Engineering Design

Degree Offered	Bachelor of Science in Engineering
Accreditation	The Bachelor of Science in Engineering degree in Engineering Design will seek accreditation from the Engineering Accreditation Commission of ABET as soon as it is eligible to do so.
Website	https://www.uab.edu/engineering/home/undergraduate/engineering-design-major
Program Director	Timothy M. Wick, PhD
Email	tmwick@uab.edu
Phone	(205) 934-8400

The School of Engineering offers undergraduates a unique opportunity to earn an engineering degree tailored to their interests with an emphasis on innovation and design with the Bachelor of Science in Engineering degree in Engineering Design (BSEED). The program includes a 15-hour engineering design, innovation, and product development core and incorporates hands-on, project-based experiences throughout a curriculum to help students develop and practice these skills. The program is intended for students whose academic/scientific interests are not necessarily aligned with an existing engineering discipline or limited to one engineering discipline offered at UAB. The ideal student will be highly adaptable, prepared to work in interdisciplinary teams, and adept at hands-on learning.

In addition to the Blazer Core, the program is based on a strong foundation of mathematics, physical sciences, and core engineering courses. In order to complete the degree requirements, students in the program will choose from a list of approved engineering minors in consultation with their advisor and in consideration of their career goals. The program allows a maximum of 18 hours of general elective credit, which can be used to complete an additional minor or a certificate in Engineering or another program, School, or College at UAB. Academic and career advising are provided within the School of Engineering to help students clarify and achieve their goals.

Qualified, motivated undergraduate students may be eligible for participation in the engineering honors program.

Please refer to the School of Engineering overview for policies regarding admission; change of major; transfer credit; transient status; dual degree programs; reasonable progress; academic warning, probation, and suspension; and graduation requirements.

Program Educational Objectives

The Educational Objectives of the Engineering Design undergraduate program are the following:

1. Achieve one or both of the following:
   a. establish careers in engineering or other professional fields in which they apply their critical thinking and problem-solving skills.
   b. earn or be enrolled in a graduate or professional degree program.
2. Pursue opportunities for professional growth, development, and service.
3. Contribute to the advancement of society.

Student Outcomes

Upon completion of the BSE degree program, graduates will have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Experiential Learning

The BSEED program encourages students to participate in experiential learning opportunities, such as industry co-ops, engineering internships, extracurricular engineering activities, and undergraduate research. These opportunities enhance a student's education and provide the real-world experience employers are seeking. The School of Engineering assists students in pursuing these opportunities.

Students in the program will choose from a list of approved minors.

Requirements		Hours
Blazer Core Requirements		**43**
CH 115 & 115R & CH 116	General Chemistry I and General Chemistry I Recitation and General Chemistry I Laboratory [a]	
EGR 103	Computer Aided Graphics and Design	
EGR 200	Introduction to Engineering [1]	
EH 101	English Composition I [b]	
EH 102	English Composition II [b]	
MA 125 & 125L	Calculus I and Calculus I Lab [c]	
PH 221 & 221L & 221R	General Physics I and General Physics Laboratory I and General Physics I Recitation [a]	
PH 222 & PH 221L & PH 221R	General Physics II and General Physics Laboratory I and General Physics I Recitation [a]	
Academic Foundations: Reasoning		
Thinking Broadly: History & Meaning		
Thinking Broadly: Creative Arts		
Thinking Broadly: Human & Their Societies		
City as a Classroom [2]		
Additional Requirements		**85**
CE 210	Statics	
CE 220	Mechanics of Solids	

CH 117 & 117R & CH 118	General Chemistry II and General Chemistry II Recitation and General Chemistry II Laboratory
EE 312	Electrical Systems [3]
or EE 314	Electrical Circuits
EGR 117	Engineering Design & Innovation I: Design Thinking [d]
EGR 150	Computer Methods in Engineering
EGR 217	Engineering Design & Innovation II: Prototyping
EGR 265	Math Tools for Engineering Problem Solving [3]
EGR 317	Engineering Design & Innovation III: Project Implementation
EGR 498	Capstone Design I [5]
EGR 499	Capstone Design II
MA 126	Calculus II
MA 260	Introduction to Linear Algebra
ME 215 & 215R	Dynamics and Dynamics Recitation
MSE 280	Engineering Materials
Engineering Coursework [6]	
Engineering Coursework [6]	
Math/Science Elective [8]	
Total Hours	**128**

[1] EGR 200 preferred; other FYE courses accepted
[2] CE 280 preferred; other CAC courses accepted
[3] Students wishing to pursue an Electrical Engineering minor must successfully complete EE 314
[4] May substitute MA 227 and MA 252 for EGR 265 and one approved MA/SCI elective
[5] Students minoring in Civil Engineering will choose one of the following to fulfill this requirement: CE 430, CE 450, CE 453, CE 455, CE 456, CE 468
[6] The student should choose courses to complete their required minor; the following courses do not fulfill this requirement: CE 200, CE 344, EE 254, EE 300, EE 318, EE 485, ME 364, or any engineering course accepted as part of the Blazer Core
[7] Could be used to complete an additional minor or certificate
[8] Math/Science Elective Options, excluding courses already required for the degree or an approved course for any section of Blazer Core except those approved for Scientific Inquiry or Quantitative Literacy:

- Any Biology (BY) course numbered 108 or above
- Any Chemistry (CH) courses numbered 200 or above
- MA 313 Patterns, Functions and Algebraic Reasoning
- MA 360 Scientific Programming
- MA 361 Mathematical Modeling
- Any Mathematics (MA) courses numbered 434 or above
- Any Physics (PH) courses numbered 223 or above
- NBL 230 Brain Science: Biology, Disorders, and Clinical Therapies

a Satisfies Blazer Core: Scientific Inquiry
b Satisfies Blazer Core: Writing
c Satisfies Blazer Core: Quantitative Literacy
d Satisfies Blazer Core: Communicating in the Modern World

Residency Requirement

In addition to UAB's residency requirement, to earn a Bachelor of Science in Engineering degree in Engineering Design from UAB, a student must complete the following courses at UAB:

Requirements		Hours
EGR 217	Engineering Design & Innovation II: Prototyping	3
EGR 317	Engineering Design & Innovation III: Project Implementation	3
EGR 498	Capstone Design I [1]	3
EGR 499	Capstone Design II	3
Minor Courses (at least 3 hours at the 400 level)		6
Total Hours		**18**

[1] Students minoring in Civil Engineering will choose one of the following to fulfill this requirement: CE 430, CE 450, CE 453, CE 455, CE 456, CE 468

Freshman

First Term	Hours	Second Term	Hours
CH 115 & CH 116[a]	4	CH 117 & CH 118	4
EGR 200[1]	3	EGR 103[c]	3
EH 101[b]	3	EGR 117[c]	3
MA 125 & 125L[d]	4	EGR 194	1
		MA 126	4
	14		**15**

Sophomore

First Term	Hours	Second Term	Hours
EGR 150	3	CE 210	3
EGR 265[2]	4	EE 312 or 314[3]	3
EH 102[b]	3	MA 260	3
EGR 217	3	MSE 280	3
PH 221 & 221L & 221R[a]	4	PH 222 & 222L & 222R[a]	4
	17		**16**

Junior

First Term	Hours	Second Term	Hours
CE 220	3	EGR 317	3
ME 215	3	BME/CE/EE/EGR/ ME/MSE[5]	3
BME/CE/EE/EGR/ ME/MSE[5]	3	Elective/Certificate Course[6]	3
BME/CE/EE/EGR/ ME/MSE[5]	3	Blazer Core: Reasoning[3]	3
Elective/Certificate Course[6]	3	Blazer Core: Creative Arts[3]	3
MA/SCI Elective[2,7]	3		
	18		**15**

Senior

First Term	Hours	Second Term	Hours
EGR 498[4]	3	EGR 499	3
BME/CE/EE/EGR/ ME/MSE[5]	3	Elective/Certificate Course[6]	3
BME/CE/EE/EGR/ ME/MSE[5]	3	Elective/Certificate Course[6]	3
Elective/Certificate Course[6]	3	Elective/Certificate Course[6]	3
Blazer Core: City as a Classroom[e]	3	Blazer Core: History & Meaning[3]	3

Blazer Core: Humans & Their Societies[3]	3	
	18	**15**

Total credit hours: 128

1 EGR 200 preferred; other FYE courses accepted

2 May substitute MA 227 and MA 252 for EGR 265 and one approved Math/Science elective

3 Students wishing to pursue an Electrical Engineering minor must successfully complete EE 314

4 The following courses do not fulfill this requirement: CE 200, CE 344, EE 254, EE 300, EE 318, EE 485, ME 364, or any engineering course accepted as part of the Blazer Core

5 Could be used to complete an additional minor or certificate

6 Math/Science Elective Options, excluding courses already required for the degree or an approved course for any section of Blazer Core except those approved for Scientific Inquiry or Quantitative Literacy:

- Any Biology (BY) course numbered 108 or above
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- NBL 230 Brain Science: Biology, Disorders, and Clinical Therapies

7 Students minoring in Civil Engineering will choose one of the following to fulfill this requirement: CE 430, CE 450, CE 453, CE 455, CE 456, CE 468

a Satisfies Blazer Core: Scientific Inquiry

b Satisfies Blazer Core: Writing

c Satisfies Blazer Core: Communicating in a Modern World

d Satisfies Blazer Core: Quantitative Literacy

e CE 280 preferred; other CAC courses accepted