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 four areas:

- Formula SAE vehicle design,
- Alternative energy transportation, EcoHawks,
- Biomechanics, and
- Industrial sponsored 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). 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://www.engr.ku.edu/career_center) 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 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 (http://enr.ku.edu/sites/engr.drupal.ku.edu/files/docs/pdfs/Majors_and_Curriculum_Guide_2014_Online.pdf) 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 and ACT scores (or equivalent SAT scores) are required.

Minimum Academic Standards for Admission

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 (http://admissions.ku.edu/apply/requirements/usfreshmen) to the University of Kansas by assured admissions or individual review AND
- Have a 3.0+ GPA AND
- Have a mathematics ACT score of 22 (or math SAT score of 540).

Important: Simply meeting these requirements won’t guarantee admission to a School of Engineering degree program. Students who perform beyond these minimums will have a better probability of being admitted to their selected major.

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 an EECS program. Electrical Engineering, Computer Science, Computer Engineering, and Interdisciplinary Computing students must have a 28+ Math ACT (640+ Math SAT) or eligibility for MATH 125 for direct admission.

First-Year General Engineering Program

Students with a 22-25 Math ACT (540-580 Math SAT) or meet eligibility requirements for Math 104 (Pre-Calculus) (http://catalog.ku.edu/liberal-arts-sciences/math/#undergraduatetext) are admitted to the School of Engineering First-Year Experience non-degree program for undergraduate students.

First-year Engineering students have one academic year (two semesters and one summer) to transition into a degree program. Admission to a degree program is possible after one of the following is met:

- Complete 12+ credit hours at KU, earn a "B" or higher in Math 104 (Pre-Calculus), earn a "C" or higher in all science and engineering courses, and earn a KU GPA of 2.5+ OR
- Earn a "C" or better in MATH 125 (Calculus I), earn a "C" or better in all science and engineering courses, and earn a KU GPA of 2.5+
Pre-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 a 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 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.

Students interested in the Information Technology program are admitted as juniors. They must have completed 60 hours of pre-requisite courses including foundational courses in math, science, and computer science and have a 2.5+ cumulative GPA or better. The Information Technology program resides at the Edwards Campus in Overland Park, KS. Click here (http://edwardscampus.ku.edu/overview-bachelors-information-technology) for more information.

Current KU Students admitted to other academic units may apply to the School of Engineering by completing a Change of School form (http://engineering.ku.edu/forms). This must be turned in to the School of Engineering Dean's Office by the appropriate deadlines indicated below.

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

<table>
<thead>
<tr>
<th>Semester</th>
<th>Applicants</th>
<th>Deadline</th>
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<tbody>
<tr>
<td>September 15</td>
<td>Priority deadline for current KU students to apply for spring admission to Engineering.</td>
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<tr>
<td>November 1</td>
<td>Final deadline for scholarship consideration for incoming freshmen planning to enter in fall or summer semesters.</td>
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</table>

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

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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<tr>
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<td>ENGL 101 (KU Core GE 2.1)</td>
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<td>ME 228</td>
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<td>ME 208</td>
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<td>ENGL 102 (KU Core GE 2.1)</td>
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Sophomore

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Junior

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<td>Hours</td>
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<td>ME 455</td>
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Total Hours: 128

**Bachelor of Science in Mechanical Engineering Degree Requirements**

**Mathematics and Basic Sciences (36)**

**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 4
- MATH 290 Elementary Linear Algebra 2
- MATH 365 Elementary Statistics 3
- or MATH 526 Applied Mathematical Statistics 3
- ME 508 Numerical Analysis of Mechanical Engineering Problems 3

**Basic Sciences:**
- CHEM 150 Chemistry for Engineers (KU Core GE3N) 5
- or CHEM 130 General Chemistry I 5
- PHSX 210 General Physics I for Engineers (satisfies GE 1.1) 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 (30)**

**English:**
- ENGL 101 Composition (KU Core GE 2.1) 3
- ENGL 102 Critical Reading and Writing (KU Core GE 2.1) 3
- Oral Communication elective - KU Core GE 2.2 3
- Economics elective (ECON 104, ECON 142, ECON 144) - KU Core GE 3S 3
- Ethics elective (PHIL 160, PHIL 180) - KU Core AE 5.1 3
- Arts and Humanities elective (from KU Core GE 3H list) 3
- Human Diversity elective (from KU Core AE 4.1 List) 3
- Global Culture/Awareness elective (from KU Core AE 4.2 list) 3
- General Electives 6

**Mechanical Engineering (62)**

**Mechanics:**
- ME 211 Statics and Introduction to Mechanics 3
- ME 311 Mechanics of Materials 3
- ME 320 Dynamics 3

**Thermal Fluids:**
- ME 312 Basic Engineering Thermodynamics 3
- ME 412 Thermal Systems 3
- ME 510 Fluid Mechanics 3
- ME 612 Heat Transfer 3

**Basic Engineering Electives:**
- 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 AE6) 4
  - **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 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** 6

**Approved General and Advanced Engineering Electives (12 hours)**

A maximum of 6 credits of **General Electives** (and a minimum of 0 if 6 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, GEOF, 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 of ROTC may be applied toward general electives for students who complete the ROTC program. Courses in business, economics, music, design, visual art, and honors can also be used to satisfy the elective requirement. A complete
A list of current approved General Electives can be found at the KUME office.

A minimum of 6 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 700- and 600-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 or CHEM 170 can also be used to fulfill the Chemistry requirement for Mechanical Engineering.

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).