

# Bachelor of Science in Engineering, BSE

## Requirements

The Bachelor of Science in Engineering (BSE) requires a minimum of 128 s.h. of credit. Students must be enrolled as a College of Engineering student for the last 30 s.h. of work toward the degree, or 45 of the last 60 s.h., or a total of 90 s.h. At the time of graduation, students must have a cumulative grade-point average of at least 2.00 in all college work used to complete degree requirements and in all UI coursework in order to be awarded the BSE.

Engineering students earn the BSE degree in one of eight undergraduate programs of study (majors): biomedical engineering, chemical engineering, civil engineering, computer science and engineering, electrical engineering, environmental engineering, industrial engineering, or mechanical engineering.

The collegiate curriculum requires all students to complete a minimum of 30 s.h. of mathematics and basic sciences; 6 s.h. of core engineering; and 19 s.h. of general education courses (including RHET:1030 Rhetoric: Writing and Communication and 15 s.h. of additional electives). Collegiate courses are typically completed early in a student's undergraduate program, thereby allowing students to change programs during the first semesters without a loss in course credit.

These foundational courses serve as prerequisites or corequisites for more advanced coursework in the major. Each major has several focus areas consisting of required and elective courses that provide students the flexibility to tailor their studies to their career interests. Each major culminates in a capstone senior design project.

## Collegiate Curriculum Requirements

All students in the College of Engineering are required to complete the following courses as part of their collegiate curriculum.

Requirements	Hours
Mathematics and Basic Sciences	30
Engineering Core	6
General Education	19

## Mathematics and Basic Sciences

Students complete a minimum of 30 s.h. in mathematics and basic sciences. Courses with the option of a laboratory component must be taken with the lab. Students should refer to the individual departmental section in the catalog for information about fulfilling the statistics course and the basic science and college-level mathematics courses for their particular BSE program.

Course #	Title	Hours
CHEM:1110	Principles of Chemistry I (with lab)	4
MATH:1550	Engineering Calculus I	4
MATH:1560	Engineering Calculus II	4
MATH:2550	Engineering Matrix Algebra	2

MATH:2560	Engineering Differential Equations	3
PHYS:1611	Introductory Physics I (with lab)	4
Basic Science or College-Level Math		6
Statistics		3

## Engineering Core

The engineering core consists of two engineering courses required by all undergraduate programs in the College of Engineering.

Course #	Title	Hours
ENGR:1100	Introduction to Engineering Problem Solving	3
ENGR:1300	Introduction to Engineering Computing	3

## General Education

Students are required to complete 19 sh. of general education courses; for more information, see General Education Component [p. 2] in this section of the catalog.

## First- and Second-Semester Plan of Study

The majority of the collegiate curriculum can be completed in the first two semesters.

### First Semester

Course #	Title	Hours
ENGR:1100	Introduction to Engineering Problem Solving	3
CHEM:1110	Principles of Chemistry I	4
MATH:1550	Engineering Calculus I	4
RHET:1030	Rhetoric: Writing and Communication	4

**Total Hours 15**

### Second Semester

Course #	Title	Hours
ENGR:1300	Introduction to Engineering Computing	3
MATH:1560	Engineering Calculus II	4
MATH:2550	Engineering Matrix Algebra	2
PHYS:1611	Introductory Physics I	4
General education or major requirement course		3-4

**Total Hours 16-17**

## Major Courses and Focus Areas

The curriculum for each BSE major is described in each of the departmental sections of the catalog. Each program has a number of focus areas that are designed to help students achieve exposure to and depth of study in an area that is complementary to their major. The focus areas enable students to gain technical skills consistent with their career goals. Moreover, these electives may contribute to earning a minor and/or certificate.

## General Education Component

The General Education Component promotes understanding of and appreciation for arts, community, culture, and learning through coursework.

Students who enter the College of Engineering with a BA or BS degree are considered to have satisfied the General Education Component.

Students who enroll in a combined degree program in the College of Engineering and with the College of Liberal Arts and Sciences or with the Tippie College of Business must complete all requirements for both degrees, including all general education requirements. Students are encouraged to complete a course for the Engineering Be Creative requirement that will satisfy a general education requirement for the second college; see the "Engineering Be Creative" section.

## General Education Areas

Students are required to complete 19 sh. of the General Education Component as outlined. Some focus areas in certain majors may recommend or require specific courses to fulfill the General Education Component. Credit may be earned by examination; consult the College of Engineering.

- Rhetoric [p. 2] (4 s.h.)
- Engineering Be Creative [p. 2] (3 s.h.)
- Cultural Perspectives, Values, and Society [p. 3] (3 s.h.)
- Approved Course Subjects [p. 3] (9 s.h.)

## Rhetoric

Course #	Title	Hours
This course:		
RHET:1030	Rhetoric: Writing and Communication	4

Transfer students should refer to the Rhetoric section of the GE CLAS Core (College of Liberal Arts and Sciences) in the catalog for information about how transfer credit may affect the Rhetoric requirement.

## Engineering Be Creative

Students must complete at least 3 s.h. selected from the following courses. Note that not all courses are offered every semester. Some courses will have sections designated for students with a major in the College of Engineering.

If a course has prerequisites listed, students wishing to take the course for the Engineering Be Creative requirement will need to request that prerequisites be waived by completing the "Request Prerequisite Special Permission" form on MyUI. This form should be completed several weeks prior to registration. Contact the College of Engineering for more information.

The following courses satisfy the Engineering Be Creative requirement.

Course #	Title	Hours
ARTS:1060	Elements of Digital Photography	3
ARTS:1510	Basic Drawing	3
ARTS:1520	Design Fundamentals	3
ARTS:2300	Hand Drawing Bicycles for Designers and Engineers	3

CERM:2010	Ceramics I: Handbuilding	3
CINE:1100	The Art of Smartphone Filmmaking	3
CINE:1150	Introduction to Screenwriting for Nonmajors	3
CINE:1834/ THTR:1834	Modes of Film and Video Production	4
CNW:1620	Introduction to Creative Nonfiction	3
CNW:2680/ ENGL:2730	The Art and Craft of Creative Nonfiction	3
CNW:2700	The Art and Craft of Personal Writing	3
CNW:2720	The Art and Craft of Writing About Culture	3
CNW:2730	The Art and Craft of Science Writing	3
CNW:2740	The Art and Craft of Writing about the Environment	3
CNW:2770	The Art and Craft of Writing for New Media	3
CNW:2780	The Art and Craft of Writing About Sports	3
CNW:2790	The Art and Craft of Humor Writing	3
CNW:2830	The Art and Craft of Immersion Journalism	3
CNW:2840	The Art and Craft of Travel Writing	3
CNW:2910	Writing for Applications and Awards	3
CNW:3632/ ENGL:3732/ WRIT:3632	Prose Style	3
CNW:3640	Writing for Business	3
CW:2100	Creative Writing	3
CW:2870	Fiction Writing	3
CW:2875	Poetry Writing	3
CW:3003	Writing and Reading Science Fiction	3
CW:3107/ INTD:3107	Creative Writing for the Health Professions	3
CW:3215/ INTD:3300	Creative Writing and Popular Culture	3
CW:3218/ INTD:3200	Creative Writing for New Media	3
CW:4745/ WRIT:4745	The Sentence: Strategies for Writing	3
CW:4751	Creative Writing for the Musician	3
CW:4760/ WRIT:4760	The Art of Revision: Rewriting Prose for Clarity and Impact	3
DANC:1150/ LAS:1150	Brazilian Culture and Carnival	3
DANC:2060	Dance and Society in Global Contexts	3
DSGN:2500	Graphic Design I	3
EDTL:4355/ CNW:4355	Approaches to Teaching Writing	3

MTLS:2910	Introduction to Jewelry and Metal Arts	3	UICB:4100/ BKAT:4100	Paperworks	3
MUS:1007	Garage Band: The Basics	2	UICB:4415/ ARTS:4415	Introduction to Classical Calligraphy	3
MUS:1012	Creativity in Music	3	WRIT:3005/ CW:3005/ INTD:3005	Professional and Creative Business Communication	3
MUS:2800/ ARTS:2800/ CINE:2800/CS:2800/ DANC:2800/ DIGA:2800/ THTR:2800	Digital Arts: An Introduction	3			
MUS:3285/ DIGA:3285	New Musical Instruments: From Design to Performance	3			
PHTO:2600	Photography I	3			
PNTG:2410	Painting I	3			
PRNT:2610	Introduction to Printmaking	3			
SCLP:2810	Undergraduate Sculpture I	3			
SCLP:3840/ DIGA:3840	Robotic Art Studio	4			
SCLP:4835/ DIGA:4835	Electronic Objects and Spaces	4			
SCLP:4840/ DIGA:4840	Air, Actuators, and Motors	4			
TDSN:2210	Introduction to 3D Design	3			
THTR:1140	Basic Acting	3			
THTR:2215	Theatre Technology	3			
THTR:2220	Production Lab	1-3			
THTR:2301	Playwriting I	3			
THTR:2610/ RHET:2610	Acting for Success	3			
THTR:2620	Improvisation for Engineers, Scientists, and the Curious	3			
THTR:2880/ DANC:2880/ DIGA:2880	Installations and Interactive Performance	3			
THTR:2890/ DANC:2890/ DIGA:2890	Producing and Directing Digital Video	3			
THTR:3202	Graphic Design for the Entertainment Industry	2-3			
THTR:3208	Mask and Puppet Crafts	3			
THTR:3210	Makeup Design for the Stage	3			
THTR:3230/ ARTS:3230	Scenic Design I	3			
THTR:3240	Costume Design I	3			
THTR:3250	Lighting Design I	3			
THTR:3260	Sound Design for the Theatre	3			
THTR:3270	Entertainment Design	3			
THTR:3876/ CINE:3876/ DANC:3876/ DIGA:3876/ INTM:3876	Projection Design	3			
THTR:4270/ ARTS:4270	Scenic Art	3			
UICB:2110/ BKAT:2110	Introduction to Book Arts	3			
UICB:3280/ BKAT:3280	Elements of Book Art	3			
UICB:3380/ BKAT:3380	Letterpress	3			

## Cultural Perspectives, Values, and Society

Students complete at least 3 s.h. from the GE CLAS Core areas of Understanding Cultural Perspectives or Values and Society.

The College of Engineering will accept transfer credit for the Cultural Perspectives, Values, and Society requirement. Students enrolled in other University of Iowa undergraduate degree programs should be aware that transfer credit may not be accepted for similar requirements in other colleges.

## Approved Course Subjects

Students complete 9 s.h. of coursework from any of the following course subjects.

## College of Law

Students may choose from University of Iowa Center for Human Rights courses (prefix HRTS); view the courses and descriptions in the corresponding College of Law section of the catalog.

## College of Liberal Arts and Sciences

Students may choose from courses in the following areas:

African American studies (prefix AFAM);  
aging and longevity studies (prefix ASP);  
American studies (prefix AMST);  
anthropology (prefix ANTH);  
art, art history, and design (prefix ARTE, ARTH, ARTS, BKAT, DSGN, DRAW, INTM, MTLS, PHTO, PNTG, PRNT, SCLP, or TDSN) with the exception of ceramics;  
cinematic arts (prefix CINE);  
classics (prefix CLSA, CLSG, or CLSL);  
communication sciences and disorders (prefix CSD);  
communication studies (prefix COMM);  
creative nonfiction writing (prefix CNW);  
creative writing (prefix CW);  
criminology, law, and justice (prefix CRIM);  
critical cultural competence (prefix CCCC);  
dance (prefix DANC);  
digital arts (prefix DIGA);  
disability studies (prefix DST);  
English (prefix ENGL);  
event planning (prefix EVNT);  
gender, women's, and sexuality studies (prefix GWSS);  
global health studies (prefix GHS);  
history (prefix HIST and JSTU);  
journalism and mass communication (prefix JMC);  
languages, linguistics, literatures, and cultures (prefix ARAB, ASIA, ASL, ASLE, CHIN, CL, FREN, GRMN, IS, ITAL, JPNS, KORE, LING, RUSS, SWAH, and WLLC, with the exception of SOAS);  
Latina/o/x studies (prefix LATS);  
medieval studies (prefix MDVL);  
museum studies (prefix MUSM);  
music (prefix MUS);  
Native American and Indigenous studies (prefix NAIS);  
philosophy (prefix PHIL);  
political science (prefix POLI);  
psychology (prefix PSY);

religious studies (prefix RELS);  
 rhetoric (prefix RHET) numbered 2000 or above;  
 social justice (prefix SJUS);  
 social work (prefix SSW);  
 sociology (prefix SOC);  
 Spanish, Portuguese, and Latin American studies (prefix LATS, PORTS, and SPAN);  
 sport and recreation management (prefix SRM);  
 sport media and culture (prefix SMC);  
 sport studies (prefix SPST);  
 theatre arts (prefix THTR);  
 therapeutic recreation (prefix TR); and  
 writing (prefix WRIT).

View the courses and descriptions in the corresponding College of Liberal Arts and Sciences section of the catalog.

## Graduate College

Students may choose from courses in urban and regional planning (prefix URP) in the School of Planning and Public Affairs; view the courses and descriptions in the corresponding Graduate College section of the catalog.

## Tippie College of Business

Students may choose from courses in economics (prefix ECON), management and entrepreneurship (prefixes ENTR and MGMT), and marketing (prefix MKTG); view the courses and descriptions in the corresponding Tippie College of Business section of the catalog.

## University College

Students may choose from courses in aerospace studies (prefix AERO), leadership studies (prefix LS), and military science (prefix MILS); view the courses and descriptions in the corresponding University College section of the catalog.

## Combined and Dual Degrees

### BSE and Undergraduate Degrees

#### BSE/BBA

The College of Engineering and the Tippie College of Business offer a combined degree program in which students earn two University of Iowa bachelor's degrees: a Bachelor of Business Administration (BBA) from the Tippie College of Business and a Bachelor of Science in Engineering (BSE) from the College of Engineering.

Students in the combined program must complete all requirements for both degrees, including all general education requirements. They must enroll in appropriate mathematics and engineering courses early in their course of study in order to complete the program in a timely way. Because courses in natural sciences, mathematics, humanities, and social sciences count toward the BBA and the BSE, students may count a single course toward both degrees.

Students usually meet the degree requirements of both colleges in about five years; the time required depends on a student's choice of major study areas. Students should consult their advisors about whether the second-grade-only option is available to them. They are assigned two advisors, one in the Tippie College of Business Undergraduate Program Office and the other in their College of Engineering major department.

To enter the combined degree program, students must have approval from both colleges and must be admitted to both colleges. Interested students should contact the Student Development Center. For information about the BBA, including

requirements for the degree, see the Undergraduate Programs (Tippie College of Business) in the catalog.

### BSE/Liberal Arts and Sciences Degree

Students may earn two University of Iowa bachelor's degrees in a combined program in the College of Engineering and the College of Liberal Arts and Sciences. Successful candidates are awarded a BSE (Bachelor of Science in Engineering) by the College of Engineering and a BA (Bachelor of Arts), BS (Bachelor of Science), BFA (Bachelor of Fine Arts), or BM (Bachelor of Music) by the College of Liberal Arts and Sciences.

Students in combined degree programs must complete all requirements for both degrees, including the College of Liberal Arts and Sciences GE CLAS Core and the College of Engineering General Education Component. Students are encouraged to complete a course for the Engineering Be Creative requirement that will also satisfy a GE CLAS Core requirement. See General Education Component [p. 2] in this section of the catalog.

Students in the combined program usually are able to meet the degree requirements of both colleges in about five academic years. The exact length of time necessary to complete the program is determined by the major areas of study selected in each college. Students who enter the combined degree program are assigned two faculty advisors, one in their major department in the College of Engineering and the other in their major department in the College of Liberal Arts and Sciences.

To enter the combined degree program, students must be admitted to both the College of Engineering and the College of Liberal Arts and Sciences and must have College of Engineering approval to enter the combined degree program. Combined degree program applicants must meet the high school course or unit requirements for admission to each of the two colleges.

It is crucial that students enroll in the proper mathematics and engineering courses early in their course of study to expedite the completion of the program. The specific engineering courses taken by each student vary according to one's engineering major. Since courses in natural sciences, mathematics, humanities, and social sciences are accepted for credit by both colleges, students may be able to count a particular course toward both degrees.

Contact the Student Development Center for information about specific requirements. To learn about liberal arts and sciences majors, visit College of Liberal Arts and Sciences in the catalog and select majors of interest in the departments.

### BS/BSE Dual Degree with Northern Iowa

The 3+2 dual degree program leads to a BS in applied physics from the University of Northern Iowa (UNI) and a BSE from the University of Iowa. It requires approximately three years of study at UNI followed by approximately two years of study at Iowa. There is no guarantee that students can complete the 3+2 degree in five years.

Students interested in the program are guaranteed admission to the University of Iowa portion of the program if they have a grade-point average of at least 3.00 (B average) in all coursework and in the chemistry, mathematics, and physics courses required by the University of Northern Iowa physics department.



During the first three years of the program, students complete at least 90 s.h. of coursework at the University of Northern Iowa. They must successfully complete courses in each of the following areas: chemistry, mathematics through differential equations, physics to satisfy the applied physics major requirements, and courses to satisfy the general education requirements. Credit for courses passed with a grade of C or higher is transferred to the University of Iowa as credit for equivalent coursework.

At the University of Iowa, students complete the BSE requirements that are current at the time of their admission to the College of Engineering. Coursework completed at the University of Iowa is transferred to the University of Northern Iowa and applied toward the requirements for that institution's BS in applied physics.

When transferring to the University of Iowa from UNI, students must submit applications for admission, housing, and financial aid to the University of Iowa by the university's established deadlines.

## **BSE and Graduate Degrees**

### **BSE/MS Programs in Engineering**

Engineering students may be eligible to enroll in one of the College of Engineering's combined BSE/MS programs, which allow students to begin working toward a master's degree in engineering while they are completing their bachelor's degree. The combined programs, which are offered by each of the college's departments, permit students to count certain courses toward both degrees, completing both programs in less time than they would need to complete them separately. See "Combined Programs" in each department's BSE sections of the catalog.

### **BSE in Biomedical Engineering (Biomechanics and Biomaterials Track)/MS in Occupational and Environmental Health (Industrial Hygiene Subprogram)**

BSE students majoring in biomedical engineering in the biomechanics and biomaterials track who are interested in earning a Master of Science in occupational and environmental health with an industrial hygiene subprogram may apply to the combined BSE/MS program offered by the College of Engineering and the College of Public Health. The combined program permits students to count a limited amount of credit toward the requirements of both degrees, enabling them to begin the study of public health before they complete the bachelor's degree. See the MS in occupational and environmental health Undergraduate to Graduate (U2G) information on the Department of Occupational and Environmental Health (College of Public Health) website.

### **BSE in Civil Engineering/MS in Urban and Regional Planning**

The College of Engineering and the School of Planning and Public Affairs offer the combined Bachelor of Science in Engineering in civil engineering/Master of Science in urban and regional planning. The program, which is completed in five years, is designed for students who wish to pursue a public or private sector career in planning, a field that encompasses the development of alternatives to improve the quality of life in cities and regions.

For additional information on the BSE in civil engineering, see that section of the catalog. For more information about the graduate degree, see the MS in urban and regional planning (Graduate College) in the catalog. Contact Engineering Student Services for information about applying to the combined program.

## **BSE in Computer Science and Engineering/MCS**

The College of Engineering and the Department of Computer Science (College of Liberal Arts and Sciences) offer a combined BSE in computer science and engineering/Master of Computer Science for computer science and engineering undergraduate students.

The combined degree program allows students to count a limited amount of credit toward both degrees. For more information, see the Master of Computer Science, MCS in the catalog.

## **Honors**

### **Honors in Engineering**

Outstanding undergraduate students who demonstrate exceptional accomplishment through research, directed independent study, teaching internships, or other approved nondegree enrichment activities may graduate with honors in engineering. They must maintain a University of Iowa grade-point average of at least 3.33, complete an honors project with a faculty member, and participate in a college-wide honors seminar with faculty members and other honors students. Successful completion of the honors requirements leads to a BSE with honors, which is noted on the student's transcript. See Engineering Honors Program on the College of Engineering website for details.

## **University of Iowa Honors Program**

In addition to honors in engineering, undergraduate students have opportunities for honors study and activities through membership in the University of Iowa Honors Program. Visit Honors at Iowa to learn about the university's honors program.

## **Career Advancement**

Engineering is a well-respected profession that is used as a foundation for a variety of careers in industry, medicine, law, government, and consulting. Engineering majors consistently rank among the top-paid majors for bachelor's degree graduates, according to the National Association of Colleges and Employers (NACE). On average, 93–98% of graduates are employed in their field of study or pursuing advanced education within seven months of graduation.

Engineering Career Services develops and promotes experiential education and professional opportunities for students in the College of Engineering. Professional staff coordinate the college's co-op and internship program, engage in employer outreach, and provide opportunities for students to network with employers, including engineering career fairs and other programming related to career development.

Engineering Career Services offers individual advising and class presentations on résumé and cover letter preparation,

job and internship search strategies, interviewing skills, job offer evaluation, and much more. Engineering Career Services partners with the Pomerantz Career Center to facilitate on-campus interviewing, postgraduation outcome collection, and the university's online recruiting system, Handshake.