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 is 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). There is also a five-year dual degree program in which students earn a B.S. in mechanical engineering as well as a bachelor of business administration degree. 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 honor 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, a student may take the national Fundamentals of Engineering examination. After 4 or more years (licensing regulations vary among states) of practice satisfactory to the board, the student may take the examination to become a registered professional engineer.

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 1001 Eaton Hall; additional information is available from 785-864-3891.

Undergraduate Admission to the School of Engineering

First-year undergraduate students may be admitted, but all admissions, both in-state and out-of-state, are selective. Visit the Office of Admissions (http://admissions.ku.edu/whyku/index.shtml) for admission requirements. Visit the Office of International Student and Scholar Services (http://www.iss.ku.edu) for information about international admissions.

Applications are judged on several factors, including but not limited to high school record, scores on national tests, academic record at college or university level, and trend of grades. High school transcripts and ACT scores are required. Equivalent SAT scores may be substituted.

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:

- 3.0 grade-point average on a 4.0 scale on the Kansas Board of Regents Qualified Admissions (http://admissions.ku.edu/apply/regents_curriculum.shtml) college-preparatory curriculum.
- Top 50 percent of the graduating class of an accredited high school or the equivalent.
- Mathematics ACT score of 22 (or mathematics SAT score of 540). Some engineering degree programs may require a higher mathematics ACT score.

These minimum admission standards apply to all departments. Meeting minimum requirements does not guarantee admission.

Transfer Admission Standards

Applications from all transfer students, whether from other institutions or from other KU units, are evaluated on a case-by-case basis. In general, students with grade-point averages under 2.5 are not considered. Students must submit mathematics ACT or SAT scores or proof of competence in calculus (grade of C or higher). No upper-level engineering credits from non-ABET-accredited engineering programs are acceptable as transfer credit for engineering programs. Admission is selective, and meeting the minimum requirements does not guarantee admission.

Mechanical Engineering 4-Year Graduation Plan

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<tr>
<th>Freshman</th>
<th>Hours Spring</th>
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<tr>
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<tr>
<td>MATH 125 (KU Core GE 1.2)</td>
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The University of Kansas
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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 3
- MATH 290 Elementary Linear Algebra 2
- MATH 365 Elementary Statistics 3
- ME 508 Numerical Analysis of Mechanical Engineering Problems 3

Basic Sciences:
- CHEM 150 Chemistry for Engineers (KU Core GE 3N) 5
  or CHEM 130 General Chemistry I
- 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 (63)

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

Basic Engineering:
- ME 228 Computer Graphics 3
- ME 208 Introduction to Digital Computational Methods in Mechanical Engineering 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
- ME 640 Design Project (enrollment in this course is required in the semester prior to taking ME 641, ME 643, ME 644, ME 645 - satisfies AE 6) 2

Select one of the following 3
- ME 641 Design Project Option A
- ME 642 Design Project Option B (Taken with ME 627, which counts as an Advanced Engineering Elective, for 7 total credits)
Approved General and Advanced Engineering Electives (12 hours)

A maximum of 6 credits of General Electives (and a minimum of 0) 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 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 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 found at 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 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, regardless of whether the student was exempted from taking ENGL 101 on admission and has satisfied the KU Core GE21 through some other means.

Pre- and Co-requisites

A grade of C or better is required in the following courses and for courses substituted for these courses to satisfy pre- and co-requisites: MATH 125, MATH 126, MATH 127, MATH 220, MATH 290, MATH 365, CHEM 150, PHSX 210, PHSX 212, ME 228, ME 208, ME 312, ME 211, ME 311, and ME 320.

Students can be removed from a Mechanical Engineering course for failing to meet the pre- and co-requisites for the course, including earning a C or better in the courses listed above.

Chemistry

CHEM 130 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.
4. A Biomechanics Advanced Engineering Elective (ME 750, 751, 753, 755, 756, 757, 760, or 765)