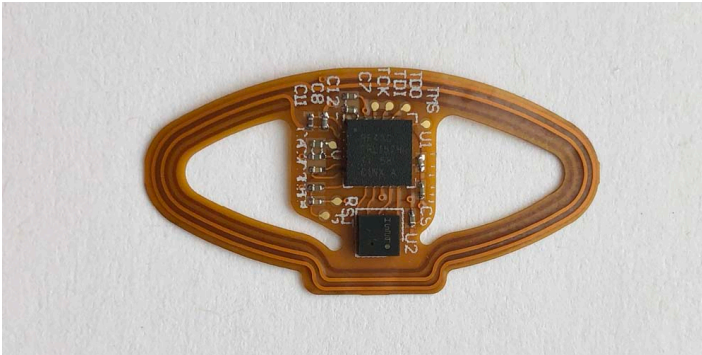# ELECTRICAL ENGINEERING (BS)

This program was approved for students entering the university in the Summer 2025-Spring 2026 catalog year. For more information about catalog year, go to Catalog Year Information (https://catalog.louisville.edu/undergraduate/university-wide-unit-specific-policies/catalog-year/).

Bachelor of Science in Electrical Engineering
Unit: Speed School of Engineering (https://engineering.louisville.edu/) (SS)
Department: Electrical & Computer Engineering (http://engineering.louisville.edu/electrical/)
Academic Plan Code(s): EE_ _BEE

Program Information

The Bachelor of Science in Electrical Engineering degree program is accredited by the Engineering Accreditation Commission (EAC) of ABET, https://www.abet.org (https://www.abet.org/), under the Commission's General Criteria and the Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs.

The BSEE degree program offers the option to incorporate a minor in Computer Engineering (https://catalog.louisville.edu/undergraduate/minors/computer-engineering-minor/) (through the CSE Department) for students wishing to obtain a stronger background in software. This minor does not require taking any additional courses beyond the 123 hours required for the BSEE degree.

The BSEE degree program also offers the option to incorporate a new minor in STEM entrepreneurship (https://catalog.louisville.edu/undergraduate/minors/entrepreneurship-stem-minor/). Students will receive 9 hours of credit from the ECE flight plan towards this 18 hour minor.

Students who graduate from ABET-accredited programs are authorized to sit for the Fundamentals of Engineering (FE) exam, and are encouraged to do so. Completion of the FE Exam is not required for any of the Engineering School's degree programs. The FE Exam is a multiple-choice test, administered by the National Council of Examiners for Engineering and Surveying (NCEES). Passing the FE exam is the first step to becoming licensed as a Professional Engineer. Engineers who have successfully passed the FE exam are considered "Engineers in Training (EIT)". Once an EIT has accumulated four years of acceptable work experience in their field of engineering, they are then able to sit for

the Principles and Practice of Engineering (PE) exam, in order to become a professionally licensed engineer. The PE exams go beyond testing academic knowledge and require knowledge gained in engineering practice. The requirement to accumulate work experience before taking a PE exam means that the program is not designed to prepare students for immediate licensure.

Degree Summary

Code	Title	Hours
General Education Requirements (https://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]		31
(19 hours of General Education requirements may be satisfied through coursework required by the degree program)		
College/School Requirements [1]		35
Program/Major Requirements		50
Supporting Courses		26
Minimum Total Hours		**123**

[1] Some courses required in this degree program satisfy multiple requirements. To complete the degree **in the minimum number of hours listed**, some hours from the General Education Requirements must be satisfied by courses defined by the unit and/or program. Using other courses to satisfy General Education requirements will require additional hours to complete the degree requirements. See the Degree Requirements and/or Track tabs for specific coursework.

Specific coursework information can be found on the Degree Requirements tab.

Incoming Student Admission Criteria

High School Curriculum Requirements: All schools require graduation from an accredited high school and completion of the Kentucky Pre-College Curriculum requirements. In addition, Speed School requires successful completion of the following courses in high school:

- Calculus or pre-calculus
- Chemistry

Students with ACT / SAT Scores

- ACT composite and math scores of 25 OR SAT combined CR+M score of 1200 and math score of 590. A 3.0 GPA on a 4.0 scale

OR

- ACT composite and math scores of 24 OR SAT combined CR+M score of 1160 and math score of 570. A 3.5 GPA on a 4.0 scale

Students without ACT / SAT Scores

- HS GPA of 3.0 (or better) on a 4.0 scale
- Comprehensive transcript evaluation
- Review of Student Resume

Transferring to Engineering BS degree programs

Students with 24 hours or more transferable semester hours will have a minimum college grade point average of 2.8 and at least B-minus grades in each of the following courses: ENGR 181 (or equivalent) OR MATH 190 (or equivalent) and Intro to Chemistry (CHEM 101 or equivalent).

It is recommended students successfully complete Physics I (PHYS 298 or equivalent) before transferring to the J.B. Speed School of Engineering.

General Education Requirements

Code	Title	Hours
General Education Requirements (https://catalog.louisville.edu/undergraduate/general-education-requirements/)		31
The following courses are required by the program and satisfy the respective General Education Requirement(s):		
CHEM 201	General Chemistry I - S (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	
CHEM 207	Introduction to Chemical Analysis I - SL (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	
COMM 111	Introduction to Public Speaking - OC (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	
or COMM 112	Business and Professional Speaking - OC (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	
ENGL 101	Introduction to College Writing - WC (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	
ENGL 102	Intermediate College Writing - WC (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	
ENGR 101	Engineering Analysis I - QR (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	
PHYS 298	Introductory Mechanics, Heat and Sound - S (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	

All degrees require the completion of the University-wide General Education Program (link provided above). To complete the degree in the minimum number of hours listed on the Overview tab, some hours from the General Education Requirements must be satisfied by courses defined by the unit and/or program. Using other courses to satisfy General Education requirements will require additional hours to complete the degree requirements

College/School Requirements

Code	Title	Hours
Speed School Core [1]		
CHEM 201	General Chemistry I - S (https://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	3

Code	Title	Hours
CHEM 207	Introduction to Chemical Analysis I - SL (https://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	1
COMM 111	Introduction to Public Speaking - OC (https://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	3
or COMM 112	Business and Professional Speaking - OC (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	
ENGL 101	Introduction to College Writing - WC (https://catalog.louisville.edu/undergraduate/general-education-requirements/) [1, 2]	3
ENGL 102	Intermediate College Writing - WC (https://catalog.louisville.edu/undergraduate/general-education-requirements/) [1, 2]	3
ENGR 101	Engineering Analysis I - QR (https://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	4
ENGR 102	Engineering Analysis II	4
ENGR 110	Engineering Methods, Tools, and Practice I	2
ENGR 111	Engineering Methods, Tools and Practice ll	2
ENGR 201	Engineering Analysis III	4
ENGR 205	Differential Equations for Engineering	2
PHYS 298	Introductory Mechanics, Heat and Sound - S (https://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	4
Minimum Total Hours		**35**

Program/Major Requirements

Code	Title	Hours
Electrical and Computer Engineering Department Requirements		
ECE 220	Network Analysis I	3
ECE 221	Network Analysis I Laboratory	1
ECE 288	Electrical & Computer Engineering Cooperative Education Seminar	0
ECE 289	Electrical & Computer Engineering Cooperative Education I	1
ECE 320	Network Analysis II	3
ECE 322	Introduction to ECE Computing Tools	1
ECE 333	Electronics I	3
ECE 334	Electronics I Lab	1
ECE 360	Probabilistic Methods in Electrical and Computer Engineering	3
ECE 389	Electrical & Computer Engineering Cooperative Education II	1
ECE/CSE 412	Introduction to Embedded Systems	3
ECE 420	Signals and Linear Systems	3
ECE 473	Introduction to Electromagnetic Fields and Waves	3
ECE 489	Electrical and Computer Engineering Cooperative Education III	1
ECE 496	Professional Issues and Current Topics Seminar	2
ECE 497	Capstone Design in ECE - CUE (https://catalog.louisville.edu/undergraduate/general-education-requirements/) (CUE)	3
ECE Elective Lecture & Lab. Select two of the following pairs:		8

ECE 510 & ECE 511	Computer Design Computer Design Laboratory	
ECE 515 & ECE 514	Introduction to VLSI Systems Introduction to VLSI Systems Laboratory	
ECE 516	Microcomputer Design	
CSE 525	Microcomputer Design	
ECE 520 & ECE 521	Digital Signal Processing Digital Signal Processing Laboratory	
ECE 533 & ECE 534	Integrated Circuit Design Integrated Circuit Design Laboratory	
ECE 543 & ECE 544	Fundamentals of Microfabrication and MEMS Microfabrications/MEMS Laboratory	
ECE 550 & ECE 551	Communication and Modulation Communication Systems Laboratory	
ECE 555 & ECE 556	Digital Image Processing Digital Image Processing Laboratory	
ECE 560 & ECE 561	Control Systems Principles Control Systems Laboratory	
ECE 564 & ECE 565	Fundamentals of Autonomous Robots Fundamentals of Autonomous Robots Lab	
Select two ECE Electives at the 500 level from the following:		6
ECE 500	Special Topics in Electrical Engineering	
ECE 510 & ECE 511	Computer Design Computer Design Laboratory	
ECE 515 & ECE 514	Introduction to VLSI Systems Introduction to VLSI Systems Laboratory	
ECE 516	Microcomputer Design	
ECE 518	Fundamentals of Computer Communications and Networks	
ECE 520 & ECE 521	Digital Signal Processing Digital Signal Processing Laboratory	
ECE 523	Introduction to Biometrics	
ECE 526	LabVIEW for Electrical Engineers	
ECE 530	Introduction to Random Processes and Estimation Theory	
ECE 531	Power Electronics	
ECE 533 & ECE 534	Integrated Circuit Design Integrated Circuit Design Laboratory	
ECE 542	Semiconductor Device Fundamentals	
ECE 543 & ECE 544	Fundamentals of Microfabrication and MEMS Microfabrications/MEMS Laboratory	
ECE 545	Optical Signal Processing	
ECE 550 & ECE 551	Communication and Modulation Communication Systems Laboratory	
ECE 555 & ECE 556	Digital Image Processing Digital Image Processing Laboratory	
ECE 560 & ECE 561	Control Systems Principles Control Systems Laboratory	
ECE 564 & ECE 565	Fundamentals of Autonomous Robots Fundamentals of Autonomous Robots Lab	
ECE 569	Intermediate Electromagnetic Fields and Waves	
ECE 581	Electric Machines and Drives	
ECE 582	Power System Analysis	
ECE 593	Independent Study in Electrical Engineering	

CSE 516	Fundamentals of Computer Communications and Networks	
CSE 525	Microcomputer Design	
Electrical and Computer Engineering Core		
ECE 210	Logic Design	3
ECE 211	Logic Design Laboratory	1
Minimum Total Hours		**50**

Code	Title	Hours
Supporting Courses		
CSE 130	Introduction to C and C++ Programming Languages	3
ISE 370	Engineering Economic Analysis	3
ENGR 330	Linear Algebra for Engineering	2
PHYS 295	Introductory Laboratories I - SL (https:// catalog.louisville.edu/undergraduate/general- education-requirements/)	1
PHYS 296	Introductory Laboratories II - SL (https:// catalog.louisville.edu/undergraduate/general- education-requirements/)	1
PHYS 299	Introductory Electricity, Magnetism and Light	4
Select one CSE/Mathematics/Science Elective from the following: [3]		3
BIOL 240	Unity of Life - S (https://catalog.louisville.edu/ undergraduate/general-education-requirements/)	
BIOL 242	Diversity of Life - S (https://catalog.louisville.edu/ undergraduate/general-education-requirements/)	
BIOL 263	Environmental Biology - B (https:// catalog.louisville.edu/undergraduate/general- education-requirements/)	
CSE 220	Object Oriented Program Design with Java	
CSE 302	Data Structures	
CSE 310	Discrete Structures	
CSE 420	Design of Operating Systems	
CHEM 202	General Chemistry II - S (https:// catalog.louisville.edu/undergraduate/general- education-requirements/)	
PHYS 220	Introduction to Weather and Climate - S (https:// catalog.louisville.edu/undergraduate/general- education-requirements/)	
or ENVS 220	Introduction to Weather and Climate - S (https:// catalog.louisville.edu/undergraduate/general- education-requirements/)	
ENVS 301	Geology for Scientists and Engineers	
MATH 311	Introduction to Higher Math	
MATH 387	Discrete Mathematics	
MATH 501	Introduction to Analysis I - CUE (https:// catalog.louisville.edu/undergraduate/general- education-requirements/)	
MATH 507	Fourier Analysis	
MATH 581	Introduction to Graph Theory	
PHYS 300	Introductory Modern Physics	
PHYS 307	Introductory Stellar Astrophysics	
PHYS 355	Optics	
PHYS 361	Thermodynamic Meteorology	
PHYS 460	Mechanics	

Select one Engineering Science Elective from the following: [3] 3

CSE 220	Object Oriented Program Design with Java
CSE 302	Data Structures
CSE 310	Discrete Structures
CSE 420	Design of Operating Systems
CEE 205	Mechanics I: Statics
CHE 253	Materials Science
ISE 446	Operations Research Methods
ME 206	Mechanics II: Dynamics
ME 251	Thermodynamics I

Select two additional courses from either the CSE/Mathematics/Science Electives list, or the ECE Electives List [3] 6

Minimum Total Hours **26**

Candidates for the Bachelor of Science degree must be in Good Standing (university GPA ≥ 2.25) and must attain a grade point average of at least 2.25 for all courses used to satisfy degree requirements.

Code	Title	Hours
Culminating Undergraduate Experience (Graduation requirement)		
Requirement fulfilled by completing:		
ECE 497	Capstone Design in ECE - CUE (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	

[1] This course is a General Education requirement for the program; see louisville.edu/provost/ger/ (http://www.louisville.edu/provost/ger/) for the listing, by academic year, of AH/P1/P2/SB/SBH Electives which satisfy the University-wide General Education requirements. Note that the 12-hour total for the AH/P1/P2/SB/SBH electives assumes the use of double counting of P1/P2 with another category. The Department recommends COMM 112 over COMM 111.

[2] Students completing ENGL 105 in lieu of ENGL 101 or ENGL 102 satisfy the General Education and Engineering Fundamentals requirements for Written Communication. However, an additional 3-hr Writing (WR) course or honors Written Communication (WC) course may be needed to satisfy program credit hour requirements. ENGL 303 or ENGL 306 is recommended as the additional course for EE students.

[3] Students must take 3 hours of CSE/Mathematics/Science Electives and 3 hours of Engineering Science Electives. Some students may wish to use these electives toward satisfying the requirements for a minor in Mathematics or Physics; additional information is available in the Department. 6 additional hours must be taken of either CSE/Mathematics/Science Electives or ECE Electives.

Flight Plan

Year 1

Fall		Hours
CHEM 201	General Chemistry I - S (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
CHEM 207	Introduction to Chemical Analysis I - SL (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
ENGL 101	Introduction to College Writing - WC (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
ENGR 101	Engineering Analysis I - QR (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	4
ENGR 110	Engineering Methods, Tools, and Practice I	2

General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Persepective - AH, SB, or SBH		3
Hours		**16**
Spring		
ECE 210	Logic Design	3
ECE 211	Logic Design Laboratory	1
ENGL 102	Intermediate College Writing - WC (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
ENGR 102	Engineering Analysis II	4
ENGR 111	Engineering Methods, Tools and Practice ll	2
PHYS 298	Introductory Mechanics, Heat and Sound - S (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	4
Hours		**17**
Summer		
ENGR 201	Engineering Analysis III	4
PHYS 295	Introductory Laboratories I - SL (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
PHYS 296	Introductory Laboratories II - SL (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
PHYS 299	Introductory Electricity, Magnetism and Light	4
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Persepective - AH, SB, or SBH		3
Hours		**13**
Year 2		
Fall		
CSE 130	Introduction to C and C++ Programming Languages	3
COMM 112 or COMM 111	Business and Professional Speaking - OC (https://catalog.louisville.edu/undergraduate/general-education-requirements/) or Introduction to Public Speaking - OC (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
ECE 220	Network Analysis I	3
ECE 221	Network Analysis I Laboratory	1
ECE 288	Electrical & Computer Engineering Cooperative Education Seminar	0
ECE 322	Introduction to ECE Computing Tools	1
ENGR 205	Differential Equations for Engineering	2
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Perspective Global Perspectives - AHP2, SBP2, or SBHP2		3
Hours		**16**
Spring		
ECE 289	Electrical & Computer Engineering Cooperative Education I	1
Hours		**1**
Summer		
ISE 370	Engineering Economic Analysis	3
ECE 320	Network Analysis II	3
Engineering Science Elective		3
ECE 473	Introduction to Electromagnetic Fields and Waves	3
Hours		**12**
Year 3		
Fall		
ECE 389	Electrical & Computer Engineering Cooperative Education II	1
Hours		**1**
Spring		
CSE/Math/Science Elective or ECE Elective		3

ECE 333	Electronics I	3
ECE 334	Electronics I Lab	1
ECE 360	Probabilistic Methods in Electrical and Computer Engineering	3
ECE 420	Signals and Linear Systems	3
ENGR 330	Linear Algebra for Engineering	2
	Hours	**15**
Summer		
ECE 489	Electrical and Computer Engineering Cooperative Education III	1
	Hours	**1**
Year 4		
Fall		

ECE 412
    or CSE 412
	Introduction to Embedded Systems
	    or Introduction to Embedded Systems
		3

CSE/Math/Science Elective or ECE Elective		3
Electrical & Computer Engineering Elective (500 level)		3
Electrical & Computer Engineering Elective (500 level)		3
ECE 496	Professional Issues and Current Topics Seminar	2
CSE/Math/Science Elective		3
	Hours	**17**
Spring		
ECE 497	Capstone Design in ECE - CUE (https://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
Electrical & Computer Engineering Elective (500 level)		3
Electrical & Computer Engineering Elective Lab (500 level)		1
Electrical & Computer Engineering Design Elective (500 level)		3
Electrical & Computer Engineering Design Lab Elective (500 level)		1
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Persepective US Perspectives - AHP1, SBP1, or SBHP1		3
	Hours	**14**
	Minimum Total Hours	**123**

The Flight Plan outlined above is intended to demonstrate one possible path to completing the degree within four years. Course selection and placement within the program may vary depending on course offerings and schedule, elective preferences, and other factors (study abroad, internship availability, etc.). Please consult your advisor for additional information about building a flight plan that works for you.

Degree Audit Report
Degree Audit reports illustrate how your completed courses fulfill the requirements of your academic plan, and which requirements are still outstanding. Degree audits also take transfer credits and test credits into account. "What-if" reports allow you to compare the courses you have completed in your current academic plan to the courses required in another academic plan. Should you have questions about either report, please consult with your academic advisor.

Flight Planner
The Flight Planner tool is available for you to create a personalized Flight Plan to graduation. Advisors have access to review your Flight Planner and can help you adjust it to ensure you remain on track to graduate in a timely manner.

To create these reports:

1. Log into your ULink account.
2. Click on the Academic Progress tile.
3. Select the appropriate report.

    a. To run a Degree Audit report, click on "View my Degree Audit."
    b. To create a What-if report, click on "What-if Advisement Report."
    c. To run a Flight Planner report, click on "Use My Flight Planner."

Click here to run a Degree Audit report, create a What-if report, or run a Flight Planner report. (https://ulink.louisville.edu)