situations or circumstances that may well justify exceptions to the normal rules or requirements. *All petitions from CEE students should be discussed with their academic advisor and then submitted to the Associate Director of the CEE School. If the matter is one over which the College, rather than the School, has jurisdiction, the Associate Director will forward the petition to the College.* The appropriate College or School committee considers petitions on a case-by-case basis.

S/U Grading Option

CEE students may enroll S/U in only one course each semester in which the choice between letter grade and S/U is an option, and *only* Liberal Studies Distribution courses or Approved Electives may be taken this way (Note: Major-Approved Electives and the Technical Communication course may not be taken S/U). Additional courses offered S/U only may be taken in the same semester. Note that courses graded S/U do not count in eligibility for the Dean's List.

Transfer Credit

After matriculation in the College, a student may transfer no more than 18 credits without petitioning for special circumstances. Transfer students may not transfer more than 72 credits, regardless of when or where the credits were earned. Cornell does not grant transfer credit for courses in which a student earned a grade less than C. Summer session courses taken at Cornell are not considered transfer credits.

Student Responsibilities

Each undergraduate enrolled in the School of Civil and Environmental Engineering is responsible for the timely selection, registration for, and completion of appropriate courses in each of the several categories needed to fulfill the requirements of the curriculum of the School and the College of Engineering. A student's failure to discharge these responsibilities in a timely manner can result in a delay in graduation and/or incorrect entries on their transcript.

Students should check the Undergraduate Bulletin Board (between rooms 221 and 223 Hollister) regularly. This board will contain important information concerning events of particular interest to undergraduates. Civil and Environmental majors also have mail folders in 220 Hollister that they should check periodically for School and College communications.

Student Progress Reports

The progress of each student toward completion of degree requirements is charted on a Progress Report. (An example Progress Report appears on the next page.) Courses that have been completed are shown in their appropriate categories on this record. Each student is encouraged to examine his/her Progress Report carefully and to report errors and desired adjustments to the Undergraduate Program Coordinator in 221 Hollister. It is important that the record be complete and accurate, because it is used by the CEE School to determine a student's eligibility for graduation.

A copy of each student's Progress Report is provided to the student and to his/her advisor whenever significant updates or changes are made. Students can request Progress Reports by emailing ndp5@cornell.edu or in 221 Hollister Hall.

Official University Transcripts

The University offers free official transcripts from the Office of the University Registrar in-person: B7 Day Hall; Fax: (607) 255-6262; <http://transcript.cornell.edu/> ; transcripts can be ordered online. If you need an official transcript, plan to obtain it well before the date needed in case there is a technical problem that would prevent the Registrar from processing your request. The Office of the University Registrar is the only office that can issue an official transcript.

SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING
Civil Engineering Major Progress Report
For the Class of 2018 and later

Name:
ID #

Advisor:

Date: 8/12/2015

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VI. Student Support Services

Having problems managing your workload or your time? Have you been sleeping more but still feel tired all the time? Having problems getting out of bed and getting motivated? Each year, many students in the College and the University find that they are having problems academically, socially, and/or personally. Deciding how you respond to these obstacles can profoundly affect your level of success at Cornell.

Cornell offers several resources to help students who are having problems academically:

Biology Advising Center

8am-4:30pm Monday-Thursday; 8am-4pm Friday; 216 Stimson Hall

Tel: (607) 255-5233; Fax: (607) 255-0470; Email: bioadvising@cornell.edu

www.bio.cornell.edu/advising

Engineering Advising Office

8:00am-4:30pm; 167 Olin Hall

Tel: (607) 255-7414; Fax: (607) 255-9297; Email: adv_engineering@cornell.edu

<http://www.engineering.cornell.edu/resources/advising/index.cfm>

Learning Strategies Center

8:30am-4:30pm Monday-Thursday; 8:30-4pm Friday; 420 Computing and Communications Center

Tel: (607) 255-6310; Email: cornell-clt@cornell.edu

<http://lsc.cornell.edu/>

Math Support Center

Open during Academic Year see website for specific hours; 256 Malott Hall

Tel: (607) 255-4658; Email: mst1@cornell.edu

<http://www.math.cornell.edu/twiki/bin/view/MSC>

Writing Walk-in Service

8:30am-5:00pm Monday-Friday – see website to schedule an appointment and locations; 174 Rockefeller Hall

Tel: (607) 255-6349; Fax: (607) 255-4010

http://www.arts.cornell.edu/knight_institute/walkin/walkin.htm

Minority & Women's Programs in Engineering

8:00am-4:30pm; 146 Olin Hall

Tel: (607) 255-7514; Email: dpeng@cornell.edu

<http://www.engineering.cornell.edu/diversity/>

Mental Wellness Support

Sometimes obstacles aren't rooted in study habits but in medical or psychological problems. These range from low iron or blood sugar to depression or anxiety. For many students this is the first time they are living away from home and are responsible for their own well-being. Although many people see you each day and may genuinely care about you, no one is making sure that you are eating well, getting regular exercise, and are healthy. Indeed, it is less likely that people will recognize if you're facing some minor or major emotional problem, especially if you are living off-campus. It is important that you care for yourself, and ask for help and direction from your Resident Advisor, faculty advisor, or other campus or community office/agency.

Cornell offers mental wellness support to students through the following services, among others:

CAPS (Counseling and Psychological Services) at Gannett: Cornell University Health Services; Tel: (607) 255-5208 or (607) 255-5155; Email: gannett@cornell.edu
<http://www.gannett.cornell.edu/services/counseling/caps/index.cfm>.

CAPS has noted a trend that engineering students tend to wait a long time before they seek assistance. This behavior results from the—usually mistaken—belief that the problem solving skills of engineers extend to emotional and psychological issues. Failure to seek help usually ends up putting the student in more academic and personal risk. If you are really stressed, tired all the time, having trouble getting yourself to class, not able to complete assignments on time, confused about life in general, sad, anxious, or just want someone to talk to so you can decompress, contact CAPS. Often times just talking with a trained professional can help you feel better. Note: each student is limited to 12 individual counseling sessions per year.

EARS (Empathy and Referral Service); Tel: (607)255-3277
<http://www.gannett.cornell.edu/services/counseling/peer.cfm>
Free and confidential.

Suicide Prevention and Crisis Service; Tel: (607) 272-1616
Free and confidential.
<http://www.gannett.cornell.edu/notice/resources/suicide.cfm>

General Medical Problems

Gannett Health Center; Tel: (607) 255-5155;

<http://www.gannett.cornell.edu>

If you've had a lingering health concern, please have it checked out. Even minor illnesses can detract from your overall enjoyment of 'the college experience'.

VII. CEE Student Activities

There are three principal student organizations in the School of Civil and Environmental Engineering: the American Society of Civil Engineers (ASCE) , Chi Epsilon and AguaClara.

American Society for Civil Engineers (ASCE)

Membership in the Cornell Student Chapter of the American Society of Civil Engineers (ASCE) is one of the best bargains you will find. In 1983 and 1991 our ASCE student chapter was named the most outstanding ASCE Chapter in the U.S. The Chapter also received a Letter of Honorable Mention for meritorious activities during 1987, and a Certificate of Commendation from the National ASCE headquarters in 1979, 1982, 1984, 1985, 1992, 1996 through 2000, and again in 2002. In 2001, the Chapter was the Ridgeway Award Finalist for Zone I and won an Outstanding Community Service Award. The ASCE Student Chapter gets involved in a large variety of activities, both professional and social, including many community service projects; a fall picnic for all students, faculty, and staff; participation in the Upstate New York Regional Conference (including the Steel Bridge Competition); hosting the two competitions in 1993, 1999, and 2007; participation in a wide variety of intramural sports; and a Spring Picnic. The Picnic has become a Cornell CEE tradition.

Watch for announcements of joint meetings with the Ithaca Section of ASCE, where you will get a chance to meet practicing engineers, enjoy a good dinner, and hear a talk on civil and environmental engineering. Derek Warner, CEE Professor, is the Faculty Advisor. Stop by the ASCE office in 215 Hollister.

ASCE: <http://www.engineering.cornell.edu/cee/academics/undergraduate/organizations/asce/index.cfm>

Chi Epsilon

Chi Epsilon is the Civil Engineering Honor Society with chapters at most CE Schools in the U.S. Membership in Chi Epsilon is by election and is based on academic standing. Chi Epsilon at Cornell is very active and sponsors many activities and holds elections each spring for the "Professor of the Year" award. The award is presented to a CEE Faculty member for outstanding performance in teaching.

Chi Epsilon: <http://www.chi-epsilon.org>

AguaClara

AguaClara is a project in Civil and Environmental Engineering at Cornell University that is improving drinking water quality through innovative research, knowledge transfer, open source engineering and design of sustainable, replicable water treatment systems. The AguaClara project continues Ezra Cornell's vision: his sense of invention, his focus on the future, his belief in hands-on learning, his dream of a well-rounded education available to anyone. The AguaClara team conducts drinking water treatment research in our laboratory and in our pilot scale facility located in the Cornell University Water Filtration Plant. The team designs hydraulic powered drinking water treatment plants using an automated design tool. The designs are built by partner organizations in Honduras, but with the full expectation that the technology will be spreading to other countries in the next few years. AguaClara water treatment plants built in Honduras were serving 13,000 people as of the summer of 2008. Students can join the AguaClara team by taking CEE 2550, CEE 4540, and CEE 4550. The AguaClara team takes a 2 week project trip during the January intersession. There are also opportunities for summer internships at Cornell and in Honduras and for yearlong internships in Honduras after graduation.

Read more about us at <http://aguaclara.cee.cornell.edu>

VIII. Employment: Summer and Permanent

There is a wide array of summer and post-graduate opportunities available to civil and environmental engineers. Employers include private consulting firms; industrial firms of all types (including aerospace and manufacturing); governmental agencies at the local, state and national level; construction firms; and research and development groups. Developing countries have a very strong need for civil and environmental engineers because the majority of their basic development needs fall within the domain of the civil and environmental engineer. Summer jobs in engineering are highly desirable; they provide experience in the "real world", giving new meaning to both previous and future coursework.

The **Engineering Career Services Office**; 201 Carpenter Hall; Tel: (607) 255-5006; http://www.engineering.cornell.edu/resources/career_services/ . The Engineering Career Services Office has an extensive recruitment program with many interviewers coming to campus each year and maintains a searchable database of employment opportunities.

The **Cornell Career Services Office** has a series of special lectures on how to approach the job market, how to prepare résumés, and how to interview. The Cornell Career Services Office is located in 103 Barnes Hall; Tel: (607) 255-5221; Email: career@cornell.edu; <http://www.career.cornell.edu>

Participants in the Co-op Program (detailed on page 11) have the opportunity to evaluate prospective employers by working with a firm. This unique opportunity provides students with a valuable and engaging experience in their area of interest. Students typically start their Co-op assignment in their fifth semester and complete it the following summer.

Many of the best job opportunities are with private construction or consulting engineering companies, industries, and agencies that do not routinely interview on campuses because they are relatively small compared with the industrial "giants" that recruit large numbers of ME's, ECE's, ChemE's, etc. Eventually many CEE graduates own their own companies. The promise of personal satisfaction and financial gain from these types of positions is very high.

The ASCE student chapter arranges and hosts a number of company information sessions each year in which a representative from a CEE firm typically talks and answers questions not only about the firm but also about job opportunities and job-hunting strategies in general.

A resource file of available employment opportunities is maintained on our School's web site at: <http://www.engineering.cornell.edu/cee/> simply click on *Resources*, then click on *After Graduation*, for all job postings. These employment opportunities are a collection of postings sent directly from organizations to the school and individual professors. Jobs vary from government and industry, to research and faculty positions available at other educational institutions. Please note that positions are posted as soon as we receive them and do have expiration dates.

IX. Professional Registration

Engineers are licensed (after examination and if they also have suitable experience) to practice engineering in each state of the U.S. While not required for all CEE jobs, registration is important for civil and environmental engineers because they are responsible for public safety in much of their work. Most states and communities require that a registered engineer give final approval to all plans and specifications for engineering projects. Students can take the first step toward getting a Professional Engineering (PE) license while still a senior at Cornell. Students are eligible during their last semester to take Part A of the nationwide examination, the “Fundamentals of Engineering (FE) Examination.” Successful completion earns the title “Intern Engineer” (often also called “Engineer-in-Training”). Because Part A emphasizes fundamental knowledge gained in engineering distribution courses and CEE Core courses, there is a comparative advantage in taking this exam during your last term. Please be sure to have the School notified of your exam results so that the School receives the feedback it needs to document the success of its graduates. Success or failure in this examination has no bearing on your academic standing at Cornell.

Information on how to apply for the Part A exam, which is given throughout the year in New York State (e.g., in Endicott, Syracuse, Albany, etc.) are available on-line at: <http://www.op.nysed.gov/prof/pels/> or <http://ncees.org/exams/> and in the Undergraduate Program Office in 221 Hollister Hall. In preparation for the exam, students may enroll in BEE 5330 Engineering Professionalism for 1 credit during the Spring semester of their senior year.

Part B of the examination may be taken after four years of suitable engineering experience is achieved after passing Part A. Successful completion of Part B will give you the title “Professional Engineer” in the state where you took the Part B exam. With some exceptions registration in other states may usually be obtained by reciprocity rather than taking another exam.

See Appendix B in this handbook for more information on registration procedures in New York State and the specific requirements for registration, including requirements for education, examinations, and practical experience. Note that a bachelor’s degree in engineering from an ABET-accredited university such as Cornell counts as eight years of “Education/Experience credit.”

Details about the professional licensure application process is available on-line at <http://www.op.nysed.gov/prof/pels/>

X. Graduate Education

It's not too early to consider additional study beyond your bachelor's degree. CEE averages about 140 graduate students, one of the largest graduate student enrollments at Cornell. For students who wish to continue their graduate program at Cornell, there are several options, as described below, leading to a Master of Engineering, Master of Science or a Doctor of Philosophy degree.

Master of Engineering Program

A report prepared by a task force of the American Society for Engineering Education (ASEE) recommended that baccalaureate students who plan to pursue careers in engineering practice be encouraged to complete, on a full-time basis, an advanced degree program focused upon engineering practice. Our School concurs and to provide students with sufficient meaningful and significant design experience CEE's solution has been the fifth-year Master of Engineering Program in either Civil and Environmental Engineering or Engineering Management. Professionally-oriented, the Master of Engineering degree programs are particularly popular for CEE seniors.

B.S. degree holders in engineering from Cornell who have a minimum grade point average of 2.7 are generally eligible for admission to either of the Master of Engineering programs outlined below. However, each application is evaluated individually, and the School reserves the right to make all admission decisions. To apply visit: www.gradschool.cornell.edu/

The Master of Engineering degree is a course work and project-oriented program. It is normally completed in two semesters of intensive study. Thirty credit hours consisting of course work in major and supporting areas and a project are required.

1. *Master of Engineering (Civil and Environmental) Program*

Master of Engineering students in Civil and Environmental Engineering may focus their studies in one of the following major subject areas: structural engineering, geotechnical engineering, environmental processes, environmental fluid mechanics and hydrology, environmental and water resource systems engineering, and transportation systems engineering. Each program typically consists of course work in a major concentration and supporting areas as well as a project. Some concentrations require a course in professional practice or management. Courses in supporting areas come from many disciplines, including microbiology, materials science, operations research, computer science, economics, architecture, historic preservation, and engineering management to name just a few.

2. *Master of Engineering (Engineering Management) Program*

The M.Eng. program in engineering management is aimed at engineers who want to stay in a technical environment, but focus on managerial roles. Students learn to identify problems, formulate and analyze models to understand these problems, and interpret the results of analyses for managerial action. Projects in the management area focus on integrating technical and economic analysis to create results that can support effective management decisions. Each student's program of study is designed individually in consultation with an academic adviser and then submitted to the Director of the Engineering Management Program for approval. Graduates of this program are in demand by civil engineering and construction firms, management consultants, industrial companies, and other organizations that focus on the efficient management of projects and technical systems.

Cooperative Programs with the Johnson Graduate School of Management

There are several special programs make it possible for students to earn degrees from both the College of Engineering and the Johnson Graduate School of Management in less time than if the degrees were

pursued sequentially. The School of Civil and Environmental Engineering cooperates with the Johnson School programs leading to both Master of Engineering and Master of Business Administration degrees. Here we describe two programs that start with a Cornell Engineering B.S. degree and one that considers a joint MEng. Degree from the Engineering College with an M.B.A. from the Johnson School.

JOINT B.S./M.ENG. (CIVIL) /M.B.A. AND JOINT B.S./M.B.A.

Two special programs make it possible for students to earn degrees from both a bachelors' degree from the College of Engineering and an M.B.A. from Johnson Graduate School of Management. One program, completed in five years, leads to a B.S. degree in engineering and a Master of Business Administration (M.B.A.) degree. The other program, which takes six years, earns three degrees: the B.S. in engineering, the Master of Engineering (M.Eng.), and the M.B.A.

Both programs require taking a specific set of courses at the undergraduate level; these curricula allow for a shortening of the combined programs by one academic year. Information about the specific requirements for each area is available from the appropriate undergraduate major coordinator and graduate program coordinator. The curriculum must include nine core courses required for the M.B.A. or allowed substitutes. See the [Engineering Undergraduate Handbook](#).

Students who decide to pursue either of these programs should take the GMAT exam, which is required by the Johnson School of Management, in March of their junior year (or earlier).

The joint B.S./M.Eng (Civil)/M.B.A. program is very attractive in that both Masters degrees are received within two years after the B.S. This program must be initiated in the junior year. This special program requires early planning so those electives taken during the junior and senior year can be used to meet requirements of the M.B.A. degree. By March 1 of the sixth term of enrollment, a student must apply for admission to the M.B.A. program through the Johnson Graduate School of Management. Application to the M.Eng. program should take place by February 1 in the student's senior year at Cornell. Students are encouraged to go to Engineering Advising and the Johnson School for more information.

Joint M.Eng./M.B.A. Program

For those interested in both the M.Eng. and M.B.A. degrees, but who do not participate in the six-year joint program described above, an alternative opportunity is the five-semester joint program. Application to this program can begin as late as the first few weeks of enrollment in the M.Eng. program. The five-semester program is open to students with B.S. degrees from Cornell or elsewhere.

Master of Science and Ph.D. Programs

Some students pursue a research-oriented Master of Science (M.S.) program either here or elsewhere, and an increasing percentage of our students continue on to the Ph.D. for careers in research, teaching, or consulting. Some students prefer to take a job immediately after receiving the B.S. and then return for graduate study a few years later. Ask your advisor, professors, or the Director of Graduate Studies, Professor James J. Bisogni, Jr., for information about graduate study in the area that interests you.

Early Admission

Cornell undergraduates who have between one and eight credit hours to earn towards completion of their undergraduate degree in the last semester of their senior year may apply for "early admission" to the Master of Engineering program. If approved, the student may begin earning credits towards their Master of Engineering degree while completing their undergraduate degree. (Double-counting of credits will not be allowed; credits used towards undergraduate requirements may not also be used

towards M.Eng. requirements.) Admitted applicants must spend a minimum of one semester registered with the Graduate School. There are two advantages to starting the M.Eng. Program early: (1) students may take a slightly heavier course load and complete the M.Eng. degree in one Graduate School semester after completion of the undergraduate degree; or (2) students may either take a lighter course load over two Graduate School semesters upon completion of the undergraduate degree or take extra courses they are interested in that do not count towards the M.Eng. Degree. A special form and guidance are required before submitting the Graduate School application for Early Admission; therefore you need to see the Graduate Program Coordinator of the Field you intend to apply to for this form and instructions.

XI. 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 implies that the work is the student's own. Outside assistance should be acknowledged, and the student's academic position truthfully reported. In addition, Cornell students have the right to expect academic integrity from each of their peers. It is plagiarism for anyone to represent another person's work as his or her 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 state clearly what is expected, and that students understand what authorship citations an instructor expects. To become better acquainted with academic integrity responsibilities, each student should read the Code of Academic Integrity. A copy may be obtained from the Engineering Advising Office, 167 Olin Hall, or from the Dean of the Faculty, 315 Day Hall. Also available on the web at: <http://www.theuniversityfaculty.cornell.edu/AcadInteg/code.html>

XII. Freedom from Sexual Harassment

The College feels it is essential for the well-being of the University community that every individual be treated with respect. Sexual harassment and sexist comments are incompatible with this goal.

Unwelcome sexual advances, requests for sexual favors, or other verbal or physical contact or written communication of a sexual nature is sexual harassment when any of the following occurs:

1. Submission to such conduct is made either explicitly or implicitly a term or condition of employment or academic standing; or
2. Submission to or rejection of such conduct is used as the basis for employment or academic decisions affecting the individual; or
3. Such conduct has the purpose or effect of unreasonably interfering with an individual's work, academic performance, or participation in extracurricular activities; or creating an intimidating, hostile, or offensive working or learning environment.

Any student, staff employee, or faculty member who believes she/he has been victimized by sexual harassment is encouraged to promptly contact a title IX coordinator via the Office of Workforce Policy and Labor Relations at (607) 254-7232 or equalopportunity@cornell.edu ., Individuals may also contact the University Ombudsman at (607) 255-4321 in 118 Stimson Hall, 8:30am-4:30pm Monday-Friday or other times by appointment.

XIII. Honors, Awards, Prizes and Competitions

Dean's List

In each term, students in the College of Engineering achieving a grade point average of 3.5 (without rounding) or greater, based upon a record including 12 credits of letter grades, with no failing grades, unsatisfactory grades, incompletes, or missing grades, are recognized by selection to the Dean's List. Students may earn Dean's List status retroactively if they meet these criteria after making up incompletes according to College rules.

Graduating with Distinction

Cornell University awards diplomas with the designation *Cum laude*, *Magna cum laude*, or *Summa cum laude* to graduating seniors who met specific grade point average benchmarks. This is subject to the absence of unsatisfactory grades, incompletes, and missing grades.

- *Cum laude*: graduating students whom overall, or in their last four terms (in each of these terms, at least 12 letter-grade credit hours must be taken), achieve a grade point average of 3.50 (without rounding) or greater.
- *Magna cum laude*: earned with a grade point average of 3.75 or greater based on all credits taken at Cornell.
- *Summa cum laude*: students who attain a GPA of 4.0 or higher for all credits taken at Cornell receive a diploma with this designation.

Graduating with Honors

Students successfully completing the CEE Honors Program (see page 11 for requirements) will be awarded their diplomas with a note stating “*with Honors*” and it will be noted on their official transcript.

Awards, Prizes, and Competitions

The following are descriptions of the awards, prizes, and competitions available annually to students in Civil and Environmental Engineering.

ASCE John P. Riley '22 Award

Established in 1990 to honor John P. Riley '22, who had been an active member of ASCE and past president of the NYC Metropolitan Section. This award provides a first-year membership to ASCE for a member of the Civil and Environmental Engineering graduating class who is a member of the Cornell Student Chapter of the American Society of Civil Engineers and has rendered meritorious service and special leadership to fellow students and to the Civil Engineering profession.

ASCE Marshal Case Haggard Award

Established in 1992 in memory of Marshal Haggard '81, president of the Cornell ASCE Student Chapter in 1980–81, who lost his life while in service in the Peace Corps in Nepal. It is presented to a member of the student chapter in recognition of outstanding contributions to the community, following the role of Marshal, who had a strong influence in developing the service activities that have become a tradition of the Cornell chapter.

ASCE Winslow T. Shearman (Student Merit) Award

The Ithaca Section established the ASCE Student Merit Award in 1932. It is presented annually to a member of the Civil and Environmental Engineering graduating class of Cornell University who is an active member of the Cornell Student Chapter of the American Society of Civil Engineers and is considered most worthy of this honor by virtue of high character and academic achievement.

ASCE Student Service Award

The Ithaca Section of ASCE established the ASCE Student Service Award in 1960. It is presented annually to a member of the Civil and Environmental Engineering graduating class who is also a member of the Cornell Student Chapter of the American Society of Civil Engineers and has rendered the most meritorious service to fellow students and to the profession of Civil Engineering.

Becker Global Education Award

This award was established in 2014. The primary objective of this award is to provide opportunities for students to have a global experience. Sophomores and juniors affiliated with the School of Civil and Environmental Engineering are eligible to apply. Funding varies and is dependent on proposal.

Clark Construction Scholarship

A monetary award and certificate presented to a junior Civil and Environmental Engineering student. The award is given to a student with an interest in construction management for academic merit, leadership, and extracurricular activities. The recipient of the award must have a cumulative GPA of at least a 3.0 and be a U.S. citizen. There may be other conditions as set by the Clark Construction Group, Inc.

Margaret Arronet Corbin '21 Prize

This award of approximately \$4,000 and a certificate is presented on Commencement Day to a graduating Civil and Environmental Engineering student. The award is given to a senior who combines academic excellence with meritorious activities and service within the Cornell community and has demonstrated a commitment to continuing his or her education in the field of civil engineering. Margaret Arronet Corbin was a pioneering female civil engineer who spent two years with President Hoover's famine relief effort in Russia before beginning her long career with the Portland Cement Association in Chicago.

Charles Lee Crandall Essay Contest

The Charles Lee Crandall Prizes are given annually by the School of Civil and Environmental Engineering for the best papers written by juniors or seniors. There are no restrictions on subject material other than to have some direct or indirect connection with civil and environmental engineering. First prize is \$2,000 and second prize is \$1,000. Details are available in Spring of each year.

Fuertes Medal

The Fuertes Medal was established in 1893 by the late Professor E.A. Fuertes, Dean of the College of Civil Engineering. The endowment awards a gold medal and a certificate that is awarded annually on Commencement Day by the faculty of the School of Civil and Environmental Engineering to the graduating senior whose scholastic achievement is most distinguished over the four consecutive years of study at Cornell.

Ve-Sing and Tseng Soo Koo Award

The Ve-Sing and Tseng Koo endowment was established in 1990 by Professor Benjamin Koo, Ph.D. '46. This prize, consisting of approximately \$4,000 and an award certificate, is awarded to an outstanding student of structural engineering in Civil and Environmental Engineering who is planning to pursue graduate studies at Cornell University.

The MOLES Student Award

The MOLES Student Award, consisting of a \$1000 prize and an Award Certificate, is given to a qualified Civil and Environmental Engineering junior or senior who is selected in recognition of high academic achievement, enthusiasm, and effort, and who shows outstanding promise for a career in construction engineering and management.

The MOLES Scholarship

A scholarship up to \$11,000 is given annually to a deserving and academically qualified junior or senior studying Civil Engineering with high academic standings and expressed interest to pursue his/her career in the construction industry.

John E. Perry Undergraduate Prize

The John E. Perry Undergraduate Prize, consisting of a certificate and a check for \$500, is awarded on Commencement Day to select graduating Civil and Environmental Engineering students. The award is given to members of the graduating class who demonstrated "enthusiastic participation in student life and commitment to the profession of engineering", in addition to scholarship. Perry Prize winners are chosen by CEE faculty and students by ballot.

John E. Perry Teaching Assistant Prize

Established in 1985, this award is given annually to the teaching assistant(s) within the School of Civil and Environmental Engineering whom "exhibits concern and care for the students in his or her class and fulfills the teaching functions enthusiastically and skillfully." The winner is identified using a ballot distributed to faculty and students. The award consists of a certificate and a check ranging from \$100-\$500.

Water Advocate Award

This \$2,000 award was established in 2013 to recognize student's enthusiasm and dedication to careers and lives focus on safeguarding clean water.

Appendix A

Professional Engineering Licensing Information

Information in this appendix is taken directly from the NY State Office of the Professions web site: <http://www.op.nysed.gov/prof/pels/pelic.htm> and is current as of July 2014. Check the web site for any changes or updates.

License Requirements

Professional Engineering

[General Requirements](#) | [Fees](#) | [Partial Refunds](#) | [Education and Experience Requirements](#) | [Examination Requirements](#) | [Intern Engineer Certificate](#) | [Applicants Licensed in Another State \(Endorsement\)](#) | [Table of Education/Experience Credits](#) | [Summary of Requirements "At a Glance"](#)

General Requirements

Any use of the title "Professional Engineer" or provision of professional engineering services within New York State requires licensure, except in certain "exempt" settings. These settings are detailed in [Section 7208](#) of the Education Law.

To be licensed as a professional engineer in New York State you must:

- be of good moral character;
- be at least 21 years of age; and
- meet education, examination and experience requirements.

Submit an application for licensure and the other forms indicated, along with the appropriate fee, to the Office of the Professions at the address specified on each form. It is your responsibility to follow up with anyone you have asked to send us material.

The specific requirements for licensure are contained in Title 8, [Article 145](#), section 7206 of New York's Education Law and [Part 68](#) of the Commissioner's Regulations.

You should also read the [general licensing information](#) applicable for all professions.

Fees

The fee for licensure and first registration is \$377.

When the Department determines you are eligible for the examination, you will be sent an examination eligibility letter. The letter will indicate which of the following exams you are eligible to take including;

- Part 1- NCEES Fundamentals of Engineering (FE)
- Part 2- NCEES Principles and Practice of Engineering (PE).

Fees paid to NYSED cover the processing and evaluation of your application by the Department, as well as, your registration as an engineer for three years from the date your New York State

license is issued. Fees are subject to change. The fee due is the one in effect, by law, when your application is received (unless fees are increased retroactively). You will be billed for the difference if fees have been increased.

- Do not send cash.
- Make your personal check or money order payable to the New York State Education Department. * Your cancelled check is your receipt.
- Mail your application and fee to:

NYS Education Department
Office of the Professions
P.O. Box 22063
Albany, NY 12201

*NOTE: Payment submitted from outside the United States should be made by check or draft on a United States bank and in United States currency; payments submitted in any other form will not be accepted and will be returned.

The examination eligibility letter you receive will include instructions on how to schedule and pay an additional fee to sit for the examination with NCEES and our examination administrator - Castle Worldwide Inc. Please refer to your examination eligibility letter for scheduling and payment of their fees.

Partial Refunds

Individuals who withdraw their licensure application may be entitled to a partial refund.


- For the procedure to withdraw your application, contact the Professional Engineering Unit at opunit1@mail.nysed.gov or by calling 518-474-3817 ext. 250 or by fax at 518-402-5354.
- The State Education Department is not responsible for any fees paid to an outside testing or credentials verification agency.

If you withdraw your application, obtain a refund, and then decide to seek New York State licensure at a later date, you will be considered a new applicant, and you will be required to pay the licensure and registration fees and meet the licensure requirements in place at the time you reapply.

Education and Experience Requirements

To become licensed as a professional engineer in New York State you must complete a combination of education and experience for which years of credit are awarded. The credit awarded for your education determines the required number of years of experience you need:

- A total of 6 years of credit is required for admission to the Fundamentals of Engineering examination (Part A)
- A total of 12 years of credit is required for admission to the Principles and Practice examination (Part B) for licensure.

The [table below](#) and a [PDF chart](#) ( 129 KB) are provided to help you determine your eligibility and the number of years of experience you need to take Part A or Part B of the examination.

Experience acceptable for licensure must be of a scope and nature satisfactory to the Department and must be appropriately verified by the Department. The experience must:

- demonstrate the intensive application of engineering principles in the practical solution of engineering problems;
- demonstrate a knowledge of engineering mathematics, physical and applied sciences, properties of materials, and the fundamental principles of engineering design;
- be broad in scope;
- develop and mature the applicant's engineering knowledge and judgment; and
- include at least two years of experience working on projects requiring knowledge and use of codes and practices commonly used in the United States.

All the experience you wish to have evaluated must be described on [Forms 4 and 4A](#) and should be accounted for chronologically. Experience descriptions must include specific duties you personally performed, the complexity of the work, and make clear the extent of your responsibility for the work. Please list your experience in a comprehensive, detailed, and explicit manner. The Department will consider only experience that you have completed by the date the application is signed. The quality of the experience, not merely the calendar time, will be evaluated. Time claimed on the forms cannot exceed actual calendar time.

Examination Requirements

To be licensed as a professional engineer in New York State, you must pass:

- The Part A, the Fundamentals of Engineering (FE) exam, and
- The Part B, the Principles and Practice of Engineering (PE) exam.

Examinations are developed by the National Council of Examiners for Engineering and Surveying (NCEES) and administered by CASTLE Worldwide, Inc. or Pearson VUE Testing Centers.

All exam applicants are required to read the "NCEES Examinee Guide" prior to being allowed to register for the exam. Please use this link to access the "NCEES Examinee Guide" at:

<http://ncees.org/exams/cbt/examinee-guide/>

Part A Fundamentals of Engineering Exam

Beginning in 2014, this exam will be delivered via a computer-based testing service. The schedule for this exam will begin in January 2014 with a 'two months on and one month off' schedule. See the [NCEES](#) website for exact dates and deadlines.

For Candidates from a Baccalaureate level EAC/ABET Accredited Program in Engineering:

If you are within 20 credits of graduating from, or have already graduated from a baccalaureate level EAC/ABET accredited program, you are eligible to apply directly to NCEES to take the Fundamentals (FE) exam.

For Candidates from a Baccalaureate level ETAC/ABET Accredited Program in Engineering Technology:

If you have graduated and earned a bachelor's degree from an ETAC/ABET accredited program, you are eligible to apply directly to NCEES to take the Fundamentals (FE) exam.

- To find out if your program is EAC/ABET Accredited or ETAC Accredited go to the ABET web site [here](#).
- For information about the difference between EAC and ETAC ABET accreditation click [here](#).

For candidates NOT from a Baccalaureate level ABET Accredited Program:

If you have not graduated from either an EAC or ETAC/ABET accredited program with a bachelor's degree, you must download and submit the New York State Engineering application [forms](#) and \$70 fee so that your qualifications can be reviewed for approval by the Department. Once approved, you will be made eligible to sit for the Fundamentals (FE) exam via a letter sent to you from the NYS Board for Engineering that will include instructions for how to schedule the exam and pay the examination fee(s) with NCEES.

For ALL FE Exam Candidates:

Information on the new computer based format of the Part A, Fundamentals of Engineering (FE) exam will be available in early September on the [NYSED Engineering](#) web site and on [NCEES'](#) website for your review.

Part B Principles and Practice (PE) Exam

Part B, the Principles and Practice of Engineering (PE) examination is administered twice a year, in April and October, at various sites throughout New York State. In order to be eligible to sit for this exam, you must first download and submit the New York State Engineering license application [forms](#), and the appropriate fees to the Department. The deadlines for submitting NYS licensure applications in preparation for the Part B, Principles and Practice (PE) Exam are:

- For April 2014 examinations – Deadline is October 18, 2013
- For October examinations - Deadline is May 1st of year in which you take the exam

After your licensure/examination application with experience documentation has been reviewed and approved by the NYS Board for Engineering, you will be sent an eligibility letter. This letter will include instructions on how to schedule the exam with NCEES and pay the examination fee(s) to Castle Worldwide, Inc.

Other Information About the Exams

NCEES limits calculators allowed in examination room.

NCEES policy prohibits calculators that communicate or that may compromise the security of the examination. NCEES publishes a list of the calculators that are acceptable for both Part A - The Fundamentals of Engineering (FE) examination, and Part B - the Principles and Practice of Engineering (PE) examination. Only the models listed on the NCEES website will be permitted in the examination room.

Review and Rescore Information for PE Examination

PE examination candidates who receive a failing grade may request a manual re-score. The request should be made in writing to the Professional Examinations Unit at OPEXAMS@mail.NYSED.gov no later than 30 days after examination grades are made available to candidates on the NCEES website. There is no review available for the NCEES examination for PE.

Accommodations

Individuals with Disabilities/Sabbath Observers/Military

The process to request a reasonable accommodation or alternate test date will be part of the registration/scheduling process with NCEES and Castle Worldwide through their online system. If you are requesting accommodations, we suggest you begin the process as soon as the NCEES registration process opens for the exam you plan to take, as this will assist in the timely processing of your request.

Intern Engineer Certificate

To qualify for an Intern Engineer Certificate in New York State you must meet the following requirements:

- Graduate of an EAC/ABET approved program in engineering leading to a baccalaureate degree, and
- Successfully complete the NCEES Fundamentals of Engineering (FE) examination.

Please note that the Intern Engineer Certificate does not qualify you to practice engineering in New York State, but is an attestation of successful completion of the requirements listed above.

Intern Engineer Certificate requires the following documentation:

- Form 1IE – Application for Intern Engineer Certificate along with \$70.00 fee, and **either**

- Form 2 – Certification of Professional Education(submitted to your school for completion upon graduation) **OR**
- Your New York State school has submitted your education utilizing a Form 20F. You need to check with your New York State school to verify if they utilize and have submitted a Form 20F.

Please note if you have previously submitted a Form 1 and the \$70 fee to apply for approval to sit for the FE exam you do not need to submit a Form 11E and fee.

Applicants Licensed in Another State (Endorsement)

You may be eligible for licensure in New York State if you:

- meet all requirements for licensure in New York State, except having completed the examination, and
- have been issued a license or a certificate to practice professional engineering upon written examination by a board of examiners in another state or political subdivision of the United States.

The examination for the license or certificate must be equivalent to the examination required in this state at the time it was issued.

You must submit full documentation of compliance with all other New York State licensure requirements including professional education and satisfactory professional experience, among other requirements, as part of your application for licensure by endorsement. New York State does not have a reciprocity/comity agreement with any jurisdiction; if you are applying with a [NCEES Record](#), you would need to submit Form1 and request NCEES to have your current NCEES Record transmitted to us for review.

Last Updated: June 9, 2014

Appendix B

American Society of Civil Engineers (ASCE) Code of Ethics

Information in this appendix is taken directly from the ASCE web site:
<http://www.asce.org/Content.aspx?id=7231> and is current as of July 2014.

Check the web site for any changes or updates.

Code of Ethics¹

Fundamental Principles²

Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

1. using their knowledge and skill for the enhancement of human welfare and the environment;
2. being honest and impartial and serving with fidelity the public, their employers and clients;
3. striving to increase the competence and prestige of the engineering profession; and
4. supporting the professional and technical societies of their disciplines.

Fundamental Canons

1. Engineers shall hold paramount the safety, health and welfare of the public and shall strive to comply with the principles of sustainable development³ in the performance of their professional duties.
2. Engineers shall perform services only in areas of their competence.
3. Engineers shall issue public statements only in an objective and truthful manner.
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.
5. Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.
6. Engineers shall act in such a manner as to uphold and enhance the honor, integrity, and dignity of the engineering profession and shall act with zero-tolerance for bribery, fraud, and corruption.
7. Engineers shall continue their professional development throughout their careers, and shall provide opportunities for the professional development of those engineers under their supervision.

Guidelines to Practice Under the Fundamental Canons of Ethics

CANON 1.

Engineers shall hold paramount the safety, health and welfare of the public and shall strive to comply with the principles of sustainable development in the performance of their professional duties.

1. Engineers shall recognize that the lives, safety, health and welfare of the general public are dependent upon engineering judgments, decisions and practices incorporated into structures, machines, products, processes and devices.
2. Engineers shall approve or seal only those design documents, reviewed or prepared by them, which are determined to be safe for public health and welfare in conformity with accepted engineering standards.
3. Engineers whose professional judgment is overruled under circumstances where the safety, health and welfare of the public are endangered, or the principles of sustainable development ignored, shall inform their clients or employers of the possible consequences.
4. Engineers who have knowledge or reason to believe that another person or firm may be in violation of any of the provisions of Canon 1 shall present such information to the proper authority in writing and shall cooperate with the proper authority in furnishing such further information or assistance as may be required.
5. Engineers should seek opportunities to be of constructive service in civic affairs and work for the advancement of the safety, health and well-being of their communities, and the protection of the environment through the practice of sustainable development.
6. Engineers should be committed to improving the environment by adherence to the principles of sustainable development so as to enhance the quality of life of the general public.

CANON 2.

Engineers shall perform services only in areas of their competence.

1. Engineers shall undertake to perform engineering assignments only when qualified by education or experience in the technical field of engineering involved.
2. Engineers may accept an assignment requiring education or experience outside of their own fields of competence, provided their services are restricted to those phases of the project in which they are qualified. All other phases of such project shall be performed by qualified associates, consultants, or employees.
3. Engineers shall not affix their signatures or seals to any engineering plan or document dealing with subject matter in which they lack competence by virtue of education or experience or to any such plan or document not reviewed or prepared under their supervisory control.

Guidelines to Practice Under the Fundamental Canons of Ethics

CANON 3.

Engineers shall issue public statements only in an objective and truthful manner.

1. Engineers should endeavor to extend the public knowledge of engineering and sustainable development, and shall not participate in the dissemination of untrue, unfair or exaggerated statements regarding engineering.
2. Engineers shall be objective and truthful in professional reports, statements, or testimony. They shall include all relevant and pertinent information in such reports, statements, or testimony.
3. Engineers, when serving as expert witnesses, shall express an engineering opinion only when it is founded upon adequate knowledge of the facts, upon a background of technical competence, and upon honest conviction.
4. Engineers shall issue no statements, criticisms, or arguments on engineering matters which are inspired or paid for by interested parties, unless they indicate on whose behalf the statements are made.
5. Engineers shall be dignified and modest in explaining their work and merit, and will avoid any act tending to promote their own interests at the expense of the integrity, honor and dignity of the profession.

CANON 4.

Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.

1. Engineers shall avoid all known or potential conflicts of interest with their employers or clients and shall promptly inform their employers or clients of any business association, interests, or circumstances which could influence their judgment or the quality of their services.
2. Engineers shall not accept compensation from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed to and agreed to, by all interested parties.
3. Engineers shall not solicit or accept gratuities, directly or indirectly, from contractors, their agents, or other parties dealing with their clients or employers in connection with work for which they are responsible.
4. Engineers in public service as members, advisors, or employees of a governmental body or department shall not participate in considerations or actions with respect to services solicited or provided by them or their organization in private or public engineering practice.
5. Engineers shall advise their employers or clients when, as a result of their studies, they believe a project will not be successful.

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6. Engineers shall not use confidential information coming to them in the course of their assignments as a means of making personal profit if such action is adverse to the interests of their clients, employers or the public.
7. Engineers shall not accept professional employment outside of their regular work or interest without the knowledge of their employers.

CANON 5.

Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.

1. Engineers shall not give, solicit or receive either directly or indirectly, any political contribution, gratuity, or unlawful consideration in order to secure work, exclusive of securing salaried positions through employment agencies.
2. Engineers should negotiate contracts for professional services fairly and on the basis of demonstrated competence and qualifications for the type of professional service required.
3. Engineers may request, propose or accept professional commissions on a contingent basis only under circumstances in which their professional judgments would not be compromised.
4. Engineers shall not falsify or permit misrepresentation of their academic or professional qualifications or experience.
5. Engineers shall give proper credit for engineering work to those to whom credit is due, and shall recognize the proprietary interests of others. Whenever possible, they shall name the person or persons who may be responsible for designs, inventions, writings or other accomplishments.
6. Engineers may advertise professional services in a way that does not contain misleading language or is in any other manner derogatory to the dignity of the profession. Examples of permissible advertising are as follows:
 - Professional cards in recognized, dignified publications and listings in rosters or directories published by responsible organizations, provided that the cards or listings are consistent in size and content and are in a section of the publication regularly devoted to such professional cards.
 - Brochures which factually describe experience, facilities, personnel and capacity to render service, providing they are not misleading with respect to the engineer's participation in projects described.
 - Display advertising in recognized dignified business and professional publications, providing it is factual and is not misleading with respect to the engineer's extent of participation in projects described.
 - A statement of the engineers' names or the name of the firm and statement of the type of service posted on projects for which they render services.

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- Preparation or authorization of descriptive articles for the lay or technical press, which are factual and dignified. Such articles shall not imply anything more than direct participation in the project described.
- Permission by engineers for their names to be used in commercial advertisements, such as may be published by contractors, material suppliers, etc., only by means of a modest, dignified notation acknowledging the engineers' participation in the project described. Such permission shall not include public endorsement of proprietary products.
- Engineers shall not maliciously or falsely, directly or indirectly, injure the professional reputation, prospects, practice or employment of another engineer or indiscriminately criticize another's work.
- Engineers shall not use equipment, supplies, laboratory or office facilities of their employers to carry on outside private practice without the consent of their employers.

CANON 6.

Engineers shall act in such a manner as to uphold and enhance the honor, integrity, and dignity of the engineering profession and shall act with zero tolerance for bribery, fraud, and corruption.

1. Engineers shall not knowingly engage in business or professional practices of a fraudulent, dishonest or unethical nature.
2. Engineers shall be scrupulously honest in their control and spending of monies, and promote effective use of resources through open, honest and impartial service with fidelity to the public, employers, associates and clients.
3. Engineers shall act with zero-tolerance for bribery, fraud, and corruption in all engineering or construction activities in which they are engaged.
4. Engineers should be especially vigilant to maintain appropriate ethical behavior where payments of gratuities or bribes are institutionalized practices.
5. Engineers should strive for transparency in the procurement and execution of projects. Transparency includes disclosure of names, addresses, purposes, and fees or commissions paid for all agents facilitating projects.
6. Engineers should encourage the use of certifications specifying zero tolerance for bribery, fraud, and corruption in all contracts.

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CANON 7.

Engineers shall continue their professional development throughout their careers, and shall provide opportunities for the professional development of those engineers under their supervision.

1. Engineers should keep current in their specialty fields by engaging in professional practice, participating in continuing education courses, reading in the technical literature, and attending professional meetings and seminars.
2. Engineers should encourage their engineering employees to become registered at the earliest possible date.
3. Engineers should encourage engineering employees to attend and present papers at professional and technical society meetings.
4. Engineers shall uphold the principle of mutually satisfying relationships between employers and employees with respect to terms of employment including professional grade descriptions, salary ranges, and fringe benefits.

¹ The Society's Code of Ethics was adopted on September 2, 1914 and was most recently amended on July 23, 2006. Pursuant to the Society's Bylaws, it is the duty of every Society member to report promptly to the Committee on Professional Conduct any observed violation of the Code of Ethics.

² In April 1975, the ASCE Board of Direction adopted the fundamental principles of the Code of Ethics of Engineers as accepted by the Accreditation Board for Engineering and Technology, Inc. (ABET).

³ In November 1996, the ASCE Board of Direction adopted the following definition of Sustainable Development: "Sustainable Development is the challenge of meeting human needs for natural resources, industrial products, energy, food, transportation, shelter, and effective waste management while conserving and protecting environmental quality and the natural resource base essential for future development."