

Bachelor of Science in Mechanical Engineering

The 128-hour bachelor of science degree in mechanical engineering offered by the Department of Mechanical Engineering is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. Students typically take four years to complete the program. The mechanical engineering curriculum builds on the basic foundation of mathematics and physical sciences learned in the first three semesters, and then focuses on engineering design and analysis in mechanical, thermal, fluids, and energy systems. First-year students are quickly immersed in hands-on design/build team projects as part of the cornerstone mechanical engineering courses. Engineering science, analysis, and design are integrated throughout the curriculum, culminating in a senior capstone design project where students complete a year-long hands-on design and build experience in one of three areas:

- Formula SAE vehicle design,
- Industrial sponsored topics, and
- Research sponsored topics.

The industrial and/or research projects may include alternative energy topics (EcoHawks), biomechanics topics or general mechanical engineering topics.

Students interested in biomedical engineering or applying to medical school after graduation may elect to complete a concentration in biomechanics (or follow a pre-medicine plan)) or complete an Undergraduate Certificate in Bioengineering (see the Bioengineering program for requirements). Students are encouraged to be active with the different engineering societies, including The American Society of Mechanical Engineers, The Society of Automotive Engineers, Engineers Without Borders, The Biomedical Engineering Society, The Society of Women Engineers, The National Society of Black Engineers, and The Society of Hispanic Engineers. KU also has active chapters of Tau Beta Pi, the national engineering society, and Pi Tau Sigma, the national mechanical engineering honor society. Study abroad is strongly encouraged and generally does not delay students' graduation since they will be taking engineering classes abroad.

Professional Licensing

Formal study in an accredited engineering program is the principal means of becoming licensed to practice engineering in Kansas and other states. During the junior or senior year, students are strongly encouraged to take the national Fundamentals of Engineering examination. After 4 or more years of practice satisfactory to the State Board (licensing regulations vary among states), engineering graduates may take the examination to become registered professional engineers.

Job Search Assistance

The Engineering Career Center (<http://ecc.ku.edu/>) offers a comprehensive array of services to students seeking permanent employment and career-related summer or co-op employment. These include on-campus interviewing; 2 career fairs each year; individual advising and group workshops on résumés; interviewing, and job search strategies; online interviewing sign-up; online job postings from many

employers not interviewing on campus; a library of employer and career literature; and an online résumé book searchable by employers.

The Engineering Career Center offers services to all engineering students. Students are encouraged to visit the Engineering Career Center early in their undergraduate or graduate studies. Many employers actively seek KU engineering and computer science students. Some prefer to hire students as early as the first-year level for internships. The Career Center is in 1410 LEEP2; additional information is available from 785-864-3891.

Undergraduate Regulations

The Mechanical Engineering program follows the undergraduate regulations of the university and school. The program has adopted a more limiting transfer policy regarding upper level mechanical engineering courses. The program also has required minimum grades in select classes for progression in the degree.

Transfer of Credit

In general, course number equivalents greater than KU Mechanical Engineering's ME 399 **cannot** be transferred to count towards the 128 credit hour BS in mechanical engineering curriculum. For a non-KU course that might be related to a KU Mechanical Engineering course greater than ME 399 course:

1. The KU Mechanical Engineering program may consider a one-time petition for transfer.
2. To be considered for transfer, the petitioned course must have been taken from an ABET-EAC accredited program.
3. Study Abroad courses will be handled on a case-by-case basis.

Grades of C- or Better

While a D may be considered a passing grade in MATH 125, MATH 126, ME 211 (CE 201 and ME 210) and ME 212, it does **not** meet the mechanical engineering program's requirements for satisfying pre-requisites for subsequent classes. The mechanical engineering program requires a C- or better in MATH 125 and MATH 126 for progression in the degree. The program requires a C- or better in ME 211 (or CE201 and ME 210) for progression in the degree. Students earning a D-, D or D+ in ME 212 may progress in the degree providing they successfully complete ME 412 (counts as Technical Elective) in the next semester that it is offered.

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://enr.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) (<http://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.

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

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.

Mechanical Engineering 4-Year Graduation Plan

Freshman

Fall	Hours Spring	Hours
ME 101	1 ME 208	3
ME 228	3 MATH 126	4
MATH 125 (KU Core GE 1.2)	4 MATH 365 or 526	3
CHEM 150 (KU Core GE 3N)	5 PHSX 210 (KU Core GE 1.1)	3
ENGL 101 (KU Core GE 2.1)	3 PHSX 216	1
	ENGL 102 (KU Core GE 2.1)	3
	16	17

Sophomore

Fall	Hours Spring	Hours
ME 211	3 ME 311	3
ME 306	3 ME 212	3
MATH 127	4 MATH 220	3
PHSX 212	3 MATH 290	2
PHSX 236	1 ECON 142, 144, or 104 (KU Core GE 3S)	3
PHIL 160 or 180 (KU Core AE5.1)	3 KU Core (GE2.2, GE3H, AE4.1, or AE4.2)	3
	17	17

Junior

Fall	Hours Spring	Hours
ME 307	2 EECS 316	3
ME 320	3 EECS 318	1
ME 321	1 ME 501	2
ME 412	3 ME 510	3
ME 508	3 ME 628	3
KU Core (GE2.2, GE3H, AE4.1, or AE4.2)	3 ME 661	3
	15	15

Senior

Fall	Hours Spring	Hours
ME 455	4 Capstone Design Opt A, B, or C	2
ME 612	3 Advanced Engineering Elective	3
ME 682	3 General Electives	5
Capstone Design Opt A, B, or C	2 KU Core (GE2.2, GE3H, AE4.1, or AE4.2)	3
Advanced Engineering Elective	3 KU Core (GE2.2, GE3H, AE4.1, or AE4.2)	3
	15	16

Total Hours 128

Bachelor of Science in Mechanical Engineering Degree Requirements

Code	Title	Hours
Mathematics and Basic Sciences		
Mathematics:		
MATH 125	Calculus I (KU Core GE1.2)	4
MATH 126	Calculus II	4
MATH 127	Calculus III	4
MATH 220	Applied Differential Equations	3
MATH 290	Elementary Linear Algebra	2
MATH 365	Elementary Statistics	3
or MATH 526	Applied Mathematical Statistics I	
ME 508	Numerical Analysis of Mechanical Engineering Problems	3
Basic Sciences:		
CHEM 150	Chemistry for Engineers (KU Core GE3N)	5
PHSX 210	General Physics I for Engineers (satisfies GE1.1)	3
PHSX 216	General Physics I Laboratory	1
PHSX 212	General Physics II	3
PHSX 236	General Physics II Laboratory	1
Electives and KU Core Requirements		
Written Communication electives - KU Core GE2.1		6
Oral Communication elective - KU Core GE2.2		3
Arts and Humanities elective - KU Core GE3H		3
Economics elective (ECON 104, ECON 105, ECON 142, ECON 143, ECON 144, ECON 145) - KU Core GE3S		3
Human Diversity elective - KU Core AE4.1		3
Global Culture/Awareness elective - KU Core AE4.2		3
Ethics elective (CE 610) - KU Core AE5.1		3
General Electives		6
Mechanical Engineering		
Mechanics:		
ME 211	Statics and Introduction to Mechanics	3
ME 311	Mechanics of Materials	3
ME 320	Dynamics	3
ME 321	Dynamics Simulations	1
ME 306	Science of Materials	3
ME 307	Engineering Materials Laboratory	2
ME 628	Mechanical Design	3
ME 682	System Dynamics and Control Systems	3
Thermal Fluids:		
ME 212	Basic Engineering Thermodynamics	3
ME 510	Fluid Mechanics	3
ME 612	Heat Transfer	3
Basic Engineering:		
ME 208	Introduction to Digital Computational Methods in Mechanical Engineering	3
ME 228	Computer Graphics	3
EECS 316	Circuits, Electronics and Instrumentation	3
EECS 318	Circuits and Electronics Lab	1
ME 455	Mechanical Engineering Measurements and Experimentation	4

ME 661	The Finite Element Method	3
Capstone Design:		
ME 501	Mechanical Engineering Design Process	2
Select one of the following (satisfies KU Core AE6.1)		
Option A		
ME 640	Design Project (Taken first semester)	
ME 641	Design Project Option A (Taken second semester after successfully completing ME 640)	
Option B		
ME 617	Research for Design Project Option B	
ME 642	Design Project Option B (Taken after successfully completing ME 627. ME 627 counts as an Advanced Engineering Elective.)	
Option C		
ME 640	Design Project (Taken first semester)	
ME 643	Design Project Option C (Taken second semester after successfully completing ME 640 and ME 643. ME 633 counts as an Advanced Engineering Elective.)	
Advanced Engineering Electives		9

Approved General and Advanced Engineering Electives (15 hours)

A maximum of 6 credits of **General Electives** (and a minimum of 0 if 9 credits of Advanced Engineering Electives are taken) can be applied toward the B.S.M.E. degree and are meant to allow a student to broaden their education. These electives are taken throughout a student's curriculum and include mathematics, basic science (ASTR, ATMO, BIOL, CHEM, EVRN, GEOG, GEOL, and PHSX,) and engineering courses beyond what is already required for the degree (without replicating content). Also included are any courses satisfying a KU Core requirement beyond what is already required for the degree (e.g. a second GE3H course). Any course from a foreign language department (in a non-native language) can satisfy the requirements. Up to 6 credit hours from courses in aerospace studies, military science, or naval science may be applied toward graduation as General Electives for the mechanical engineering degree. A student normally must complete the ROTC curriculum, whether or not it leads to a commission, to receive ROTC hours toward a bachelor's degree in mechanical engineering. Courses in business, economics, music, design, visual art, and honors can also be used to satisfy the elective requirement. A complete list of current approved General Electives can be found at the KUME office.

A minimum of 9 hours of **Advanced Engineering Electives** (and a maximum of 12) can be applied toward the B.S.M.E. degree and are designed to provide students with additional technical depth in the discipline. These electives are usually taken by seniors in the program and consist of advanced topics in the field of mechanical engineering. These courses tend to be all 500-, 600- and 700-level ME courses not explicitly named above. A complete list of current approved Advanced Engineering Electives can be obtained from the KUME office.

In a case where an experience has been used to satisfy a KU Core requirement without an accompanying credit-hour load, the student will be allowed to use any **General Electives** course to fulfill the number of credit hours required for graduation.

The Mechanical Engineering Department requires six credits of ENGL courses to satisfy the English requirement, with KU-allowed exemptions being possible.

Potential Core Credit Hour Waivers

For GE2.1, GE2.2, and AE4.2, it is possible to obtain ME Department waivers, as listed below; but the maximum total hours waived by the ME department is six.

1. If your KU transcript shows that the ENGL 101 and/or ENGL 102 requirements (GE2.1) have been waived (e.g., due to an ACT score) while giving zero hours of credit, the ME department accepts this waiver as a three or six credit hour reduction in the total hours required for graduation.
2. If your KU transcript shows that your Oral Communications Core has been waived while giving zero hours of credit, the ME Department accepts petitions for potentially waiving three credit hours. The KU transcript waiver must be the result of actual oral communications experience that was at least the equivalent of one semester of study. "Credit by exam" alone will not be acceptable.
3. If your KU transcript shows that your Global Culture/Awareness Core requirement (AE4.2) has been waived while giving zero hours of credit, the ME department accepts petitions for potentially waiving three credit hours. An example of an acceptable waiver request could be for a semester-long Study Abroad experience while immersed in the country's culture. An unacceptable waiver request would be for a four to six week time period spent abroad.

Chemistry

CHEM 130/135, CHEM 170/175, or Honors equivalent courses may be substituted for CHEM 150. Both courses in the Chemistry sequence must be taken to fulfill the Chemistry requirement. The additional credit hours can count as General Electives.

Biomechanics Concentration

Students interested in a career in biomechanics can obtain a concentration in the area which will be noted on the student's BSME transcript. To obtain the concentration students must complete the following four courses:

1. One of the following BIOL courses (all of which count as General Electives): 150/151, 152/153, 240, or 246.
2. ME 633 Basic Tissue Mechanics and Biodynamics (which counts as an Advanced Engineering Elective).
3. A Biomechanics Capstone Design Project (ME 643).
4. A Biomechanics Advanced Engineering Elective (ME 750, 751, 753, 755, 756, 757, 758, 760, 765, or 767)

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