

Fall 2009

*DEPARTMENT OF CIVIL
AND ENVIRONMENTAL ENGINEERING
UNDERGRADUATE HANDBOOK*



CEE @
Carnegie Mellon

*Civil and Environmental Engineering
At the Intersection of Built, Natural and Virtual Environments*

Introduction and Welcome
By
James H. Garrett, Jr.

On behalf of the faculty and staff, I wish to welcome you to the Department of Civil and Environmental Engineering. We hope your experience at Carnegie Mellon is both productive and rewarding and, toward these ends, we shall be pleased to help you in any way possible.

This handbook is intended to provide most of the department information that undergraduate students find useful at the beginning of the academic year. It is intended to supplement University information found in “The Word”, the undergraduate Student Handbook. Additional information is available on the CEE Web pages (www.ce.cmu.edu) and the Carnegie Mellon Web pages (www.cmu.edu). Please look through it as soon as you have the opportunity, and become familiar with department and university policies. Naturally, if you have any questions, your academic advisor, Patty Langer (the undergraduate program coordinator), or I shall be happy to answer them.

Again, welcome to the Department of Civil and Environmental Engineering at Carnegie Mellon, and best wishes for a successful year.

Department of Civil and Environmental Engineering

Vision Statement

The department vision is to continue to achieve national and international recognition through the impact of its research and alumni in four core areas: advanced infrastructure systems; mechanics, materials and computing; water and air quality; and green design. Our vision includes our department being a collegial, collaborative and welcoming environment in which to learn and work.

Mission Statement

- *To create, disseminate and integrate knowledge of engineering, science and technology that expands our civil and environmental engineering knowledge base, which in turn enables the betterment of human society.*
- *To develop and transfer innovative applications of engineering, science and technology to improve civil and environmental engineering practice.*
- *To be recognized by our peers as a highly effective leader in the conduct of interdisciplinary research and the development of innovative approaches to solving civil and environmental engineering problems.*
- *To attract and welcome undergraduate students to our Bachelor of Science program in Civil Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.*
- *To attract and welcome graduate students into advanced study and to graduate Master of Science and Doctoral students who possess both breadth and depth in their chosen focus area and are heavily recruited by industry and academia for their academic strengths and their leadership skills.*
- *To maintain an intellectually challenging, yet supportive and welcoming environment, that encourages and enables our students, faculty and staff to achieve their best in a diverse community.*

Statement of Values

- **OUR PEOPLE ARE OUR CORE STRENGTH**
Our primary strength lies in our students, faculty and staff.
- **EXCELLENCE**
Excellence is our goal in all our endeavors.
- **INTEGRITY**
Engineering research, education, and practice all demand the highest moral and ethical standards.
- **RESPECT FOR ALL**
Respect for all encourages our community to enjoy a diversity of opinion, intellectual perspective, and cultural heritage.

- **COLLEGIALITY**
a collegial, collaborative and welcoming environment is vital to our success.
- **INTERDISCIPLINARITY**
Our strong support for interdisciplinary research teams and collaborative research enhances our collegial environment.
- **CONTINUOUS IMPROVEMENT**
Continuous improvement and innovation are essential to accomplish our goals.
- **ENGAGEMENT IN COMMUNITY**
Involvement in campus life, external industry, government and professional organizations, and public outreach activities, all of which provide important links to the broader community.

Educational Objectives

The objectives of the Bachelor of Science in Civil Engineering curriculum are to develop:

- Graduates effectively tackle both routine and cutting-edge professional challenges at the intersections of the built, natural and information environments;
- Graduates are successful and recognized as innovative and adaptive leaders in academic research, government service and private sector activity, over a wide range of engineering and non-engineering professions, and both in the U.S. and internationally; and
- Graduates use the skills learned during their undergraduate education as leaders of their professional and social communities – problem finding/modeling/solving; critical and systems-level thinking; ethical reasoning; written, oral and graphical communications; collaborative team-building and problem solving; and self – and life-long learning.

The Civil Engineering curriculum is intended to allow ample opportunity for students to pursue areas of personal interest. The opportunity for self-exploration requires careful advising to gain meaningful educational experiences. We believe that design and team working experiences should occur at regular intervals in the curriculum, and that graduates should have appropriate “hands on” experience in laboratories and projects. Students are encouraged to participate in research projects and to pursue study or work abroad.

By the end of the B.S. program, students should have a variety of abilities and skills:

- A: an ability to apply knowledge of mathematics (specifically, differential equations and probability and statistics), science (specifically, calculus-based physics and general chemistry) and engineering to practice and problem solving
- B: an ability to design and conduct experiments, as well as to analyze critically and interpret data in environmental engineering, solid mechanics, fluid mechanics and soil mechanics

C: an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

D: an ability to function on multi-disciplinary teams

E: an ability to identify, formulate and solve civil engineering problems

F: an understanding of professional and ethical responsibility

G: an ability to communicate effectively in graphics, speech and words

H: the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context

I: recognition of the need for and an ability to engage in lifelong learning

J: knowledge of contemporary issues relevant to engineering practice

K: an ability to use the techniques, skills and modern engineering tools necessary for civil engineering practice

L: apply knowledge in environmental engineering

M: apply knowledge in structural engineering

N: apply knowledge in construction and management

O: apply knowledge in computing in civil engineering

P: explain basic concepts in management, business, public policy, leadership, and the importance of professional licensure.

The curriculum has been designed, and is periodically evaluated and refined, to provide students instruction and experiences that lead to the development of these abilities and skills.

**Department of Civil and Environmental Engineering
Faculty Directory**

Name	Office	Phone
Acharya, Amit (amita+@andrew.cmu.edu) Professor	PH 101	412-268-4566
Adams, Peter (petera+@andrew.cmu.edu) Associate Professor	PH 111	412-268-5624
Akinci, Burcu (bakinci+@andrew.cmu.edu) Professor	PH 123K	412-268-2959
Bielak, Jacobo (jbielak+@andrew.cmu.edu) University Professor	PH 123H	412-268-2958
Cartwright, Larry (lc23+@andrew.cmu.edu) Teaching Professor & Lab Manager	PH 107D	412-268-2954
Cohon, Jared University President	WH 602	412-268-2200
Davidson, Cliff (cliff+@andrew.cmu.edu) Professor, Director of the Environmental Institute	PH 123E	412-268-2951
Dayal, Kaushik (kaushik+@andrew.cmu.edu) Assistant Professor	PH 113	412-268-2949
Dzombak, David (dzombak+@andrew.cmu.edu) Blenko Professor & Associate Dean CIT	PH 107B	412-268-2946
Fenves, Steven Professor Emeritus DC	National Institute of Science & Technology – Washington,	
Finger, Susan (sfinger+@ri.cmu.edu) Professor	PH 123B	412-268-8828
Garrett, Jr., James (garrett+@andrew.cmu.edu) Professor & Head	PH1119D	412-268-2941
Gregory, Kelvin (kgregory+@andrew.cmu.edu) Assistant Professor	PH 123F	412-268-9811
Hendrickson, Chris (cth+@andrew.cmu.edu) Duquesne Light Professor	PH 123J	412-268-2299

**Department of Civil and Environmental Engineering
Faculty Directory (cont.)**

Lowry, Gregory (glowry+@andrew.cmu.edu) Professor	PH 123L	412-268-2948
Maloney, Craig (craigmaloney@andrew.cmu.edu) Assistant Professor	PH 103	412-268-1468
Matthews, H. Scott (hsm+@andrew.cmu.edu) Associate Professor	PH 123A	412-268-6218
McMichael, Francis (fm2a+@andrew.cmu.edu) Professor Emeritus	PH 118H	412-268-3865
Nakles, David (dnakles+@andrew.cmu.edu) Research Faculty	PH 118H	
Oppenheim, Irving (ijo+@andrew.cmu.edu) Professor	PH 107A	412-268-2950
Soibelman, Lucio (lucio+@andrew.cmu.edu) Professor	PH 123C	412-268-2952
Small, Mitchell (ms35+@andrew.cmu.edu) Heinz Professor	PH 123D	412-268-8782
VanBriesen, Jeanne (jeanne+@andrew.cmu.edu) Professor	PH 123G	412-268-4603
Weber, Christopher (clweber+@andrew.cmu.edu) Research Faculty	PH 118K	412-268-5550

**Department of Civil and Environmental Engineering
Staff Directory**

Name	Office	Phone
Dadowski, Gloria (dadowski+@andrew.cmu.edu) Conference & Event Coordinator	PH 119	412-268-1068
Langer, Patty (patty+@andrew.cmu.edu) Undergraduate Program Administrator/ Alumni Relations	PH 118M	412-268-1070
Leffard, Maxine (leffard+@andrew.cmu.edu) Graduate Program Administrator	PH 118N	412-268-5673
Marano, Donna I. (donna+@andrew.cmu.edu) Director of Finance and Administration	PH 119	41-268-2942
Mobley, Mireille (mmobley+@andrew.cmu.edu) Office Coordinator/Graphic Design	PH 119	412-268-2940
Moore, Cornelia (cornelia+@andrew.cmu.edu) Graduate Admissions Coordinator	PH 118P	412-268-2940
Musati, Karen (kp11+@andrew.cmu.edu) Editorial Assistant/Secretary	PH 119	412-268-1071
Ron Ripper (ronr+@andrew.cmu.edu) Lab Manager	PH 207C	412-268-3819
Rooney, Andrea (francioni+@andrew.cmu.edu) Director of Publications/Assistant to the Dept. Head	PH 119	412-268-9723
Yeske, Curt (help@ce.cmu.edu) Director, Computing Services & Physical Facilities	PH A1	412-268-2891
Darlene Zin (dzin+@andrew.cmu.edu) Editorial Assistant		Home

General Information

Frequently Asked Questions

Undergraduate Programs and Career Opportunities in Civil and Environmental Engineering

What is Civil and Environmental Engineering?

Civil and Environmental Engineering is a profession that applies technology to meet society's needs. Civil and Environmental Engineers are essential to provide buildings, clean water, roadways and the protection of the natural environment. With the advent of new information technologies, civil and environmental engineering is at the intersection of the built, natural and information environments. The information environment for civil and environmental engineering includes computer-aided design, local and remote sensing, environmental monitoring, field robotic control, and models of complex natural and built systems. The challenge of civil and environmental engineering is to meld the built, information and natural environments effectively to meet society's needs.

What do Civil Engineers do?

Civil engineers conceive and manage the physical infrastructure and environmental protection systems of our society. They design, plan, construct and manage physical facilities, including roadways, dams, buildings and pipelines. They may own a construction firm, be a partner in a consulting company, or work for a government agency or corporation. They can find work anywhere in the world, because there are needs for physical facilities everywhere.

Graduates with a civil engineering degree also enter other professions or career paths. These graduates have a broad, problem solving background from their civil engineering studies, which can provide an excellent preparation for many careers. Indeed, engineering might be considered to be the "liberal arts" of the 21st Century. Civil engineering graduates may work as medical doctors, lawyers, military officers, managers, software engineers or in many other positions.

What do Environmental Engineers do?

Environmental engineering developed as an area of civil engineering and now is important in all civil engineering activities. Environmental engineers identify and design solutions for environmental problems. They provide safe drinking water, manage wastes, maintain air quality, control water pollution, and clean sites contaminated by spills or improper disposal of hazardous wastes. Increasingly, pollution prevention is as important a concern for environmental engineers as treatment and management of wastes. Environmental engineers may work for government agencies, private industry or a variety of non-governmental, non-profit organizations.

What degrees in Civil and Environmental Engineering are offered for undergraduates at Carnegie Mellon?

Carnegie Mellon offers a Bachelor of Science in Civil Engineering and an undergraduate engineering student may also minor in Environmental Engineering. The Bachelor of Science program in Civil Engineering is an accredited and widely recognized degree program for entry into the civil engineering profession. The minor in environmental engineering is offered for any engineering students interested in focusing on this important specialization area. The Civil Engineering curriculum is very flexible, allowing students to pursue specializations in a variety of areas such as structural engineering or industrial management.

While the Bachelor of Science in Civil Engineering is adequate for entry into professional work, it is advisable for engineering professionals to continue learning throughout their careers. In most cases, a post-graduate degree such as a Master of Science is an important goal at some point during a career. A Master of Science in Environmental Engineering is often required for even entry-level positions in this specialization area.

What is different about Civil and Environmental Engineering at Carnegie Mellon?

Carnegie Mellon's Civil and Environmental Engineering is distinctive:

- First year engineering courses provide an early introduction to civil engineering and a chance to apply your mathematics and science tools to real problems.
- We provide more flexibility in course selection than any other civil engineering program in the United States. This allows students to pursue their own interests, but still remain within the framework of an accredited program.
- As a small program, students and faculty know each other very well. Students receive personal attention. Opportunities for leadership and involvement abound, including participation in research projects.
- The regular faculty teaches required courses, while many elective classes are offered by professional practitioners to provide a different viewpoint. We pride ourselves on excellence in teaching throughout the department.
- Our faculty is passionately interested in both educational and research innovation. Many faculty have received support from sources such as the National Science Foundation to develop new course materials or to disseminate new teaching techniques.
- Computer use and information technology are integrated throughout the curriculum. Graduates are prepared for the modern workplace, which places a premium on effective use of information technology. We maintain a computer cluster for the exclusive use of our undergraduates.

What is required for the Minor in Environmental Engineering?

The minor in Environmental Engineering requires additional course work in the specialized area of environmental engineering beyond a traditional engineering major degree program. Seven courses are required, including two courses in environmental science, three in environmental engineering, and two in environmental policy. The environmental policy courses can also be counted towards the general education course requirements and two of the engineering and science courses can be counted towards a student's major program of study.

Can undergraduates in Civil Engineering complete additional majors or minors at Carnegie Mellon?

Yes. A variety of additional majors and minors are available at Carnegie Mellon. An additional major in Engineering and Public Policy is the most popular. Other common additional major programs include Biomedical and Health Engineering, Business, Economics, Mathematics and Modern Languages. Popular minors include business, engineering design, environmental engineering and architecture.

Can Civil Engineering undergraduates participate in varsity sports?

Yes; Civil engineers have played all of the varsity sports at Carnegie Mellon. Football and swimming are the most common sports for these varsity athletes. As a Division III NCAA program, academics and athletic participation are designed to be compatible.

How long does it take to complete a Bachelor of Science degree in Civil Engineering, especially if I do an additional major?

Nearly all civil engineering students finish within four years of starting their program. With seven free elective courses, there is ample opportunity to pursue specific interests such as an additional major or minor. Students pursuing these programs need to plan ahead in selecting elective courses.

Is it possible to study overseas or have co-op industrial experiences as an undergraduate?

Yes. Civil Engineering students have spent either a semester or a year abroad in countries such as Australia, Japan, South Africa or Switzerland. The College of Engineering has a long-standing exchange program with the Ecole Polytechnique Fédérale de Lausanne (EPFL) in Lausanne, Switzerland. The availability of seven free elective courses in the undergraduate curriculum gives considerable flexibility for overseas study. For co-op industrial experiences, students can undertake internships over the summers or opt for a semester and summer combined industrial internship. However, these longer co-op experiences will delay graduation. If you are interested, you should contact the Study Abroad Office, Warner Hall 219, 412-268-4969.

Can I get involved in a research or other group project?

Yes. Undergraduates have worked on research projects ranging from acid mine drainage to construction robots to computer aided design methods. Courses require hands-on project work in each of the four years of study. Elective courses also have projects, such as the annual "Design and Construction" course, which involves designing and building a facility on campus. Past projects have included stairways, parks and amphitheaters.

How does undergraduate advising in Civil and Environmental Engineering work?

Each undergraduate in Civil Engineering is assigned a faculty advisor. Faculty advisors usually stay with a student throughout their undergraduate careers. The faculty advisors and students meet periodically to discuss programs of study, career plans or student problems. Students also seek advice from other faculty members or staff in the department for specialized fields of study or internship opportunities.

How can I learn more about Civil and Environmental Engineering?

Many sources can be helpful:

- For general information, consult the department website at <http://www.ce.cmu.edu/>
- For administrative information, visit the department offices in Porter Hall Room 119.
- To ask specific questions, call the department receptionist (412-268-2940) or send email to the undergraduate coordinator, Patty Langer (patty+@andrew.cmu.edu)
- For information on placement and graduate salaries, see the Career Center website at <http://www.as.cmu.edu/career/home.html> and look for civil and environmental engineering.
- For information on civil engineering generally, consult the website of the American Society of Civil Engineers: <http://www.asce.org/>

Business Office

The Department offices are located in the Porter Hall (PH) 119 wing and are open from 8:30 am to 5:00 pm, Monday through Friday. The Department has a copier, stapler, paper punch, etc., available for your use in the lounge. Students are required to pay \$0.05 per page for photocopying. Please see the receptionist for photocopying. Secretarial services and office supplies are not provided for students. The University Shoppe, located in the University Center, carries a wide range of office materials for purchase.

A fax machine is located in the main office if you wish to send a fax. Please complete a fax cover sheet, available in the bin marked "Fax Cover Sheets". The receptionist will see that it is sent. Personal faxes to numbers within the U.S., Canada and Mexico will be

charged \$1.00 per page. The charge for overseas faxes is \$1.50 per page. All personal faxes are payable at the time they are sent.

Computing

Carnegie Mellon has a large and complex computing environment with many unique aspects. Computing ranges from personal computers through workstations to high-performance computers at the Pittsburgh Supercomputing Center (PSC). As a Carnegie Mellon student, you may deal with a variety of these computing facilities, including those operated by the department, those of Computing Services (CS), those of the School of Computer Science (SCS), etc. In total, we have thousands of machines, all connected together in a vast network.

Computing will play an integral part of your college experience, including use in courses, research, writing papers and reports, and communicating with faculty, students and friends. Being computer literate is an essential part of the Carnegie Mellon experience. Understanding how to use these machines, and the overall computing environment is essential.

The department makes computer allocations for computing and printing prior to the beginning of each academic year. Curt Yeske, Director of Computing Services and Physical Facilities, is responsible for assessing and maintaining computing resources for the entire department. The allocation of computing resources is managed by the Departmental Computing Committee, chaired by Professor James H. Garrett, Jr.

Undergraduate Computer Lab – Porter Hall 107C

We need your help if we are going to continue to maintain the undergraduate computer cluster. The following principles and policies are in force for the undergraduate computer cluster, plus the relevant university policies for use of computing and respect for other members of the community. In years past, the department has had to deny use of the cluster if the users could not abide by these rules.

Keep the work areas clean and functional.

1. No food or drink are allowed in the computer cluster
2. Use the Tung Au Lab for pizza, snack breaks, and group meetings

A safe and secure environment is everyone's right.

1. Keep doors closed. The environmental controls on each of the radiators provide temperature control - not the door.
2. Do not admit anyone into the computer cluster you do not know. People who are not in the department should not be using 107C.
3. Introduce yourself to newcomers. Check the photographs in the hall if you are unsure that someone is a fellow CEE student.
4. Keep your ID with you.
5. Call Campus Police at x82323 for possible intruders or problems. A phone is located in the cluster, and down the hall outside of PH 103.

Keep the department informed of suggestions or problems:

Send email to help@ce.cmu.edu to report problems or suggestions to improve service.

Respect other users' environment:

1. Electronic vandalism such as renaming icons or changing backgrounds is confusing and annoying
2. Reset properties back to the default after you are done using a system
3. We will be experimenting with ways of providing individual accounts on these systems, but implementation will be slow.

The systems should be reliable; please help keep them that way:

1. Don't use the system units as footstools
2. Don't take the systems apart
3. Clean up your area when leaving, (the amount of paper, cellophane, and crumbs caught in the cooling fans is amazing.)
4. Don't tug or kick on the cabling
5. Power down the printers or computers only when completely necessary
6. Don't drop paper clips or staples into printers or keyboards
7. Don't put books and papers on top of monitors – they'll overheat.

The scanner, plotter, and color printer require special care:

1. Don't use the color printer for black and white prints
2. Print black and white drafts of color output on the black and white printer
3. Avoid touching or smudging the glass on the scanner
4. Make sure you know how to use the plotter before using the first time.

You have a unique electronic identity:

1. Protect it and your work
2. Do not share your passwords or rename your userid.

EMERGENCY PROCEDURES

Medical Emergencies

Calling Carnegie Mellon Security can provide emergency transportation (24 hours/day) at 412-268-2323, or campus 82323. In event of an emergency, students are directed to go to Presbyterian University Hospital Emergency Room, entrance on DeSoto Street, call: 412-647-333. Donna Marano (412-268-2942), Director of Finance and Administration or Patty Langer, Undergraduate Program Coordinator (412-268-1070) should be notified of all medical emergencies as soon as appropriate.

Fire Emergencies

Suspicion of fire should be reported to Carnegie Mellon Security (24 hour/day) at 412-268-2323 or campus 82323. Pull the fire alarm in your building, lock doors and immediately leave the building. In the case of fire alarm activation, lock doors and evacuate the building immediately.

Additional Emergency Contacts

Computing Facilities

Curt Yeske, Director of Computing Services and Physical Facilities at 412-268-2891, cellular 412-260-2403

Physical Facilities

Curt Yeske at 412-268-2891, cellular 412-260-2403 or Donna Marano, Director of Finance & Administration at 412-268-2942, cellular 412-427-0890

Medical

Patty Langer, Undergraduate Program Coordinator at 412-28-1070, cellular 412-576-6256 or Donna Marano, Director of Finance & Administration at 412-268-2942, cellular 412-427-0890

Academic Support Services

Besides faculty advising, many other resources are available at Carnegie Mellon to help students succeed in their studies. Some that you should be aware of include:

- The Career Center (Lisa Dickter) provides career counseling. The Center also helps graduating students who are seeking employment with resume preparation, interview skills, and contacting potential employers. In addition, the Center can also assist you in choosing or confirming a choice of major and minor areas, in clarifying a career choice, or in planning for graduate school. Call 412-268-2064. The Center is located in the basement of the University Center.

- Health Services (Anita Barkin, Director) is staffed by a physician, nurse practitioners, and registered nurses. They are located in the Morewood Gardens E-tower. Appointments are required, but walk-in urgent care is available. Call 412-268-2157 for an appointment. For medical emergencies, contact campus police at 412-268-2323.
- Counseling and Psychological Services provides an opportunity to talk about personal or academic concerns. Counseling sessions are free and confidential, and they can be scheduled by calling 412-268-2922. Crisis intervention is available 24 hours a day by calling the center. They are located in the Morewood Gardens E-tower.
- The Office of Academic Development (Linda Hooper, Director) is located in the Cyert Hall, Suite B5. They provide assessment and instruction on study skills. Study skills include textbook reading strategies, lecture note taking, test anxiety, test preparation, and time and stress management. Students often have difficulty with courses due to weaknesses in one or more of these skills, and by addressing them early; you can take an important first step towards improving classroom performance. The center also provides tutoring in calculus, biology, chemistry, physics, and writing, geared primarily for the large introductory courses. They can be reached at 412-268-8298, or you can send email by going to their website: <http://www.cmu.edu/acadev/>
- The Office of International Education (Linda Gentile, Interim Director) located in Warner Hall 301 or at 412-268-5231, is the primary contact point for all students and scholars who are not United States citizens or permanent residents. The Study Abroad Office has a reference library of over 3,000 available programs, including information on funding.

University Smoking Policy

Tobacco smoke, whether inhaled directly by a tobacco smoker, or indirectly by a person in general vicinity of a smoker, is a danger to one's health. Carnegie Mellon University has a vital interest in maintaining a healthy and safe environment for its students, faculty, staff and visitors, while responding sympathetically to individual choice. Consistent with these concerns, and in response to the City of Pittsburgh ordinance prohibiting smoking (Pittsburgh Code Title Six, Article 1, Chapter 617), the following policy has been established to restrict smoking in most areas and to provide procedures for accommodating the preferences of both smokers and non-smokers.

Smoking is prohibited at Carnegie Mellon; smoking is permitted only in areas specifically posted as smoking areas.

Disciplinary Action of Matters on Cheating and Plagiarism

While there is a university-wide disciplinary committee which handles serious disciplinary matters referred to it, the responsibility for establishing disciplinary guidelines rest with each department. It is felt that the following set of rules can be uniformly and fairly applied in the Department of Civil and Environmental Engineering.

First, cheating in any form is not permitted as an ethical or professional behavior and will not be tolerated. Cheating includes, but is not necessarily limited to:

1. The use of unauthorized materials including computer programs in preparation of an assignment or during an examination.
2. The submission or use of falsified data.
3. The submission of work that is not the student's own.
4. The use of an alternate/stand-in proxy during an examination.
5. Supplying unauthorized data to another student for the preparation of an assignment or during an examination.
6. Collaboration in the preparation of an assignment, unless specifically required by the instructor, will usually be viewed as cheating. Each student, therefore, is responsible for understanding the policies of the instructor offering any course as they refer to the amount of help and collaboration permitted in preparation of assignments.

Should any student be found guilty of cheating on a quiz, exam, homework or project, at minimum a zero grade will be recorded and then averaged in with the other grades (should there be any) for the term. Depending on the circumstances, and at the discretion of the instructor and the Department Head, the student may be failed in the course and may be expelled from the University. A repeated occurrence of cheating in a course will be treated as an automatic failure (R grade) and expulsion from the University.

A subtler form of cheating arises in the form of plagiarism, which is defined as “passing off as one's own the ideas or works of another”. Making use of reference material and failing to note (either at all or properly) the original source constitutes plagiarism. When two or more people work together on an individual project and each then turns in his/her individual report as though no collaboration was involved, this also is plagiarism. Simply rewriting another's words or thoughts, or rearranging another's materials, is in every sense plagiarism – unless the student properly and completely references such material, each and every time it is used and to the full extent of usage.

It should be emphasized that any group collaboration which involves individual take-home projects or papers should be carried out only with considerable discretion. That is, students are encouraged to discuss and collaborate among themselves on the various principles, which are expounded in class or covered in the reading materials, etc.; but any group discussion or collaboration which involves any specifics of take-home projects, papers or thesis should be avoided – unless the ideas or efforts of others are to be properly noted. Put differently, when individual work and thinking is called for, group thinking and/or work is entirely inappropriate and is a form of plagiarism.

In any case of cheating or plagiarism, the student may request a review of the instructor's decision by the department head, which will then make the final decision for the department. The student, of course, can appeal any faculty decision to the University Committee on Discipline.

Meeting with your Advisor

For all first year students in the engineering college, initial planning and advising are handled through the office of the Associate Dean for Undergraduate Studies. After you select Civil and Environmental Engineering at the end of the first year as your major, you will be assigned a faculty advisor in the department.

During the sophomore year, you should begin planning your career at Carnegie Mellon in earnest. Students should meet with their advisors in order to plan for each semester, and also to make longer range plans. The Civil and Environmental Engineering Department's faculty advisors have information available to help you plan your curriculum and identify concentrations appropriate to your career objectives. Many options required taking a sequence of courses, some of which might have pre-requisites. Be sure to check co-requisites and pre-requisites as you plan your schedule, particularly for courses in other departments. Your academic advisor can provide you with technical details about the curriculum, but in addition, your advisor is available to help you plan your electives and options after graduation.

Your advisor can also help you plan for summer internships, application to graduate school, study abroad options, and the job interview process.

You should get to know your advisor and his or her office location, and see your advisor at least once per semester. Normally, you should contact your advisor during his or her office hours and make an appointment. Many advisors will post sign-up sheets outside their offices to set appointments for advising, others may contact you by email and ask you to select available times. Feel comfortable in asking questions or discussing plans for your degree and your career. Your advisor is there to help you, not just to sign forms.

When you meet with your advisor, please don't be late or miss a scheduled appointment. To make the most of your meetings, prepare in advance with specific questions, and bring an outline of your plan of study which can form the basis for the meeting's discussion.

Note that the responsibility for planning your schedule falls squarely upon your shoulders. If you do not plan your schedule wisely, you will find it difficult to satisfy the degree requirements or to get the most out of your degree.

Registration and Adding and Dropping of Courses

Students should register on-line. You are strongly encouraged to meet with your academic advisor before you finalize your selection of courses and register on OLR. If you do not know your advisor, please contact Patty Langer at 412-268-1070 or patty@andrew.cmu.edu. Advisors may put registration holds on their students until you

have met and gone over the schedule with them. If you have a problem getting registered into a CEE course, please contact Patty Langer for assistance.

Students are expected to follow the University rules governing allowable times for adding and dropping of courses. This means that a course may be added up to and including the last day of classes, however, a dean's signature is required after the tenth day of classes. In addition, students may drop a course up to and including the last day of classes by submitting an official course drop form (RAD) with their advisor's signature.

The appropriate instructors must approve requests for adding or dropping of courses as well as the student's department head or faculty designates. For special actions, such as changes in grades or petitions to College Council, the department head's signature is required. Please see Patty Langer for the required form.

Curriculum

All students admitted to CIT are not required to declare a major until the end of their first year, and may have selected a variety of Introductory Engineering Electives and associated Restricted Technical Electives within the common foundation specified for first year in CIT. Regardless of this selection in the first year, a civil engineering major is expected to have completed, in addition to 12-100 Introduction to Civil and Environmental Engineering, the following Restricted Technical Electives by the end of the sophomore year:

09-105	Modern Chemistry I	10
09-101	Intro to Experimental Chemistry	3
15-100	Intro to Programming & Computer Science	10
21-120	Differential and Integral Calculus	10
21-122	Integration, Differential Equations & Approximations	10
33-106	Physics for Engineering Students I	12
33-107	Physics for Engineering Students II	12

Appearing below is the recommended four-year program of study for the BS in civil engineering. Advising and formulation of appropriate programs is available through the department for transfer students, students with advanced placement, or students wishing to study overseas.

First Year

Fall		Units
12-100	Introduction to Civil & Environmental Engineering	12
21-120	Differential and Integral Calculus	10
33-106	Physics for Engineering Students I	12
99-10x	Computing @Carnegie Mellon	3
xx-xxx	H&SS Elective	9
		<hr/> 46

Spring

xx-xxx	Introduction to Engineering (other than CEE)	12
21-122	Integration, Differential Equations & Approximations	10
33-107	Physics for Engineering Students II	12
xx-xxx	H&SS Elective	9
		<hr/> 43

Sophomore Year

Fall		Units
12-212	Statics	9
15-100	Introductory / Intermediate Programming	10
21-259	Calculus in Three Dimension	9
09-101	Intro to Experimental Chemistry	3
09-105	Modern Chemistry I	10
xx-xxx	H&SS Elective	9
		<hr/> 50

Spring

12-231	Solid Mechanics	9
12-232	Solid Mechanics Lab	3
12-271	Intro Computer Apps in Civil & Environmental Engr	9
21-260	Differential Equations	9
xx-xxx	H&SS or CFA Elective	9
xx-xxx	Elective 1	9
		<hr/> 48

***Notes:**

If a student takes an Introduction to Engineering course which has a co-requisite other than Physics II, the co-requisite (15-100 or 09-105 and 09-101) should be taken in the first year while Physics II will fill the respective slot in the sophomore year.

Since CIT first year students are not required to select a major, the above curriculum is based on the assumption that a potential CEE student is likely to select 12-200 as one of the two Introduction to Engineering courses in the first year. Otherwise, incoming sophomores should take 12-100 in the fall in lieu of Modern Chemistry or the H&SS elective.

Junior Year

		Units
Fall		
12-301	Civil and Environmental Engineering Projects	12
12-335	Soil Mechanics	9
12-336	Soil Mechanics Lab	3
12-355	Fluid Mechanics	9
12-356	Fluid Mechanics Lab	3
xx-xxx	H&SS or CFA Elective	9
xx-xxx	Elective 2	9
<hr/>		54

Spring

12-351	Introduction to Environmental Engineering	9
12-352	Environmental Engineering Lab	3
27-357	Materials Selection	6
12-358	Materials Lab	3
36-220	Engineering Statistics and Quality Control	9
xx-xxx	Elective 3	9
xx-xxx	Elective 4	9
<hr/>		48

Senior Year

		Units
Fall		
12-401	Civil and Environmental Engineering Design	15
12-411	Project Management	9
12-421	Engineering Economics	6
xx-xxx	H&SS or CFA Elective	9
xx-xxx	Elective 5	9
<hr/>		48

Spring

xx-xxx	H&SS or CFA Elective	9
xx-xxx	H&SS or CFA Elective	9
xx-xxx	Elective 6	9
xx-xxx	Elective 7	9
xx-xxx	Elective 8	9
<hr/>		45

Minimum number of units required for degree: 379

Notes on Electives

1. One elective must be in the basic sciences, either

09-106 Modern Chemistry II or
33-104 Experimental Physics

Substitutions may be made only with the approval of the Department Head.

2. One elective course is restricted to any Civil Engineering course number 600 or above. The Civil Engineering elective is a co-requisite for 12-401.

Specialty Areas in Civil Engineering

Students are encouraged to select a set of civil engineering and technical electives in the junior and senior years that enable them to concentrate in a specialty area if they so desire. Some available options for grouping electives into specialty areas, together with representative course selections, are indicated below.

Civil Infrastructure Systems and Computer-Aided Engineering

12-600 AutoCAD
12-605 Design and Construction
12-631 Structural Design
12-636 Geotechnical Engineering
12-657 Water Resources Engineering
15-211 Fundamental Structures of Computer Science I
18-100 Introduction to Electrical and Computer Engineering
21-228 Discrete Mathematics
21-241 Matrix Algebra

Environmental Engineering

12-651 Air Quality Engineering
12-657 Water Resources Engineering
12-658 Hydraulic Structures
06-221 Thermodynamics
06-620 Global Atmospheric Chemistry
09-510 Introduction to Green Chemistry
24-424 Energy and the Environment
48-596 LEED buildings and Green Design

*Students interested in environmental engineering should consider pursuing the Environmental Engineering designated minor see: Jeanne VanBriesen
<Jeanne+@andrew.cmu.edu>

Structures, Mechanics and Geotechnical Engineering

12-600 AutoCAD
12-605 Design and Construction
12-635 Structural Analysis
12-631 Structural Design
12-636 Geotechnical Engineering

21-228	Discrete Mathematics
21-241	Matrix Algebra
24-262	Stress Analysis
24-356	Engineering Vibrations
24-401	Engineering Analysis

Suggestive schedule of classes for specific majors:

Conventional Civil Engineering Electives

24-351 Dynamics	Fall Junior Year
12-605 Design and Construction	Spring Senior Year
12-631 Structural Design	Fall Senior Year
12-635 Structural Analysis	Fall Senior Year
12-636 Geotechnical Engineering	Spring Senior Year
12-657 Water Resources Engineering	Spring Junior/Senior Year (offered alternating years)

BHE Double Major with CEE

Required four CORE courses, one merged (DESIGN) course, three DOMAIN courses and two additional DOMAIN or ELECTIVE courses

Required:

Course	Suggested Scheduling
42-101 Intro to BHE (CORE)	Fall or Spring First year
03-121 Biology or 03-231 Biochemistry (CORE)	Anytime after First year
42-301 Physiology (CORE)	Fall Sophomore
42-201 BHE Seminar (CORE)	Fall Sophomore
42-401 BHE Capstone (CORE)	Fall Senior

Domain Courses:

Students are ultimately responsible for creation and completion of their schedules to ensure they meet graduation and degree requirements. In general, BHE recommends that students in CEE schedule Domain and Elective courses as follows:

1 BHE DOMAIN	Spring Sophomore
1 BHE DOMAIN	Fall Junior
1 BHE DOMAIN	Spring Senior
1 BHE ELECTIVE or DOMAIN	Spring Junior
1 BHE ELECTIVE or DOMAIN	Spring Senior

BHE DOMAIN and ELECTIVE Courses are listed on page 99 of the 2000-2002 Undergraduate Catalog.

For students whose interest in BHE is related to environmental biology, we recommend the following DOMAIN courses: 42-621 Biotechnology and Environmental Processes, 42-622 Bio Process Design and 42-723 Biological Processes in Environmental Systems.

For students whose interest in BHE is more medically related, we recommend 2 courses from Biology (03-XXX) and one or more from BHE (42-XXX) as DOMAIN.

Course Descriptions

Civil and Environmental Engineering

Undergraduate Courses

12-100 Introduction to Civil and Environmental Engineering

Spring or Fall: 12 units

Presentation of selected topics in the discipline with an emphasis on fundamentals. The course includes treatment of topics in mechanics and provides an exposure to environmental engineering. Problem-solving exercises within the course apply these concepts to integrate the steps of analysis, synthesis, and evaluation through individual and group projects that require steps of analysis, synthesis, and evaluation through individual and group projects that require attention to a broad range of issues. The course also exposes the students to issues related to engineering practice such as scheduling, evaluating risk, and making ethical decisions. In addition to regular lectures and project exercises, the course includes guest speakers, field trips, and class demonstrations. 3 hrs.rec., 1 hr. lab. Co-requisites: 21-120 and 33-106.

12-212 Statics

Fall: 9 units

Introduction to vector mechanics; equivalent systems of forces; equilibrium of rigid bodies; free body diagram; distributed forces, hydrostatic forces, effective forces, centroids; applications to simple statically determinate trusses, beams, frames, cables, and other physical systems; friction. 3 hrs. rec. Co-requisites: 12-100, 21-122, 33-103.

12-231 Solid Mechanics

Spring : 9 units

Analysis of deformable bodies incorporating concepts of stress, strain, mechanical properties of materials, and geometric compatibility. Response under axial loads, torsion, bending, transverse shear, and combined loadings. Stress and strain transformations and Mohr's circles, deflections of beams and shafts, buckling of columns. Pre-requisite: 12-212 and 21-259 Co-requisite: 21-260

12-232 Solid Mechanics Laboratory

Spring: 3 units

Analysis of stress-strain relationships, torsion of solid shafts, deformation due to bending, deformations in three dimensions. Mohr's circle representation of stress and strain, buckling of slender columns. Laboratory experiments and reports associated with theoretical concepts. 1 hr. lab. Pre-requisite: 12-212 Co-requisites: 12-231

12-271 Introduction to Computer Applications in Civil & Environmental Engineering

Spring: 9 units

Introduction to the use of computer-based applications in civil engineering, using generic tools such as spread-sheets, equation solvers and computer graphics. Discussion of the role of computer-based methods in civil engineering practice. 3hrs. rec. Pre-requisites: 21-120 and 33-106.

12-301 Civil and Environmental Engineering Projects

Fall: 12 units

Basic elements of civil and environmental engineering projects, from project conception through design, to implementation and operation. Project components are explored through formal instruction combine with analysis of actual engineering projects and student team activities. The course is intended to develop skills and understanding related to the application of engineering and science principles, approximations, empiricism, and experience to engineering projects; basic theory and practice of design; the importance and challenge of team efforts and effective communications; and the utility of measurements, modeling, visualization, quality control, and engineering graphics. 4 hrs.rec. Pre-requisites: 12-212, and 12-271.

12-335 Soil Mechanics

Fall: 9 units

Sampling, testing and identification of soils. Physical, chemical and hydraulic characteristics. Stress-strain-strength relationships for soils. Permeability, seepage, consolidation, and shear strength, with applications to deformation and stability problems, including earth dams, foundations, retaining walls, slopes and landfills. 3hrs. rec. Pre-requisite: 12-231. Co-requisite: 12-355.

12-336 Soil Mechanics Laboratory

Fall: 3 units

Examination of material properties and behavior of soils, concrete, steel, polymers, and timber. 1 hr. lab. Pre-requisites: 12-231 Co-requisites:12-335.

12-351 Environmental Engineering

Spring: 9 units

Provides a scientific and engineering basis for understanding environmental issues and problems, introduces material and energy balances for tracking substances in the atmosphere, surface and ground waters, and soil systems. Pertinent environmental laws are described, simple quantitative engineering models are developed, and qualitative descriptions of environmental engineering control technologies are presented. 3 hrs.rec. Pre-requisites: 12-100 or 06-100.

12-352 Environmental Engineering Lab

Spring: 3 units

(Required for CEE students, not for others)

Laboratory and field experiments that illustrate the basic principles of environmental engineering. 1 hr. lab. Co-requisite: 12-351

12-355 Fluid Mechanics**Fall: 9 units**

Fluid characteristics; continuity, momentum and energy equations; dynamic similitude; laminar and turbulent boundary layers; flow in pipes; lift and drag on immersed bodies; open channel flow. Co-requisites: 21-260, 21-259

12-356 Fluid Mechanics Laboratory**Fall: 3 units**

Fluid properties: density, specific gravity, viscosity; fluid characteristics; continuity, conservation of energy; fluid behavior: center of pressure, pipe flow, open-channel flow. Laboratory experiments illustrating basic principles. 1 hr. lab. Co-requisites: 12-355

12-358 Materials Laboratory**Spring: 3 units**

Examinations of materials properties and behavior of concrete, masonry, and timber 2 hr. lab. Pre-requisite: 27-357

12-401 Civil and Environmental Engineering Design**Fall: 15 units**

Methodology for formulating and solving design problems, characterized by incomplete specifications, open-ended solution space, and partial evaluations. The methodology is illustrated and applied in the context of realistic design problems drawn from civil and environmental engineering. Design projects performed by teams, emphasizing collaborative problem-solving and preparation of written and oral reports. 2hrs. rec., 2 hrs. lab. Pre-requisite : Senior Standing in Civil and Environmental Engineering or instructor approval for Design Minors.

12-421 Engineering Economics**Fall: 6 units**

Basic concepts of economic analysis and evaluation of alternative engineering projects for capital investment. Consideration of time value of money and common merit measures such as net present value and internal rate of return. Selection of independent projects and mutually exclusive proposals, using various methods of analysis. Capital budgeting and project financing. Influence of price level changes, depreciation and taxation on choice of alternatives. Uncertainty and risk in operation and financing. Important factors affecting investment decisions for private and public projects. 3 hrs. rec. Pre-requisite: 21-120 and Senior Standing in Civil and Environmental Engineering.

12-604 Introduction to Transportation Engineering**Spring: 9 units**

Introduction to traffic engineering and highway design providing practical experience that can be used directly in the workforce. Course material will provide a solid foundation in preparing for the Professional Engineer exam. The course incorporates the “soft” side of transportation engineering with tasks such as traffic analyses and traffic studies and the “hard” side of transportation engineering including traffic signal design, signing design, pavement marking design, maintenance and protection of traffic during construction design, and highway design.

12-605 Design and Construction

Spring: 9 units

Introduction to steel, concrete, wood, and masonry construction methods and material selection; integration of design and constructability criteria; conformance of designs to applicable building and fire codes; preparation of plans and specifications; laboratory demonstration and experiments. 2 hrs. rec., 2 hrs. lab. Pre-requisites: 12-231 or permission of instructor.

12-611 Project Management for Construction**Fall: 9 units**

Introduction to construction project management from owner's perspective in organizing planning, design, construction and operation as an integrated process. Examination of labor productivity, material management and equipment utilization. Cost estimation and financing of constructed facilities. Contracting, construction planning and fundamental scheduling procedures. Cost control, monitoring and accounting for construction. 3 hrs. rec. Co-requisite: 36-220 or equivalent.

12-629 Environmental Microbiology for Engineers**Fall: 9 units**

This class provides a general introduction to microorganisms in natural and engineered environments. Selected topics include: cellular architecture, energetics and energy conservation, growth and catabolism; evolution and genetics; population and community dynamics; water and soil microbiology; biogeochemical cycling; biofilms; and microorganisms in wastewater, pollution attenuation, and bioremediation. 3 hrs., rec. Pre-requisites: 03-121

12631 Structural Design**Fall: 12 units**

Design of structural members for bending moment, shear force, axial force, and combined axial force and bending. Reinforced concrete, structural steel, and composite beam construction are considered. Buckling effects in columns, beams and local plate segments are treated. Serviceability limits such as deflection and cracking are addressed. Design projects include the determination of loads and the selection of system geometry. Pre-requisite: 12-231, 27-357 and 12-358

12-635 Structural Analysis**Spring: 9 units**

Matrix Algebra. Introduction to the Stiffness Method – spring element, direct stiffness method, stiffness assembly, boundary conditions, potential energy approach; one-dimensional governing equations for heat flow, axial bar, transversely loaded spring, diffusion, electric current, laminar pipe flow; truss analysis; beam analysis; frame and grid analysis, arbitrarily oriented beam in space, substructure analysis; plane stress and plane strain analysis, equations of elasticity, constant strain triangle, body and surface forces, linear strain triangle; axisymmetric elements; isoparametric formulation, bar element, rectangular elements, Gaussian quadrature, high order shape functions Pre-requisite: 12-231

12-636 Geotechnical Engineering**Spring: 9 units**

Emphasis is on three major components of geotechnical engineering: (1) planning and design of exploration programs, interpretation of field and laboratory test data for use in geotechnical site characterization; (2) problem definition (e.g., slope stability, settlement analysis, etc.) and development of idealized analytical models; and (3) applications of analytical and numerical methods, particularly computer methods, applied to analysis and design. 3 hrs. rec. Pre-requisite: 12-335

12-651 Air Quality Engineering

Fall: 9 units

Problems and methodologies for studies of environmental management, with an emphasis on air pollution. Key topics include sources of pollutants, focusing on combustion chemistry for a hydrocarbon fuel; behavior of gaseous and particulate pollutants in the atmosphere including the role of meteorology and the use of dispersion equations; effects of pollutants on human health and global climate; and procedures by which air pollution standards are developed and enforced by regulatory agencies. Statistical treatment of data is included at several places in the course. 3 hrs. rec. Pre-requisite: 12-355 and 36-211

12-657 Water Resources Engineering

Spring: 9 units

Principles and applications of open channel flow. Hydrology of surface and ground water sources and the estimation of water requirements. Planning and design of water distribution and wastewater and stormwater collection systems. 3 hrs. rec. Co-requisite : 12-355.

12-658 – Hydraulic Structures

Spring: 9 units

Theory and practice of design of riverine and coastal structures, including dams, levees, bridge piers, culverts, jetties and groins, seawalls, bulkheads, breakwaters, marinas, and harbors. Key related concepts from surface and ground water hydrology, and wave mechanics. 3 hrs rec. Co-requisite: 12-355

12-690 Independent Study

Spring or Fall: 3 to 12 units

In depth investigation of a special topic in Civil and Environmental Engineering under the direction of a faculty member. The topic usually involves open-ended problems whose solution requires some elements of syntheses, analysis, construction, testing and evaluation of an engineering device or system. Pre-requisite: Junior or Senior Standing in the Civil and Environmental Engineering.

Graduate Courses

The following graduate courses are available to undergraduate students who have appropriate prerequisite and permission of the instructor. Descriptions of these and other graduate courses may be found in the graduate catalog of Civil and Environmental Engineering:

12-702 Fundamentals of Water Quality Engineering

12-704 Probability and Estimation Methods for Engineering System

12-706 Civil Systems Planning, Pricing, and Finance

12-709 Advanced Project Management
12-711 Project Management for Construction
12-712 Introduction to Sustainability Engineering
12-713 Industrial Ecology and Sustainable Engineering Design
12-714 Environmental Life Cycle Assessment
12-715 Case Studies in Sustainability Engineering
12-717 Symbolic Product and Process Modeling
12-720 Water Resources Chemistry
12-721 Modeling Microbial Systems: Suspended and Attached Growth
12-722 Wastewater Treatment: Theory and Design
12-723 Microbial Processes in the Environment
12-724 Advanced Biological Wastewater Treatment
12-725 Fate and Transport Processes of Organic Contaminants in Aquatic Systems
12-726 Mathematical Modeling of Environmental Quality Systems
12-727 Characterizing and Analyzing Environmental Samples and Systems
12-728 Remediation Engineering
12-729 Environmental Microbiology for Engineers
12-740 Data Acquisition, Sensing, and Instrumentation for Infrastructure Systems
12-741 Data Management and Analysis
12-742 Computational Decision Support
12-743 Decision Contexts for Civil Infrastructure Domain
12-744 AIS Systems Project Preparation Course
12-745 AIS Systems Project Course
12-746 Databases
12-750 Infrastructure Management
12-751 Air Quality Engineering
12-755 Finite Element in Mechanics I
12-756 Finite Element in Mechanics II
12-757 Vibrations of Elastic Systems
12-758 Numerical Algorithms in Computational Science and Engineering
12-760 Earthquake Engineering and Soil Dynamics
12-768 Computational Biomechanics
12-769 Inelasticity: Theory and Computation
12-771 Dislocation mechanics: Theory and Computation
12-790 Teaching Workshops
12-791 Graduate Projects
12-792 Advanced Independent Study
12-793 Graduate Teaching Assignment
12-794 Graduate Seminar
12-799 Doctoral Thesis
12-995 Practicum in Civil and Environmental Engineering

Additional Majors and Minors

Civil engineering students may pursue additional majors and minors in a variety of subjects, taking advantage of the free elective courses for other requirements. The College of Engineering has added designated minors to promote flexibility and diversity among engineering students. Many CEE undergraduates pursue designated minors in such areas as Engineering Design or Environmental Engineering.

What should I do in order to minor in a designated minor degree program that is offered within the college of engineering?

Designated minors within the college of engineering are described in the Undergraduate Catalog in the section Undergraduate Minors in Carnegie Institute of Technology, Designated minors, and the faculty member who are the point of contact, are as follows:

Audio Engineering
Professor Tom Sullivan
HH A209

Environmental Engineering & Sustainability
Professor Jeanne VanBriesen
PH 123G

Automation Control
Professor Bruce Krogh
PH B22

International Engineering
Dean Kurt Larsen
SH 110

Biomedical Engineering
Professor Jeffrey Hollinger
DH 2100

Manufacturing Engineering
Professor Bruce Krogh
PH B22

Colloids, Polymers, and Surfaces
Professor Annette Jacobson
DH 3102B

Material Science & Engineering
Professor Michael McHenry
RH 243

Data Storage Systems Technology
Professor William C. Messner
SH 307

Mechanical Behavior of Materials
Professor Warren Garrison
WEH 3301

Electronic Materials
Professor David Greve
HH B204

Robotics
Professor Howie Choset
SH 315

Engineering Design
Professor Susan Finger
PH 123B

If you are interest in the following a designate minor, contact one of the faculty members listed above. Although students can generally complete a designated minor without increasing the number of units required for graduation, early planning is important.

Is it possible to pursue a minor in another engineering department?

No. At this time, departments within the college of engineering do not offer minors that are available to students that are majoring in another engineering discipline the college does offer minors in Engineering Studies, and in Technology and Policy, but those are available only to students who are not majoring in an engineering discipline.

What is the procedure to minor or double major in a department outside of the college of engineering?

Essentially every department outside the college of engineering offers a minor degree program, so your choices are very broad. You should contact the main office in the department in which you would like to minor, and inquire about the minor degree requirements. They will provide you with information that describes the courses that are necessary to complete the minor. In addition, they will certify upon graduation that the requirements for the minor were indeed completed. This same procedure is to be followed in the case of a double major.

It is important to note that in certain popular fields, such as computer science and business administration, it can become difficult to enroll in the necessary courses. The ability to complete a minor or double major in some fields is determined by the ability to enroll in the necessary courses. The priority for enrollment is based upon a student's primary major field, and not the double major or minor area.

QPA Requirements

I am failing a class that I'm taking. What is the university policy on dropping or withdrawing from the course?

You can drop a course on or before the drop deadline for that semester. The course will be removed from your record, and it will not appear on your transcript. However, if you are a full-time student and you decide to drop the class, you must maintain a course load of a least 36 units in order to maintain full-time status.

After the drop deadline, but on or before the last day of class prior to the final examination, you can withdraw. The grade of W will be assigned, and it will appear on your transcript.

Can I retake a class in order to get a higher grade?

You are allowed to repeat a course in which you obtained a passing grade. However, the grades from both enrollments in the course will appear on the transcript; both will be used in calculating the total QPA; and both will be used in determining your class rank. The units, however, are counted only once. Therefore, if a course is taken more than once, the additional enrollments cannot be used to satisfy another curricular requirement, such as a free elective.

What is the minimum QPA requirement in order to maintain good academic standing?

A student will be placed on academic probation if the QPA during a semester of the first year is below 1.75, or if the semester QPA of a student in good standing beyond the first year falls below 2.00. Students who are subsequently unable to maintain minimum QPA standards can receive further academic actions leading to continued probation, suspension, or being dropped from the program.

What is the minimum QPA required in order to graduate?

The College of Engineering requires that the cumulative QPA of 2.00 or higher for all courses taken after the first year. Your first year grade for 12-100 for Introduction to Civil and Environmental Engineering is included in the calculation of your average for required civil and environmental engineering courses. However, the college 2.00 QPA requirement at graduation is based on courses taken after the first year.

How do I earn Dean's List commendation?

The criterion to make the CIT Dean's List is a QPA of at least 3.75 while completing a minimum of 36 factorable units and earning no incomplete grades during a given semester.

Co-Operative Education Program

Students in civil and environmental engineering are encouraged to undertake professional internships during summer breaks. In addition, a formal cooperative internship program is available for either Jan-Aug or May-Dec in the junior year. Students undertaking these 8-month professional internships would ordinarily graduate after an additional semester of study. Program details are available from the Career Center or the Civil and Environmental Engineering office.

Integrated BS/MS Program

Interested undergraduates may plan a course of study that leads to both the BS in Civil Engineering and the MS in Civil and Environmental Engineering. This course of study will ordinarily require ten semesters of study, although advanced placement or other study may reduce this time. Students can apply appropriate units earned as undergraduates for their MS program as long as they are beyond the 379 units required for the BS in Civil Engineering degree. In the 9th and 10th semesters of study, students should register in graduate status. Interested students should consult their academic

advisor or the CEE department office for information about admission to the MS program.

Note: Enrollment Services only accepts changes via an authorized Declaration of Additional Major or Minor form.

Changing departments

Undergraduates who wish to change departments must meet with their advisor and complete a “Notification of Internal Department Transfer” form. The form must be signed by the student’s new dean and new department head. The new dean will send the form to Enrollment Services.

Changing address

In order for important materials (e.g. grades, schedules, invoices) to reach students, we need their current address (es). We record three types of addresses:

- Permanent
- Local/campus
- Contact

The permanent address is where we can mail correspondence at any time (usually a parent’s address). All students have a permanent address. The local/campus address is where we usually mail correspondence during the school year. The address is either on campus (e.g. dormitory, fraternity or sorority) or off-campus in the local Pittsburgh area. The contact address is where we (or the police, Health Services, etc.) can reach someone in an emergency.

Students can change their addresses by contacting Patty Langer in Porter Hall 119.

PCHE Cross-Registration

Carnegie Mellon participates in cross-registration overseen by the Pittsburgh Council of Higher Education (PCHE). PCHE allows for student enrolled full-time at a PCHE school to cross-register at any other PCHE school. A cross-registration course cannot count towards the full-time enrollment requirement. Full credit and grades are transferred between PCHE schools. Students may cross-register for one class per semester and must adhere to the registration deadlines of the host college. Summer cross-registration does not exist, because none of the PCHE schools have summer “full-time” enrollment, and part-time students are not allowed to cross-register.

Carnegie Mellon students may take summer courses at other schools. Only credit is transferred; not the grade.

Part-time students are usually not allowed to cross-register. However, the home school may grant a waiver of the PCHE cross-registration guidelines and allow their student to

cross-register. If a part-time Carnegie Mellon student wants to cross-register, they must receive special permission from the Registrar, John Papinchak.

There are currently ten PCHE schools:

- Carlow College;
- Carnegie Mellon University;
- Chatham College;
- Community College of Allegheny County (CCAC);
- Duquesne University;
- LaRoche College;
- Pittsburgh Theological Seminary;
- Point Park College;
- Robert Morris University;
- University of Pittsburgh.

Carnegie Mellon students wishing to cross-register must get a PCHE Cross-Registration Request form from the CEE office. The student must complete the appropriate sections, and return it to Patty Langer in the CEE Business Office. Host schools send grades to Enrollment Services approximately one week after our deadline for grades. They will add the grade to the student's academic record. Some PCHE schools don't send grades to cross-registered students. If a student does not receive a grade mailer from the host school, they can come to the HUB to find out what grade they received.

Study Abroad/International Exchange

All Carnegie Mellon students who are studying abroad (except those involved in summer CMU-administered programs) must complete the "Study Abroad Transfer Credit Permission" form. The form is available from the Office of International Education (OIE).

Study Abroad

This program allows eligible students to study at selected foreign universities during the fall or spring semesters or during the summer session. In most cases, transfer credit is awarded for courses taken abroad.

Fall and Spring

The student begins the Study Abroad process by completing a Study Abroad Transfer Credit Permission Form. The form requires the student to plan in advance which courses they will be taking abroad. They should meet with their academic advisor to plan which Carnegie Mellon Courses can be completed with transfer credit. The student must obtain appropriate signatures from their major department, additional major and minor department (if necessary), advisor and OIE.

International Exchange

This joint program allows eligible students to study at a variety of international institutions. This program differs from Study Abroad, in that:

1. International Exchange participating institutions send their students to other participating institutions;
2. International Exchange students pay tuition to their home institution, rather than to the host institution.

Like Study Abroad, students begin the International Exchange process by picking up an Application packet (including the Study Abroad Transfer Credit Permission Form) from OIE. The application requires the student to plan in advance which courses they will be taking abroad. They should meet with their academic advisor to plan which Carnegie Mellon courses can be completed with transfer credit. The student must obtain appropriate signatures from their major department, additional major and minor department (if necessary), advisor and OIE.

After the student has completed the term abroad, they must ask the host institution to submit appropriate credit and levels of achievement to OIE. OIE sends the information to the student's home department and the department determines how much credit should be awarded. This information must be sent to us to be included on the student's academic record.

Student Organizations within the department

Chi Epsilon is the Civil Engineering Honors Society. Dedicated to the purpose of maintaining and promoting the status of Civil Engineering as an ideal profession, Chi Epsilon was organized to recognize the characteristics of the individual Civil Engineer deemed to be fundamental to the successful pursuit of an engineering career, and to aid in the development of those characteristics in the Civil Engineering student. Students in the top 1/3 of their class are invited to be inducted. The Carnegie Mellon student chapter was founded in 1983 and in the 98th student chapter of Chi Epsilon. Lucio Soibelman is the current faculty advisor.

The American Society of Civil Engineers is an international organization made up of students and professionals in civil engineering. The Carnegie Mellon chapter hosts various lectures, as well as social and networking events throughout the year. Students are invited to attend events with other student chapters and young professionals in the Pittsburgh area, and may also participate in the annual concrete canoe design competition. Membership is free to all undergraduates. Larry Cartwright is the current faculty advisor.

Department Events

The department sponsors events for faculty, staff, graduate and undergraduate students to participate in each year. These events include a canoe trip in the fall, a ski and tubing trip in January and a Pirate ball game the end of April or beginning of May. The ASCE student chapter also sponsors an undergrad Halloween party, Holiday Party and end of the year department picnic. You will most probably enjoy these events along with department ice cream socials, graduation pictures, hard hats and t-shirts, sophomore welcome dinner and senior dinner; these events are supported in large part through alumni donations to the department.