Bachelor of Science in Computer Science

B.S. in Computer Science Program

Educational Objectives

Graduates who have earned the bachelor's degree in computer science, 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

Computer scientists may pursue the design, analysis, and implementation of computer algorithms; study the theory of programming methods and languages; or design and develop software systems. They also may work in artificial intelligence, database systems, parallel and distributed computation, human-computer interaction, computer graphics, operating systems, or computer systems analysis and administration. Computer scientists may work for software companies, government and defense, telecommunications, 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/admission-requirements/) 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.

Freshman Admission Standards to the School of Engineering

To be considered for admission to the School of Engineering, beginning freshmen (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.

Pre-Engineering

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

Transfer Student Admission Standards to the School of Engineering

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**
- Earn a cumulative college transferable grade-point average of 2.5+, **AND**
- Earn a grade of C or better in MATH 125 (Calculus I, or its direct equivalent), **AND**
- Earn grades of C or better in math, science, and engineering courses applicable to the engineering degree.

Students must also complete their last 30 hours of credit at KU (http://policy.ku.edu/governance/FSRR/#art4sect5).

Current Student Admission Standards to the School of Engineering

Students who are currently enrolled at KU, need to meet the following:

- Earn a 2.5+ KU GPA, **AND**
- Earn a grade of C or better in MATH 125 or its direct equivalent, **AND**
- Earn a grade of C or better in all math, science, and engineering courses.

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). Contact the engineering recruitment team (studyengineering@ku.edu) if you have any questions. Per University Registrar deadlines for processing, Change of School applications for the fall semester will be accepted until the last Friday in October of each school year; Change of School applications for the spring semester will be accepted until the last Friday in March of each school year.

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

November 1	Priority scholarship deadline for incoming freshmen.
December 1	Deadline to apply for the Self Engineering Leadership Fellows Program for incoming freshmen.
May 1	Enrollment Deposit due.
Last Friday in October	Deadline to submit Change of School applications for fall semester admission.
Last Friday in March	Deadline to submit Change of School applications for spring semester admission.

Bachelor of Science in Computer Science Degree Requirements

A total of 126 credit hours[1] is required for the B.S. degree in computer science (CS), as follows:

Code	Title	Hours
Computer Science		
EECS 101	New Student Seminar	1
EECS 140	Introduction to Digital Logic Design	4
or EECS 141	Introduction to Digital Logic: Honors	
EECS 168	Programming I	4
or EECS 169	Programming I: Honors	
EECS 268	Programming II	4
EECS 330	Data Structures and Algorithms	4
EECS 348	Software Engineering I	4
EECS 388	Embedded Systems	4
EECS 468	Programming Language Paradigms	3
EECS 510	Introduction to the Theory of Computing	3
EECS 563	Introduction to Communication Networks	3
EECS 565	Introduction to Information and Computer Security	3
EECS 581	Software Engineering II	3
EECS 645	Computer Systems Architecture	3
EECS 678	Introduction to Operating Systems	4
Capstone Course		
EECS 582	Computer Science and Interdisciplinary Computing Capstone	3
For CS majors, 7 CS electives must be chosen from the following courses. Under unusual circumstances, other courses can be considered but only with an accompanying petition.		21
2 or more CS electives must be from the list:		
EECS 455	Cyber Defense Practice	
EECS 465	Cyber Defense	
EECS 630	Advanced Data Structures and Algorithms	
EECS 658	Introduction to Machine Learning	
EECS 665	Compiler Construction	
2 or more CS electives must be from the list:		
EECS 443	Digital Systems Design	
EECS 447	Introduction to Database Systems	
EECS 569	Computer Forensics	
EECS 649	Introduction to Artificial Intelligence	
EECS 662	Programming Languages	
Additional CS elective options:		
EECS 568	Introduction to Data Mining	
EECS 639	Introduction to Scientific Computing	
EECS 672	Introduction to Computer Graphics	
EECS 675	Multicore and GPU Programming	
EECS 690	Special Topics: _____	
Additionally, any EECS 700 or above course may be taken as a CS elective.		
Mathematics		
MATH 125	Calculus I (Core 34: Math/Stats (SGE)) [030]	4
or MATH 145	Calculus I, Honors	
or MATH 115 & MATH 116	Calculus I and Calculus II	
MATH 126	Calculus II	4
or MATH 146	Calculus II, Honors	
MATH 127	Calculus III	4
or MATH 147	Calculus III, Honors	
MATH 290	Elementary Linear Algebra	2
or MATH 291	Elementary Linear Algebra, Honors	
EECS 210	Discrete Structures	4
EECS 461	Probability and Statistics	3
Basic Science		
EPHX 210	General Physics I for Engineers	3
or PHSX 211	General Physics I	

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*** (ULE) by attaining grades of C or better (C- does not qualify) in each of the following 14 courses:

Core 34 English (Both)

EPHX 210 & PHSX 216

MATH 125, 126, 127, 290

EECS 101, 140, 168, 210, 268, 348

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 eecs.ku.edu (http://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.

Computer Science 4-Year Graduation Plan

Freshman

Fall	Hours	Spring	Hours
EECS 101	1	EECS 140	4
EECS 168	4	MATH 126	4
MATH 125 (Core 34: Math and Statistics (SGE))[030***]	4	EECS 268	4
Core 34: English (SGE)[010]	3	Core 34 - English (SGE)[010]	3
Core 34: Communications (SGE)[020]	3		
	15		**15**

Sophomore

Fall	Hours	Spring	Hours
MATH 127	4	MATH 290	2
EPHX 210	3	EECS 330	4
EECS 210	4	EECS 388	4
PHSX 216 (Core 34: Natural and Physical Sciences (SGE))[040**]	1	Core 34: US Culture (SGE)[070]	3
EECS 348	4		
	16		**13**

Junior

Fall	Hours	Spring	Hours
EECS 461	3	EECS 563	3
EECS 468	3	EECS 565	3
EECS 510	3	EECS 645	3
EECS 678	4	EECS CS Elective 2	3
EECS CS Elective 1	3	EECS CS Elective 3	3
		PHIL 375 (Core 34: Arts and Humanities (SGE))[060**]	3
	16		**18**

Senior

Fall	Hours	Spring	Hours
EECS 581	3	EECS 582 (Capstone)	3
EECS CS Elective 4	3	EECS CS Elective 6	3
EECS CS Elective 5	3	EECS CS Elective 7	3
Core 34: Arts and Humanities (SGE)[060]	3	Core 34: Social and Behavior Science (SGE)[050]	3
Core 34: Social and Behavior Science (SGE)[050]	3	Core 34: Global Culture (SGE)[070]	3
	15		**15**

Total Hours 123

[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.

Notes:

* - This course is a Required major course and is also part of Core 34: Systemwide General Education. If this course is not taken to fulfill the Core 34:SGE requirement, it must be taken in place of elective hours.

** - This course is a Recommended Core 34: Systemwide General Education course. This specific course is not required but is recommended by the program's faculty.

*** - This course is a Required Core 34: Systemwide General Education course. This program is approved by the Kansas Board of Regents to require this specific Core 34:Systemwide General Education course. If a student did not take this course it must be taken in addition to other degree requirements.

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.