INDUSTRIAL ENGINEERING, BACHELOR OF SCIENCE IN INDUSTRIAL ENGINEERING

Specific Admission Requirements Applying as an Incoming Freshman

In order to be considered for admission to the BSE or BSIE as an incoming freshman, a student must:

- Be placed into MATH 126 Calculus and Analytic Geometry I (GT-MA1) (5 c.h.), or higher.
- Have a high school GPA of 3.25 or higher on a 4.0 scale.

The number of students admitted to the BSE or the BSIE as incoming freshmen is limited. Priority is given to students with the highest GPA's and ACT/SAT scores. A student admitted as an incoming freshman may continue in the BSE or BSIE program as a sophomore if he or she completes the required first year engineering courses (EN 101 Introduction to Engineering (2 c.h.), EN 103 Problem Solving for Engineers (3 c.h.), and EN 107 Engineering Graphics (2 c.h.)) with a B or better in each course. If a student admitted as an incoming freshman does not meet the requirements to continue in the program as a sophomore, he or she is eligible to apply as a sophomore, as described below.

Applying After Completing Required First-Year Courses

A student (including a transfer student) who does not receive admission as a freshman must complete the required first year courses (EN 101 Introduction to Engineering (2 c.h.), EN 103 Problem Solving for Engineers (3 c.h.), EN 107 Engineering Graphics (2 c.h.), ENG 101 Rhetoric & Writing I (GT-CO1) (3 c.h.), ENG 102 Rhetoric & Writing II (GT-CO2) (3 c.h.), MATH 126 Calculus and Analytic Geometry I (GT-MA1) (5 c.h.), MATH 224 Calculus and Analytic Geometry II (5 c.h.), and PHYS 221 General Physics I (4 c.h.), PHYS 221L General Physics I Lab (1 c.h.)) with a grade of C or better in each course in order to be eligible to apply for admission to the BSE or BSIE as a sophomore. Admission is not guaranteed as priority is given to students with the highest GPA's.

The BSIE program has the following educational objectives and outcomes, which have been approved and are reviewed regularly by the BSIE Advisory Board.

BSIE Program Outcomes

The BSIE program is designed so that students graduate from the program with the following abilities and knowledge:

1. An ability to apply knowledge of mathematics, science, and engineering;
2. An ability to design and conduct experiments, as well as to analyze and interpret data;
3. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
4. An ability to function on multi-disciplinary teams;
5. An ability to identify, formulate, and solve engineering problems;
6. An understanding of professional and ethical responsibility;
7. An ability to communicate effectively;
8. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
9. A recognition of the need for, and an ability to engage in life-long learning;
10. A knowledge of contemporary issues; and
11. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

BSIE Educational Objectives

During the first few years after graduation, BSIE graduates should be able to:

- Identify root causes of symptoms and fix problems in situations where data and resources may be lacking and multiple problems may exist;
- Function well on teams of engineers with different skill levels;
- Obtain jobs of increasing responsibility applying industrial engineering skills and knowledge to a wide range of problems in a wide range of industries;
- Continue their education, for example, in MS, PhD, and MBA programs;
- Obtain additional certifications, such as Professional Engineer, Six Sigma Black Belt, Certified Manufacturing Engineer, or Railroad Engineering; and
- Achieve management positions.

Outcomes Assessment Activities

The BSE and BSIE programs and the courses in each program are designed to support the Program Outcomes listed for each degree. Each program has an Advisory Board that meets annually and the input from those Boards is used to revise the programs. The Department also uses the following assessment activities:

- During the final term of study, all engineering students are required to demonstrate their ability to apply and integrate the skills and knowledge learned in the program by producing a capstone engineering design project. This project must incorporate subject material covered in two or more courses in the student's major, involve knowledge or skill not learned in a class thus demonstrating the student's ability to engage in life long learning, involve reflection on the impact of the proposed solution in a global and societal context, and be presented in written and oral reports to demonstrate the student's communication skills.
- All senior engineering studies are encouraged to take the Fundamentals of Engineering (FE) exam administered by the Colorado State Board of Registration for Professional Engineers. The Department periodically sets goals for and reviews the section-by-section performance of students on the FE. The results are used to identify areas of the curriculum that may need improvement.

Specific Program Requirements

Students are required to have earned a cumulative GPA of 2.000 or better in required EN courses.

Course	Title	Credits
Required EN Courses		
EN 101	Introduction to Engineering	2
EN 103	Problem Solving for Engineers	3
EN 107	Engineering Graphics	2
EN 211	Engineering Mechanics I	3
EN 212	Engineering Mechanics II	3
EN 215	Introduction to Industrial and Systems Engineering	3
EN 231 & 231L	Circuit Analysis I and Circuit Analysis I Lab	5
EN 321	Thermodynamics	3
EN 324 & 324L	Materials Science and Engineering and Materials Science and Engineering Lab	4
EN 343	Engineering Economy	3
EN 375	Stochastic Systems Engineering	3
EN 420	Simulation Experiments	4
EN 430	Project Planning and Control	3
EN 439	Time and Motion Studies	2
EN 440	Safety Engineering	3
EN 441 & 441L	Engineering of Manufacturing Processes and Engineering & Manufacturing Proc Lab	4
EN 443	Quality Control and Reliability	3
EN 471	Operations Research	3
EN 473 & 473L	Computer Integrated Manufacturing and Computer Integrated Mfg Lab	3
EN 475	Facility Planning and Design	3
EN 477	Operations Planning and Control	3
EN 486	Senior Seminar	2
EN 488	Industrial Engineering Design	3
Other Required Courses		
MATH 126	Calculus and Analytic Geometry I (GT-MA1)	5
MATH 207	Matrix and Vector Algebra with Applications	3
MATH 224	Calculus and Analytic Geometry II	5
MATH 337	Differential Equations I	3
PHYS 221 & 221L	General Physics I and General Physics I Lab	5
PHYS 222 & 222L	General Physics II and General Physics II Lab (GT-SC1)	5
ENG 101	Rhetoric & Writing I (GT-CO1)	3
ENG 102	Rhetoric & Writing II (GT-CO2)	3
CID 103	Speaking & Listening	3
General Education		15
Math/Science Electives		3
Technical Electives [1]		3
Total Credits		**126**

[1] Technical electives must be chosen from an approved list or have the approval of an Engineering adviser.

Planning Sheet

Disclaimer: The Planning Sheet is designed as a guide for student's planning their course selections. The information on this page provides only a suggested schedule. Actual course selections should be made with the advice and consent of an academic advisor. While accurately portraying the information contained in the college catalog, this form is not considered a legal substitute for that document. Students should become familiar with the catalog in effect at the time in which they entered the institution.

Course	Title	Credits
Year 1		
Fall		
EN 101	Introduction to Engineering	2
EN 103	Problem Solving for Engineers	3
ENG 101	Rhetoric & Writing I (GT-CO1)	3
MATH 126	Calculus and Analytic Geometry I (GT-MA1)	5
General Education		3
	Credits	**16**
Spring		
EN 107	Engineering Graphics	2
ENG 102	Rhetoric & Writing II (GT-CO2)	3
MATH 224	Calculus and Analytic Geometry II	5
PHYS 221	General Physics I	4
PHYS 221L	General Physics I Lab	1
	Credits	**15**
Year 2		
Fall		
EN 211	Engineering Mechanics I	3
EN 231	Circuit Analysis I	4
EN 231L	Circuit Analysis I Lab	1
EN 215	Introduction to Industrial and Systems Engineering	3
MATH 207	Matrix and Vector Algebra with Applications	3
PHYS 222	General Physics II	4
PHYS 222L	General Physics II Lab (GT-SC1)	1
	Credits	**19**
Spring		
MATH 337	Differential Equations I	3
EN 212	Engineering Mechanics II	3
EN 324	Materials Science and Engineering	3
EN 324L	Materials Science and Engineering Lab	1
CID 103	Speaking & Listening	3
General Education		3
	Credits	**16**
Year 3		
Fall		
EN 321	Thermodynamics	3
EN 343	Engineering Economy	3
EN 375	Stochastic Systems Engineering	3
EN 439	Time and Motion Studies	2
EN 471	Operations Research	3
	Credits	**14**
Spring		
EN 420	Simulation Experiments	4
EN 441	Engineering of Manufacturing Processes	3
EN 441L	Engineering & Manufacturing Proc Lab	1
EN 443	Quality Control and Reliability	3
General Education		3
Math/Science Elective		3
	Credits	**17**
Year 4		
Fall		
EN 440	Safety Engineering	3
EN 473	Computer Integrated Manufacturing	2
EN 473L	Computer Integrated Mfg Lab	1
EN 475	Facility Planning and Design	3

EN 486	Senior Seminar	2
General Education		3
	Credits	**14**
Spring		
EN 430	Project Planning and Control	3
EN 477	Operations Planning and Control	3
EN 488	Industrial Engineering Design	3
General Education		3
Technical Elective		3
	Credits	**15**
	Total Credits	**126**