

Department of Civil, Structural and Environmental Engineering  
School of Engineering and Applied Sciences



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# **UNDERGRADUATE STUDENT MANUAL**

## **CIVIL ENGINEERING**

Updated July 2013

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# 1. INTRODUCTION

## 1.1 Purpose of This Manual

This manual is intended for students currently enrolled in the B.S. civil engineering degree program. Since most information is now easily accessible online, the focus of the manual is to supplement the available information and to provide answers to many of the frequently asked questions. The information presented in this manual, to the best of our knowledge, is based on the policies and procedures of the University at Buffalo (UB), the School of Engineering and Applied Sciences (SEAS), and the Department of Civil, Structural and Environmental Engineering (CSEE) currently in effect. Official UB policies are found in the [Undergraduate Catalog](#). Additional information may be found at the website of the [Office of Undergraduate Education](#). UB rules and regulations regarding student rights and responsibilities may be found at the website of the [Office of Judicial Affairs & Student Advocacy](#).

Please contact the Director of Undergraduate Studies with any comments, suggestions, or errors. In the event that there is a contradiction between information presented in this document and official UB policies and procedures, the official policies will take precedence. Students pursuing the B.S. environmental engineering degree should consult the Environmental Engineering Undergraduate Manual.

## 1.2 Civil Engineering at UB

### The Department

The Department of Civil, Structural and Environmental Engineering offers the most established degree in civil engineering within the State University of New York system. With 30 full-time faculty members, the department has yearly research expenditures of approximately \$6 million, and is the home of several major research centers. The integration of research with undergraduate teaching provides students with unique opportunities for state-of-the-science training. The goals of the department are expressed in its Vision and Mission statements:

### ***Vision Statement***

*Our vision is to be recognized as a prominent department in civil engineering in the United States and a premier department in civil engineering among public universities in the northeastern United States. Our vision is guided by principles of stability and flexibility. We will maintain our strength in the traditional areas of civil engineering, but we will be flexible and we will face the new challenges in our professional environment. We foresee the need for a continual reassessment and change of our teaching and research focus as we respond to the following trends: (a) advancements in technology, (b) multidisciplinary approach, (c) responsibility to society, and (d) accountability and efficiency.*

### ***Mission Statement***

*Civil, structural and environmental engineers contribute to the health, safety, and quality of life of society through the design, construction, and operation of public and private infrastructure. The mission of the Department of Civil, Structural and Environmental Engineering is to:*

- *Educate students in fundamental concepts, critical thinking, technical skills and ethical principles as applied to engineering analysis and design,*
- *Serve the engineering profession and society through scholarship and innovative research, and*

- *Provide the local, national, and international communities with continuing educational opportunities, technical assistance, and intellectual resources.*

## **The Curriculum**

UB's civil engineering program provides you with an integrated education in mathematics, basic sciences, English composition, ethics, humanities, and fundamentals of civil engineering, engineering design, and computer simulations in engineering. A solid foundation is provided in four major discipline areas of civil engineering, with more in-depth specialization provided through a choice of senior-year electives. While pursuing your B.S. degree, you can also gain valuable industrial experience through our co-op/internship program. Civil engineering students interested in other areas of study can consider the options of double-degree, double-major or minor programs. The B.S. (Civil Engineering)/MBA combined degree program is described in [Section 4.2](#).

## **The Faculty**

Instruction in the Department of Civil, Structural and Environmental Engineering is provided by 30 distinguished full-time faculty members and approximately 5 adjunct faculty members. All full-time faculty members hold doctoral degrees, and many have earned national awards, including (among the current faculty): the SUNY Chancellor's Award for Teaching Excellence, Milton Plesur Award for Teaching Excellence, National Science Foundation Presidential Young Investigator Award/CAREER Award, ASCE Newmark Medal, SUNY Chancellor's Award for Excellence in Scholarship and Creative Activity, SUNY Distinguished Professor, and Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring.

## **Employment Opportunities**

Graduates of UB's civil engineering program have found employment in:

- **Private practice (consulting or industry):** participating in the research, planning, design, construction, and maintenance of public and commercial facilities and structures.
- **Public practice (city, county, or state agencies):** participating in city/regional planning and the design and construction of highways, pipelines, and other public works.
- **Multidisciplinary settings:** combining civil engineering training with geology, economics, law, software engineering, architecture, and information technology.

Several return immediately or within a few years to graduate school for advanced studies leading to a Master of Engineering (M.E.), Master of Science (M.S.) or Doctor of Philosophy (Ph.D.) degree. A few of these students go on to careers in academia, training future civil engineers and conducting research to develop new and improved technologies. Graduates of the program also have the skills and most of the prerequisites to pursue further education in law, management, and other professional fields.

## **Professional Registration**

The UB civil engineering program is designed to support eventual licensure as a Professional Engineer (PE). It is strongly recommended that all students consider professional registration as part of their career path. Obtaining registration as a PE is a multi-step process that normally includes graduation with a B.S. degree from an ABET-accredited program. If you are within 20 credits of graduation, you are eligible to take the Fundamentals of Engineering (FE) exam, the next step in the process. To assist with preparation for the FE exam, an evening review class is offered each year by the Engineering Society of Buffalo. More information on the [FE exam and professional licensure](#) is available on the CSEE website.

Starting January 2014 there will be a new format for the fe exam and a transition to computer-based testing. Additional details will be provided as soon as they are made available.

## 2. PROGRESS TOWARDS GRADUATION

### 2.1 Why should I check email?

[Email](#) is the standard form of electronic communication at UB among students, faculty and staff. Check your UB email often (summer and winter too!) for information about your classes, the program, scholarship and internship opportunities, etc. Emails from the undergraduate office are sent out via the civil engineering undergraduate listserv ([CIEUG-L@listserv.buffalo.edu](mailto:CIEUG-L@listserv.buffalo.edu)).

### 2.2 Who is my advisor?

You have a variety of resources for academic advisement. As you progress through the academic program, each member of your advisement team will play a different role, depending on your status and needs. Most civil engineering students start out meeting with their engineering advisor in the SEAS Office of Undergraduate Education (410 Bonner Hall). As you enter your junior year, you should meet with your civil engineering faculty advisor. Students who are in academic trouble should schedule a meeting with the Director of Undergraduate Studies. Key advisement personnel are summarized in Table 2.1. Additional information on advisement can be found on the department [website](#).

**Table 2.1 Advisement Guide (See contacts in [Appendix A](#))**

<b>If You Need Help With:</b>	<b>Contact:</b>
General education, transfer credits, academic advisement report errors, degree audit, Finish in 4	Engineering advisor
Elective choices, career opportunities	Civil engineering <a href="#">faculty advisor</a>
Academic integrity issues	Course instructor, Director of Undergraduate Studies, Department Chair
Forms, forced registration	Undergraduate Academic Coordinator
MAE 177 exceptions, students in academic trouble, and any other issues	Director of Undergraduate Studies

### 2.3 What is a flowsheet?

Flowsheets show the required courses by semester and indicate the pre-requisites and co-requisites for a particular course. Use the [interactive flowsheets](#) posted on the SEAS website to help you understand the curriculum and see how the courses fit together.

The current flowsheet (for students entering their junior year on or after 2012) includes two general education courses in the last semester of study. If you have already completed all your general education courses by then you have a variety of options. Some students elect to take the minimum 12 credits during the last semester to allow plenty of time to participate in the various ASCE student competitions. Others opt to take a light load to allow sufficient time to study for the FE exam, or participate in an internship. Alternatively, students who are planning to go to graduate school can start their graduate courses.

## 2.4 Can I take classes early/out of sequence?

The curriculum is designed to be completed in 4 years (8 semesters), and assumes no college credit for math, physics and chemistry. If you are off-sequence (perhaps by virtue of credit earned for your high school AP classes) you must select your courses carefully to ensure a logical sequence of material and must pay close attention to the course co-requisites and pre-requisites. The following junior and senior courses may be taken ahead of schedule without loss of continuity:

- **CIE 308 Engineering Statistics** (requires MTH 241): Can be taken as early as fall of the sophomore year for students ahead in the calculus sequence.
- **CIE 303 Geodesy, GIS and GPS** (requires MAE 177): Can be taken fall of the sophomore year.
- **CIE 340 Environmental Engineering**: Can be taken spring of the sophomore year.
- **CIE 439 Transportation Engineering**: Can be taken fall of the junior year.
- **Applied math elective**

Technical electives should be taken during your senior year. See the Director of Undergraduate Studies if you are ahead of schedule and would like approval to take a technical elective early or have other questions about your schedule.

## 2.5 Class Registration

### How do I register for classes?

You must register for your courses on HUB, a web-based personal portal to online UB resources which is accessible through [MyUB. Registration](#) takes place during specific periods of time. You will be assigned an enrollment appointment based on the number of credit hours completed, with priority given to students with higher credit hours earned. You can view your personal enrollment appointment information in the HUB Student Center.

Before your registration appointment, visit your HUB Student Center to determine if you have any holds on your account that might prevent you from registering for courses, and take the necessary steps to remove these holds.

When registering, remember that **pre- and co-requisite requirements, especially in the Department and SEAS, are strictly enforced**. Consult the University Catalog for pre- and co-requisite requirements. If you are registering for a course that has co-requisites, make sure that all of these courses are in your shopping cart.

If you experience difficulty with any aspect of the registration process, contact the Director of Undergraduate Studies or Undergraduate Academic Coordinator. At UB, each department has control over their own courses. Therefore, we can only help you register for CIE courses. If you need help with registering for EAS courses, you need to see an advisor in 410 Bonner Hall. If you need help with mathematics courses, you need to go to the mathematics department etc.

It is your responsibility to ensure that all course registration activities are completed in a timely fashion. UB will assess a [late fee](#) if you fail to register by a specific date, usually the first day of classes.

### **What is forced registration?**

A forced registration course is a course that you cannot register for by yourself; you must be 'forced' into the course by the Undergraduate Academic Coordinator. One course each semester of your junior and senior year will require forced registration. This system is in place to ensure that you meet regularly with your faculty advisor. To complete the forced registration process you should:

- Download and complete the [advisement form](#), and print a copy of your transcript.
- Schedule an appointment with your faculty advisor to discuss course selection and obtain the necessary signature on the advisement form (list of advisors is [here](#)).
- Submit a copy of your signed advisement form to the Undergraduate Academic Coordinator (see contact list in [Appendix A](#)).
- Register for all non-force courses.
- Check HUB periodically to verify that the required forced registration has been completed.

### **How many credit hours can I take?**

During the regular semester, a full time undergraduate student must be registered for at least 12 credit hours. The maximum number of credits is 19. If you wish to register for more than 19 credit hours, you must consult with an engineering advisor for approval and must have a minimum grade point average (GPA) of 3.0. There are also [credit limits for summer and winter sessions](#).

### **How many times can I repeat a course?**

The repeat policy in engineering is strict. If you are an approved major entering UB Engineering in 2009 or later, the total number of repeat attempts to satisfy the required courses in a SEAS major must not exceed four. If you exceed four repeat attempts, you will be dismissed from SEAS. Remember that only required courses count. However, any course that you repeat where the original grade was C or better (or W), is not counted. In addition, you are allowed two "R" grades (official resignations) without penalty. Additional R grades are then counted as repeated classes. The rationale behind this strict policy is that engineers in practice must get things right 'the first time'; public safety is at stake.

In terms of enrollment, you can only enroll yourself twice into a course for which you have a grade other than 'W' (administrative withdrawal). Any further repeat enrollment requires the approval and action of the academic unit offering the course. The academic unit may require you to consult an academic advisor before you are permitted to repeat the course.

Remember that to maintain full-time status for financial aid purposes, you must maintain 12 credits in addition to the course(s) you plan to repeat. Eligibility requirements for U.S. and New York State student financial aid programs differ from one another and may not fully match UB's requirements for good academic standing and satisfactory academic progress. Consequently, if you plan to repeat a course you should consult a financial aid advisor to identify the consequences on your financial aid eligibility status.

### **What are controlled enrollment courses?**

Some courses are designated as 'controlled enrollment' courses, which means that you may be prevented from enrolling a second time during the regular academic year. These courses include:

- ENG 101 Writing 1
- ENG 102 Writing 2

- ENG 201 Advanced Writing 1
- MTH 141 College Calculus 1
- MTH 142 College Calculus 2
- MTH 241 College Calculus 3
- UGC 111 World Civilization 1
- UGC 112 World Civilization 2

If you need to repeat a controlled enrollment course, you should plan to do so in the summer, as registration opportunities in fall or spring semesters are severely restricted. Some academic units will allow you to register for an enrollment controlled course after the Add/Drop period, provided there are still available seats.

### **Can I take a graduate course for undergraduate credit?**

Under some circumstances you may select a graduate course as a technical elective. Please see the [Office of the Registrar website](#) for the proper form: Petition for Course Credit Outside Your Primary Academic Career. This form must be signed by you, the course instructor, the Director of Undergraduate Studies, and an academic advisor. A minimum overall GPA of 3.0, including transfer credit, is required and completion of the required prerequisites for the graduate course.

### **Can I take a graduate course for graduate credit?**

Yes. Undergraduate students are also eligible to take graduate courses for graduate credit (with permission from the Director of Graduate Studies). Please see the [Office of the Registrar website](#) for the proper form: Petition for Course Credit Outside Your Primary Academic Career. A minimum GPA of 3.0 is required. Undergraduate students may take no more than two graduate courses (not to exceed a total of 8 credit hours) during their undergraduate career. These courses may not be applied towards the bachelor's degree, but may be applied toward a subsequent post baccalaureate degree program at UB. Registration in at least 12 undergraduate credits in addition to the graduate credits is required during the semester to sustain TAP and other financial support.

## **2.6 Can I resign a course?**

If you [drop a class](#) during the first 7 days of the fall or spring semester, there will be no financial penalty and no record on your transcript. From the 8th day of classes until the end of the 11th week of classes, you may "Resign" from one or more of your classes, but this action will result in an "R" that remains on your transcript. In addition, depending on when you resign, there is also a 50-100% tuition penalty. For more information, see the published [Liability Deadlines](#). Before resigning from a class, you must also consider the financial aid implications.

Note that the specific Add/Drop/Resign dates are different for the [summer](#), [fall](#), [winter](#), and [spring](#) semesters.

## **2.7 Am I in academic good standing?**

For students in the School of Engineering and Applied Sciences, [academic good standing](#) is based upon your Technical GPA, both cumulative and the most recent semester. Technical GPA is calculated based on engineering, math, technical electives, and science courses taken at UB that are required in the major.

For UB, [academic good standing](#) is based upon your Overall GPA, both cumulative and the most recent semester. Overall GPA is calculated based on all courses taken at UB.

In all cases, your GPA must be a 2.0 or higher to be in good academic standing. If you are not in academic good standing you will be placed on academic probation. Students who are on academic probation are not eligible to participate in university activities.

## **2.8 What is academic review?**

Both the School of Engineering and UB periodically review your performance to ensure that you are making satisfactory progress towards graduation. Poor performance may result in probation or dismissal.

### **Mid-Semester Review**

To help you understand where you stand in your classes, instructors are asked to provide mid-semester evaluations for students' coursework. Mid-semester grades are: Satisfactory (MS), Unsatisfactory (MU), or standard A-F grades. Mid-semester grades received from faculty are available on the HUB Student Center. If your performance is less than satisfactory, you are encouraged follow up with your instructors and advisors promptly.

### **UB Engineering Academic Review**

UB Engineering conducts an academic review of all accepted major students at the conclusion of the fall and spring semesters. It is important that all students are aware of the current [academic review policies](#). You can view the results of the most recent review [online](#). Students who are on probation for the first time are required to attend a mandatory meeting with an engineering advisor in the SEAS Office of Undergraduate Education. If you fail to attend a meeting, you will receive an advising hold that will limit your ability to register for subsequent classes.

If you are dismissed from the School of Engineering, you will receive official notification via your UB email account, and all future academic-year registrations will be removed and/or blocked. However, you are still permitted to register for classes in the summer or winter session immediately following your initial dismissal. You are permitted to appeal the dismissal by submitting a personal statement during a period that will be specified in the dismissal letter. If you are dismissed after the fall semester, the dismissal will be automatically deferred until the end of the spring semester. Think of the spring semester as your opportunity to show significant improvement!

### **UB Academic Standards Review**

In addition to the UB engineering academic review, the University also conducts its own academic review at the end of each fall and spring semester. See the [academic review](#) section of the undergraduate catalog for current policies and definitions of good standing, academic warning, academic probation and academic dismissal.

If you are dismissed from UB, you will receive official notification via U.S. mail and your UB email account, and all future academic-year registrations will be removed and/or blocked. However, you will be permitted to register for classes in the summer or winter session immediately following your initial dismissal. You are also permitted to appeal the dismissal in writing to the Dean of Undergraduate Education during a period of time specified in the dismissal letter. Consultation with an engineering advisor in SEAS is required as part of the dismissal appeal process. If the appeal is granted, you will receive a notice that will include the terms and conditions of continued study. If you decide not to appeal, or if your appeal is unsuccessful, you will

not be allowed to reapply to UB and register for a period of at least one year. Academic dismissal will be noted on your official transcript and will be part of your student record.

## 2.9 How do I calculate my GPA?

HUB gives your cumulative UB GPA. However, be aware that if you repeat a class its effect may not show up correctly initially. This is because the university only runs the repeat rules periodically. You can also view your Technical GPA by looking at the results of the most recent Engineering Academic Review. However, the review is only conducted twice per year.

To calculate your own GPA, follows the steps outlined below:

1. Calculate total quality points (QP): The QP for each class is the number of credit hours multiplied by the number of quality points associated with your grade: A (4 points), A- (3.67 points), B+ (3.33 points), B (3 points), B- (2.67 points), C+ (2.33 points), C (2 points), C- (1.67 points), D+ (1.33 points), D (1 point), F (0 points). For a three credit hour class in which you earned an A-, you would have 11.01 quality points.
2. Add up the total number of credit hours.
3.  $GPA = QP / \text{credit hours}$

To calculate your Overall UB GPA, include all classes. To calculate your Technical GPA, include only math, science and engineering classes.

Whilst the calculation is straight forward, it is complicated by the university repeat rules. If you repeat a class once, the first grade (and associated credit hours) is **not** included in the GPA calculation, even if the first grade is better than the second. All subsequent attempts **are** included. Note that after you repeat a class it may take some time before your correct GPA is reported in HUB. This is because the 'repeat rules' (when grade A is replaced with grade B) are only run periodically.

## 2.10 What General Education Courses should I take?

Civil engineering students who enter UB as freshmen are required to take seven [general education](#) courses. See the link for the specific requirements. International students who take ESL 407 and ESL 408 are required to take eight. Transfer students should see the engineering advisors in 410 Bonner Hall for their specific requirements.

Choose your general education courses carefully to allow you to learn more about an area of interest and to broaden your understanding of your chosen major. The social and behavioral course requirement can be satisfied by courses in a large number of areas: communications, economics, geography, sociology, psychology, social sciences interdisciplinary, and environmental design. Two popular courses in environmental design are END 120 (Intro to Urban Environments) and END 212 (Urban and Environmental Planning). The humanities requirement can be satisfied by a language course or a philosophy course, in which you could study ethics or critical thinking.

### Suggested Courses

The intent of this section is to provide recommendations from your peers. If you have taken any general education courses that you found particularly valuable as a civil engineering major, please provide your comments to the Director of Undergraduate Studies so that we can start compiling a list.

## 2.11 How do I apply for graduation?

The Bachelor of Science degree in civil engineering is awarded upon successful completion of the required courses with GPAs of 2.0 or higher in two categories: Overall GPA (all UB courses) and Technical GPA (engineering, math, technical elective, and science courses taken at UB). You must apply for graduation via the HUB Student Center prior to the published deadline dates. Additional information on graduation can be found in the [undergraduate catalog](#). All university, major and minor requirements must be satisfied on the HUB Academic Advisement Report prior to degree conferral. Please see an engineering advisor if there appears to be an error with your Academic Advising Report. After you have applied for graduation, formal review of the academic records is performed by the SEAS Office of Undergraduate Education to verify that all graduation requirements have been met.

Once you have applied for graduation, registration in all future semesters (including summer and winter) will be blocked. If you need to register for subsequent classes to complete your degree, you must change your graduation date.

A separate registration is required to participate in the engineering commencement. Information about commencement is posted on the School of Engineering and Applied Sciences website. Even if you will not graduate until the summer you are still welcome to participate in the ceremony, although your name will not appear in the program.

## 2.12 What is the career development curriculum?

The [Career Development Curriculum](#) program is a collaborative effort between UB Engineering and the Office of Career Services intended to help you develop the knowledge, skills, and experience to secure an exciting and high-paying position upon graduation. The program also identifies actions to take in preparation for graduate school. The key part of the curriculum is the [career development chart](#). The chart comprises a series of milestones for each semester and summer during your academic career.

## 2.13 What should I do if I observe unethical behavior, such as cheating or plagiarism?

Engineers have special ethical obligations. Students and professionals are guided by the [American Society of Civil Engineers \(ASCE\) Code of Ethics](#) and the [National Society of Professional Engineers \(NSPE\) Code of Ethics](#). As a UB engineering student, you are also expected to conduct yourself in accordance with the UB Engineering Code of Ethics and the university's policies on [academic integrity](#), which address issues of plagiarism and other dishonest acts. These rules are strictly enforced in our classes.

If you encounter a classmate behaving in an unethical manner, the best course of action is to address the behavior as soon as possible. Use your best judgment. You may attempt to resolve the issue directly with the individual by pointing out that his or her behavior is unethical. If this approach is not successful, promptly speak to the faculty member in charge of the class or the Director of Undergraduate Studies. Because consequences can be severe, make sure your account of the incident is accurate. Read more about [ethics and academic integrity](#) on the CSEE website.

## 3. OPPORTUNITIES WHILE AT UB

### 3.1 Overview

Students pursuing the B.S. degree in civil engineering have a number of opportunities to enhance their academic program of study through student clubs, study abroad, work experiences, and research. Interested students should contact the Director of Undergraduate Studies to discuss current opportunities.

### 3.2 Student Organizations

There are many engineering oriented student clubs at UB. All provide the opportunity for you to meet other students, network in your field and learn future career skills. The main student organization that civil engineers majors participate in is the **American Society of Civil Engineers (ASCE)** student chapter. The student chapter of [ASCE](#) contains the Concrete Canoe, Steel Bridge and Seismic Design Teams. The club also organizes various social, volunteer events and networking events.



Members of the **Concrete Canoe Team** must apply the engineering principles they learn in the classroom, along with important team and project management skills to design and build a concrete canoe. Each year students participate in a regional concrete canoe competition, hoping to qualify for the national competition. In addition to design and construction, students must create a display, write a design report, give an oral presentation and race the canoe. The UB team placed 2<sup>nd</sup> in 2012 and 4<sup>th</sup> in 2013 at the regional competition.



The **Steel Bridge Team** designs, fabricates and builds a one-tenth scale model steel bridge. Each year students participate in the regional student steel bridge competition. In 2013, the UB team placed 2<sup>nd</sup> regionally, qualifying them for the national completion, which was held in Seattle. Teams are judged on display, construction speed, lightness, stiffness, construction economy, and structural efficiency. At nationals, the UB team placed 11<sup>th</sup> out of 49 universities. CONGRATULATIONS UB!

The **Seismic Design Team** designs and builds a scale model skyscraper using only balsa wood and dampers. Each spring the team participates in the national Earthquake Engineering Research Institute (EERI) Undergraduate Seismic Design Competition (held in San Diego in 2011, Memphis in 2012, and Seattle in 2013). Each school gives a presentation on their designs, and then the models are subjected to three different real life earthquakes on a small shake table.

Civil engineering students at UB also participate in many other nationally recognized professional organizations, including:

- **Chi Epsilon, Civil Engineering Honor Society:** Chi Epsilon was founded in 1922 to recognize civil engineering students and professionals and to promote the status of civil engineering as a profession. Students are selected to become members based on recognition of their scholarship, character, practicality and sociability, considered by Chi Epsilon to be the four primary traits of a successful en-

gineer. For student members, scholarship is determined by being in the top third of their junior or senior class.

- **Engineers for a Sustainable World (ESW):** ESW works to improve the quality of life through active example and by proactively working to reduce the harmful impact of humanity on the environment. In ESW you can join engineering students from different disciplines to use both engineering knowledge and practicality to work on projects both on and off campus. Watch for the ESW solar-powered smoothie cart.
- **National Society of Black Engineers (NSBE):** Started in 1971 by two Purdue undergraduates, NSBE's mission is to increase the number of culturally responsible black engineers who excel academically, succeed professionally, and positively impact the community. In addition to fulfilling this mission, the UB NSBE chapter also strives to assist minorities of all disciplines to create a sense of awareness on campus. NSBE gladly welcomes anyone who is motivated to support this mission.
- **Society of Women Engineers (SWE):** SWE was founded to help women achieve their full potential in careers as engineers and leaders. Meet other female engineering students and network with members from the professional section. Activities include Shadow Day for local high school students, speak panel, and Habitat for Humanity.
- **Society of Hispanic Professional Engineers (SHPE):** SHPE was founded in 1974 by a group of engineers employed by the city of Los Angeles. Their objective was to form a national organization of professional engineers to serve as role models in the Hispanic community. The UB student chapter was founded in 1990.
- **Tau Beta Pi, Engineering Honor Society:** Tau Beta Pi was founded in 1885 and is the second oldest honor society in the nation. The chapter at the University at Buffalo was established in 1967 and has between 50-100 members. Invitations to join Tau Beta Pi are sent out once each semester. The club organizes a wide variety of events, including the long lived Honors Dinner and engineering tutoring programs.

### 3.3 Studying Abroad

Engineering today is a global profession. Participating in a study abroad experience, whether over the summer or for a longer period, will allow you to see the world from an entirely new perspective and will help you develop new skills, independence, and self-confidence.

Study abroad programs are available to all UB students. For details, visit the [UB Study abroad webpage](#). UB is also a participant in the [Global Engineering Education Exchange](#) (Global E<sup>3</sup>). Global E<sup>3</sup> is a group of more than 60 universities worldwide—33 in the United States and 31 in Asia, Australia, Europe, Latin America, and the Middle East—that allows engineering students at member universities to enjoy a fulfilling study abroad experience whilst paying tuition at their home institution. The programs are flexible so that you can study abroad for a summer, a semester, or the entire school year. However, since the civil engineering curriculum is relatively rigid, make sure you plan well in advance to minimize the impact on your courses at UB. In addition, check to see if the grades you receive abroad will transfer to UB.

#### Featured Summer Program

UB engineering students have the opportunity to spend the summer after their freshmen year studying at the [University of Troyes \(UTT\) in France](#). Troyes is a small city of 120,000 located approximately an hour and a half from Paris by road or rail. Whilst at UTT, you will take EAS 207: Statics from a UB faculty member, and UGC 112: World Civilization II: Intro to European Union from a UTT faculty member. The program lasts for approximately 6 weeks. In addition to classes, various planned excursions and cultural

activities are organized, including a field trip to Paris. To be eligible, you must have successfully completed General Physics (PHY 107) and College Calculus II (MTH 142) and have a minimum overall GPA of 2.67.

### **Featured Semester Program**

Junior civil engineering students have the opportunity to spend a semester (or two) at Istanbul Technical University (ITU) in Turkey. UB students can take the same classes as the Turkish [UB/ITU Dual Diploma Program](#) (DDP) students. These classes closely mirror the classes taught at UB and are all taught in English. For additional information, see the Director of Undergraduate Studies.

### **3.4 Getting an Internship**

Recent surveys of employers of UB civil engineering graduates have indicated that prior work experience is an important factor in hiring and promotion. In addition, many students who have successfully completed an internship are considered preferentially for full-time employment by those companies upon graduation.

The Engineering Career Institute (ECI), a program administered by SEAS, will help you understand the job market and how to successfully apply for an internship. Classes are also given in leadership, communication, teamwork, total quality management, and other pertinent subjects. The material is delivered through a 1-credit course (EAS 396) that can be taken during the spring of your sophomore or junior year. The course meets for only 6 hours during the semester, but includes a full week of presentations by industry experts during the week following exams. The course is pass/fail. This program is unique to UB and supplements the technical curriculum.

To help find an internship, you can search opportunities and post your resume on [BullsEye](#), administered by Career Services. In addition, check your email regularly for any job announcements sent out directly by the department Chair or Director of Undergraduate Studies.

Students with an internship who would like to earn academic credit can enroll in [EAS 496](#). This course can be taken during any semester, including the summer. You may take the course more than once. Relevant internship experience gained after completing your junior year may be counted as a technical elective. See the Director of Undergraduate Studies or the course instructor for details.

### **3.5 Participating In Undergraduate Research**

You can find out about current undergraduate research opportunities at UB through the Center for Undergraduate Research & Creative Activities ([CURCA](#)). Students doing a research project through CURCA can apply for one of the center's [\\$500 Undergraduate Research Awards](#). Alternatively, contact your faculty advisor or other CSEE faculty members to discuss available research opportunities in the department. See the [SEAS](#) website for more detailed information about finding a research opportunity. Additional summer research programs at UB include the Collegiate Science and Technology Entry Program ([CSTEP](#)) and the Louis Stokes Alliance for Minority Participation ([LSAMP](#)).

Many universities around the country host [Research Experiences for Undergraduates](#) (REUs) during the summer months. Through these NSF-funded programs, students work in the research programs of the host institution. Each student is associated with a specific research project, where they work closely with the faculty and other researchers. Students are granted stipends and, in some cases, financial assistance with housing and travel.

Another competitive program is the SEAS Senior Scholars Program, which is intended to attract the best engineering students and encourage them to continue on to graduate school. Senior scholars receive a stipend of \$500 and have the opportunity to conduct research with departmental faculty members during the spring semester of their senior year. Senior scholars are also eligible to receive an additional \$500 if they enroll in UB Engineering for graduate school along with early admission and preferred consideration for an assistantship.

### **3.6 Order of the Engineer Ceremony**

The [Order of the Engineer](#) was initiated in the United States to foster a spirit of pride and responsibility in the engineering profession. The first ceremony was held on June 4, 1970 at Cleveland State University. At UB, the School of Engineering and Applied Sciences holds a ceremony for all graduating engineering seniors during the spring semester. At the ceremony, students are invited to accept the Obligation of the Engineer and a stainless steel ring. The Obligation sets forth an ethical code. Students pledge to uphold the standards and dignity of the engineering profession and to serve humanity by making the best use of Earth's precious wealth.

By taking part in the ceremony, you signify that you understand and support the special ethical obligations of an engineer. Check your email for information about the ceremony. Space is limited, so register early.

## 4. SPECIAL PROGRAMS

### 4.1 UB/ITU Dual Degree Program

UB has a [Dual Diploma Program](#) (DDP) with Istanbul Technical University (ITU). Students from Turkey spend their freshmen and junior years at ITU and their sophomore and senior years at UB. The first cohort of students graduated in 2008. Up to 35 students are admitted into the program each year.

### 4.2 B.S. (Civil Engineering)/MBA Combined-Degree Program

The Department of Civil, Structural and Environmental Engineering and the School of Management offer a five-year program leading to a combined degree in [B.S. \(Civil Engineering\)/MBA](#) (Masters in Business Administration). This program reduces, by one year, the usual pattern of a four-year undergraduate degree and a two-year MBA program.

Candidates must meet all the degree requirements of each program, except for a reduction of 18 credit hours in the total credit hours required for the usual pattern of a four-year B.S. (Civil) degree and a two-year MBA degree. The reduction in total credit hours translates into fewer civil engineering technical electives and hence less opportunity to add breadth or depth to the required civil engineering courses. However, for some students the opportunity to obtain both a B.S. and MBA in five years is very attractive.

Students wishing to pursue the joint program should take the Graduate Management Admissions Test (GMAT) and apply to the MBA program during their junior year. The application for the joint program is [available online](#). Applications are considered on a rolling basis starting in January, with July 1 as the target deadline. Currently, the middle 80 percent of admitted students have GMAT scores in the range of 560-670.

For additional information, see a current [summary of the curriculum](#) or contact the CSEE Director of Undergraduate Studies.

### 4.3 Double Major

A double major is the awarding of one degree with two majors (e.g., a student completing a double major in civil engineering and environmental engineering earns one B.S. degree). Students must be accepted into each major and fulfill all requirements of each major in addition to satisfying all university requirements.

Probably the most common double major is civil and environmental engineering. However, civil engineering students with an interest in environmental engineering also have the option of choosing technical electives within the environmental engineering track and pursuing a subsequent graduate degree in environmental engineering. Other students have pursued a double major in civil engineering and mechanical engineering, or civil engineering and mathematics.

### 4.4 Minors

Civil engineering students can pursue a variety of minors. A common minor for civil engineering students is [mathematics](#) because only two additional mathematics classes are required above the five mathematics classes required for the major. Recent graduates have also pursued minors in music, economics, computer science and architecture. See the undergraduate catalog for the [complete list of approved minors](#).

## 5. AWARDS AND SCHOLARSHIPS

### 5.1 CSEE Awards and Scholarships

In addition to being eligible for a number of [general awards and scholarships given out by SEAS](#), students may be nominated by the department for several CSEE-specific awards and scholarships (see Table 5.1). Other scholarships specifically for UB CSEE students require a separate application (see Table 5.2). All students are recognized at the annual SEAS scholarship reception, generally held towards the end of March. Students receiving awards, together with their families, are encouraged to attend the reception.

**Table 5.1 Description of CSEE Awards and Scholarships**

<b>Award</b>	<b>Description</b>	<b>Amount (2013)</b>
Robert P. Apmann Memorial Award	For an outstanding graduating senior in water resources and environmental engineering	\$500
S.P. Prawel Award	Recognizes superior achievements in structural engineering courses	\$100
R.R. Rumer Award	Recognizes outstanding students in fluid mechanics and hydraulics	\$100
R.P. Shaw Award	Recognizes superior achievements in engineering mechanics courses	\$100
Julian Snyder Endowment Fund Scholarship (ASCE)	For academic achievement and active participation in student organizations and activities	\$1,000
ASCE Student of the Year Award	For high-level scholastic achievement and leadership activities consistent with ASCE's goals	\$750
CSEE Chair's Recognition Award - Undergraduate	Recognizes scholastic achievement and/or dedication to the department	\$100

**Table 5.2 Scholarships Requiring Separate Applications**

Application announcements for the scholarships listed below are sent out via the civil engineering listserv.

<b>Scholarship</b>	<b>Description</b>	<b>Amount (2013)</b>
Clark Patterson Lee Award (ends 2013-2014 AY)	Intended to support a civil engineering student in good standing, entering junior year of study, with specific interest in civil site, transportation, or municipal design. Students may be given the opportunity to do paid internships with Clark Patterson Lee.	\$2,500 for 2 years
SEAS Senior Scholar Awards	To enable outstanding engineering seniors to work with a faculty member or research group as a prelude to graduate study	\$500 (+ additional \$500 if enroll in graduate school at UB)
Garman Senior Scholar	Recognizes commitment to academic excellence and potential for contributing to society through civil and environmental engineering and to encourage graduate school enrollment.	\$1,000

Scholarship	Description	Amount (2013)
Garman Scholarship	Recognizes commitment to academic excellence and potential for contributing to society through civil and environmental engineering and helps defray the costs of an undergraduate education.	up to \$2,500
Paul J. Koessler Memorial Scholarship	For a junior, senior or graduate student focusing on transportation or structural engineering, with special consideration for students focused on bridge design.	\$5,000

## 5.2 Additional Scholarships

**Association of Bridge Construction and Design (ABCD) Western New York Chapter** has been providing college scholarships to area students since 1998, including many UB students. One \$4,000 and two \$2,000 scholarships are awarded annually. For more information, see the [ABCD website](#).

**American Council of Engineering Companies of New York (ACEC-NY)** awards at least 10 scholarships to undergraduate students intending to become consulting engineers. At least 9 scholarships will provide a stipend of \$2,500 each, and one \$5,000 stipend, to be used for the senior year of full-time undergraduate study toward a bachelor's degree in one of the following engineering fields: mechanical, electrical, structural, civil, environmental, and chemical, and engineering technology or surveying. To be eligible, applicants must be in their junior year. The application deadline is typically in December. For more information, see the [ACE-NY website](#).

**Western New York Prosperity Scholarship** provides assistance to undergraduate and graduate students who are actively preparing for careers that further economic development and growth, especially in the Western New York region. Students can receive scholarship support of up to \$25K annually based on financial need. Eligible applicants include undergraduate students in engineering, management, biomedical science, and biotechnology who have at least junior-level standing during the award period; are in good academic standing; have an interest in bolstering the WNY economy; and have financial need. Graduate students are also eligible. For full details, visit the [scholarship website](#).

**The Science, Mathematics, And Research for Transformation (SMART)** scholarship-for-service program fully funds undergraduate and graduate degrees in a wide range of technical areas, including all fields of engineering, physics, chemistry, biology, brain and cognitive sciences, and mathematics. This highly selective national program fully supports educational costs (including full tuition, generous stipend, book allowance, and a summer internship) while in school, and then provides guaranteed employment with the Defense Department upon graduation. The application web page is at [www.asee.org/SMART](http://www.asee.org/SMART).

**UB Engineering and Applied Sciences Alumni Scholarships** recognize "Leaders in Excellence" and aims to encourage students to develop "Engineering Spirit" and loyalty to the UB School of Engineering and Applied Sciences. More information is available on the [SEAS website](#).

# APPENDIX A. IMPORTANT CONTACTS AND WEBSITES

## Contacts

<b>Department of Civil, Structural And Environmental Engineering</b> (all phone numbers: 716-645-)				
Name	Extension	Office	Email Address	Function
Andrew Whittaker		212 Ketter	<a href="mailto:chaircie@buffalo.edu">chaircie@buffalo.edu</a>	Department Chair
Christine Human	x4374	207 Jarvis	<a href="mailto:chuman@buffalo.edu">chuman@buffalo.edu</a>	Director of Undergraduate Studies
Éva McGovern	x4352	212D Ketter	<a href="mailto:cseeug@buffalo.edu">cseeug@buffalo.edu</a>	Undergraduate Academic Coordinator
<b>School Of Engineering And Applied Sciences</b> (all phone numbers: 716-645-)				
Name	Extension	Office	Email Address	Function
John Van Benschoten		412M Bonner	<a href="mailto:jev@buffalo.edu">jev@buffalo.edu</a>	Assoc. Dean for Undergraduate Education
Kerry Collins-Gross		410 Bonner	<a href="mailto:collinsk@buffalo.edu">collinsk@buffalo.edu</a>	Assist. Dean for Undergraduate Education
Jane Sinclair		410 Bonner	<a href="mailto:jsinclair@buffalo.edu">jsinclair@buffalo.edu</a>	Senior Academic Advisor
Bill Wild		412L Bonner	<a href="mailto:wgwild@buffalo.edu">wgwild@buffalo.edu</a>	Director of Special Student Programs

## Websites

Site	Address	Function
Department of Civil, Structural and Environmental Engineering	<a href="http://www.csee.buffalo.edu">http://www.csee.buffalo.edu</a>	Departmental information
School of Engineering and Applied Sciences	<a href="http://www.eng.buffalo.edu">http://www.eng.buffalo.edu</a>	School information
University at Buffalo	<a href="http://www.buffalo.edu">http://www.buffalo.edu</a>	Access to University information
MyUB	<a href="http://www.myub.buffalo.edu">http://www.myub.buffalo.edu</a>	Student access to grades, class schedules, and other general information
SEAS Office of Undergraduate Education	<a href="http://www.eng.buffalo.edu/undergrad/">http://www.eng.buffalo.edu/undergrad/</a>	Detailed information and services for engineering students
Student Response Center	<a href="http://sarfs.buffalo.edu/src.php">http://sarfs.buffalo.edu/src.php</a>	Student access to registration, HUB, financial aid, billing, etc.
Office of Student Affairs	<a href="http://www.student-affairs.buffalo.edu">http://www.student-affairs.buffalo.edu</a>	Services and programs to support the social, interpersonal, and emotional growth of UB students
Transfer and Articulation Services	<a href="http://taurus.buffalo.edu">http://taurus.buffalo.edu</a>	Information about course transfers
Career Services	<a href="http://www.ub-careers.buffalo.edu">http://www.ub-careers.buffalo.edu</a>	Information on careers, summer jobs, and the GREs