Bachelor of Science in Electrical Engineering

B.S. in Electrical Engineering Program

Educational Objectives

Graduates who have earned the bachelor's degree in electrical engineering, within a few years following graduation, will have demonstrated technical proficiency, collaborative activities, and professional development.

Technical Proficiency

Graduates will have achieved success and visibility in their chosen careers as shown by technical accomplishments in industry, government, entrepreneurial activities, or academia.

Collaborative Activities

Graduates will have exercised shared responsibilities through activities such as contributions to multiperson or multidisciplinary technical projects, participation in professional society/organization functions, or performing collaborative research. In all such cases, graduates will have contributed to documentation of the collaborative activities.

Professional Development

Graduates will have demonstrated continual updating to extend their expertise and adapt to a changing environment through graduate studies; short courses, conferences, and seminars; or professional self-study. In addition, graduates will have demonstrated evidence of increasing technical and/or managerial impact.

Careers

Professional Opportunities

Electrical engineers may work in circuit design, electronic devices, electrical and optical communications, control and automation, electromagnetics, instrumentation, energy and power, or signal processing. Electrical engineers may work in telecommunications, consumer electronics, or public utility companies; government agencies; and defense-related or consulting firms.

Undergraduate Admission to the School of Engineering

Admission to the KU School of Engineering (and its degree programs) is selective. Students may be admitted to an engineering or computer science degree program (https://engr.ku.edu/2021-curriculum-guide-links/) as freshmen (first year) students, but all admissions, for both in-state and out-of-state students, are selective. Applications are judged on several factors, such as high school record, scores on national tests, academic record at college or university level, and trend of grades and more. High school transcripts are required.

Minimum Academic Standards for Admission to the School of Engineering

To be considered for admission to the School of Engineering, beginning first-year students must meet or exceed the following minimum standards:

- Must be admissible (https://admissions.ku.edu/major-specific-requirements/) to the University of Kansas by assured admissions or individual review, AND
- Have a 3.0+ high school GPA, AND
- Demonstrate mathematics preparedness by:
  - Obtaining a mathematics ACT score of 22+ (or math SAT score of 540+), or
  - Achieving a 'B' or better in 'college algebra' or a more advanced mathematics course, or
  - Achieving a 'C' or better in a high school calculus course; or
  - Earning credit via IB or AP credit for the above-mentioned courses in accordance with KU placement credit requirements; or
  - Achieving at minimum a qualifying score for MATH 104 on the ALEKS mathematics placement exam.

Minimum Academic Standards for Direct Admission into Degree Program for incoming Freshmen

Students with a 26+ Math ACT (600+ Math SAT) or meet eligibility requirements for MATH 125 (Calculus I) (https://catalog.ku.edu/liberal-arts-sciences/math/#undergraduatetext) may be admitted directly into their chosen major, with the exception of those seeking admission into the Electrical Engineering, Computer Science, Computer Engineering, and Interdisciplinary Computing (EECS) majors. For EECS program admission, students must:

- Be admissible (https://admissions.ku.edu/major-specific-requirements/) to the University of Kansas by assured admissions or individual review, AND
- Have a 3.0+ high school GPA, AND
- Demonstrate mathematics preparedness by:
  - Obtaining a mathematics ACT score of 28+ (or math SAT score of 660+), or
  - Achieving a 'C' or better in a high school calculus course; or
  - Earning credit via IB or AP credit for the above-mentioned course in accordance with KU placement credit requirements; or
  - Achieving at minimum a qualifying score for MATH 125 on the ALEKS mathematics placement exam.

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Students who are not admissible to their desired major are
 admitted to the School of Engineering as undecided engineering
 undergraduate students.
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Exploring Engineering

Students not admitted directly to the School of Engineering or their major but who are admissible to the university may be admitted to the College of Liberal Arts and Sciences as an Undecided student. They can later re-apply to the School of Engineering during the semester they are completing the admission requirements for transfer students.

Transfer Admission Standards

Applications from all transfer students, whether from other institutions or from other academic schools at the University of Kansas, are evaluated on a case-by-case basis. Transfer students must be admissible (http://admissions.ku.edu/apply/requirements/ustransfer/) to KU **AND** have

a cumulative college transferable grade-point average of 2.5+ to be considered. In addition, students must have grades of "C" or better in those courses in math (must include MATH 125 Calculus I or equivalent), science, and engineering applicable to the engineering degree.

Current KU Students admitted to other academic units may apply to the School of Engineering by completing a Change of School form (https://inowformsprivate.ku.edu/imagenowforms/fs/?form=OUR%20Change%20of%20School%20Form).

Already Applied to KU, But Not Engineering?

Don't worry. It's not too late to change your mind if you've already applied to KU and selected a major outside the School of Engineering. If you think one of the 12 engineering or computer science majors is a better fit for your talents, you can still change your requested major — preferably before May 1 — and be considered for admission to the School of Engineering and all the benefits that go with it.

To update your application, visit Undergraduate Admissions (http://admissions.ku.edu/update-your-application/) and click on "Change application term, major, mailing address, and/or email address."

Please contact a member of our recruitment team (studyengineering@ku.edu), 785-864-3881, if you have any difficulty.

Application Deadlines For New Freshman and Transfer Applicants

September 15	Priority deadline for current KU students to apply for spring admission to Engineering.
November 1	Final deadline for scholarship consideration for incoming freshmen planning to enter in fall or summer semesters.
December 1	Final deadline to apply for the Self Engineering Leadership Fellows Program for incoming freshmen
February 1	Final deadline for scholarship consideration for transfer students planning to enter in fall or summer semesters. Applications available for the Engineering Learning Community
February 15	Priority deadline for current KU students to apply for summer or fall admission to Engineering.
May 1	Enrollment Deposit due.

Bachelor of Science in Electrical Engineering Degree Requirements

The KU Core

This is the university-wide curriculum that all incoming undergraduate students will complete as part of their degree requirements. It comprises three general education goals and three advanced education goals. Associated with each goal is one or more learning outcomes:

- GE 1.1, Goal 1/Outcome 1, Critical Thinking;
- GE 1.2, Goal 1/Outcome 2, Quantitative Literacy;
- GE 2.1, Goal 2/Outcome 1, Written Communication (2 units);
- GE 2.2, Goal 2/Outcome 2, Oral Communication;
- GE 3H, Goal 3/Outcome 1, Arts & Humanities;
- GE 3N Goal 3/Outcome 2, Natural Sciences;
- GE 3S Goal 3 /Outcome 3, Social Sciences;
- AE 4.1, Goal 4/Outcome 1, Diversity;
- AE 4.2 Goal 4/Outcome 2, Culture;
- AE 5.1/5.2, Goal 5/Outcome 1/2, Social Responsibility & Ethics (course and/or practice);
- AE 6.1/6.2, Goal 6/Outcome 1/2, Integration & Creativity.

Details of the KU Core can be found at kucore.ku.edu (http://kucore.ku.edu/). Some required courses in the EECS curricula satisfy a KU Core goal and/or outcome. For these courses, the goal/outcome code is given in parentheses after the course on the pages below. Where required courses do NOT specifically satisfy KU Core goals (Goals 2, 3, and 4) students must choose from a list of several means to satisfy the required goals.

A total of 128 credit hours[1] is required for the B.S. degree in electrical engineering, as follows:

Code	Title	Hours
Electrical Engineering		
EECS 101	New Student Seminar (Part of KU Core AE 5.1)	1
EECS 140	Introduction to Digital Logic Design	4
EECS 168	Programming I	4
EECS 202	Circuits I	4
EECS 212	Circuits II	4
EECS 312	Electronic Circuits I	3
EECS 361	Signal and System Analysis	3
EECS 388	Embedded Systems	4
EECS 412	Electronic Circuits II	4
EECS 420	Electromagnetics II	4
EECS 443	Digital Systems Design	4
EECS 444	Control Systems	3
EECS 470	Electronic Devices and Properties of Materials	3
EECS 501	Senior Design Laboratory I (Part of KU Core AE 5.1)	3
EECS 502	Senior Design Laboratory II (KU Core AE 6.1)	3
EECS 562	Introduction to Communication Systems	4
Senior electives (Any EECS course numbered 400 or above excluding EECS 498 and EECS 692. Only one of EECS 643 and EECS 645 may be used to satisfy EE degree requirements. Under unusual circumstances other courses can be considered but only with an accompanying petition.)		9

Mathematics		
MATH 125	Calculus I (KU Core GE 1.2)	4
MATH 126	Calculus II	4
MATH 127	Calculus III	4
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra	2
EECS 461	Probability and Statistics	3
Basic Science		
CHEM 130	General Chemistry I	5
or CHEM 150	Chemistry for Engineers	
PHSX 210	General Physics I for Engineers	3
PHSX 216	General Physics I Laboratory (Part of KU Core AE 5.1)	1
EECS 220	Electromagnetics I	4
PHSX 313	General Physics III (KU Core GE 3N)	3
PHSX 316	Intermediate Physics Laboratory I	1
Professional Electives		
2 courses from the following list of approved technical, scientific, and professional courses:		6
EECS: Any course except EECS 137, EECS 138, EECS 315, EECS 316, EECS 317, EECS 318, EECS 498 and 692. Only 1 of EECS 643 or EECS 645 may be used.		
Engineering: IT 320, IT 330, IT 416, IT 430, IT 450 and any course from any other engineering department numbered 200 or above, except AE 211, ENGR 300, ENGR 490, ENGR 504, ME 208, and ME 228.		
Natural science: Any course designated GE3N, except PHSX 111, PHSX 112, PHSX 114, PHSX 115, PHSX 212, PHSX 236, and CHEM 110.		
Mathematics: Any MATH course numbered 500 or above, except MATH 526 and MATH 701.		
Business: Any course 200 and above from the School of Business that applies towards a Business major, minor, or certificate, except for Statistsics and Computing courses.		
ROTC Courses: Up to 6 hours of ROTC may be petitioned to count toward the professional elective requirement.		
Foreign Language: Any foreign language course may be petitioned to count as a Professional Elective or additional Humanities or Science hours.		
Communications		
Satisfy KU Core GE 2.1 [1]		6
Satisfy KU Core GE 2.2 [1]		3
Arts/Humanities/Social Science		
Economics elective:		3
Select one of the following:		
ECON 142	Principles of Microeconomics (KU Core GE 3S, preferred)	
ECON 144	Principles of Macroeconomics (KU Core GE 3S)	
Satisfy KU Core GE 3H Arts & Humanities [1]		3
Satisfy KU Core AE 4.1 and AE 4.2 [1]		**6**

[1] Means of satisfying KU Core Goals are chosen from a variety of options (see kucore.ku.edu (http://kucore.ku.edu/)). Hours listed are assuming the goals are satisfied with course work.

Course Prerequisites and Corequisites

Students must pass (at the appropriate grade level) all prerequisite courses for a given course **before** taking the subsequent course. If Course A is a Corequisite for Course B, Course A must be taken in the same semester as Course B *or* be completed prior to taking Course B.

Upper Level Eligibility

In addition to prerequisites and co-requisites, EECS undergraduates are required to earn ***Upper Level Course Eligibility*** by attaining grades of C or better (C- does not qualify) in each of the following 15 courses:

GE 21 (both)

PHSX 210 & 216

MATH 125, 126, 127, 220, 290

EECS 101, 140, 168, 202, 212, 221

CHEM 130 or 150

If students earn less than a C in any of the above listed courses, they must repeat the course at the next available opportunity and must ***not*** take a course for which that course is a prerequisite. It is the *students' responsibility* to contact their advisors *before beginning the new semester* regarding any required repetitions and the associated enrollment adjustments (drops and adds).

To enroll in *any* upper#level EECS course beyond the ULE list , students must have fulfilled the ***Upper Level Eligibility Requirements*** detailed above. Exceptions: EECS 312, EECS 330, EECS 361, and EECS 388 may be taken in the same semester as students are completing their upper level eligibility. Students may also petition for a *Partial Waiver of Upper Level Eligibility Requirements* by completing the appropriate petition, found in the EECS office or at www.eecs.ku.edu (http://www.eecs.ku.edu).

Double Major

If students wish to double-major (earn two degrees), they must fulfill all the requirements for the degrees in question. They must also consult the Engineering Dean's office and the department and/or school of the second major to find out if there are any additional requirements. If they wish to obtain two degrees offered by the EECS department, the following rule applies: a course that is required for one EECS degree program may not be used to satisfy a Senior Elective or General Elective requirement of another EECS degree program.

Electrical Engineering 4-Year Graduation Plan

Freshman

Fall	Hours	Spring	Hours
EECS 101 (Part of KU Core AE 5.1)	1	EECS 168	4
EECS 140	4	MATH 126	4
KU Core GE 2.1 (first)[1]	3	EPHX 210	3

MATH 125 (KU Core GE 1.2)	4	PHSX 216 (Part of KU Core AE 5.1)	1
ECON 142 or 144 (KU Core GE 3S)	3	KU Core GE 2.1 (second)[1]	3
	15		**15**

Sophomore

Fall	Hours	Spring	Hours
EECS 202	4	EECS 212	4
MATH 127	4	EECS 220	4
MATH 220	3	CHEM 130 or 150	5
MATH 290	2	KU Core GE 3H[1]	3
KU Core GE 2.2[1]	3		
	16		**16**

Junior

Fall	Hours	Spring	Hours
EECS 312	3	EECS 412	4
EECS 361	3	EECS 444	3
PHSX 313 & PHSX 316 (KU Core GE 3N)	4	EECS 461	3
EECS 388	4	EECS 562	4
KU Core AE 4.1[1]	3	Professional elective 1	3
	17		**17**

Senior

Fall	Hours	Spring	Hours
EECS 420	4	EECS 443	4
EECS 470	3	EECS 502 (KU Core AE 6.1)	3
EECS 501 (Part of KU Core AE 5.1)	3	Senior elective 2	3
Senior elective 1	3	Senior elective 3	3
Professional elective 2	3	KU Core AE 4.2[1]	3
	16		**16**

Total Hours 128

[1] Means of satisfying KU Core Goals are chosen from a variety of options (see kucore.ku.edu (http://kucore.ku.edu/)). Hours listed are assuming the goals are satisfied with course work.

Departmental Honors

An undergraduate student may graduate with departmental honors in electrical engineering, computer engineering, computer science, or interdisciplinary computing by graduating with a minimum grade-point average requirement while maintaining full-time status. In addition, students must enroll in EECS 498 Honors Research for their last 2 semesters and must complete an independent research project paper and oral presentation to a panel of 3 judges. See the EECS Undergraduate Handbook for full details.