College of Engineering

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Introduction

The College of Engineering offers degree programs in engineering and computer science. These degree programs prepare men and women for one or more of the many career opportunities in the engineering or computer science professions, such as those in design, production, research, development, management, or sales. An engineering or computer science education also prepares a student for further study in medicine, law, business administration, and other areas.

Instruction in the college is complemented by intensive research activity by most of the faculty. Research is directed toward supporting the educational programs of the college, solving contemporary technological problems, and extending the frontiers of scientific knowledge. This continuing research activity helps to insure the integrity and progressive evolution of instructional programs at all levels. In conjunction with their teaching and research, many of the faculty also engage in public service activities in the community and in government on the local, state, and federal levels.

Mission of the College

The mission of the College of Engineering at the University of Illinois at Chicago is to provide the opportunity for each student to become all that he or she is capable of becoming through excellence in education in the three areas of teaching, research, and service. In the area of teaching, the college provides academic excellence to its students through ten Bachelor of Science programs in six departments: Bioengineering; Chemical Engineering; Civil and Materials Engineering; Computer Science; Electrical and Computer Engineering; and Mechanical and Industrial Engineering. With the changing dynamics of society, the college continues to strive for excellence and innovation in both its instructional and research programs. In the area of community service and as part of the University's Great Cities Program related to economic development and environmental concerns, the college is continuously strengthening ties with the industrial community, especially the dynamic region of Illinois.

Undergraduate Study in Engineering

A primary goal of the UIC College of Engineering is to ensure that its students are well prepared for:

1. Practice in the engineering profession;
2. Continued formal education at the graduate level; and
3. Continued education to adapt to evolving technologies and changing markets.

College faculty and administration are continually reevaluating and revising curricula so that engineering and computer science degree programs consistently incorporate the changes that are occurring in technology and society.

The college attracts students and faculty who represent a broad spectrum of nationalities, cultures, races, ages, and genders. Diversity is also reflected in the number and types of employment opportunities available to students. Area corporate partnerships support co-op and internship experiences that are tailored to individual student needs.

Educational Objectives

The UIC College of Engineering offers undergraduate and graduate students opportunities to join faculty in cutting-edge research. In the classroom, students become familiar with the fundamental mathematical and scientific principles that are common to engineering and computer science disciplines, and they learn to apply these principles to current engineering and computer science problems of analysis, design, and experimentation. Through individual and group projects, students make use of current techniques, instruments, equipment, and computers, and gain proficiency in communicating the results of their work. Study in other disciplines provides students with an understanding of the professional ethical responsibilities of practicing engineers. Students also have the opportunity to participate in a number of the many on-campus student chapters of national engineering professional organizations as a way to supplement their classroom experiences.

In the first two years each student will be required to complete courses in mathematics, chemistry and physics (or other science requirements, for computer science majors), and University Writing. Beginning in the second year, the student will start course work in a particular major that represents the technical phase of the student's academic career and constitutes a cohesive program of advanced work in a chosen field. Although the course work in the major becomes progressively specialized in the junior and senior years, each student is also required to take engineering or computer science courses outside of his or her chosen field.

A student must also complete course work in the general fields of humanities and social sciences. Because engineers and computer scientists are no longer narrow specialists, they must recognize the effects of their work on the general welfare of society. The humanities/social sciences phase of their education helps them to become serious contributors to the quality of life. Requirements for the degrees often include free electives that introduce flexibility into the curricula.

Accreditation

Eight undergraduate degree programs of the College of Engineering are accredited by the Accreditation Board for Engineering and Technology (ABET), 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; phone (410) 347-7700. Those programs receiving approval by the Engineering Accreditation Commission (EAC) of ABET include bioengineering, chemical engineering, civil engineering, computer engineering, electrical engineering, industrial engineering, and mechanical engineering. The Computing Accreditation Commission (CAC) of ABET has accredited the program in computer science. Accreditation has not been sought for two interdisciplinary programs—engineering management and engineering physics.

Degree Requirements

To earn a BS degree from the College of Engineering at UIC, students need to complete University, college, and department degree requirements. University and college degree requirements for all College of Engineering students are outlined below. Students should consult their department section for additional degree requirements.

Semester Hour Requirement (see below)

Course Requirements

General Education Core

General Education at UIC is designed to serve as a foundation for lifelong learning. Students are required to complete a minimum of 24 semester hours in the General Education Core with at least one course from each of the following categories:

I. Analyzing the Natural World
II. Understanding the Individual and Society
III. Understanding the Past
IV. Understanding the Creative Arts
V. Exploring World Cultures
VI. Understanding U.S. Society

For a description and a list of courses for each General Education Core category, students should consult the *General Education* section of the catalog. Information on meeting the General Education requirements for each degree program is provided in the College of Engineering department sections.

General Education Proficiencies—University Writing Requirement

College of Engineering students meet the requirement by achieving a passing grade in English 160 and 161. Credit for English 160 may be earned on the basis of a score of 4–5 on the AP English Language and Composition exam, an ACT English subscore of 27 or more, or an SAT Verbal score of 610 or more. Students should consult the *Registering and Enrolling in Courses at UIC* and *Academic Standing* sections for more information on required scores.

Orientation Course Requirement

All incoming freshmen and transfer students must take an engineering orientation course ENGR 100 or ENGR 189, as appropriate, during the first or second term at UIC. Satisfactory completion of the engineering orientation course is a graduation requirement.

Recommended First-Year Program

Courses	Hours
Engineering Orientation[a]	0[a]
English 160 and 161	6
Chemistry[b] (Computer Science majors may take Biological Sciences or Earth and Environmental Sciences)	5
Mathematics[c]	10
Physics (Computer Science majors may take Biological Sciences or Earth and Environmental Sciences)	4
Engineering/computer course	3
General Education Core courses	0–6
Total Hours—First-Year Program	**28–34**

[a] *ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation. However, the hour does count in the calculation of tuition and toward full- or part-time enrollment status and financial aid eligibility. The course must be taken in the first or second term at UIC.*

[b] *The normal chemistry requirement is Chemistry 112—General College Chemistry I for students who pass the placement examination in chemistry. Students who do not pass the examination may be required to take Chemistry 101—Preparatory Chemistry.*

[c] *The beginning mathematics course in the College of Engineering is Mathematics 180—Calculus I for students who pass the mathematics placement examination. Students who do not pass the examination will be placed in specific preparatory mathematics courses by the mathematics department.*

Other Requirements

Course Work Limitations

For the degree of Bachelor of Science, a minimum of 128 semester hours acceptable to the College of Engineering is required for graduation. (See individual majors for the specific hours required for graduation.)

Course work that duplicates previous credit does not count toward graduation; no credit is given for a course in which a failing grade is received.

Credit earned in English 070 or 071 or ESL 050, 060, and 108 does not count toward graduation in the college, except in the following way: students may earn 3 semester hours of credit in English 070 or 071 and a waiver of English 160 for the term in which they receive written authorization from the Department of English.

Credit for graduation is not given by the College of Engineering for courses numbered below Chemistry 112,

Semester Hour Requirement

Degree Program	Department	Degree Conferred	Total Hours
Bioengineering	Bioengineering	BS in Bioengineering	128
Chemical Engineering	Chemical Engineering	BS in Chemical Engineering	128
Civil Engineering	Civil and Materials Engineering	BS in Civil Engineering	128
Computer Engineering	Electrical and Computer Engineering	BS in Computer Engineering	128
Computer Science	Computer Science	BS in Computer Science	128
Electrical Engineering	Electrical and Computer Engineering	BS in Electrical Engineering	128
Engineering Management[a]	Mechanical and Industrial Engineering	BS in Engineering Management	128
Engineering Physics[b]	Electrical and Computer Engineering	BS in Engineering Physics	128
Industrial Engineering	Mechanical and Industrial Engineering	BS in Industrial Engineering	128
Mechanical Engineering	Mechanical and Industrial Engineering	BS in Mechanical Engineering	128

[a] *Offered jointly with the College of Business Administration.*

[b] *Offered jointly with the Department of Physics in the College of Liberal Arts and Sciences.*

Physics 141, and Mathematics 180; such preparatory courses cannot be used as nonmajor electives or free electives.

All courses will be used when determining a student's full-time or part-time status; for computing grade point averages (except for 000-level courses); and in determining probation, dismissal, and Dean's List statuses.

Free Elective Credit

Students in some majors must complete 1–6 credit hours in free elective courses to reach 128 hours required for engineering degrees. These hours are in addition to specific types of elective groups (humanities, social science, nonmajor-rubric, additional math, technical, or area electives). These free elective courses may be technical or nontechnical, but remedial or duplicative courses are not allowed. A maximum of 2 semester hours of free elective credit in kinesiology is allowed. Programs that have such free electives are chemical engineering, computer science, and engineering management.

Grade Point Average (GPA) Requirement

In order to receive a degree from the College of Engineering, a student must present a minimum grade point average of 2.00/4.00 in all work in the major. In addition, the student must satisfy the University requirement of a 2.00/4.00 grade point average in two categories: (1) all work taken at UIC; (2) all work taken at UIC and all other two- and four-year institutions combined.

Graduation Declaration/Filing to Graduate

Students declare their intent to graduate online using *Student Self-Service.* The deadline for submission to the Pending Degree List is the end of the third week (fall and spring) or second week (Summer Session 2) of the term in which graduation is sought. Failure to submit the request at this time may delay the awarding of the degree. A final review will be made following the close of the term. If a student has satisfactorily completed all the degree requirements, the student's name will be placed on the official degree list.

Enrollment Residence Requirement

Either the first 90 or the last 30 semester hours of degree work must be completed in continuous, uninterrupted enrollment residence at UIC. In addition, at least one-half of the credit hours required in the student's major area of study must be completed at UIC. Concurrent attendance at the University of Illinois at Chicago and another collegiate institution or enrollment during the summer at another institution, when approved by the student's college, does not interrupt the UIC enrollment residence requirement for graduation. Work taken at the Urbana-Champaign or Springfield campuses of the University of Illinois cannot be used to satisfy this requirement. Credit earned through proficiency examinations, including credit earned through the College Level Examination Program (CLEP), UIC extension courses, and Urbana-Champaign correspondence courses does not apply toward nor interrupt the enrollment residence requirement.

Transfer Credit Limitations

The College of Engineering requires that of the 128 semester hours needed for the degree, at least 60 semester hours after attaining junior standing must be taken at UIC or another accredited four-year institution; the university enrollment residence requirement (see above) must also be satisfied. For most transfer students, these requirements mean that additional transfer credits from junior (or community) colleges are severely restricted or not permitted.

Upper-division (300- and 400-level) courses in ABET-accredited engineering or computer science majors can be transferred only from other ABET-accredited engineering or computer science programs. This limits transfer of credits from junior colleges, U.S. vocational or technology programs, and overseas programs to lower-division (100- and 200-level) courses.

Transfer Credit for Continuing Students

Continuing students planning to take non-UIC courses must get prior approval from the College of Engineering.

College Policies

Academic Load

During the fall and spring semesters, a full-time program is 12 to 18 semester hours. More than 18 semester hours is considered an overload and students must seek approval by filing a petition in 123 SEO. For Summer Session 1 (Four Week) and Summer Session 2 (Eight Week), UIC considers a total aggregate of 6 semester hours as the minimum number necessary to constitute full-time enrollment. Students seeking to take more than 9 semester hours during the summer should file a petition in 123 SEO.

Academic Probation and Dismissal Rules

Probation Rules

1. Any student whose UIC cumulative grade point average falls below 2.00/4.00 is placed on 2.25 academic probation. A student on 2.25 probation is required to earn at least one B and no grade less than a C in each ensuing term until both the UIC cumulative grade point average and the total cumulative grade point average are above 2.00/4.00.
2. Any student whose grade point average for any term falls below 2.00/4.00 but whose UIC cumulative grade point average is above 2.00 will be placed on 2.00 academic probation for the following term. The student will return to clear status if a grade point average of at least 2.00 is earned without any grade less than C in the following term.

Dismissal Rules

1. A student on academic probation who does not meet the probationary requirements will be dismissed from the University.
2. A student who fails to make progress toward a degree may be dismissed. Examples of failure to make progress include excessive term deficit points,[a] failure to complete required courses, accumulation of excessive number of Incomplete (I) grades, failure to earn credit in any semester, and failure to maintain a 2.00 average in the major discipline.
3. A student may be readmitted after the first dismissal with petition and presentation of above-satisfactory performance in college-level courses taken outside of UIC. The non-UIC work evaluated for readmission may or may not apply towards a UIC degree. However, only in rare cases, a student will be readmitted after the second dismissal.

[a] *Credit-hour weighted sum of following values: A=+2, B=+1, C=0, D=-1, F=-2.*

Change of Course Schedule—Dropping Courses

Undergraduate students may drop courses using *Student Self-Service* through the end of the second week of classes for fall and spring semesters, the first Wednesday of Summer Session 1, or the first Friday of Summer Session 2. During weeks 3 through 10 of the fall and spring semesters (first Thursday through the second Wednesday of Summer Session 1 or weeks 2 through 5 of Summer Session 2) students may drop courses with the permission

of their major college. If the drop occurs between 0 and 2 weeks in fall and spring, there will be no notation on the transcript. If the drop occurs during weeks 3 through 10 in fall and spring (first Thursday through the second Wednesday of Summer Session 1 or weeks 2 through 5 of Summer Session 2), a W is noted on the transcript. Undergraduate students may drop a maximum of 4 UIC individual courses that result in a W notation on their transcript during their entire undergraduate degree program. College of Engineering students must submit a Late Drop Petition Form to the COE Front Office, 123 SEO.

A student who wishes to drop all courses must withdraw from the University by completing a special form and submitting it to the College Office, 123 SEO, by the end of the last business day before final examinations. The grades of W for all courses in the term withdrawn do not count towards the maximum of four allowed late course drops. Student can register normally in the next term.

Changes within a Major

Changes within degree programs are handled through petitions. A General Engineering Petition or Petition for Modification of Major is required when a student wishes to change contents of a major. Petitions often require long lead-times for processing and the College Office, 123 SEO, should be contacted for specific instructions. If approved, the student is sent a notification by mail or fax.

Class Attendance

In case of excessive absences, the course instructor may recommend to the college that a student be dropped from the course. Adverse consequences of such involuntary course drop must be weighed against high probability of failure in the course. Moreover, such involuntary course drops must be within the framework of four allowable late course drops by sixth week in fall or spring (between the third Wednesday of Summer Session 1 and fifth Friday of Summer Session 2).

Course Prerequisites

Some departments verify whether students have listed prerequisites and may drop students who cannot provide satisfactory proof of having completed the prerequisites by first or second week of the term. In other instances, it is students' responsibility to ensure that they have the listed prerequisites. It is difficult to perform satisfactorily in most engineering courses without having the listed prerequisites.

Credit/No Credit Option

Certain types of courses may be taken on the credit/no credit option in the College of Engineering. In this option, a student will be allowed to complete a limited number of courses with a grade of credit (CR) or no credit (NC) instead of a letter grade. Courses below the 200-level, required courses, and essential prerequisite courses cannot be taken as credit/no credit. For detailed information on the college's policy on credit/no credit, the student should inquire in 123 SEO.

Students must apply at their college office no later than the tenth day of the term (first Wednesday of Summer Session 1 or first Friday of Summer Session 2) to have a course designated for credit/no credit grading option.

Declaring a Major

All students entering the College of Engineering must declare a major in order to be assigned a departmental faculty advisor after the first term. Students must declare their majors at the time of entry to the college or by the end of their first term. Students can petition to change their major by completing a form in the College Office, but the petition will not be approved if the intended major is oversubscribed and thus closed.

Double Major, Double Degree, and Second Bachelor's Degree

Double Major

This option is not available in the College of Engineering.

Double Degrees

Double degrees are possible for some College of Engineering students who want to pursue two bachelor's degrees in Engineering concurrently. Students must complete a minimum of 30 additional hours of 300- and 400-level course work for the second engineering degree. Combination of degrees that have substantial overlap is not allowed. Interested students should speak with an advisor and submit a petition to College of Engineering Office, 123 SEO. Double degrees with another college are not permitted.

Second Bachelor's Degree

Students who have already earned a bachelor's degree must apply and be admitted as an undergraduate to the College of Engineering in order to pursue a second bachelor's degree. Students must complete all requirements for the second degree as specified by the college and the major department, including a minimum of 30 additional hours of 300- and 400-level course work beyond those required for the first degree. The UIC enrollment residence requirement must also be met, i.e., the last 30 semester hours for second degree must be taken at UIC. Combination of degrees that have substantial overlap is not allowed.

Graduate-Level Courses for Undergraduate Credit

Many 400-level courses are part of required or elective courses. Students need special permission from the college to take 500-level courses.

Proficiency Examinations

Students with nontransferable college-level credits in Academic Writing, mathematics, sciences, and computer programming may earn credits through proficiency examinations, if such examinations are allowed by the departments offering these courses.

Registration Approval

All incoming freshmen and transfer students need approval of a college advisor before registration for courses. Such approval is typically obtained during the orientation visit to the campus. All continuing students need approval from their faculty advisor before registering for courses.

Repeat Policy for Standard Graded Courses

Students may repeat a course to increase their knowledge of the subject matter. There are circumstances under which repeating a course is advisable and to a student's advantage. There are also circumstances where repeating a course may disadvantage a student and narrow a student's options. Some colleges require students to discuss any plan to repeat a course with their academic advisor before they register to repeat the course.

Courses with A or B grades may not be repeated. Normally, courses with a C grade may not be repeated. Courses with D or F grades may be repeated once without written permission. In all cases, the original grade for the course and the grade for each repeat will appear on the transcript. The original grade will be calculated into the grade point average, unless the student initiates a request for *Repeating a Course with Grade Point Average Recalculation* as described below. Only one registration for the course counts toward the total number of credits required for graduation. A course cannot be repeated after receiving credit in a course for which the repeat course is a prerequisite.

To repeat a course more than once requires written permission from the student's college dean. Students who have been dismissed may not appeal on the grounds of intention to repeat courses. Certain courses may not be repeated; students should consult their college before repeating a course.

Repeating a Course with Grade Point Average Recalculation

Important Note: Grade point average recalculation for a repeated course **is not** automatic. The student must initiate a request in the college office as outlined below.

For the grade point average recalculation policy to apply, a student must declare to his or her college the intent to repeat a course for a change of grade before reenrolling in the course. The course must be repeated within three semesters of the receipt of the original grade, and it must be taken at UIC. Only one registration for the course counts toward the total number of credits required for graduation.

Undergraduate students are allowed grade point average recalculation in up to four repeated courses. Under the course repeat policy, all courses taken and their grades appear on the transcript in the semester in which they were taken. Under the grade point average recalculation policy, the grade earned the first time the course is taken will be dropped from the calculation of the cumulative GPA and the grade(s) earned when the course is repeated will be used in the calculation. This rule holds, even if the second grade is lower than the first. If a course is repeated more than once, the first grade is not counted in the GPA, but all other grades for that course are calculated in the cumulative GPA.

Transferring

Intercollege Transfer Students

Students enrolled in other UIC colleges who wish to transfer to the College of Engineering may apply at any time during the regular semester; see the *Transfer Students from Other Colleges and Universities* section below for specific requirements.

Transfer Students from Other Colleges and Universities

The College of Engineering admits qualified transfer students from accredited institutions. Depending upon space availability, admission preference will be given to individuals who qualify as Illinois residents as determined by the University (see Regulations Governing the Determination of State Residence Status for Admission and Assessment of Student Tuition). Generally 60 semester hours (90 quarter hours) of transfer work must include English, math, and science courses listed below for admission. Exceptional students who have completed most of these listed English, math, and science courses may be admitted even if they have not completed 60 semester hours by the time of entry to the college. The college will consider residents of the state of Illinois who have a transfer grade point average of at least 2.50/4.00 in math/science/technical courses as well as on a cumulative basis. Out-of-state residents must have a minimum transfer GPA (math/science/technical and cumulative) of 2.50/4.00 and international students that of 2.75/4.00 to be considered for admission. Admission criteria may vary for different programs. Meeting the minimum criteria does not guarantee admission due to limited space availability.

All transfer applicants should complete the following course work by the time of entry to the College of Engineering:

1. Academic Writing (two courses).
2. Chemistry, equivalent to Chemistry 112 at UIC. (Computer Science students may substitute Biological Sciences or Earth and Environmental Sciences.)
3. Physics for engineers, emphasizing mechanics, electricity, and magnetism (with calculus as a prerequisite). (Computer Science students may substitute Biological Sciences or Earth and Environmental Sciences.)
4. Mathematics through differential equations.

See the *Admissions* section for application deadline dates and other procedures for transfer students.

Transferring Out of the College

Since procedures for changing colleges differ among the undergraduate colleges, a student should inquire in 123 SEO for proper instructions.

Undergraduate Research in Engineering

Several engineering majors allow undergraduate research within respective engineering departments as technical electives if certain eligibility criteria are met. Prior approval of research topic and scope by a faculty advisor and the director of undergraduate studies is required; special forms are available online and at the college office. Submission of copies of a final report to the department and college offices is also required before undergraduate research credits can be applied for the degree.

Minors

Although a minor is not required, a student may elect to complete one or more minors. The College of Engineering will acknowledge, on a student's transcript, the successful completion of a minor offered by any engineering program in the college for which the student is eligible to enroll and for which the student meets the requirements for the minor listed below. The number of semester hours required for the minor varies by the field of specialization. Minors offered by the College of Engineering include:

Minor	Department	Hours[a]
Bioengineering	Bioengineering	12
Chemical Engineering	Chemical Engineering	16–18
Civil Engineering	Civil and Materials Engineering	18–19
Computer Engineering	Electrical and Computer Engineering	19
Computer Science	Computer Science	14–17
Electrical Engineering	Electrical and Computer Engineering	18
Environmental Engineering	Interdepartmental	15–19
Industrial Engineering	Mechanical and Industrial Engineering	12
Information Technology	Computer Science	12
International Studies	N/A; contact College of Engineering	18–21
Materials Engineering	Interdepartmental	14–19
Mechanical Engineering	Mechanical and Industrial Engineering	16–18

[a] *All engineering minors require prerequisite courses. Please see department sections for information on prerequisite courses associated with each minor.*

Requirements for the Minor

See the appropriate engineering program for a detailed description of each minor. At least 9 semester hours in the minor field of specialization must be at the advanced level (200-, 300-, or 400-level courses), and a minimum grade point average of 2.00/4.00 is required. Engineering minors require that at least 9 semester hours be taken from the UIC College of Engineering.

Admission to an Engineering Minor

Admission to a minor in the College of Engineering will not be approved for any student if there is substantial course overlap between the proposed minor and the student's major. For example, students majoring in Computer Science may not minor in Computer Engineering. Engineering students who are interested in completing an engineering minor must submit a request form in 123 SEO and obtain approval.

Engineering Minors for Non-Engineering Students

Nonengineering students will be allowed to complete minor areas of study within engineering if they meet the transfer eligibility criteria at the time of application and so long as space permits. Students must submit a request form in 123 SEO and obtain approval. Nonengineering students must also consult their home colleges about the acceptability and applicability of engineering course credits toward their degrees. Most engineering classes are closed to nonengineering students; those students with approved minors must submit petitions to the college office at the beginning of the term to register for engineering courses needed.

Minor Areas Outside of Engineering for Engineering Students

Engineering majors may complete one or more minors offered by other UIC colleges. Successful completion of a minor outside the College of Engineering will be acknowledged on an engineering student's transcript if certification of completion of the minor is received from the other college by applicable deadlines for the term of graduation. Engineering students must submit a request form in 123 SEO and obtain approval before petitioning to another college. Minors will be approved by the College of Engineering if the requirements for the minor, as defined by the nonengineering department offering the minor, are satisfied. The request for the minor must be approved by both colleges.

Area of Concentration

Some College of Engineering majors offer areas of concentration within the majors by prescribing some or all of technical, nonmajor, and free electives. Completion of an area of concentration is noted on the transcript. On the other hand, engineering minors offer students the opportunity to study an engineering discipline outside of the major; minors generally require additional course work to meet prerequisite and course requirements. Minors are also noted on the transcripts.

Academic Advising

Contact the College Office, 123 SEO, for the names of college advisors and departmental offices for faculty advisors.

Advising Policy

Faculty advisors are available to assist students with the selection of courses after the first term. Students declare a major when they enter the University and are assigned a faculty advisor by the appropriate department. In addition, the College Office for Undergraduate Administration on the first floor of SEO advises newly admitted freshman and transfer students, seniors contemplating graduation, and students facing academic or other difficulties. All continuing students should take advantage of advance advising and advance registration periods to ensure that they can get into the classes of their choice.

Academic Honors

University Honors

At graduation, students are awarded University Honors for academic distinction. Such honors are designated on the diplomas as Cum laude, Magna cum laude, or Summa cum laude. The minimum cumulative grade point average needed to qualify for University Honors is 3.50/4.00 in all UIC course work and in all work offered for the degree.

Cum Laude is awarded to a student who earns at least a 3.50 cumulative grade point average; Magna cum laude is awarded to a student who earns at least a 3.75 cumulative grade point average; Summa cum laude is awarded to a student who earns at least a 3.85 cumulative grade point average. All transfer work accepted for the degree is included in the determination of grade point averages. The grades for military science courses are excluded unless a student completes the four-year military science program, in which case 5 semester hours of advanced credit are included in the determination of averages for University Honors.

The Bell Honors Award is given in recognition of attaining the highest grade point average in each graduating class. At the Engineering Convocation, award recipients are recognized and given a certificate acknowledging their scholastic attainments.

Dean's List

Any student who achieves a grade point average of 3.50/4.00 with 12 or more graded hours in any semester is placed on the Dean's List.

Special Programs and Opportunities

Cooperative Engineering Education Program

The College of Engineering offers a cooperative engineering education program. It is a coordinated alternating work and study program that provides an opportunity for the undergraduate student not only to acquire academic knowledge but also to obtain work experience in the chosen area of study. Interested students are invited to interview representatives of participating companies during the sophomore year. The first work session usually starts during the summer following the sophomore year. Further information on the program is available in 820 SEO.

The Minority Engineering Recruitment and Retention Program (MERRP)

The Minority Engineering Recruitment and Retention Program promotes academic excellence among minority students of engineering at the University of Illinois at Chicago. Specifically, the program offers structured and individual academic support programs for African Americans, Hispanics, and other minorities currently underrepresented in the engineering profession. By combining personal and academic support with opportunities and incentives, the program seeks to increase the number of minority students who receive undergraduate and graduate degrees from the College of Engineering. Further information may be obtained by calling (312) 996-2201.

Student Organizations

During their early years in the college, students receive information about the many professional engineering societies. Each society has an official representative among the college faculty. Students are strongly advised to join at least one professional society closely affiliated with their career interests. Professional society chapters include those of AIAA, AIChE, ASCE, ASME, ACM, BMES, IEEE, IEEE-CS, IIE, SAE, and SME. Honor society chapters

include those of Alpha Eta Mu Beta, Eta Kappa Nu, Pi Tau Sigma, and Tau Beta Pi. Other society chapters include those of NSBE, SHPE, and SWE. Engineering Council (EC) is an umbrella organization in the college that coordinates some of the activities of these society chapters.

Department of Bioengineering

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Student Services: 123 SEO
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Accreditation

The Department of Bioengineering offers a program of study leading to the degree of Bachelor of Science in Bioengineering that is accredited by the Accreditation Board for Engineering and Technology http://www.abet.org/.

BS in Bioengineering

Bioengineering is a field of engineering science that develops and applies quantitative analysis and design to living systems. Biological systems are interesting, efficient and successful, but also highly complex; they are dynamic, nonlinear, self-repairing, and yet programmed to terminate. The classic engineering approach of measure-and-model must be carefully recast to deal with the complex nature of living systems, requiring bioengineers to balance analytical rigor with innovation.

Bioengineers are uniquely qualified to work at the interface between living and nonliving systems, enhancing our ability to repair or replace physiological substances or processes as needed in healthcare applications. Potential applications include creating engineered bone replacements, optimizing bionic implants to treat blindness, and the design of molecules as new therapeutic drugs. Training in bioengineering prepares students for graduate school or industry, and is an excellent preparation for professional programs (medicine, dentistry, nursing, pharmacy). Exciting career opportunities exist for bioengineers at the BS level in biotechnology, pharmaceutical and medical device industries, in hospitals, federal labs, and environmental agencies.

The department faculty routinely includes undergraduate students in world-class bioengineering research programs, and maintains strong interactions with faculty in the Colleges of Medicine, Dentistry and Pharmacy, the Department of Biological Sciences, and other engineering disciplines. The undergraduate curriculum includes rigorous training in bioengineering fundamentals, complimented by significant course work in physiology, mathematics, chemistry and physics. Each student must complete a program of required core courses and select an individualized course track in one specialized area (neural engineering, cell and tissue engineering, or bioinformatics) best suited to the student's interests. The department offers elective courses in medical product development and technology transfer to help prepare students for launching start-up companies or careers in industry or consulting. An accelerated BS/MS track is available; consult the director of undergraduate studies for further information.

The department mission statement and the educational objectives for the Bachelor of Science in Bioengineering can be found at the departmental Web site http://www.uic.edu/depts/bioe/.

Degree Requirements

To earn a Bachelor of Science in Bioengineering degree from UIC, students need to complete University, college, and department degree requirements. The Department of Bioengineering degree requirements are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies.

BS in Bioengineering Degree Requirements	Hours
Nonengineering and General Education Requirements	69–71
Required Engineering Courses	28
Selective Engineering Courses	20–23
Bioengineering Concentration Area Electives	11
Total Hours—BS in Bioengineering	**128**

Nonengineering and General Education Requirements

Courses	Hours
CHEM 112—General College Chemistry I[a]	5
CHEM 114—General College Chemistry II[a]	5
PHYS 141—General Physics I (Mechanics)[a]	4
PHYS 142—General Physics II (Electricity and Magnetism)[a]	4
Choose one from the following: PHYS 244—General Physics III (Modern Physics) (3) PHYS 245—General Physics IV (Heat, Fluids, and Wave Phenomena) (4)	3–4
MATH 180—Calculus I[a]	5
MATH 181—Calculus II[a]	5
MATH 210—Calculus III[a]	3
MATH 220—Introduction to Differential Equations	3
ENGL 160—Academic Writing I: Writing for Academic and Public Context	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[b]	3
Understanding the Creative Arts course[b]	3
Understanding the Individual and Society course[b]	3
Understanding the Past course[b]	3
Understanding U.S. Society course[b]	3
BIOS 100—Biology of Cells and Organisms[a]	5
Choose one from the following: BIOS 220—Mendelian and Molecular Genetics (3) BIOS 222—Cell Biology (3) BIOS 240—Homeostatis: The Physiology of Plants and Animals (3) BIOS 286—Biology of the Brain (3) BIOS 352—Introductory Biochemistry (3)	3
Choose one from the following: BIOS 430—Evolution (4) BIOS 443—Animal Physiological Systems (4) BIOS 484—Neuroscience I (3) BIOS 485—Neuroscience II (3)	3–4
Total Hours—Nonengineering and General Education Requirements	**69–71**

[a] *This course is approved for the Analyzing the Natural World General Education category.*

[b] *Students should consult the* General Education *section of the catalog for a list of courses in this category.*

Required Engineering Courses

Courses	Hours
BIOE 101—Introduction to Bioengineering	2
BIOE 240—Modeling Physiological Data and Systems	3
BIOE 250—Clinical Problems in Bioengineering	3
CME 260—Properties of Materials	3
BIOE 339—Biostatistics	3
BIOE 396—Senior Design I	3
BIOE 397—Senior Design II	3
BIOE 430—Bioinstrumentation and Measurements I	3
BIOE 431—Bioinstrumentation and Measurements I Laboratory	2
BIOE 460—Materials in Bioengineering	3
Total Hours—Required Engineering Courses	**28**

Selective Engineering Courses

Courses	Hours
Choose one from the following:	0[a]
ENGR 100—Orientation (0)[a]	
ENGR 189—Minority Engineering Freshman and Transfer Student Orientation (0)[a]	
Choose one from the following:	3–4
ECE 115—Introduction to Electrical and Computer Engineering	
ECE 210—Electrical Circuit Analysis (3)	
ECE 225—Circuit Analysis (4)	
Choose one from the following:	3–4
CS 107—Introduction to Programming (4)	
CS 108—Fortran Programming for Engineers (3)	
CS 109—C/C++ Programming for Engineers with MatLab (3)	
Choose one from the following:	3–4
BIOE 325—Biotransport (3)	
ME 211—Fluid Mechanics (4)	
CS 201—Data Structures and Discrete Mathematics (4)	
CHE 311—Transport Phenomena I (3)	
Choose one from the following:	3
BIOE 310—Biological Systems Analysis (3)	
ECE 310—Discrete and Continuous Signals and Systems (3)	
ME 312—Dynamic Systems and Control (3)	
Choose one from the following:	3
BIOE 205—Bioengineering Thermodynamics (3)	
CHE 201—Introduction to Thermodynamics (3)	
ME 205—Introduction to Thermodynamics (3)	
Choose one from the following:	3
BIOE 455—Introduction to Cell and Tissue Engineering (3)	
BIOE 475—Neural Engineering I (3)	
BIOE 480—Introduction to Bioinformatics (3)	
Choose one from the following:	2
BIOE 456—Cell and Tissue Engineering Laboratory (2)	
BIOE 476—Neural Engineering I Laboratory (2)	
BIOE 481—Bioinformatics Laboratory (2)	
Total Hours—Selective Engineering Courses	**20–23**

[a] ENGR 100 and 189 are one-semester-hour courses, but the hour does not count toward the total hours required for graduation.

Bioengineering Concentration Area Electives

Courses	Hours
These courses are to be selected in consultation with the advisor, must relate to each other in such a way as to define an area of concentration, and are subject to the following restrictions:	11

1. A minimum of 3 hours must be upper-division (300- or 400-level) bioengineering or other engineering courses.
2. Nonengineering courses may be used only if they can be justified and prior approval is obtained from the advisor.
3. A maximum of 3 hours of BIOE 398 may be applied as concentration area elective hours.
4. A maximum of 4 hours from the following courses may be applied as concentration area elective hours: BIOE 402, BIOE 406, BIOE 408, ENGR 400, ENGR 404, and ENGR 420.
5. The following Web-based courses may not be applied as concentration area electives: ENGR 401, ENGR 402, ENGR 403, and ENGR 410.

Total Hours—Bioengineering Concentration Area Electives	**11**

Sample Course Schedule

Freshman Year

First Semester	Hours
MATH 180—Calculus I	5
ENGR 160—Academic Writing I: Writing for Academic and Public Content	3
BIOS 100—Biology of Cells and Organisms	5
BIOE 101—Introduction to Bioengineering	2
Total Hours	**15**

Second Semester	Hours
MATH 181—Calculus II	5
PHYS 141—General Physics I (Mechanics)	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
CHEM 112—General College Chemistry I	5
ENGR 100—Orientation	0[a]
Total Hours	**17**

[a] ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.

Sophomore Year

First Semester	Hours
MATH 210—Calculus III	3
PHYS 142—General Physics II (Electricity and Magnetism)	4
BIOE 240—Models of Physiological Data and Systems	3
CHEM 114—General College Chemistry II	5
BIOS 286—Biology of the Brain	3
Total Hours	**18**

Second Semester	Hours
MATH 220—Introduction to Differential Equations	3
BIOE 250—Clinical Problems in Bioengineering	3
ECE 210—Electrical Circuit Analysis	3
CME 260—Properties of Materials	3
CS 108—Fortran Programming for Engineers	3
Total Hours	**15**

Junior Year

First Semester	Hours
BIOE 339—Biostatistics I	3
BIOE 325—Biotransport	3
PHYS 244—General Physics III (Modern Physics)	3
BIOE 310—Biological Systems Analysis	3
BIOS 484—Neuroscience I	3
Total Hours	**15**

Second Semester	Hours
BIOE 205—Bioengineering Thermodynamics	3
ECE 430—Bioinstrumentation and Measurements I	3
BIOE 431—Bioinstrumentation and Measurements I Laboratory	2
Concentration Area Electives	6
General Education Core course	3
Total Hours	**17**

Senior Year

First Semester	Hours
BIOE 460—Materials in Bioengineering	3
BIOE 396—Senior Design I	3
Concentration Area Elective	3
General Education Core courses	6
Total Hours	**15**

Second Semester	Hours
BIOE 397—Senior Design II	3
BIOE 475—Neural Engineering I	3
BIOE 476—Neural Engineering I Laboratory	2
Concentration Area Elective	2
General Education Core courses	6
Total Hours	**16**

Minor in Bioengineering

For the minor, 12 semester hours are required, excluding prerequisite courses. Students outside the Department of Bioengineering who wish to minor in Bioengineering must complete the following:

Prerequisite Courses—Bioengineering Minor	Hours
BIOS 100—Biology of Cells and Organisms (or higher)	5
MATH 180—Calculus I	5
MATH 181—Calculus II	5
MATH 210—Calculus III	3
MATH 220—Introduction to Differential Equations	3
PHYS 141—General Physics I (Mechanics)	4
PHYS 142—General Physics II (Electricity and Magnetism)	4
Minimum Total Hours—Prerequisites for Bioengineering Minor	**29**

Required Courses—Bioengineering Minor	Hours
BIOE 101 —Introduction to Bioengineering	2
BIOE 240—Modeling Physiological Data and Systems	3
Choose one from the following (prerequisites vary):	3
BIOE 415—Biomechanics (3)	
BIOE 421—Biomedical Imaging (3)	
BIOE 430—Bioinstrumentation and Measurements I (3)	
BIOE 432—Bioinstrumentation and Measurements II (3)	
BIOE 439—Biostatistics (3)	
BIOE 455—Introduction to Cell and Tissue Engineering (3)	
BIOE 460—Materials in Bioengineering (3)	
BIOE 475—Neural Engineering I: Introduction to Hybrid Neural Systems (3)	
BIOE 480—Introduction to Bioinformatics (3)	
Four additional hours of 400-level BIOE courses, which may be chosen from the list above (additional prerequisites may apply)	4
Total Hours—Required Courses for Bioengineering Minor	**12**

Department of Chemical Engineering

202 Chemical Engineering Building (CEB)
(312) 996-3424
kmilla@uic.edu
http://www.uic.edu/depts/chme
Administration: Head, Dr. Sohail Murad
Director of Undergraduate Studies, Dr. Ludwig C. Nitsche
Student Services: Graduate/Undergraduate Program Coordinator, Karen Milla, kmilla@uic.edu
Academic Advisors: Professors Akpa, Liu, Meyer, Murad, Nitsche, Regalbuto, Turian, and Wedgewood.

BS in Chemical Engineering

In the Chemical Engineering curriculum, students learn to apply chemistry, physics, and mathematics to the industrial-scale production of chemicals, including petroleum products, polymers, pharmaceuticals, electronic devices, and foods. This program also explores chemical engineering applications in environmental protection, waste treatment, the creation of alternative energy sources, and other frontiers, such as microelectronic materials and nanotechnology.

The BS in Chemical Engineering program offers expertise in a wide variety of areas, including thermodynamics, separation processes, transport phenomena, reactor design, combustion, and process control. Students may use elective courses to specialize in these and other areas. The program's goal is to prepare students for careers in industry or government, and for further study at the graduate level. As the only chemical engineering department at a public university in the Chicago metropolitan area, this program provides unique opportunities for students to interact with world-class industries through research projects and internship programs.

Degree Requirements

To earn a Bachelor of Science in Chemical Engineering degree from UIC, students need to complete University, college, and department degree requirements. The Department of Chemical Engineering degree requirements are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies.

BS in Chemical Engineering Degree Requirements	Hours
Nonengineering and General Education Requirements	74
Required in the College of Engineering	45
Technical Elective	3
Electives outside the Major Rubric	6
Total Hours—BS in Chemical Engineering	**128**

Nonengineering and General Education Requirements

Courses	Hours
ENGL 160— Academic Writing I: Writing for Academic and Public Contexts	3
ENGL 161— Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[a]	3
Understanding the Creative Arts course[a]	3
Understanding the Past course[a]	3
Understanding the Individual and Society course[a]	3
Understanding U.S. Society course[a]	3
MATH 180—Calculus I[b]	5
MATH 181—Calculus II[b]	5
MATH 210—Calculus III[b]	3
MATH 220—Introduction to Differential Equations I	3
PHYS 141—General Physics I (Mechanics)[b]	4
PHYS 142—General Physics II (Electricity and Magnetism)[b]	4
CHEM 112—General College Chemistry I[b]	5
CHEM 114—General College Chemistry II[b]	5
CHEM 222—Analytical Chemistry	4
CHEM 232—Organic Chemistry I	4
CHEM 233—Organic Chemistry Laboratory I	1
CHEM 234—Organic Chemistry II	4
CHEM 342—Physical Chemistry I	3
CHEM 346—Physical Chemistry II	3
Total Hours—Nonengineering and General Education Requirements	**74**

[a] *Students should consult the* General Education *section of the catalog for a list of approved courses in this category.*

[b] *This course is approved for the Analyzing the Natural World General Education category.*

Required in the College of Engineering

Courses	Hours
ENGR 100—Orientation[a]	0[a]
CHE 201—Introduction to Thermodynamics	3
CHE 210—Material and Energy Balances	4
CHE 301—Chemical Engineering: Thermodynamics	3
CHE 311—Transport Phenomena I	3
CHE 312—Transport Phenomena II	3
CHE 313—Transport Phenomena III	3
CHE 321—Chemical Reaction Engineering	3
CHE 341—Chemical Process Control	3
CHE 381—Chemical Engineering Laboratory I	2
CHE 382—Chemical Engineering Laboratory II	2
CHE 396—Senior Design I	4
CHE 397—Senior Design II	3
CME 260—Properties of Materials	3
ECE 210—Electrical Circuit Analysis	3
CHE 499—Professional Development Seminar	0
Choose one of the following courses: CS 108—Fortran Programming for Engineers with MatLab (3) CS 109—C/C++ Programming for Engineers with MatLab (3)	3
Total Hours—Required in the College of Engineering	**45**

[a] *ENGR 100 is one-semester-hour course, but the hour does not count toward the total hours required for graduation.*

Technical Elective

Courses	Hours
One technical elective to be chosen from the following list of design-oriented courses:[a]	3
CHE 392—Undergraduate Research (3)[b]	
CHE 410—Transport Phenomena (3)	
CHE 413—Introduction to Flow in Porous Media (3)	
CHE 421—Combustion Engineering (3)	
CHE 422—Biochemical Engineering (3)	
CHE 423—Catalytic Reaction Engineering (3)	
CHE 431—Numerical Methods in Chemical Engineering (3)	
CHE 438—Computational Molecular Modeling (3)	
CHE 440—Non-Newtonian Fluids (3)	
CHE 441—Computer Applications in Chemical Engineering (3)	
CHE 445—Mathematical Methods in Chemical Engineering (3)	
CHE 450—Air Pollution Engineering (4)	
CHE 456—Fundamentals and Design of Microelectronics Processes (3)	
CHE 494—Selected Topics in Chemical Engineering (3)	
Total Hours—Technical Elective	**3**

[a] *Possible technical elective credit for a 400-level CHE course not listed above will require departmental approval by petition to the Undergraduate Committee.*

[b] *An appropriate design-related research project may be selected with the approval of the Department of Chemical Engineering.*

Electives outside the Major Rubric

Courses	Hours
Electives outside the CHE Rubric	6
Total Hours—Electives outside the Major Rubric	**6**

Sample Course Schedule

Freshman Year

First Semester	Hours
MATH 180—Calculus I	5
CHEM 112—General College Chemistry I	5
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
General Education Core course	3
ENGR 100—Orientation[a]	0[a]
Total Hours	**16**

[a] *ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.*

Second Semester	Hours
MATH 181—Calculus II	5
PHYS 141—General Physics I (Mechanics)	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
CHEM 114—General College Chemistry II	5
Total Hours	**17**

Sophomore Year

First Semester	Hours
MATH 210—Calculus III	3
PHYS 142—General Physics II (Electricity and Magnetism)	4
CS 108—Fortran Programming for Engineers with MatLab ***OR*** CS 109—C/C++ Programming for Engineers with MatLab	3
CHEM 232—Organic Chemistry I	4
CHE 201—Introduction to Thermodynamics	3
Total Hours	**17**

Second Semester	Hours
MATH 220—Introduction to Differential Equations	3
CHEM 234—Organic Chemistry II	4
CHEM 233—Organic Chemistry Lab I	1
CHE 210—Material and Energy Balances	4
ECE 210—Electrical Circuit Analysis	3
CME 260—Properties of Materials	3
Total Hours	**18**

Junior Year

First Semester	Hours
CHEM 342—Physical Chemistry I	3
CHE 301—Chemical Engineering Thermodynamics	3
CHE 311—Transport Phenomena I	3
CHEM 222—Analytical Chemistry	4
General Education Core course	3
Total Hours	**16**

Second Semester	Hours
CHEM 346—Physical Chemistry II	3
CHE 312—Transport Phenomena II	3
CHE 313—Transport Phenomena III	3
CHE 321—Chemical Reaction Engineering	3
General Education Core course	3
Total Hours	**15**

Senior Year

First Semester	Hours
CHE 381—Chemical Engineering Laboratory I	2
CHE 396—Senior Design I	4
CHE design elective—Selected from CHE 410, 413, 421, 422, 423, 431, 438, 440, 441, 445, 450, 456, 494, or 392 (departmental approval is required for CHE 392)	3
Elective outside the Major Rubric	3
General Education Core course	3
Total Hours	**15**

Second Semester	Hours
CHE 382—Chemical Engineering Laboratory II	2
CHE 341—Chemical Process Control	3
CHE 397—Senior Design II	3
CHE 499—Professional Development Seminar	0
Elective outside the Major Rubric	3
General Education Core course	3
Total Hours	**14**

BS in Chemical Engineering—Biochemical Engineering Concentration

Students are required to complete 9–10 semester hours in elective courses by choosing 3–4 courses from the following list:

Required Courses—Biochemical Engineering Option	Hours
One technical elective from Chemical Engineering:	
CHE 422—Biochemical Engineering	3
Two electives in nonmajor rubric category from among the following:	5–7
BIOS 350—General Microbiology (3)	
BIOS 351—Microbiology Laboratory (2)	
CHEM 352—Introductory Biochemistry (3)	
CHEM 452—Biochemistry I (4)	
Free elective (if needed)	0–1
Total Hours—Required Courses Biochemical Engineering Concentration[a]	**9–10**

[a] Due to prerequisites for the concentration, students may require more than the minimum 128 semester hours for the degree.

Minor in Chemical Engineering

For the minor, 16–18 semester hours are required, excluding prerequisite courses. Students outside the Department of Chemical Engineering who wish to minor in Chemical Engineering must complete the following:

Prerequisite Courses—Chemical Engineering Minor	Hours
Choose one of the following courses:	5
CHEM 112—General College Chemistry I (5)	
CHEM 116—Honors General Chemistry I (5)	
CHEM 342—Physical Chemistry I	3
Choose one of the following courses:	3
CS 108—Fortran Programming for Engineers with MATLAB (3)	
CS 109—C/C++ Programming for Engineers with MATLAB (3)	
MATH 180—Calculus I	5
MATH 181—Calculus II	5
MATH 210—Calculus III	3
MATH 220—Introduction to Differential Equations	3
PHYS 141—General Physics I (Mechanics)	4
PHYS 142—General Physics II (Electricity and Magnetism)	4
Total Hours—Prerequisites for Chemical Engineering Minor	**35**

Required Courses—Chemical Engineering Minor	Hours
CHE 210—Material and Energy Balances	4
CHE 301—Chemical Engineering Thermodynamics	3
CHE 321—Chemical Reaction Engineering	3
Choose one of the following courses:	3–4
CHE 311—Transport Phenomena I (3)	
ME 211—Fluid Mechanics I (4)	
Choose one of the following courses:	3–4
CHE 312—Transport Phenomena II (3)	
ME 321—Heat Transfer (4)	
CHE 313—Transport Phenomena III (3)	
Total Hours—Required Courses for Chemical Engieering Minor	**16–18**

Department of Civil and Materials Engineering

2095 Engineering Research Facility (ERF)
(312) 996-3428
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http://www.uic.edu/depts/cme/index.html
Administration: Head, Farhad Ansari
Director of Undergraduate Studies, Karl Rockne

BS in Civil Engineering

Civil engineering is a broadly based discipline that encompasses many specialties. The civil engineering curriculum provides students with a strong background in engineering and applied sciences.

Civil Engineering Program Objectives

The operational goals of the Civil Engineering Program are to graduate civil engineers who have the fundamental knowledge and modern tools necessary for civil engineering practice in industry and government in the following areas of specialization: environmental and water resources

engineering, geotechnical engineering, structural engineering, and transportation engineering; can apply their knowledge and skills to formulate and solve civil engineering problems, both well-defined and ill-defined; are sufficiently proficient in their areas of specialization to achieve professional licensure in civil engineering, and in structural engineering, if desired, in view of the special role of civil engineers in the design and operation of public works and public buildings; are prepared and motivated to pursue graduate study, and are cognizant of the role of basic and applied research in civil engineering; understand the role and importance of effective communication in working effectively in multidisciplinary teams and have the leadership potential to become team leaders; appreciate and understand their ethical, professional, and community responsibilities to society. A majority of graduates from the department who enter the engineering profession should pass the Principles and Practice of Engineering Examination (PE) five years after graduation. Those who are interested in practicing structural engineering in Illinois should also pass the Illinois Structural Engineering Examination (SE) in five to ten years.

Civil Engineering Program Outcomes

Graduates of the Civil Engineering Program will be able to: apply knowledge of mathematics and science in engineering problems; design and conduct experiments; analyze and interpret data; design civil engineering systems; function effectively in multidisciplinary design teams; identify and formulate engineering problems; understand their ethical and professional responsibilities; recognize the importance and need to engage in lifelong learning; understand the societal and global impact of engineering solutions; comprehend the significance of contemporary issues; communicate their engineering solutions in a professional and effective manner; use techniques, skills, and modern engineering tools for efficient practice of civil engineering. A majority of the graduates should pass the Fundamentals of Engineering Examination (FE) upon graduation.

Degree Requirements

To earn a Bachelor of Science in Civil Engineering degree from UIC, students need to complete University, college, and department degree requirements. The Department of Civil and Materials Engineering degree requirements are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies.

All students must take the Fundamentals of Engineering Examination (FE Exam) by graduation.

BS in Civil Engineering Degree Requirements	Hours
Nonengineering and General Education Requirements	50
Required in the College of Engineering	66
Technical Electives	9
Electives outside the Major Rubric	3
Total Hours—BS in Civil Engineering	**128**

Nonengineering and General Education Requirements

Courses	Hours
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[a]	3
Understanding the Creative Arts course[a]	3
Understanding the Past course[a]	3
Understanding the Individual and Society course[a]	3
Understanding U.S. Society course[a]	3
MATH 180—Calculus I[b]	5
MATH 181—Calculus II[b]	5
MATH 210—Calculus III[b]	3
MATH 220—Introduction to Differential Equations I	3
PHYS 141—General Physics I (Mechanics)[b]	4
PHYS 142—General Physics II (Electricity and Magnetism)[b]	4
CHEM 112—General College Chemistry I[b]	5
Total Hours—Nonengineering and General Education Requirements	**50**

[a] *Students should consult the* General Education *section of the catalog for a list of approved courses in this category.*

[b] *This course is approved for the Analyzing the Natural World General Education category.*

Required in the College of Engineering

Courses	Hours
ENGR 100—Orientation[a]	0[a]
CS 109—C++ Programming for Engineers with MatLab	3
CME 201—Statics	3
CME 203—Strength of Materials	3
CME 205—Structural Analysis I	3
CME 211—Fluid Mechanics and Hydraulics	3
CME 216—Introduction to Environmental Engineering	3
CME 260—Properties of Materials	3
CME 300—Composition and Properties of Concrete	2
CME 301—Behavior and Design of Metal Structures	3
CME 302—Transportation Engineering	3
CME 310—Design of Reinforced Concrete Structures	3
CME 311—Water Resources Engineering	3
CME 315—Soil Mechanics and Laboratory	4
CME 396—Senior Design I	3
CME 397—Senior Design II	3
CME 402—Geometric Design of Highway Facilities	3
CME 405—Foundation Analysis and Design	3
CME 434—Finite Element Analysis I	3
IE 201—Engineering Economy	3
ME 210—Engineering Dynamics	3
ME 250—Engineering Graphics and Design	3
Choose one of the following courses:	3
ECE 210—Electrical Circuit Analysis (3)	
ME 205—Introduction to Thermodynamics (3)	
Total Hours—Required in the College of Engineering	**66**

[a] *ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.*

Technical Electives

Courses	Hours
At least two courses (6 hours) to be chosen from the following list to strengthen the design content:	6
CME 400—Advanced Design of Reinforced Concrete (3)	
CME 401—Advanced Design of Metal Structures (3)	
CME 403—Hydraulic Design (3)	
CME 406—Bridge Design (3)	
CME 408—Traffic Engineering and Design (3)	
CME 409—Structural Analysis II (3)	
CME 410—Design of Prestressed Concrete Structures (3)	
CME 415—Environmental Geotechnology (3)	
CME 421—Water Treatment Design (3)	

CME 422—Wastewater Treatment Design (3) CME 425—Environmental Remediation Engineering (3) CME 427—Engineering Hydrology (3) CME 428—Groundwater Hydraulics and Contaminant Transport Modeling (3) CME 454—Structural Analysis and Design of Tall Buildings (3)	
Three additional hours to be selected from any 400-level CME courses, including those listed above	3
Total Hours—Technical Electives	**9**

Note: Students who are interested in taking the Illinois Structural Engineering Licensure Examination must take two courses in the structural design area. This statement is not a degree requirement and the availability of the structural design courses varies from time to time.

Electives outside the Major Rubric

Courses	Hours
Electives outside the CME Rubric	3
Total—Electives outside the Major Rubric	**3**

Sample Course Schedule

Freshman Year

First Semester	Hours
MATH 180—Calculus I	5
CHEM 112—General College Chemistry I	5
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
General Education Core course	3
ENGR 100—Orientation[a]	0[a]
Total Hours	**16**

[a] ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.

Second Semester	Hours
MATH 181—Calculus II	5
PHYS 141—General Physics I (Mechanics)	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
ME 250—Engineering Graphics and Design	3
General Education Core course	3
Total Hours	**18**

Sophomore Year

First Semester	Hours
MATH 210—Calculus III	3
PHYS 142—General Physics II (Electricity and Magnetism)	4
CS 108—Fortran Programming for Engineers	3
CME 201—Statics	3
IE 201—Engineering Economy	3
Total Hours	**16**

Second Semester	Hours
MATH 220—Introduction to Differential Equations	3
ME 205—Introduction to Thermodynamics ***OR*** ECE 210—Electrical Circuit Analysis	3
CME 203—Strength of Materials	3
ME 210—Engineering Dynamics	3
CME 211—Fluid Mechanics and Hydraulics	3
Total Hours	**15**

Junior Year

First Semester	Hours
CME 205—Structural Analysis I	3
CME 216—Environmental Engineering	3
CME 302—Transportation Engineering	3
CME 315—Soil Mechanics and Laboratory	4
General Education Core course	3
Total Hours	**16**

Second Semester	Hours
CME 310—Design of Reinforced Concrete Structures	3
CME 311—Water Resources Engineering	3
CME Technical Elective I	3
CME 260—Properties of Materials	3
CME 300—Composition and Properties of Concrete	2
General Education Core course	3
Total Hours	**17**

Senior Year

First Semester	Hours
CME 301—Behavior and Design of Metal Structures	3
CME 396—Senior Design I	3
CME 434—Finite Element Analysis I	3
CME Technical Elective II	3
Elective outside the Major Rubric	3
Total Hours	**15**

Second Semester	Hours
CME 397—Senior Design II	3
CME 402—Geometric Design of Highway Facilities	3
CME Technical Elective III	3
CME 405—Foundation Analysis and Design	3
General Education Core course	3
Total Hours	**15**

Minor in Civil Engineering

For the minor, 18–19 semester hours are required, excluding prerequisite courses. Students outside the Department of Civil and Materials Engineering who wish to minor in Civil Engineering must complete the following:

Prerequisite Courses—Civil Engineering Minor	Hours
CHEM 112—General College Chemistry I	5
CS 108—Fortran Programming for Engineers	3
MATH 180—Calculus I	5
MATH 181—Calculus II	5
MATH 210—Calculus III	3
MATH 220—Introduction to Differential Equations	3
PHYS 141—General Physics I (Mechanics)	4
CME 201—Statics	3
Total Hours—Prerequisites for Civil Engineering Minor	**31**

Required Courses—Civil Engineering Minor	Hours
CME 203—Strength of Materials	3
CME 211—Fluid Mechanics and Hydraulics	3
Three courses from the following list: CME 205—Structural Analysis I (3) CME 216—Environmental Engineering (3) CME 260—Properties of Materials (3) CME 302—Transportation Engineering (3) CME 311—Water Resources Engineering (3) CME 315—Soil Mechanics and Laboratory (4)	9–10

One course from the following list:	3
CME 301—Behavior and Design of Metal Structures (3)	
CME 310—Design of Reinforced Concrete Structures (3)	
CME 402—Geometric Design of Highway Facilities (3)	
CME 405—Foundation Analysis and Design (3)	
CME 422—Wastewater Treatment Design (3)	
Total Hours—Required Courses for Civil Engineering Minor	**18–19**

Department of Computer Science

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BS in Computer Science

Computer science is a relatively young but extremely rich and diverse discipline. At one end of the spectrum, computer science may be viewed as the formal study of what can be computed and what resources are required for computation. At the other end of the spectrum, computer science may be seen as the application of human resources, software, and, of course, computers to solve computational problems relating to society's and individuals' needs.

A well-trained computer scientist requires knowledge of both ends of this spectrum—and several points in between. The Computer Science program in the Department of Computer Science is intended to provide that broad background. Along with a strong theoretical component, the Computer Science program places special emphasis on the development of applied skills in design, implementation, and validation of computer systems. In our experience, industry and graduate programs alike value—above all—people who can solve real problems, and who come prepared to use the tools of their trade.

All students acquire a common background in the fundamental areas of computer science: computer systems, organization and architecture, algorithms and data structures, principles of software design, elements of the theory of computation, and operating systems. In addition, students obtain specialized backgrounds through the selection of five technical elective courses in computer science. Required and elective courses in the sciences and mathematics, along with additional courses in writing, humanities, social sciences, and the arts give students the opportunity to expand their horizons and to prepare for multidisciplinary careers.

There are very few areas in modern society untouched by computer science. Computer science is present in everything from healthcare, telecommunications, and entertainment, to transportation, education, and defense. The result of this diversity is that a computer scientist must be capable of working with people outside his or her field. In support of this, the Computer Science program provides its students with a well-rounded education requiring significant course work outside the Department of Computer Science, placing a strong emphasis on writing and communication skills.

Given the breadth and diversity of the computer science discipline, the Department of Computer Science also offers a Computer Systems Concentration within the BS in Computer Science program. The Computer Systems Concentration represents a subspecialty that provides more emphasis on understanding and designing computer hardware. The student continues to learn the fundamental areas of computer science, including programming, data structures, discrete math, algorithms, formal languages, architecture, and operating systems. Unlike traditional computer science, however, the student also studies low-level circuit analysis and high-level system design, and has the option to take additional hardware-oriented courses. The result is a unique blend of computer science and computer engineering.

The Department of Computer Science also offers a Software Engineering Concentration within the BS in Computer Science program. The Software Engineering Concentration emphasizes the knowledge and skills needed to begin a professional practice in software engineering. The concentration continues to cover in depth the fundamental areas of computer science, including programming, data structures, discrete mathematics, algorithms, formal languages, computer architecture, and operating systems. In addition, the concentration focuses on key topics of software engineering practice such as software cost estimation, large-scale software development, and risk management.

Degree Requirements—Computer Science

To earn a Bachelor of Science in Computer Science degree from UIC, students need to complete University, college, and department degree requirements. The Department of Computer Science degree requirements are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies.

BS in Computer Science Degree Requirements	**Hours**
Nonengineering and General Education Requirements	61
Required in the College of Engineering	38
Technical Electives	15
Required Mathematics Courses	9
Free Electives	5
Total Hours—BS in Computer Science	**128**

Nonengineering and General Education Requirements

Courses	**Hours**
ENGL 160—Academic Writing I: Writing for Academic and Public Context	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[a]	3
Understanding the Creative Arts course[a]	3
Understanding the Past course[a]	3
Understanding the Individual and Society course[a]	3
Understanding U.S. Society course[a]	3
Humanities/Social Sciences/Art Electives[b]	15
MATH 180—Calculus I[c]	5
MATH 181—Calculus II[c]	5
MATH 210—Calculus III[c]	3
Lab Science Sequence and Science Electives Lab Science Sequence (8–10)[d]—See below Science Electives (2–4)[e]—See below	12
Total Hours—Nonengineering and General Education Requirements	**61**

[a] *Students should consult the* General Education *section of the catalog for a list of approved courses in this category.*

[b] *These electives must be selected from a list of approved courses provided by the CS department.*

[c] *This course is approved for the Analyzing the Natural World General Education category.*

[d] *All courses on the lab science sequence list below are approved for the Analyzing the Natural World General Education category.*

[e] *Science electives must be selected from a list of approved courses provided by the CS department. More explanation of the science requirement is given below.*

Required in the College of Engineering

Courses	Hours
ENGR 100—Orientation[a]	0[a]
CS 101—Introduction to Computing	3
CS 102—Introduction to Programming	3
CS 201—Data Structures and Discrete Mathematics I	4
CS 202—Data Structures and Discrete Mathematics II	3
CS 266—Computer Architecture I: Logic and Computer Structures	4
CS 301—Languages and Automata	3
CS 335—Computer Ethics	2
CS 340—Software Design	4
CS 366—Computer Architecture II: Hardware-Software Interface	4
CS 376—Practicum in Computer Science Oral Presentations	1
CS 385—Operating Systems Concepts and Design	4
CS 401—Computer Algorithms I	3
Total Hours—Required in the College of Engineering	**38**

[a] *ENGR 100 is a one-semester-hour course, but the hour does not count toward the total required for graduation.*

Technical Electives

Courses	Hours
Students must complete at least fifteen hours of courses from among the following list of courses, only one of which may be outside the CS rubric:	15
CS 398—Undergraduate Design/Research (3)	
CS 411—Artificial Intelligence (3)	
CS 415—Computer Vision I (3)	
CS 421—Natural Language Processing (3)	
CS 422—User Interface Design and Programming (3)	
CS 426—Multimedia Computing (3)	
CS 440—Software Engineering I (3)	
CS 441—Distributed Object Programming Using Middleware (3)	
CS 442—Software Engineering II (3)	
CS 450—Introduction to Networking (3)	
CS 455—Design and Implementation of Network Protocols (3)	
CS 466—Advanced Computer Architecture (3)	
CS 469—Computer Systems Design (3)	
CS 473—Compiler Design (3)	
CS 474—Object-Oriented Languages and Environments (3)	
CS 476—Programming Language Design (3)	
CS 480—Database Systems (4)	
CS 485—Networked Operating Systems Programming (4)	
CS 488—Computer Graphics I (3)	
MCS 320—Introduction to Symbolic Computation (3)	
MCS 425—Codes and Cryptography (3)	
MCS 471—Numerical Analysis (3)	
MCS 481—Computational Geometry (3)	
STAT 471—Linear and Nonlinear Programming (3)	
Total Hours—Technical Electives	**15**

Required Mathematics Courses

Courses	Hours
Nine hours from among the following list of courses, with at least one course taken from IE 342— Probability and Statistics for Engineers or STAT 381—Applied Statistical Methods:	9
One of the following courses must be chosen:	
IE 342—Probability and Statistics for Engineers (3)[a]	
OR	
STAT 381—Applied Statistical Methods (3)	
MATH 215—Introduction to Advanced Mathematics (3)	
MATH 220—Introduction to Differential Equations (3)	
One of the following courses may be chosen:	
MATH 310—Applied Linear Algebra (3)	
OR	
MATH 320—Linear Algebra I (3)	
MATH 430—Formal Logic I (3)	
MATH 435—Foundations of Number Theory (3)	
MATH 436—Number Theory for Applications (3)	
MCS 421—Combinatorics (3)	
MCS 423—Graph Theory (3)	
MCS 471—Numerical Analysis(3)[b]	
STAT 401—Introduction to Probability (3)	
STAT 472—Game Theory (3)	
Total Hours—Required Mathematics Courses	**9**

[a] *Students who take IE 342 will not receive credit for either STAT 381 or STAT 401.*

[b] *Students may choose to use MCS 471—Numerical Analysis as either a CS technical elective from outside the CS department or as a required mathematics course, but not both.*

Lab Science Sequence and Science Electives

Every student must take one of the two-course lab sequences from Biological Sciences, Chemistry, Earth and Environmental Sciences, or Physics. In Chemistry, either the sequence CHEM 112, CHEM 114, or the sequence CHEM 116, CHEM 118 may be chosen. The choices are in the list below. Additionally, students must take a total of at least 12 semester hours, including that sequence, in the science area. Additional courses may be other courses on this list, courses that have any of these courses as prerequisites, or other sciences and quantitative social sciences courses from a list maintained by the Computer Science department.

Courses	Hours
Twelve hours from among the following list of courses,[a] including the sequence described above:	12
BIOS 100—Biology of Cells and Organisms (5)	
BIOS 101—Biology of Populations and Communities (5)	
CHEM 112—General Chemistry I (5)	
CHEM 114—General Chemistry II (5)	
CHEM 116—Honors General Chemistry I (5)	
CHEM 118—Honors General Chemistry II (5)	
PHYS 141—General Physics I (Mechanics) (4)	
PHYS 142—General Physics II (Electricity and Magnetism) (4)	
EAES 101—Introduction to Earth and Environmental Sciences I (5)	
EAES 102—Introduction to Earth and Environmental Sciences II (5)	
Total Hours—Lab Science/Science Electives	**12**

[a] *These courses are approved for the Analyzing the Natural World General Education category*

Free Electives

Courses	Hours
Total Hours—Free Electives	**5**

Sample Course Schedule—Computer Science

Freshman Year

First Semester	Hours
MATH 180—Calculus I	5
CS 101—Introduction to Computing	3
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
General Education Core course	3
ENGR 100—Orientation[a]	0[a]
Total Hours	**14**

[a] ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.

Second Semester	Hours
MATH 181—Calculus II	5
Lab Science Sequence I	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
CS 102—Introduction to Programming	3
Total Hours	**15**

Sophomore Year

First Semester	Hours
MATH 210—Calculus III	3
Lab Science Sequence II	4
CS 201—Discrete Mathematics and Data Structures I	4
General Education Core course	3
Free Elective	2
Total Hours	**16**

Second Semester	Hours
CS 266—Computer Architecture I	4
CS 202—Discrete Mathematics and Data Structures II	3
Required Mathematics course	3
Science Elective	4
General Education Core course	3
Total Hours	**17**

Junior Year

First Semester	Hours
CS 366—Computer Architecture II	4
CS 340—Software Design	4
Required Mathematics course	3
General Education Core course	3
Humanities/Social Sciences/Art Elective	3
Total Hours	**17**

Second Semester	Hours
CS 301—Languages and Automata	3
Free Elective	3
CS 385—Operating Systems Concepts and Design	4
Required Mathematics course	3
Humanities/Social Sciences/Art Elective	3
Total Hours	**16**

Senior Year

First Semester	Hours
CS 335—Computer Ethics	2
CS 401—Computer Algorithms	3
Technical Elective	3
Technical Elective	3
General Education Core course	3
Humanities/Social Sciences/Art Elective	3
Total Hours	**17**

Second Semester	Hours
Technical Elective	3
Technical Elective	3
Technical Elective	3
Humanities/Social Sciences/Art Elective	3
Humanities/Social Sciences/Art Elective	3
CS 376—Practicum in CS Oral Presentations	1
Total Hours	**16**

Degree Requirements—Computer Science with Computer Systems Concentration

To earn a Bachelor of Science in Computer Science, Computer Systems Concentration degree from UIC, students need to complete University, college, and department degree requirements. The Department of Computer Science degree requirements are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies.

BS in Computer Science, Computer Systems Concentration Degree Requirements	Hours
Nonengineering and General Education Requirements	60
Required in the College of Engineering	38
Technical Electives	18
Required Mathematics Courses	6
Free Elective	6
Total Hours—BS in Computer Science, Computer Systems Concentration	**128**

Nonengineering and General Education Requirements

Courses	Hours
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[a]	3
Understanding the Creative Arts course[a]	3
Understanding the Past course[a]	3
Understanding the Individual and Society course[a]	3
Understanding U.S. Society Course[a]	3
Humanities/Social Sciences/Art Electives[b]	15
MATH 180—Calculus I[c]	5
MATH 181—Calculus II[c]	5
MATH 210—Calculus III[c]	3
MATH 220—Introduction to Differential Equations	3
PHYS 141—General Physics I (Mechanics)[c]	4
PHYS 142—General Physics II (Electricity and Magnetism)[c]	4
Total Hours—Nonengineering and General Education Requirements	**60**

[a] Students should consult the General Education *section of the catalog for a list of approved courses in this category.*

[b] These electives must be selected from a list of approved courses provided by the CS department.

[c] This course is approved for the Analyzing the Natural World General Education category.

Required in the College of Engineering

Courses	Hours
ENGR 100—Orientation[a]	0[a]
CS 101—Introduction to Computing	3
CS 102—Introduction to Programming	3
ECE 225—Circuit Analysis	4
CS 201—Data Structures and Discrete Mathematics I	4
CS 202—Data Structures and Discrete Mathematics II	3
CS 266—Computer Architecture I: Logic and Computer Structures	4
CS 301—Languages and Automata	3
CS 335—Computer Ethics	2
CS 366—Computer Architecture II: Hardware-Software Interface	4
CS 376—Practicum in Computer Science Oral Presentations	1
CS 385—Operating Systems Concepts and Design	4
CS 469—Computer Systems Design	3
Total Hours—Required in the College of Engineering	**38**

[a] ENGR 100 is a one-semester-hour course, but the hour does not count toward the total required for graduation.

Technical Electives

Courses	Hours
Eighteen hours of courses from among the following list of courses, of which at most eleven hours may be from any department outside Computer Science provided that no more than one course is from the MCS or STAT rubrics. MCS 471 may count toward either the technical elective or the mathematics requirement.	18
CS 398—Undergraduate Design/Research (3)	
CS 401—Computer Algorithms I (3)	
CS 411—Artificial Intelligence (3)	
CS 415—Computer Vision I (3)	
CS 421—Natural Language Processing (3)	
CS 422—User Interface Design and Programming (3)	
CS 426—Multimedia Computing (3)	
CS 440—Software Engineering I (3)	
CS 441—Distributed Object Programming Using Middleware (3)	
CS 450—Introduction to Networking (3)	
CS 455—Design and Implementation of Network Protocols (3)	
CS 466—Advanced Computer Architecture (3)	
CS 473—Compiler Design (3)	
CS 474—Object-Oriented Languages and Environments (3)	
CS 476—Programming Language Design (3)	
CS 480—Database Systems (4)	
CS 485—Networked Operating Systems Programming (4)	
CS 488—Computer Graphics I (3)	
ECE 340—Electronics I (4)	
ECE 367—Microprocessor-Based Design (4)	
ECE 465—Digital Systems Design (3)	
ECE 467—Introduction to VLSI Design (4)	
MCS 320—Introduction to Symbolic Computation (3)	
MCS 425—Codes and Cryptography (3)	
MCS 471—Numerical Analysis (3)	
MCS 481—Computational Geometry (3)	
STAT 471—Linear and Nonlinear Programming (3)	
Total Hours—Technical Electives	**18**

Required Mathematics Courses

Courses	Hours
Six hours from among the following list of courses, with at least one course taken from IE 342—Probability and Statistics for Engineers or STAT 381—Applied Statistical Methods	6
One of the following courses must be chosen:	
IE 342—Probability and Statistics for Engineers[a] (3)	
OR	
STAT 381—Applied Statistical Methods (3)	
MATH 215—Introduction to Advanced Mathematics (3)	
One of the following courses may be chosen:	
MATH 310—Applied Linear Algebra (3)	
OR	
MATH 320—Linear Algebra I (3)	
MATH 430—Formal Logic I (3)	
MATH 435—Foundations of Number Theory (3)	
MATH 436—Number Theory for Applications (3)	
MCS 421—Combinatorics (3)	
MCS 423—Graph Theory (3)	
MCS 471—Numerical Analysis (3)[b]	
STAT 401—Introduction to Probability (3)	
STAT 472—Game Theory (3)	
Total Hours—Required Mathematics Courses	**6**

[a] Students who take IE 342 will not receive credit for either STAT 381 or STAT 401.

[b] Students may choose to use MCS 471—Numerical Analysis as either a CS technical elective from outside the CS department or as a required mathematics course, but not both.

Free Electives

Courses	Hours
Total Hours—Free Electives	**6**

Sample Course Schedule—Computer Science with Computer Systems Concentration

Freshman Year

First Semester	Hours
MATH 180—Calculus I	5
CS 101—Introduction to Computing	3
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
General Education Core course	3
Humanities/Social Sciences/Art Elective	3
ENGR 100—Orientation[a]	0[a]
Total Hours	**17**

[a] ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.

Second Semester	Hours
MATH 181—Calculus II	5
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
CS 102—Introduction to Programming	3
General Education Core course	3
Humanities/Social Sciences/Art Elective	3
Total Hours	**17**

Sophomore Year

First Semester	Hours
MATH 210—Calculus III	3
PHYS 141—General Physics I (Mechanics)	4
CS 201—Discrete Mathematics and Data Structures I	4
General Education Core course	3
Humanities/Social Sciences/Art Elective	3
Total Hours	**17**

Second Semester	Hours
MATH 220—Introduction to Differential Equations	3
CS 202—Data Structures and Discrete Mathematics II	3
PHYS 142—General Physics II (Electricity and Magnetism)	4
General Education Core course	3
Humanities/Social Sciences/Art Elective	3
Total Hours	**16**

Junior Year

First Semester	Hours
CS 266—Computer Architecture I	4
CS 301—Languages and Automata	3
ECE 225—Circuit Analysis	4
Required Mathematics course	3
Free Elective	3
Total Hours	**17**

Second Semester	Hours
CS 366—Computer Architecture II	4
Technical Elective	3
Technical Elective	3
Required Mathematics course	3
General Education Core course	3
Total Hours	**16**

Senior Year

First Semester	Hours
CS 376—Practicum in CS Presentations	1
CS 385—Operating Systems Concepts and Design	4
Technical Elective	3
Technical Elective	3
Humanities/Social Sciences/Art Elective	3
Total Hours	**14**

Second Semester	Hours
Technical Elective	3
Technical Elective	3
CS 335—Computer Ethics	2
CS 469—Computer Systems Design	3
Free Elective	4
Total Hours	**15**

Degree Requirements—Computer Science with Software Engineering Concentration

To earn a Bachelor of Science in Computer Science, Software Engineering Concentration degree from UIC, students need to complete University, college, and department degree requirements. The Department of Computer Science degree requirements are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies.

BS in Computer Science with Software Engineering Concentration Degree Requirements	Hours
Nonengineering and General Education Requirements	61
Required in the College of Engineering	47
Technical Electives	9
Required Mathematics Courses	6
Free Elective	5
Total Hours—BS in Computer Science, Software Engineering Concentration	**128**

Nonengineering and General Education Requirements

Courses	Hours
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[a]	3
Understanding the Creative Arts course[a]	3
Understanding the Past course[a]	3
Understanding the Individual and Society course[a]	3
Understanding U.S. Society course[a]	3
Humanities/social sciences/art electives[b]	15
MATH 180—Calculus I[c]	5
MATH 181—Calculus II[c]	5
MATH 210—Calculus III[c]	3
Lab Science Sequence and Science Electives Lab Science Sequence (8–10)[d]—See below Science Electives (2–4)[e]—See below	12
Total Hours—Nonengineering and General Education Requirements	**61**

[a] *Students should consult the* General Education *section of the catalog for a list of approved courses in this category.*

[b] *These electives must be selected from a list of approved courses provided by the CS department.*

[c] *This course is approved for the Analyzing the Natural World General Education category.*

[d] *All courses on the lab science sequence list below are approved for the Analyzing the Natural World General Education category.*

[e] *Science electives must be selected from a list of approved courses provided by the CS department. More explanation of the science requirement is given below.*

Required in the College of Engineering

Courses	Hours
ENGR 100—Orientation[a]	0[a]
CS 101—Introduction to Computing	3
CS 102—Introduction to Programming	3
CS 201—Data Structures and Discrete Mathematics I	4
CS 202—Data Structures and Discrete Mathematics II	3
CS 266—Computer Architecture I: Logic and Computer Structures	4
CS 301—Languages and Automata	3
CS 335—Computer Ethics	2
CS 340—Software Design	4
CS 366—Computer Architecture II: Hardware-Software Interface	4
CS 376—Practicum in Computer Science Oral Presentations	1
CS 385—Operating Systems Concepts and Design	4
CS 401—Computer Algorithms I	3
CS 440 –Software Engineering I	3
CS 442—Software Engineering II	3
IE 342—Probability and Statistics for Engineers	3
Total Hours—Required in the College of Engineering	**47**

[a] *ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.*

Technical Electives

Courses	Hours
Students must complete at least nine hours of courses from among the following list of courses, only one of which may be outside the CS rubric. Two of these courses must be taken from the following list of courses: CS 422, CS 480 and either CS 441 or CS 485.	9

CS 398—Undergraduate Design/Research (3)
CS 411—Artificial Intelligence (3)
CS 421—Natural Language Processing (3)
CS 422—User Interface Design and Programming (3)
CS 426—Multimedia Computing (3)
CS 441—Distributed Object Programming Using Middleware (3)
CS 450—Introduction to Networking (3)
CS 455—Design and Implementation of Network Protocols (3)
CS 473—Compiler Design (3)
CS 474—Object-Oriented Languages and Environments (3)
CS 476—Programming Language Design (3)

CS 480—Database Systems (4)
CS 485—Networked Operating Systems Programming (4)
CS 488—Computer Graphics I (3)
IE 345—Regression Applications and Forecasting in Engineering (3)
MCS 425—Codes and Cryptography (3)
STAT 471—Linear and Nonlinear Programming (3)

Total Hours—Technical Electives	**9**

Required Mathematics Courses

Courses	**Hours**
Six hours from among the following list of courses:	6
MATH 215—Introduction to Advanced Mathematics (3)	
MATH 220—Introduction to Differential Equations (3)	
One of the following courses may be chosen:	
MATH 310—Applied Linear Algebra (3)	
OR	
MATH 320—Linear Algebra I (3)	
MATH 430—Formal Logic I (3)	
MATH 435—Foundations of Number Theory (3)	
MATH 436—Number Theory for Applications (3)	
MCS 421—Combinatorics (3)	
MCS 423—Graph Theory (3)	
MCS 471—Numerical Analysis (3)[a]	
STAT 473—Game Theory (3)	
Total Hours—Required Mathematics Courses	**6**

[a] Students may choose to use MCS 471—Numerical Analysis as either a CS technical elective from outside the CS department or as a required mathematics course, but not both.

Lab Science Sequence and Science Electives

Every student must take one of the two-course lab sequences from Biological Sciences, Chemistry, Earth and Environmental Sciences, or Physics. In Chemistry, either the sequence CHEM 112, CHEM 114, or the sequence CHEM 116, CHEM 118 may be chosen. The choices are in the list below. Additionally, students must take a total of at least 12 credit hours, including that sequence, in the science area. Additional courses may be other courses on this list, courses that have any of these courses as prerequisites, or other sciences and quantitative social sciences courses from a list maintained by the Computer Science Department. Also, students preparing for the Fundamentals of Engineering Examination, which leads to becoming a Licensed Professional Engineer, are advised to take the Physics sequence of PHYS 141 and PHYS 142.

Courses	**Hours**
Twelve hours from among the following list of courses, including the sequence described above.	12
BIOS 100—Biology of Cells and Organisms (5)	
BIOS 101—Biology of Populations and Communities (5)	
CHEM 112—General Chemistry I (5)	
CHEM 114—General Chemistry II (5)	
CHEM 116—Honors General Chemistry I (5)	
CHEM 118—Honors General Chemistry II (5)	
PHYS 141—General Physics I (Mechanics) (4)	
PHYS 142—General Physics II (Electricity andMagnetism) (4)	
EAES 101—Introduction to Earth and Environmental Sciences I (5)	
EAES 102—Introduction to Earth and Environmental Sciences II (5)	
Total Hours—Lab Science/Science Electives	**12**

Free Electives

Students preparing for the Fundamentals of Engineering Examination, which leads to becoming a Licensed Professional Engineer, are advised to use these hours to take CME 201—Statics and one course from the following: CME 203—Strength of Materials, CME 260—Properties of Materials, and ME 211—Fluid Mechanics I.

Courses	**Hours**
Total Hours—Free Electives	**5**

Sample Course Schedule—Computer Science with Software Engineering Concentration

Freshman Year

First Semester	**Hours**
MATH 180—Calculus I	5
CS 101—Introduction to Computing	3
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
General Education Core course	3
ENGR 100—Orientation[a]	0[a]
Total Hours	**14**

[a] ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.

Second Semester	**Hours**
MATH 181—Calculus II	5
Lab Science Sequence I	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
CS 102—Introduction to Programming	3
Total Hours	**15**

Sophomore Year

First Semester	**Hours**
MATH 210—Calculus III	3
Lab Science Sequence II	4
CS 201—Discrete Mathematics and Data Structures I	4
General Education Core course	3
Free Elective	2
Total Hours	**16**

Second Semester	**Hours**
CS 266—Computer Architecture I	4
CS 202—Discrete Mathematics and Data Structures II	3
IE 342—Probability and Statistics for Engineers	3
Science Elective	4
General Education Core course	3
Total Hours	**17**

Junior Year

First Semester	**Hours**
CS 366—Computer Architecture II	4
CS 340—Software Design	4
Required Mathematics course	3
IE 201—Engineering Economy	3
General Education Core course	3
Total Hours	**17**

Second Semester	**Hours**
CS 301—Languages and Automata	3
Free Elective	3
CS 385—Operating Systems Concepts and Design	4
Required Mathematics course	3
Humanities/Social Sciences/Art Elective	3
Total Hours	**16**

Senior Year

First Semester	Hours
CS 335—Computer Ethics	2
CS 401—Computer Algorithms	3
CS 440—Software Engineering I	3
Technical Elective	3
General Education Core course	3
Humanities/Social Sciences/Art Elective	3
Total Hours	**17**

Second Semester	Hours
CS 442—Software Engineering II	3
Technical Elective	3
Technical Elective	3
Humanities/Social Sciences/Art Elective	3
Humanities/Social Sciences/Art Elective	3
CS 376—Practicum in CS Oral Presentations	1
Total Hours	**16**

Minors

Minor in Computer Science

For the minor, 14–17 semester hours are required, excluding prerequisite courses. This minor is not available to students in very closely related fields, including Computer Systems, Computer Engineering, and Mathematical Computer Science.

Prerequisite Courses—Computer Science Minor	Hours
MATH 180—Calculus I	5
Total Hours—Prerequisites for Computer Science Minor	**5**

Required Courses—Computer Science Minor	Hours
CS 101—Introduction to Computing[a]	3
CS 102—Introduction to Programming[a]	3
CS 201—Data Structures and Discrete Mathematics I	4
CS 202—Data Structures and Discrete Mathematics II	3
One of the following courses:	3–4
CS 301—Languages and Automata (3)	
CS 340—Software Design (4)	
CS 401—Computer Algorithms (3)	
Total Hours—Required Courses for Computer Science Minor	**14–17[a]**

[a] A student may substitute CS 107 for both CS 101 and CS 102, thus reducing the number of hours for the CS Minor by 2 credit hours. This substitution was designed for students in the College of Engineering.

Minor in Information Technology

The explosive growth of the World Wide Web and its universal acceptance by society has changed the computing landscape forever. Today, the typical computer user neither knows nor needs to know very much about how a computer works in order to use it. They need to have appropriate systems in place. Those systems must work properly, be secure, and be upgraded, maintained, and replaced as appropriate. What these users need, however, is a professional who can help them access new technologies effectively and appropriately. The Information Technologist is that professional. People throughout an organization require support from Information Technology staff who understand computer systems and their software, and are committed to solving computer-related problems they might have. From Web masters to network and system administrators, information technologists are the key agents in the societal revolution that is changing us from an industrial society to a digital/information society.

For the minor, 12 semester hours are required, excluding prerequisite courses. Students who wish to minor in Information Technology (IT) must complete the following:

Prerequisite Courses—Information Technology Minor	Hours
MATH 121—Precalculus Mathematics (for nonengineering students only)	5
One of the following courses:	3–4
IT 101—Java Programming for Information Technology (3)	
CS 102—Introduction to Programming (3)	
CS 107—Introduction to Computing and Programming (4)	
Total Hours—Prerequisites for Information Technology Minor	**8–9**

Required Courses—Information Technology Minor	Hours
IT 201—Introduction to Computer Configuration and Operating Systems Software	3
IT 202—Web and Multimedia Technology	3
IT 301—Networks and Distributed Computing Technology	3
IT 302—Database Administration and Installation	3
Total Hours—Required Courses for Information Technology Minor	**12**

Department of Electrical and Computer Engineering

1020 Science and Engineering Offices (SEO)
(312) 996–3423
http://www.ece.uic.edu
Administration: Head of the Department, Mitra Dutta
Director of Undergraduate Studies, Roland Priemer
ECE Student Services: Alicja Wroblewski

BS in Electrical Engineering

The Electrical Engineering curriculum is concerned with analysis and design of modern electronic systems, devices, and signals for a broad range of applications such as wireless or network communication, electrical power and control, and multimedia information technology. The curriculum provides a wide background in the fundamental theory of electrical engineering and in the mathematical and scientific tools necessary for an electrical engineer to meet the current and future challenges of a professional career. The field of electrical engineering is currently evolving at a rapid pace since it has a major role in the accelerated growth of the technological world. This requires the modern electrical engineer not only to have a sound basis in the fundamental principles but also to have the capacity to learn and assimilate novel advances as soon as they materialize. These qualities are anticipated in the curriculum, which includes not only a sound theoretical background but also offers a variety of courses that develop the student's ability to gain knowledge autonomously and to combine it with contemporary design techniques. Courses are in diverse areas such as signal processing, power electronics, communications, optical and electromagnetic technologies, control systems, integrated circuits, multimedia networks, and image analysis.

The curriculum includes both required and elective courses. The required courses are in engineering, mathematics, and physics; they provide a wide backdrop in science and engineering. The elective courses are more specialized and offer a broad range of electrical engineering applications. Each student is assigned a faculty advisor who assists in the selection of the courses.

In addition to classroom experience, the Electrical

Engineering curriculum is planned to provide laboratory experience in electrical and electronic circuits, electromagnetics, communication and signal processing, controls, computers, and digital systems. The curriculum incorporates design projects in the student's experience starting from the freshman year and culminating in a capstone design project in the senior year. The project requires the students to undertake a significant group design that enriches their knowledge in practical aspects of engineering principles and methodologies. Most of these projects solve realistic problems and the results are presented in an exposition. The curriculum also requires the students to acquire oral and writing skills in expressing their professional ideas and ethical norms.

The educational objectives of the Electrical Engineering undergraduate program are for its graduates to:

- have knowledge of fundamental principles in electrical engineering and fundamental scientific principles and tools to design and develop products and practical solutions for problems in public and private sectors;
- demonstrate an ability to function independently and in multidisciplinary teams with the communication skills and ethical conduct necessary for professional success;
- demonstrate an understanding of the need for lifelong learning, acquiring new knowledge, and mastering emerging technologies and new tools and methods;
- have knowledge necessary to pursue graduate/professional education and/or engineering practice.

Opportunities are available to participate in the activities of the student chapter of the Institute of Electrical and Electronic Engineers (IEEE) and Eta Kappa Nu, the honor society of electrical engineering. An interest in robotics can be pursued by joining the Engineering Design Team, a College of Engineering student group.

Degree Requirements—Electrical Engineering

To earn a Bachelor of Science in Electrical Engineering degree from UIC, students need to complete University, college, and department degree requirements. The Department of Electrical and Computer Engineering degree requirements are outlined below. Students should consult the College of Engineering section for additional degree requirements and college academic policies. See the ECE Department Web site for any revisions of the EE curriculum http://www.ece.uic.edu.

BS in Electrical Engineering Degree Requirements	Hours
Nonengineering and General Education Requirements	50
Required in the College of Engineering	55
Technical Electives	17
Additional Mathematics Requirement	3
Electives outside the Major Rubric	3
Total Hours—BS in Electrical Engineering	**128**

Nonengineering and General Education Requirements

Courses	Hours
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[a]	3
Understanding the Creative Arts course[a]	3
Understanding the Past course[a]	3
Understanding the Individual and Society course[a]	3
Understanding U.S. Society course[a]	3
MATH 180—Calculus I[b]	5
MATH 181—Calculus II[b]	5
MATH 210—Calculus III[b]	3
MATH 220—Introduction to Differential Equations I	3
PHYS 141—General Physics I (Mechanics)[b]	4
PHYS 142 —General Physics II (Electricity and Magnetism)[b]	4
CHEM 112—General College Chemistry I[b]	5
Total Hours—Nonengineering and General Education Requirements	**50**

[a] Students should consult the General Education *section of the catalog for a list of approved courses in this category.*

[b] This course is approved for the Analyzing the Natural World General Education category.

Required in the College of Engineering

Courses	Hours
Electrical Engineering Core Courses	
ENGR 100—Orientation[a]	0[a]
One of the following courses:	3
CHE 201—Introduction to Thermodynamics (3)	
ME 205—Introduction to Thermodynamics (3)	
CS 107—Introduction to Computing and Programming	4
ECE 115—Introduction to Electrical and Computer Engineering	4
ECE 225—Circuit Analysis	4
ECE 265—Introduction to Logic Design	4
ECE 267—Computer Organization I	3
ECE 310—Discrete and Continuous Signals and Systems	3
ECE 322—Communication Electromagnetics	3
ECE 340—Electronics I	4
ECE 341—Probability and Random Process for Engineers	3
ECE 346—Solid-State Device Theory	4
ECE 396—Senior Design I	2
ECE 397—Senior Design II	2
Electrical Engineering Advanced Core Courses	
Three of the following courses, each with a laboratory:	12
ECE 311—Communication Engineering (4)	
ECE 317—Digital Signal Processing I (4)	
ECE 342—Electronics II (4)	
ECE 350—Principles of Automatic Control (4)	
ECE 367—Microprocessor-Based Design (4)	
ECE 424—RF and Microwave-Guided Propagation (4)	
Total Hours—Required in the College of Engineering	**55**

[a] ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.

Technical Electives

Courses	Hours
Seventeen hours chosen from the following list. Those courses not used to meet the advanced electrical engineering core requirement can be used as technical electives.	
However, no more than a total of two courses below the 400-level may be used to meet the technical elective requirement. Also, no more than one course from outside of the Electrical and Computer Engineering Department may be used to meet the technical electives requirement.	17
PHYS 244—General Physics III (Modern Physics) (3)	
CS 385—Operating Systems Concepts and Design (4)[a]	
ECE 333—Computer Communication Networks I (4)	
ECE 347—Integrated Circuit Engineering (3)	

ECE 366—Computer Organization II (4)
ECE 368—CAD-Based Digital Design (4)
ECE 401—Quasi-static Electric and Magnetic Fields (3)
ECE 407—Pattern Recognition I (3)
ECE 410—Network Analysis (3)
ECE 412—Introduction to Filter Synthesis (3)
ECE 415—Image Analysis and Computer Vision I (3)
ECE 417—Digital Signal Processing II (4)
ECE 418—Statistical Digital Signal Processing (3)
ECE 421— Introduction to Antennas and Wireless Propagation (3)
ECE 423—Electromagnetic Compatibility (3)
ECE 427—Modern Linear Optics (3)
ECE 431—Analog Communication Circuits (4)
ECE 432—Digital Communications (3)
ECE 434—Multimedia Systems (3)
ECE 436—Computer Communication Networks II (3)
ECE 437—Wireless Communications (3)
ECE 442—Power Semiconductor Devices and Integrated Circuits (4)
ECE 445—Analysis and Design of Power Electronic Circuits (4)
ECE 448—Transistors (3)
ECE 449—Microdevices and Micromachining Technology (4)
ECE 451—Control Engineering (3)
ECE 452—Robotics: Algorithms and Control (3)
ECE 458—Electromechanical Energy Conversion (3)
ECE 465—Digital Systems Design (3)
ECE 466—Computer Architecture (3)
ECE 467—Introduction to VLSI Design (4)
ECE 468—Analog and Mixed-Signal VLSI Design (4)
ECE 469—Computer Systems Design (3)
MCS 425—Coding and Cryptography (3)

Total Hours—Technical Electives	**17**

[a] CS 385 is an acceptable technical elective for Electrical Engineering majors, provided they satisfy the prerequisites for this course, which are not otherwise required in this program.

Additional Mathematics Requirement

Courses	**Hours**
One of the following courses:	3
MATH 310—Applied Linear Algebra (3)	
MATH 410—Advanced Calculus I (3)	
MATH 417—Complex Analysis with Applications (3)	
MCS 471—Numerical Analysis (3)	
MATH 481—Applied Partial Differential Equations (3)	
Total Hours—Additional Mathematics Requirement	**3**

Electives outside the Major Rubric

Courses	**Hours**
Three hours from outside the ECE rubric	3
Total Hours—Electives outside the Major Rubric	**3**

Students preparing for the Fundamentals of Engineering Examination, which leads to becoming a Licensed Professional Engineer, are advised to use these hours to take CME 201—Statics and one course from the following courses: CME 203—Strength of Materials, CME 260—Properties of Materials, or ME 211—Fluid Mechanics I.

Sample Course Schedule— Electrical Engineering

Freshman Year

First Semester	**Hours**
MATH 180—Calculus I	5
CHEM 112—General College Chemistry I	5
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ECE 115—Introduction to Electrical and Computer Engineering	4
ENGR 100—Orientation[a]	0[a]
Total Hours	**17**

[a] ENGR 100 is one-semester-hour course, but does not count toward the total hours required for graduation.

Second Semester	**Hours**
MATH 181—Calculus II	5
PHYS 141—General Physics I (Mechanics)	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
CS 107—Introduction to Computing and Programming	4
Total Hours	**16**

Sophomore Year

First Semester	**Hours**
MATH 210—Calculus III	3
PHYS 142—General Physics II (Electricity and Magnetism)	4
ECE 265—Introduction to Logic Design	4
General Education Core courses	6
Total Hours	**17**

Second Semester	**Hours**
MATH 220—Introduction to Differential Equations	3
CHE 201—Introduction to Thermodynamics ***OR*** ME 205—Introduction to Thermodynamics	3
ECE 267—Computer Organization I	3
General Education Core courses	6
Total Hours	**15**

Junior Year

First Semester	**Hours**
ECE 225—Circuit Analysis	4
ECE 310—Discrete and Continuous Signals and Systems	3
ECE 346—Solid State Device Theory	4
General Education Core course	3
Additional Mathematics course	3
Total Hours	**17**

Second Semester	**Hours**
ECE 322—Communication Electromagnetics	3
ECE 341—Probability and Random Processes for Engineers	3
ECE 340—Electronics I	4
Advanced EE Core Elective	4
Elective outside the Major Rubric	3
Total Hours	**17**

Senior Year

First Semester	**Hours**
ECE 396—Senior Design I	2
Advanced EE Core electives	8
Technical Electives	5
Total Hours	**15**

Second Semester	**Hours**
ECE 397—Senior Design II	2
Technical Electives	13
Total Hours	**15**

Minor in Electrical Engineering

For the minor, 18 semester hours are required, excluding prerequisite courses. Students outside the Department of Electrical and Computer Engineering must complete the following:

Prerequisite Courses—Electrical Engineering Minor	Hours
MATH 180—Calculus I	5
MATH 181—Calculus II	5
MATH 210—Calculus III	3
MATH 220—Introduction to Differential Equations	3
PHYS 141—General Physics I (Mechanics)	4
PHYS 142—General Physics II (Electricity and Magnetism)	4
ECE 115—Introduction to Electrical and Computer Engineering	4
Total Hours—Prerequisite Courses for Electrical Engineering Minor	**28**

Required Courses—Electrical Engineering Minor	Hours
ECE 225—Circuit Analysis	4
ECE 265—Introduction to Logic Design	4
ECE 310—Discrete and Continuous Signals and Systems	3
ECE 322—Communication Electromagnetics	3
ECE 340—Electronics I	4
Total Hours—Required Courses for Electrical Engineering Minor	**18**

BS in Computer Engineering

Computer Engineering is concerned with the application of electrical engineering and computer science principles to the design of computer systems and digital networks. Through creative utilization of tools and knowledge, a computer engineer designs digital systems that are being employed in virtually all fields of human endeavor. This requires a background in physical sciences, information sciences, electrical engineering, and computer science. Computer engineering requires skills in both the design and development of computer hardware and computer software. Depending on need, the computer engineer may work with electrical engineers, computer scientists, information systems experts, biomedical researchers, and people in almost any other field. The diversity of products that involve the design talents of a computer engineer is unlimited. These range from large to small computers to special purpose computing hardware and software embedded within devices and systems. The applications, for example, are in business to organize, process, and communicate data, communications over mobile and satellite networks, digital sound and picture processing for entertainment, household appliances, automotive systems, manufacturing process control, biomedical instrumentation, machine control, and innumerable other fields. The emphasis in computer engineering is on the design of hardware as well as software tools and systems for the acquisition, processing, storage, and transmission of data and signals by digital means.

All students are required to obtain a strong mathematical foundation, including discrete mathematics and probability and statistics. Each student acquires a common background in the fundamentals of electrical engineering and computer science. This includes course work in computer languages, data structures and algorithms, software design and development, circuit analysis, signal processing, computer architecture, digital networks, microprocessor-based design, digital electronic circuits design, and computer operating systems design. Furthermore, in consultation with an advisor, each student can follow an individualized program by taking courses selected from a departmentally approved list of technical elective courses for computer engineering. In almost all course work, students do design projects while learning to apply basic computer tools. The curriculum also requires the students to acquire oral and writing skills in expressing their professional ideas and ethical norms. As a senior, each student gains further design experience working in a group on a two-semester design project involving practical application of engineering principles.

The educational objectives of the Computer Engineering undergraduate program are for its graduates to:

- have knowledge of fundamental principles in computer engineering and fundamental scientific principles and tools to design and develop products and practical solutions for problems in public and private sectors;
- demonstrate an ability to function independently and in multidisciplinary teams with the communication skills and ethical conduct necessary for professional success;
- demonstrate an understanding of the need for life-long learning, acquiring new knowledge, and mastering emerging technologies and new tools and methods;
- have knowledge necessary to pursue graduate/professional education and/or engineering practice.

Students are encouraged to participate in the activities of the student chapters of the Institute of Electrical and Electronic Engineers (IEEE) and the Association for Computing Machinery (ACM). An interest in robotics can be pursued by joining the Engineering Design Team, a College of Engineering student group.

Degree Requirements—Computer Engineering

To earn a Bachelor of Science in Computer Engineering degree from UIC, students need to complete University, college, and department degree requirements. The Department of Electrical and Computer Engineering degree requirements are outlined belowc Students should consult the *College of Engineering* section for additional degree requirements and college academic policies. See the ECE Department Web site for any revisions of the CE curriculum http://www.ece.uic.edu.

BS in Computer Engineering

Degree Requirements	Hours
Nonengineering and General Education Requirements	50
Required in the College of Engineering	58–59
Technical Electives	14
Additional Mathematics Requirement	3
Electives outside the Major Rubric	3
Total Hours—BS in Computer Engineering	**128**

Nonengineering and General Education Requirements

Courses	Hours
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[a]	3
Understanding the Creative Arts course[a]	3
Understanding the Past course[a]	3
Understanding the Individual and Society course[a]	3
Understanding U.S. Society course[a]	3
MATH 180—Calculus I[b]	5

MATH 181—Calculus II[b]	5
MATH 210—Calculus III[b]	3
MATH 220—Introduction to Differential Equations I	3
PHYS 141—General Physics I (Mechanics)[b]	4
PHYS 142—General Physics II (Electricity and Magnetism)[b]	4
CHEM 112—General College Chemistry I[b]	5
Total Hours—Nonengineering and General Education Requirements	**50**

[a] *Students should consult the* General Education *section of the catalog for a list of approved courses in this category.*

[b] *This course is approved for the Analyzing the Natural World General Education category.*

Required in the College of Engineering

Courses	Hours
Computer Engineering Core Courses	
ENGR 100—Orientation[a]	0[a]
One of the following courses:	3
CHE 201—Introduction to Thermodynamics (3)	
ME 205—Introduction to Thermodynamics (3)	
CS 107—Introduction to Computing and Programming	4
CS 201—Data Structures and Discrete Mathematics I	4
ECE 115—Introduction to Electrical and Computer Engineering	4
ECE 225—Circuit Analysis	4
ECE 265—Introduction to Logic Design	4
ECE 267—Computer Organization I	3
ECE 310—Discrete and Continuous Signals and Systems	3
ECE 340—Electronics I	4
ECE 341—Probability and Random Processes for Engineers	3
ECE 366—Computer Organization II	4
ECE 396—Senior Design I	2
ECE 397—Senior Design II	2
Computer Engineering Advanced Core Courses	
Students must complete at least two courses from each of the following two groups of courses:	14–15
Group A:	
ECE 333—Computer Communication Networks I (4)	
ECE 367—Microprocessor-Based Design (4)	
ECE 368—CAD-Based Digital Design (4)	
CS 385—Operating Systems Concepts and Design (4)	
Group B:	
ECE 465—Digital Systems Design (3)	
ECE 466—Computer Architecture (3)	
ECE 467—Introduction to VLSI Design (4)	
CS 401—Algorithms (3)	
Total Hours— Required in the College of Engineering	**58–59**

[a] *ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.*

Technical Electives

Courses	Hours
Fourteen hours chosen from the following list. Those courses not used to meet the advanced computer engineering core requirement can be used as technical electives.	
However, no more than a total of two courses below the 400-level may be used to meet the technical elective requirement. Also, no more than one course from outside of the ECE Department may be used to meet the technical elective requirement.	14
CS 202—Data Structures and Discrete Mathematics II (3)	
CS 473—Compiler Design (3)	
CS 485—Networked Operating Systems Programming (4)	
ECE 311—Communication Engineering (4)	
ECE 317—Digital Signal Processing I (4)	
ECE 322—Communication Electromagnetics (3)	
ECE 342—Electronics II (4)	
ECE 346—Solid-State Device Theory (4)	
ECE 347—Integrated Circuit Engineering (3)	
ECE 350—Principles of Automatic Control (4)	
ECE 401—Quasi-Static Electric and Magnetic Fields (3)	
ECE 407—Pattern Recognition I (3)	
ECE 410—Network Analysis (3)	
ECE 412—Introduction to Filter Synthesis (3)	
ECE 415—Image Analysis and Computer Vision I (3)	
ECE 417—Digital Signal Processing II (4)	
ECE 418—Statistical Digital Signal Processing (3)	
ECE 421—Introduction to Antennas and Wireless Propagation (3)	
ECE 423—Electromagnetic Compatibility (3)	
ECE 424—RF and Microwave-Guided Propagation (4)	
ECE 427—Modern Linear Optics (3)	
ECE 431—Analog Communication Circuits (4)	
ECE 432—Digital Communications (3)	
ECE 434—Multimedia Systems (3)	
ECE 436—Computer Communication Networks II (3)	
ECE 437—Wireless Communications (3)	
ECE 442—Power Semiconductor Devices and Integrated Circuits (4)	
ECE 445—Analysis and Design of Power Electronic Circuits (4)	
ECE 448—Transistors (3)	
ECE 449—Microdevices and Micromachining Technology (4)	
ECE 451—Control Engineering (3)	
ECE 452—Robotics: Algorithms and Control (3)	
ECE 458—Electromechanical Energy Conversion (3)	
ECE 468—Analog and Mixed-Signal VLSI Design (4)	
ECE 469—Computer Systems Design (3)	
MCS 425—Coding and Cryptography (3)	
PHYS 244—General Physics III (Modern Physics) (3)	
Total Hours—Technical Electives	**14**

Additional Mathematics Requirement

Courses	Hours
One of the following courses:	3
MATH 310—Applied Linear Algebra (3)	
MATH 410—Advanced Calculus I (3)	
MATH 417—Complex Analysis with Applications (3)	
MCS 471—Numerical Analysis (3)	
MATH 481—Applied Partial Differential Equations (3)	
Total Hours—Additional Mathematics Requirement	**3**

Electives outside the Major Rubric

Courses	Hours
Three hours from outside the ECE Rubric	3
Total Hours—Elective outside the Major Rubric	**3**

Students preparing for the Fundamentals of Engineering Examination, which leads to becoming a Licensed Professional Engineer, are advised to use these hours to take CME 201—Statics and one course from the following courses: CME 203—Strength of Materials, CME 260—Properties of Materials, or ME 211—Fluid Mechanics.

Sample Course Schedule— Computer Engineering

Freshman Year

First Semester	Hours
MATH 180—Calculus I	5
CHEM 112—General College Chemistry I	5
ENGL 160—Academic Writing I: Writing fo Academic and Public Contexts	3
ECE 115—Introduction to Electrical and Computer Engineering	4
ENGR 100—Orientation[a]	0[a]
Total Hours	**17**

[a] ENGR 100 is one-semester-hour course, but does not count toward the total hours required for graduation.

Second Semester	Hours
MATH 181—Calculus II	5
PHYS 141—General Physics I (Mechanics)	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
CS 107—Introduction to Computing and Programming	4
Total Hours	**16**

Sophomore Year

First Semester	Hours
MATH 210—Calculus III	3
PHYS 142—General Physics II (Electricity and Magnetism)	4
CS 201—Data Structures and Discrete Mathematics I	4
ECE 265—Introduction to Logic Design	4
General Education Core course	3
Total Hours	**18**

Second Semester	Hours
MATH 220—Introduction to Differential Equations	3
CHE 201—Introduction to Thermodynamics ***OR*** ME 205—Introduction to Thermodynamics	3
ECE 267—Computer Organization I	3
General Education Core courses	6
Total Hours	**15**

Junior Year

First Semester	Hours
ECE 225—Circuit Analysis	4
ECE 310—Discrete and Continuous Signals and Systems	3
Advanced CE Core Elective	4
General Education Core course	3
ECE 366—Computer Organization II	3
Total Hours	**18**

Second Semester	Hours
Additional Mathematics course	3
ECE 341—Probability and Random Processes for Engineers	3
ECE 340—Electronics I	4
Advanced CE Core Elective	4
General Education Core course	3
Total Hours	**17**

Senior Year

First Semester	Hours
ECE 396—Senior Design I	2
Advanced CE Core Elective	3
Elective outside the Major Rubric	3
Technical Electives	6
Total Hours	**14**

Second Semester	Hours
ECE 397—Senior Design II	2
Technical Electives	8
Advanced CE Core Elective	3
Total Hours	**13**

Minor in Computer Engineering

For the minor, 19 semester hours are required, excluding prerequisite courses. Students outside the Department of Electrical and Computer Engineering must complete the following:

Prerequisite Courses—Computer Engineering Minor	Hours
MATH 180—Calculus I	5
MATH 181—Calculus II	5
MATH 210—Calculus III	3
MATH 220—Introduction to Differential Equations	3
PHYS 141—General Physics I (Mechanics)	4
PHYS 142—General Physics II (Electricity and Magnetism)	4
CS 107—Introduction to Computing and Programming	4
ECE 115—Introduction to Electrical and Computer Engineering	4
Total Hours—Prerequisite Courses for Computer Engineering Minor	**32**

Required Courses—Computer Engineering Minor	Hours
ECE 225—Circuit Analysis	4
ECE 265—Introduction to Logic Design	4
ECE 267—Computer Organization I	3
ECE 366—Computer Organization II	4
CS 201—Data Structures and Discrete Mathematics I	4
Total Hours—Required Courses for Computer Engineering Minor	**19**

BS in Engineering Physics

The BS in Engineering Physics is offered by the Department of Electrical and Computer Engineering (College of Engineering) in association with the Department of Physics (College of Liberal Arts and Sciences).

The Engineering Physics major bridges the gap between science and technology by combining a strong background in physics and mathematics with exposure to the most fundamental areas of engineering. The program is based on the recognition that most engineering disciplines are rooted in the field of physics, and that new and emerging technologies rarely fall neatly within a single engineering discipline but often straddle different fields. The program highlights, for instance, the subtle and deep relations between materials science and civil engineering, between solid-state physics and chemical engineering, and between electromagnetics and telecommunication engineering.

This training is especially well suited to students who wish to pursue careers in research and development in advanced technology and applied science. In particular, students majoring in this program are well qualified to pursue graduate studies in most areas of engineering and applied physics.

The content of this program strongly emphasizes topics in physics and mathematics; however, this curriculum also gives students great flexibility in the choice of topics for technical electives. Students can customize their curriculum by choosing four technical elective courses from many fields. Engineering training is completed by a senior design project, which can be taken in any department within the engineering college.

Students interested in the Engineering Physics major should contact Professor George Uslenghi in the Department of Electrical and Computer Engineering at uslenghi@uic.edu.

Degree Requirements—Engineering Physics

To earn a Bachelor of Science in Engineering Physics degree from UIC, students need to complete University and college degree requirements. The course requirements for this program are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies. See the ECE Department Web site for revisions to the Engineering Physics curriculum http://www.ece.uic.edu.

BS in Engineering Physics Degree Requirements	Hours
Nonengineering and General Education Requirements	65
Required in the College of Engineering	33–36
Advanced Electromagnetics Requirement	7–8
Advanced Mechanics Requirement	3–4
Technical Electives	12–17
Electives outside Major Rubric	3
Total Hours—BS in Engineering Physics	**128**

Nonengineering and General Education Requirements

Courses	Hours
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[a]	3
Understanding the Creative Arts course[a]	3
Understanding the Past course[a]	3
Understanding the Individual and Society course[a]	3
Understanding U.S. Society course[a]	3
MATH 180—Calculus I[b]	5
MATH 181—Calculus II[b]	5
MATH 210—Calculus III[b]	3
MATH 220—Introduction to Differential Equations I	3
PHYS 141—General Physics I (Mechanics)[b]	4
PHYS 142—General Physics II (Electricity and Magnetism)[b]	4
PHYS 215—Mathematical Methods for Physicists	4
PHYS 244—General Physics III (Modern Physics)	3
PHYS 411—Quantum Mechanics I	4
PHYS 481—Modern Experimental Physics I	4
CHEM 112—General College Chemistry I[b]	5
Total Hours—Nonengineering and General Education Requirements	**65**

[a] *Students should consult the* General Education *section of the catalog for a list of approved courses in this category.*

[b] *This course is approved for the Analyzing the Natural World General Education category.*

Required in the College of Engineering

Courses	Hours
ENGR 100—Orientation[a]	0[a]
CME 201—Statics	3
CME 203—Strength of Materials	3
CME 260—Properties of Materials	3
Senior Design Requirement chosen from the following:	4–7
BIOE 396—Senior Design I (3)	
BIOE 397—Senior Design II (3)	
OR	
CME 396—Senior Design I (3)	
CME 397—Senior Design II (3)	
OR	
CHE 396—Senior Design I (4)	
CHE 397—Senior Design II (3)	
OR	
ECE 396—Senior Design I (2)	
ECE 397—Senior Design II (2)	
OR	
ME 396—Senior Design (4)	
One of the following courses:	3
CHE 201—Introduction to Thermodynamics (3)	
ME 205—Introduction to Thermodynamics (3)	
One of the following courses:	3
CS 102—Introduction to Programming (3)	
CS 108—Fortran Programming for Engineers (3)	
ECE 225—Circuit Analysis[b]	4
ECE 310—Discrete and Continuous Signals and Systems	3
ECE 346—Solid State Device Theory	4
ME 212—Fundamentals of Fluid Mechanics	3
Total Hours—Required in the College of Engineering	**33–36**

[a] *ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.*

[b] *For the Engineering Physics major, the prerequisite ECE 115 is not required.*

Advanced Electromagnetics Requirement

Courses	Hours
One of the following two-course sequences:	7–8
ECE 322—Communication Electromagnetics (3)	
ECE 424—RF and Microwave-Guided Propagation (4)	
OR	
PHYS 401—Electromagnetism I (4)	
PHYS 402—Electromagnetism II (4)	
Total Hours—Advanced Electromagnetics Requirement	**7–8**

Advanced Mechanics Requirement

Courses	Hours
One of the following courses:	3–4
ME 413—Dynamics of Mechanical Systems (3)	
PHYS 441—Theoretical Mechanics (4)	
Total Hours—Advanced Mechanics Requirement	**3–4**

Technical Electives

Courses	Hours
Twelve to seventeen semester hours from a list of technical electives available from the advisor. These courses should be selected in consultation with the advisor and should be chosen from approved sequences in the following areas:	12–17
Bioengineering	
Civil and Materials Engineering	
Chemical Engineering Design	

Chemical Engineering Multiphase Transport Phenomena	
Chemical Engineering Chemical Process	
Computer Science	
Electrical and Computer Engineering Circuits and VLSI	
Electrical and Computer Engineering Communications and Signal and Processing	
Electrical and Computer Engineering Solid State, MEMS, and Nanotechnology	
Electrical and Computer Engineering	
Electromagnetics and Optics	
Mechanical Engineering Thermal/Fluid Science	
Mechanical Engineering Mechanical Systems	
Modern Physics	
Total Hours—Technical Electives	**12–17**

Electives outside Major Rubric

Courses	Hours
Electives outside the PHYS and ECE Rubrics	3
Total Hours—Electives outside the Major Rubric	**3**

Sample Course Schedule— Engineering Physics

Freshman Year

First Semester	Hours
MATH 180—Calculus I	5
CHEM 112—General College Chemistry I	5
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
General Education Core course	3
ENGR 100—Orientation[a]	0[a]
Total Hours	**16**

[a] ENGR 100 is one-semester-hour course, but does not count toward the total hours required for graduation.

Second Semester	Hours
MATH 181—Calculus II	5
PHYS 141—General Physics I (Mechanics)	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
General Education Core course	3
Total Hours	**15**

Sophomore Year

First Semester	Hours
MATH 210—Calculus III	3
PHYS 142—General Physics II (Electricity and Magnetism)	4
CME 201—Statics	3
CS 108—Fortran Programming for Engineers	3
General Education Core course	3
Total Hours	**16**

Second Semester	Hours
MATH 220—Introduction to Differential Equations	3
PHYS 215—Mathematical Methods for Physicists	4
PHYS 244—General Physics III (Modern Physics)	3
CME 240—Strength of Materials	3
General Education Core course	3
Total Hours	**16**

Junior Year

First Semester	Hours
PHYS 481—Modern Experimental Physics I	4
ECE 225—Circuit Analysis	4
ME 212—Fundamentals of Fluid Mechanics	3
Technical Elective	3
Elective outside ECE and PHYS	3
Total Hours	**17**

Second Semester	Hours
Advanced Mechanics Requirement	3–4
ECE 310—Discrete and Continuous Signals and Systems	3
ME 205—Thermodynamics	3
Technical Electives	6
Total Hours	**15–16**

Senior Year

First Semester	Hours
PHYS 411—Quantum Mechanics I	4
Advanced Electromagnetics Requirement I	4
Senior Design I	2–4
Technical Elective	3
General Education Core course	3
Total Hours	**16–18**

Second Semester	Hours
ECE 346—Solid State Device Theory	4
Senior Design II	0–3
CME 260—Properties of Materials	3
Advanced Electromagnetics Requirement II	4
Technical Elective	3
Total Hours	**14–17**

Department of Mechanical and Industrial Engineering

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Student Services: Undergraduate Engineering Office, 123 Science and Engineering Offices (SEO)
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The Department of Mechanical and Industrial Engineering offers both fundamental and advanced courses that prepare students for careers in the engineering profession or for advanced study at the graduate level. The department offers Bachelor of Science degrees in Mechanical Engineering, Industrial Engineering, and Engineering Management. All programs are offered in an economically thriving, industrialized, and world-class city. The campus is located in the heart of Chicago, and has a diverse student body in a leading-edge research environment.

Accreditation

The Department of Mechanical and Industrial Engineering offers two programs accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. These degrees are the Bachelor of Science in Mechanical Engineering and Bachelor of Science in Industrial Engineering. The Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology offices are located at 111 Market Place, Suite 1050, Baltimore, MD 21201-4012, (410) 347-7700.

BS in Mechanical Engineering

Mechanical engineering is essential to a wide range of activities that include the design, development, manufacture, management, and control of engineering systems, subsystems, and their components. Typically mechanical engineers are employed in a wide range of industries, such as manufacturing, power, aerospace, automotive, materials, and processing industries. As a result of the recent rapid expansion of technology, mechanical engineers also have become increasingly involved in computer-aided design and visualization; robotics; bioengineering; environmental engineering; solar, wind, and ocean energy sources; and space exploration. The breadth of the field provides the graduate with many possibilities for a satisfying career.

The program has been developed to provide students with a broad base on which to build a successful mechanical engineering career. Courses are offered in the mechanical design and thermal fluid science fields. Topics covered in mechanical design include kinematics, mechanisms, stress analysis, dynamic systems, material properties, CAD/CAM, dynamics, vibrations, mechatronics, microelectrical mechanical systems (MEMS), and control theory. Courses offered in the thermal fluid sciences include thermodynamics, heat transfer, and combustion. These courses provide a basis for all types of power applications, including internal combustion engines, nuclear reactors, heating systems, refrigeration systems, and solar power. The program also emphasizes computer applications, professional ethics, communication skills, ability to work in a multidisciplinary team, awareness of broad education, lifelong learning, and contemporary issues.

The objectives of the Bachelor of Science in Mechanical Engineering can be found online http://www.mie.uic.edu/programs/bsme_objectives.htm.

Degree Requirements— Mechanical Engineering

To earn a Bachelor of Science in Mechanical Engineering degree from UIC, students need to complete University, college, and department degree requirements. The Department of Mechanical and Industrial Engineering degree requirements are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies.

BS in Mechanical Engineering Degree Requirements	Hours
Nonengineering and General Education Requirements	53
Required in the College of Engineering	63
Technical Electives	9
Electives outside the Major Rubric	3
Total Hours—BS in Mechanical Engineering	**128**

Nonengineering and General Education Requirements

Courses	Hours
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[a]	3
Understanding the Creative Arts course[a]	3
Understanding the Past course[a]	3
Understanding the Individual and Society course[a]	3
Understanding U.S. Society course[a]	3
MATH 180—Calculus I[b]	5
MATH 181—Calculus II[b]	5
MATH 210—Calculus III[b]	3
MATH 220—Introduction to Differential Equations	3
CHEM 112—General College Chemistry I[b]	5
PHYS 141—General Physics I (Mechanics)[b]	4
PHYS 142—General Physics II (Electricity and Magnetism)[b]	4
PHYS 244—General Physics III (Modern Physics)	3
Total Hours—Nonengineering and General Education Requirements	**53**

[a] *Students should consult the* General Education *section of the catalog for a list of approved courses in this category.*

[b] *This course is approved for the Analyzing the Natural World General Education category.*

Required in the College of Engineering

Courses	Hours
ENGR 100—Orientation[a]	0[a]
CME 201—Statics	3
CME 203—Strength of Materials	3
CME/ME 261—Materials for Manufacturing	2
CS 108—Fortran Programming for Engineers	3
ECE 210—Electrical Circuit Analysis	3
IE 201—Financial Engineering	3
ME 205—Introduction to Thermodynamics	3
ME 210—Engineering Dynamics	3
ME 211—Fluid Mechanics I	4
ME 250—Engineering Graphics and Design	3
ME 308—Mechanical Vibrations	3
ME 312—Dynamic Systems and Control	3
ME 320—Mechanisms and Dynamics of Machinery	4
ME 321—Heat Transfer	4
ME 325—Intermediate Thermodynamics	3
ME 341—Experimental Methods in ME	3
ME 380—Manufacturing Process Principles	3
ME 396—Senior Design[b]	4
ME 428—Numerical Methods in Mechanical Engineering	3
ME 447—Introduction to Computer-Aided Design	3
ME 499—Professional Development Seminar	0
Total Hours—Required in the College of Engineering	**63**

[a] *ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.*

[b] *ME 445 may be used as a substitute for ME 396; ME 444 is a prerequisite for ME 445.*

Technical Electives

Courses	Hours
Nine hours from the list below:	9
ECE 458—Electromechanical Energy Conversion (3)	
IE 342—Probability and Statistics for Engineers (3)	
ME 370—Design of Machine Components (3)	
ME 392—Undergraduate Research (3 or 6)	
Any 400-level ME course not required above	
Total Hours—Technical Electives	**9**

Electives outside the Major Rubric

Courses	Hours
Electives outside the ME Rubric	3
Total Hours—Electives outside the Major Rubric	**3**

Sample Course Schedule— Mechanical Engineering

Freshman Year

First Semester	Hours
MATH 180—Calculus I	5
CHEM 112—General College Chemistry I	5
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
General Education Core course	3
ENGR 100—Orientation[a]	0[a]
Total Hours	**16**

[a] ENGR 100 is one-semester-hour course, but the hour does not count toward the total hours required for graduation.

Second Semester	Hours
MATH 181—Calculus II	5
PHYS 141—General Physics I (Mechanics)	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
ME 250—Engineering Graphics and Design	3
CS 108—Fortran Programming for Engineers	3
Total Hours	**18**

Sophomore Year

First Semester	Hours
MATH 210—Calculus III	3
PHYS 142—General Physics II (Electricity and Magnetism)	4
IE 201—Financial Engineering	3
CME 201—Statics	3
CME 261—Materials for Manufacturing	2
Total Hours	**15**

Second Semester	Hours
MATH 220—Introduction to Differential Equations	3
PHYS 244—General Physics III (Modern Physics)	3
CME 203—Strength of Materials	3
ME 205—Introduction to Thermodynamics	3
Elective outside Major Rubric	3
Total Hours	**15**

Junior Year

First Semester	Hours
ECE 210—Electrical Circuit Analysis	3
ME 210—Engineering Dynamics	3
ME 211—Fluid Mechanics I	4
ME 325—Intermediate Thermodynamics	3
General Education Core course	3
Total Hours	**16**

Second Semester	Hours
ME 308—Mechanical Vibrations	3
ME 312—Dynamic Systems and Control	3
ME 320—Mechanisms and Dynamics of Machinery	4
ME 321—Heat Transfer	4
General Education Core course	3
Total Hours	**17**

Senior Year

First Semester	Hours
ME 380—Manufacturing Process Principles	3
ME 428—Numerical Methods in Mechanical Engineering	3
ME 447—Introduction to Computer-Aided Design	3
Technical Elective	3
General Education Core course	3
Total Hours	**15**

Second Semester	Hours
ME 341—Experimental Methods in Mechanical Engineering	3
ME 396—Senior Design	4
ME 499—Professional Development Seminar	0
General Education Core course	3
Senior Technical Electives	6
Total Hours	**16**

Minor in Mechanical Engineering

For the minor, 16–18 semester hours are required, excluding prerequisite courses. Students not majoring in Mechanical Engineering who wish to minor in Mechanical Engineering must complete the following:

Prerequisite Courses— Mechanical Engineering Minor	
CME 201—Statics	3
One of the following courses:	3
CS 101—Introduction to Computing (3)	
CS 108—Fortran Programming for Engineers (3)	
MATH 180—Calculus I	5
MATH 181—Calculus II	5
MATH 210—Calculus III	3
MATH 220—Introduction to Differential Equations	3
One of the following courses:	3
ME 205—Introduction to Thermodynamics (3)	
CHE 201—Introduction to Thermodynamics (3)	
PHYS 141—General Physics I (Mechanics)	4
Total Hours—Prerequisite Courses for Mechanical Engineering Minor	**29**

Required Courses—Mechanical Engineering Minor	Hours
CME 203—Strength of Materials	3
ME 210—Engineering Dynamics	3
ME 211—Fluid Mechanics I	4
Two courses from the following:	6–8
ME 308—Mechanical Vibrations (3)	
ME 312—Dynamic Systems and Control (3)	
ME 320—Mechanisms and Dynamics of Machinery (4)	
ME 321—Heat Transfer (4)	
ME 325—Intermediate Thermodynamics (3)	
ME 341—Experimental Methods in Mechanical Engineering (3)	
ME 380—Manufacturing Process Principles (3)	
ME 447—Introduction to Computer Aided Design (3)	
Total Hours—Required Courses for Mechanical Engineering Minor	**16–18**

BS in Industrial Engineering

Industrial engineering is concerned with the design, improvement, and installation of integrated systems of people, material, and equipment. The Industrial Engineering program gives knowledge of principles and methods in engineering design, physical sciences, and social sciences. This knowledge then is used to specify, predict, and evaluate systems. By collecting, analyzing, and arranging such knowledge, industrial engineers enable management to utilize resources effectively and efficiently.

In order to design and operate complex systems, the industrial engineer must acquire comprehensive knowledge in the following areas: manufacturing engineering; production engineering; systems engineering; and human factors, maintenance, and safety engineering.

Manufacturing engineering is involved with planning and selecting manufacturing methods, with designing and developing manufacturing equipment, and with increasing the efficiency and productivity of current manufacturing technologies as well as creating new ones. Manufacturing engineers use materials science, metal cutting and forming theories, stochastic-dynamic models, principles of numerical and adaptive control, engineering statistics, and other physical sciences to solve manufacturing problems. A new area in manufacturing is virtual manufacturing, which combines virtual reality techniques, factory design, equipment design, training, and contamination control in industrial applications.

Production engineering deals with the analysis, design, installation, and maintenance of operational and management systems involved in the production and distribution of goods and services. Such topics as quality control, production scheduling, production planning, inventory control, and maintenance policy are included in this area.

Systems engineering involves the theory and practice of modeling a general system design. The systems engineer develops mathematical, statistical, and computer models of complex systems to predict how a design or policy change will affect the real world. Human factors, maintenance, and safety engineering deal with the problems caused by the interaction of complex man-machine systems. The engineers in this area apply knowledge about sensory, perceptual, and mental characteristics in the engineering design of equipment and facilities to ensure worker comfort and safety.

Because the training of industrial engineers is so broad, they are in demand not only in all types of industry but also in service organizations, such as hospitals, banks, insurance companies, and research laboratories.

The program also emphasizes computer applications, professional ethics, communication skills, ability to work in a multidisciplinary team and awareness of broad education, lifelong learning, and contemporary issues.

The objectives of the Bachelor of Science in Industrial Engineering can be found online http://www.mie.uic.edu/programs/bsie_objectives.htm.

Degree Requirements—Industrial Engineering

To earn a Bachelor of Science in Industrial Engineering degree from UIC, students need to complete University, college, and department degree requirements. The Department of Mechanical and Industrial Engineering degree requirements are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies.

BS in Industrial Engineering Degree Requirements	Hours
Nonengineering and General Education Requirements	56
Required in the College of Engineering	65
Technical Elective	3–4
Electives outside the Major Rubric	3
Free Elective (may be required)	0–1
Total Hours—BS in Industrial Engineering	**128**

Nonengineering and General Education Requirements

Courses	Hours
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course[a]	3
Understanding the Creative Arts course[a]	3
Understanding the Past course[a]	3
Understanding the Individual and Society course[a]	3
Understanding U.S. Society course[a]	3
MATH 180—Calculus I[b]	5
MATH 181—Calculus II[b]	5
MATH 210—Calculus III[b]	3
MATH 220—Introduction to Differential Equations	3
MATH 310—Applied Linear Algebra	3
CHEM 112—General College Chemistry I[b]	5
PHYS 141—General Physics I (Mechanics)[b]	4
PHYS 142—General Physics II (Electricity and Magnetism)[b]	4
MGMT 340—Introduction to Organizations	3
Total Hours—Nonengineering and General Education Requirements	**56**

[a] *Students should consult the* General Education *section of the catalog for a list of approved courses in this category.*

[b] *This course is approved for the Analyzing the Natural World General Education category.*

Required in the College of Engineering

Courses	Hours
ENGR 100—Orientation[a]	0[a]
CME 201—Statics	3
CME 203—Strength of Materials	3
CS 108—Fortran Programming for Engineers	3
ECE 210—Electrical Circuit Analysis	3
IE 201—Financial Engineering	3

IE 441—Ergonomics and Human Factors	3
IE 342—Probability and Statistics for Engineers	3
IE 345—Regression Applications and Forecasting in Engineering	3
IE 365—Work Productivity Analysis	4
IE 380—Manufacturing Process Principles	3
IE 396—Senior Design	4
IE 446—Quality Control and Reliability	3
IE 461—Safety Engineering	3
IE 463—Plant Layout and Materials Handling	3
IE 464—Virtual Automation	3
IE 466—Production Planning and Inventory Control	3
IE 467—Discrete Event Computer Simulation Application	3
IE 471—Operations Research I	3
IE 472—Operations Research II	3
ME 250—Engineering Graphics and Design	3
ME 205—Introduction to Thermodynamics	3
IE 499—Professional Development Seminar	0
Total Hours—Required in the College of Engineering	**65**

[a] ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.

Technical Elective

Courses	Hours
One course from the list below:	3–4
IE 392—Undergraduate Research (3)	
ME 210—Engineering Dynamics (3)	
ME 211—Fluid Mechanics I (4)	
ME 325—Intermediate Thermodynamics (3)	
ME 447—Introduction to Computer-Aided Design (3)	
Any IE course at the 400-level not required above (3)	
Total Hours—Technical Elective	**3–4**

Electives outside the Major Rubric

Courses	Hours
Electives outside the IE rubric	3
Total Hours—Electives outside the Major Rubric	**3**

Free Elective

Courses	Hours
Free Elective—One semester hour may be required	**0–1**

Sample Course Schedule— Industrial Engineering

Freshman Year

First Semester	Hours
MATH 180—Calculus I	5
CHEM 112—General College Chemistry I	5
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
General Education Core course	3
ENGR 100—Orientation[a]	0[a]
Total Hours	**16**

[a] ENGR 100 is one-semester-hour course, but the hour does not count toward the total hours required for graduation.

Second Semester	Hours
MATH 181—Calculus II	5
PHYS 141—General Physics I (Mechanics)	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
ME 250—Engineering Graphics and Design	3
CS 108—Fortran Programming for Engineering	3
Total Hours	**18**

Sophomore Year

First Semester	Hours
MATH 210—Calculus III	3
PHYS 142—General Physics II (Electricity and Magnetism)	4
IE 201—Financial Engineering	3
CME 201—Statics	3
General Education Core course	3
Total Hours	**16**

Second Semester	Hours
MATH 220—Introduction to Differential Equations	3
MATH 310—Applied Linear Algebra	3
CME 203—Strength of Materials	3
ME 205—Introduction to Thermodynamics	3
General Education Core course	3
Total Hours	**15**

Junior Year

First Semester	Hours
IE 441—Ergonomics and Human Factors	3
IE 342—Probability and Statistics for Engineers	3
IE 365— Work Productivity Analysis	4
MGMT 340—Introduction to Organizations	3
General Education Core course	3
Total Hours	**16**

Second Semester	Hours
IE 345—Regression Applications and Forecasting in Engineering	3
IE 380—Manufacturing Process Principles	3
IE 446—Quality Control and Reliability	3
ECE 210—Electrical Circuit Analysis	3
General Education Core course	3
Total Hours	**15**

Senior Year

First Semester	Hours
IE 461—Safety Engineering	3
IE 464— Virtual Automation	3
IE 467— Discrete Event Computer Simulation Application	3
IE 471—Operations Research I	3
Technical Elective	3
Free Elective	1
Total Hours	**16**

Second Semester	Hours
IE 396—Senior Design	4
IE 463—Plant Layout and Materials Handling	3
IE 466—Production Planning and Inventory Control	3
IE 472—Operations Research II	3
IE 499—Professional Development Seminar	0
Elective outside Major Rubric	3
Total Hours	**16**

Minor in Industrial Engineering

For the minor, 12 semester hours are required, excluding prerequisite courses. Students not majoring in Industrial Engineering who wish to minor in Industrial Engineering must complete the following:

Prerequisite Courses—Industrial Engineering Minor	Hours
One of the following courses:	3
CS 101—Introduction to Computing (3)	
CS 108—Fortran Programming for Engineers (3)	
MATH 180—Calculus I	5
MATH 181—Calculus II	5
MATH 210—Calculus III	3
MATH 220—Introduction to Differential Equations	3
MATH 310—Applied Linear Algebra	3
IE 201—Financial Engineering	3
Total Hours—Prerequisite Courses for Industrial Engineering Minor	**25**

Required Courses—Minor in Industrial Engineering	Hours
IE 342—Probability and Statistics for Engineers	3
IE 446—Quality Control and Reliability	3
IE 463—Plant Layout and Materials Handling	3
IE 471—Operations Research I	3
Total Hours—Required Courses for Minor in Industrial Engineering	**12**

BS in Engineering Management

The College of Engineering and the College of Business Administration offer a joint program in engineering management that allows students latitude to study in both the business administration and engineering disciplines. This program prepares students to begin careers that may lead to administrative, staff, or management positions in small technological engineering or manufacturing operations or positions as production supervisors, administration staff, or managers of departments in large technological organizations. The program also prepares students for careers in large nontechnological organizations such as banks, which may require a combination of engineering and management experiences.

The Bachelor of Science in Engineering Management is awarded by the College of Engineering. Entrance requirements are the same as for the College of Engineering.

To complete the required 128 semester hours of University credit, students take required courses in engineering as well as courses in business administration, including accounting, finance, marketing, economics, and management. Additionally, there are required courses in English composition, mathematics, chemistry, and physics. Engineering courses are chosen from courses acceptable for other students in the College of Engineering. No more than 32 hours may be taken in courses offered by the College of Business Administration.

Degree Requirements—Engineering Management

To earn a Bachelor of Science in Engineering Management degree from UIC, students need to complete University, college, and department degree requirements. The Department of Mechanical and Industrial Engineering degree requirements are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies.

BS in Engineering Management Degree Requirements	Hours
Nonengineering and General Education Requirements	72
Required in the College of Engineering	52
Elective outside the Major Rubric	3
Free Elective	1
Total Hours—BS in Engineering Management	**128**

Nonengineering and General Education Requirements

Courses	Hours
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
Understanding the Past course[a]	3
Understanding the Creative Arts course[a]	3
Exploring World Cultures course[a]	3
MATH 180—Calculus I[b]	5
MATH 181—Calculus II[b]	5
MATH 210—Calculus III[b]	3
MATH 310—Applied Linear Algebra	3
CHEM 112—General College Chemistry I[b]	5
PHYS 141—General Physics I (Mechanics)[b]	4
PHYS 142—General Physics II (Electricity and Magnetism)[b]	4
ACTG 210—Introduction to Financial Accounting	3
ACTG 211—Introduction to Managerial Accounting	3
ECON 120—Principles of Microeconomics[cd]	3
ECON 121—Principles of Macroeconomics[cd]	3
FIN 300—Introduction to Managerial Finance	3
MGMT 340—Introduction to Organizations	3
MGMT 350— Business and Its External Environment	3
MGMT 495—Competitive Strategy	4
MKTG 360—Introduction to Marketing	3
Total Hours—Nonengineering and General Requirements	**72**

[a] *Students should consult the* General Education *section of the catalog for a list of approved courses in this category.*

[b] *This course is approved for the Analyzing the Natural World General Education category.*

[c] *This course is approved for the Understanding the Individual and Society General Education category.*

[d] *This course is approved for the Understanding U.S. Society General Education category.*

Required in the College of Engineering

Courses	Hours
ENGR 100—Orientation[a]	0[a]
CME 201—Statics	3
CME 203—Strength of Materials	3
CS 108—Fortran Programming for Engineers	3
IE 201—Financial Engineering	3
IE 441—Ergonomics and Human Factors	3
IE 342—Probability and Statistics for Engineers	3
IE 345—Regression Applications and Forecasting in Engineering	3
IE 365— Work Productivity Analysis	4
IE 380—Manufacturing Process Principles	3
IE 446—Quality Control and Reliability	3
IE 461—Safety Engineering	3

IE 463—Plant Layout and Materials Handling	3
IE 464— Virtual Automation	3
IE 466—Production Planning and Inventory Control	3
IE 467— Discrete Event Computer Simulation Application	3
IE 471—Operations Research I	3
IE 472—Operations Research II	3
IE 499—Professional Development Seminar	0
Total Hours—Required in the College of Engineering	**52**

[a] ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.

Elective outside the Major Rubric

Courses	Hours
Elective outside the IE Rubric and College of Business Administration	3
Total Hours—Elective outside the Major Rubric	**3**

Free Elective

Courses	Hours
Total Hours—Free Elective	**1**

Sample Course Schedule— Engineering Management

Freshman Year

First Semester	Hours
MATH 180—Calculus I	5
CHEM 112—General College Chemistry I	5
ENGL 160—Academic Writing I: Writing for Academic and Public Contexts	3
ECON 120—Principles of Microeconomics	3
ENGR 100—Orientation[a]	0[a]
Total Hours	**16**

[a] ENGR 100 is one-semester- hour course, but the hour does not count toward the total hours required for graduation.

Second Semester	Hours
MATH 181—Calculus II	5
PHYS 141—General Physics I (Mechanics)	4
ENGL 161—Academic Writing II: Writing for Inquiry and Research	3
ECON 121—Principles of Macroeconomics	3
Free Elective	1
Total Hours	**16**

Sophomore Year

First Semester	Hours
MATH 210—Calculus III	3
PHYS 142—General Physics II (Electricity and Magnetism)	4
IE 201—Financial Engineering	3
ACTG 210—Introduction to Financial Accounting	3
CS 108—Fortran Programming for Engineering	3
Total Hours	**16**

Second Semester	Hours
ACTG 211—Introduction to Managerial Accounting	3
CME 201—Statics	3
MATH 310—Applied Linear Algebra	3
MGMT 340—Introduction to Organizations	3
MKTG 360— Introduction to Marketing	3
Total Hours	**15**

Junior Year

First Semester	Hours
IE 441—Ergonomics and Human Factors	3
IE 342—Probability and Statistics for Engineers	3
IE 365— Work Productivity Analysis	4
CME 203—Strength of Materials	3
General Education Core course	3
Total Hours	**16**

Second Semester	Hours
IE 345—Regression Applications and Forecasting in Engineering	3
IE 380—Manufacturing Process Principles	3
IE 446—Quality Control and Reliability	3
FIN 300— Introduction to Managerial Finance	3
General Education Core course	3
Total Hours	**15**

Senior Year

First Semester	Hours
IE 461—Safety Engineering	3
IE 464— Virtual Automation	3
IE 467— Discrete Event Computer Simulation Application	3
IE 471—Operations Research I	3
MGMT 350—Business and Its External Environment	3
General Education Core course	3
Total Hours	**18**

Second Semester	Hours
MGMT 495—Competitive Strategy	4
IE 463—Plant Layout and Materials Handling	3
IE 466—Production Planning and Inventory Control	3
IE 472—Operations Research II	3
IE 499—Professional Development Seminar	0
Elective outside Major Rubric	3
Total Hours	**16**

College of Engineering Additional Interdisciplinary Opportunities

In addition to the programs in Engineering Management (see the Department of Mechanical and Industrial Engineering section) and Engineering Physics (see the Department of Electrical and Computer Engineering section), the College of Engineering offers the following interdisciplinary minors:

- Minor in Environmental Engineering
- Minor in International Studies
- Minor in Materials Engineering

Minor in Environmental Engineering

Growth in the world's population continues to put increasing pressure on resources. Demands in the areas of food, energy, services, and technology also place demands on those resources. The Second Law of Thermodynamics points out that all processes involving heat and useful work exchange energy with the environment. Environmental Engineering is involved, in part, with the cleanliness of that exchange. It involves the study of clean air, clean water, preservation of resources, and waste management in ways that minimize effects detrimental to the earth's environment. The College of Engineering offers a minor area

of study in Environmental Engineering that crosses disciplinary boundaries among engineering specialists and engineering departments. Students interested in the Minor in Environmental Engineering should contact Professor Karl Rockne in the Department of Civil and Materials Engineering at krockne@uic.edu.

For the minor, 15–19 semester hours are required, excluding prerequisite courses. Students who wish to minor in Environmental Engineering must complete the following courses:

Prerequisite Courses—Environmental Engineering Minor	**Hours**
MATH 180—Calculus I	5
MATH 181—Calculus II	5
MATH 210—Calculus III	3
MATH 220—Introduction to Differential Equations	3
PHYS 141—General Physics I (Mechanics)	4
One of the following courses:	3
CS 101—Introduction to Computing (3)	
CS 108—Fortran Programming for Engineers (3)	
CME 201—Statics	3
One of the following courses:	3–5
CHEM 112—General Chemistry I (5)	
CHEM 116—Honors General Chemistry I (5)	
CHE 201—Introduction to Thermodynamics (3)	
ME 205—Introduction to Thermodynamics (3)	
Total Hours—Prerequisite Courses for Environmental Engineering Minor	**29–31**

Required Courses[a] —Environmental Engineering Minor	**Hours**
Three courses from the following list:	9–12
CHE 210—Material and Energy Balances (4)	
CHE 301—Chemical Engineering Thermodynamics (3)	
CHE 321—Chemical Reaction Engineering (3)	
CME 215—Hydraulics and Hydrology (3)	
CS 108—Fortran Programming for Engineers (3)	
ME 325—Intermediate Thermodynamics (3)	
ME 211—Fluid Mechanics (4)	
OR	
CHE 311—Transport Phenomena I (3)	
CHE 312—Transport Phenomena II (3)	
OR	
ME 321—Heat Transfer (4)	
One of the following courses:	3–4
CHE 421—Combustion Engineering (3)	
ME 426—Applied Combustion (3)	
ME 429—Internal Combustion Engines (3)	
ME/CHE 450—Air Pollution Engineering (4)	
One of the following courses:	3
CHE 413—Introduction to Flow in Porous Media (3)	
CME 494—Special Topics in Civil Engineering, Mechanics, and Materials (when topic is Treatment of Wastewater) (3)	
ME 318—Fluid Mechanics II (3)	
Total Hours—Required Courses for Environmental Engineering Minor	**15–19**

[a] *At least two courses must be outside the student's department.*

Minor in International Studies

The scope of operations for many engineering companies is becoming more international each year. These companies are placing a percentage of their engineers outside the United States. In order to be prepared for living and working in a different culture, the College of Engineering offers the International Studies Minor, a cluster of courses related to a specific country outside of the United States.

The International Studies Minor consists of the following requirements:

- 18–21 semester hours of credit in foreign language and cultural studies courses related to a foreign country or geographical area of the world outside of the U.S. It is recommended that a majority of credit hours should be in nonlanguage courses.
- Minimum grade point average of 2.00/4.00.
- An academic or technical/industrial experience outside the U.S. that is supported by documentation.

Engineering students interested in completing the International Studies Minor should consult the associate dean of undergraduate administration in the College of Engineering in 102 SEO.

Minor in Materials Engineering

Materials selection is a part of most areas of engineering. As technology advances and the envelope of new achievement is enlarged, many demands are placed on materials for operating under more extreme conditions. Higher temperature tolerance, higher strength, lower weight, reduced corrosion susceptibility, and better compatibility with other materials and fluids become important considerations. Materials engineering involves the understanding and characterization of materials for such considerations, and the College of Engineering offers it as a minor area of study crossing disciplinary boundaries in engineering and basic science. Students interested in the Minor in Materials Engineering should contact Professor Michael McNallan in the Department of Civil and Materials Engineering at mcnallan@uic.edu.

For the minor, 14–19 semester hours are required, excluding prerequisite courses. Students who wish to minor in Materials Engineering must complete the following:

Prerequisite Courses—Materials Engineering Minor	**Hours**
MATH 180—Calculus I	5
MATH 181—Calculus II	5
PHYS 141—General Physics I (Mechanics)	4
One of the following courses:	5
CHEM 112—General Chemistry I (5)	
CHEM 116—Honors General Chemistry I (5)	
Total Hours—Prerequisite Courses for Materials Engineering Minor	**19**

Required Courses[a] —Materials Engineering Minor	**Hours**
One of the following courses:	2–3
CME 260—Properties of Materials (3)	
CME 261—Materials for Manufacturing (2)	
Four courses from the following:	12–16
BIOE 460—Materials in Bioengineering (3)	
CHE 440—Non-Newtonian Fluids (3)	
CHE 494—Selected Topics in Chemical Engineering (when topic is Design of Microelectronics Processing) (1–4)	
CME 433—Fracture Mechanics and Failure Analysis I (3)	
CME 460—Crystallography and X-Ray Diffraction (4)	
CME 470—Physical and Mechanical Properties of Materials (4)	
CME 471—Thermodynamics of Materials (3)	
CME 480—Welding Metallurgy (4)	
EAES 424—X-Ray Crystallography (4)	
ECE 346—Solid State Device Theory (4)	
ECE 347—Integrated Circuit Engineering (3)	
ECE 449—Microdevices and Micromachining Technology (4)	
ME 380—Manufacturing Process Principles (3)	
PHYS 481—Modern Experimental Physics I (4)	
Total Hours—Required Courses for Minor in Materials Engineering	**14–19**

[a] *Some of these courses have prerequisites not included in the minor. Consult the Course Descriptions in the catalog or the Schedule of Classes for course prerequisites.*