Electrical and Computer Engineering

Chair: Leon Jololian, PhD

Degree Offered	Bachelor of Science in Electrical and Computer Engineering
Accreditation	The Bachelor of Science in Electrical Engineering degree program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s) and Similarly Named Engineering Programs.
Website	https://www.uab.edu/engineering/ece/undergrad
Program Co-Directors	Jon R. Marstrander, PhD and Seyedabdollah Mirbozorgi, PhD
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The Department of Electrical and Computer Engineering offers a bachelor's degree in electrical and computer engineering (BSECE), which provides the foundation for students to succeed in any of the areas of electrical or computer engineering, including electronics, biomedical instrumentation, digital computer systems, software systems, power systems, digital control, signal processing, and data analysis.

In addition to the Blazer Core, the program includes a strong foundation in mathematics and physical sciences including calculus-based physics, a core of courses in the breadth of Electrical and Computer Engineering, Electrical and Computer Engineering electives, and courses from other engineering disciplines.

Each student must complete a senior design team project that comprises six semester hours of coursework (EE 498 Team Design Project I and EE 499 Team Design Project II).

Vision

To be a nationally recognized Department of Electrical and Computer Engineering: the first choice for undergraduate and graduate education.

Mission

To prepare graduates to be immediately productive and able to adapt to a rapidly changing environment while also creating and applying knowledge for the benefit of Birmingham, the state, and beyond.

Program Educational Objectives

The Electrical and Computer Engineering undergraduate program prepares graduates to:

1. Succeed in a career or graduate studies in Electrical and Computer Engineering
2. Approach problem solving with an engineering mindset
3. Grow professionally

Student Outcomes

Upon completion of the BSECE degree program, our 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.

Bachelor of Science in Electrical and Computer Engineering

Requirements		Hours
Blazer Core Requirements		**43**
CH 115 & 115R & CH 116	General Chemistry I and General Chemistry I Recitation and General Chemistry I Laboratory	
EH 101	English Composition I	
EH 102	English Composition II	
EGR 103	Computer Aided Graphics and Design	
EGR 200	Introduction to Engineering [1]	
MA 125 & 125L	Calculus I and Calculus I Lab	
PH 221 & 221L & 221R	General Physics I and General Physics Laboratory I and General Physics I Recitation	
PH 222 & 222L & 222R	General Physics II and General Physics Laboratory II and General Physics II - Recitation	
Academic Foundations: Reasoning		
Thinking Broadly: History & Meaning		
Thinking Broadly: Creative Arts		
Thinking Broadly: Humans & Their Societies		
City as a Classroom [2]		
Other Required Courses		**67**
EE 210	Digital Logic	
EE 233	Engineering Programming Methods	
EE 254	Applied Numerical Methods [3]	
EE 300	Engineering Problem Solving II	
EE 314 & 314R	Electrical Circuits and Electrical Circuits Recitation	

EE 316 & 316L	Electrical Networks and Electrical Networks Laboratory	
EE 318	Signals and Systems	
EE 333	Engineering Programming Using Objects	
EE 337 & 337L	Introduction to Microprocessors and Introduction to Microprocessors Laboratory	
EE 341	Electromagnetics	
EE 351 & 351L	Electronics and Electronics Laboratory	
EE 421	Communication Systems	
EE 426	Control Systems	
EE 431	Analog Integrated Electronics	
EE 485	Engineering Operations	
EE 498	Team Design Project I	
EE 499	Team Design Project II	
EGR 150	Computer Methods in Engineering	
EGR 194	Engineering Explorations	
EGR 265	Math Tools for Engineering Problem Solving [3]	
MA 126	Calculus II	
Engineering Electives [4]		**18**
Select six courses from the following:		
CE 210	Statics	
EE 250	Engineering Problem Solving I	
EE 361 & 361L	Machinery I and Machinery I Laboratory	
EE 412	Practical Computer Vision	
EE 418	Wireless Communications	
EE 423	Digital Signal Processing	
EE 427	Industrial Control	
EE 432	Introduction to Computer Networking	
EE 433	Engineering Software Solutions	
EE 434	Power Semiconductor Electronics	
EE 437	Introduction to Embedded Systems	
EE 438	Computer Architecture	
EE 444	Real-Time Process & Protocols	
EE 447	Internet/Intranet Application Development	
EE 448	Software Engineering Projects	
EE 452	Digital Systems Design	
EE 458	Medical Instrumentation	
EE 461	Machinery II	
EE 463	Medical Image Analysis	
EE 467	Brain Machine Interface	
EE 471	Power Systems I	
EE 472	Power Systems II	
EE 473	Protective Relaying of Power Systems	
EE 489	Undergraduate Engineering Research	
ME 251	Introduction to Thermal Sciences	
Total Hours		**128**

1 EGR 200 preferred; other FYE courses accepted
2 CE 280 preferred; other CAC courses accepted
3 May substitute MA 227 and MA 252 for EGR 265 and EE 254
4 Any graduate-level EE courses can be taken as electives with permission of the Undergraduate Program Director and approval of UAB Graduate School

Residency Requirement

In addition to UAB's residency requirement, to earn a Bachelor of Science in Electrical and Computer Engineering from UAB, the ECE department requires that students complete the following courses at UAB:

Requirements		Hours
EE 421	Communication Systems	3
EE 426	Control Systems	3
EE 431	Analog Integrated Electronics	4
EE 498	Team Design Project I	3
EE 499	Team Design Project II	3
Nine hours of EE 400-level electives		9
Total Hours		**25**

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; reinstatement appeals; and graduation requirements.

Curriculum for the Bachelor of Science in Electrical and Computer Engineering (BSECE)

Freshman

First Term	Hours	Second Term	Hours
CH 115 & 115R & CH 116^	4	EE 210	3
EGR 200[1]	3	EGR 150	3
EH 101%	3	EGR 194	1
MA 125 & 125L*	4	EH 102	3
EGR 103	3	MA 126	4
		PH 221 & 221L & 221R^	4
	17		**18**

Sophomore

First Term	Hours	Second Term	Hours
EE 233	3	EE 254[2]	3
EE 314 & 314R	3	EE 316 & 316L	4
EGR 265[2]	4	EE 333	3
PH 222 & 222L & 222R^	4	EE 300	3
Blazer Core: Creative Arts[3]	3	Blazer Core: Reasoning[3]	3
	17		**16**

Junior

First Term	Hours	Second Term	Hours
EE 341	3	EE 337 & 337L	4
EE 318	3	EE 431	4
EE 351 & 351L	4	EE 421	3
EE 485	3	Blazer Core: Humans and Societies[3]	3

Blazer Core: City as a Classroom[$]	3		
	16		**14**

Senior

First Term	Hours	Second Term	Hours
EE 426	3	EE 499	3
EE 498	3	Electrical Engineering Elective[4]	9
Electrical Engineering Elective[4]	9	Blazer Core: History & Meaning[3]	3
	15		**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 EE 254
[3] Refer to the Blazer Core as specified for engineering majors
[4] Must be chosen from the approved list of electives
^ Satisfies Blazer Core: Scientific Inquiry
% Satisfies Blazer Core: Writing
# Satisfies Blazer Core: Communicating in the Modern World
* Satisfies Blazer Core: Quantitative Literacy
$ CE 280 preferred; other CAC courses accepted