

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

University Requirements

General Education

The UMKC General Education Core (<http://catalog.umkc.edu/undergraduate-academic-regulations-information/general-education-requirements>) is the university-wide curriculum that all undergraduate students will complete. The 30-credit hour core curriculum includes three course types designated as Anchor, Discourse and Focus and is detailed in the General Education (<http://catalog.umkc.edu/undergraduate-academic-regulations-information/general-education-requirements>) section of the catalog.

Constitution Course

Every undergraduate student must take a course covering the United States Constitution and the Missouri State Constitution before graduation. Course options are included in the program requirements section below.

RooWriter Assessment

Candidates for all baccalaureate degrees must complete the online UMKC RooWriter Writing Assessment after they have passed Discourse 200 (or its equivalent) but before they have attained 90 credit hours. Incoming transfer students with more than 90 credit hours must complete the RooWriter by the end of their first semester of enrollment or within one semester after passing Discourse 200 (or its equivalent). Students who have not completed the RooWriter Writing Assessment within two semesters after passing Discourse 200 (or its equivalent) will be blocked from enrollment until they successfully complete the RooWriter. Additional information is available in the Undergraduate Academic Regulations and Information (<http://catalog.umkc.edu/undergraduate-academic-regulations-information/roowriter>) section of the catalog.

Exit Examinations

Information on exit examinations and/or major field exams is available in the Undergraduate Academic Regulations and Information (<http://catalog.umkc.edu/undergraduate-academic-regulations-information/graduation/exitexams>) section of the catalog.

Student Learning Outcomes

Students graduating from this program will:

- 1. Students will be able to use mathematical methods to make design decisions.
- 2. Students will be able to analyze conduction and convection properties of thermal-fluid systems.
- 3. Students will be able to analyze kinematics and dynamics of mechanical components.
- 4. Students will be able to develop algorithms for solving engineering problems.
- 5. Students will be able to analyze strength characteristics of engineering materials.
- 6. Students will be able to use measurements to solve engineering problems.

Admissions

High school students planning to apply to the School of Computing & Engineering are strongly encouraged to take a college preparatory program that emphasizes mathematics, science and communication skills.

First-time college student applicants to the undergraduate program in information technology will be admitted if they obtain:

1. An ACT mathematics score of at least 25 and
2. An ACT composite score of at least 24

First-time college student applicants who do not meet the above criteria but do meet UMKC general admission requirements will have their applications reviewed by a faculty committee for admission. Applicants who are not admitted to SCE but do meet UMKC general admission requirements may be admitted to University College.

Students without the prerequisite preparation must take the needed coursework before enrolling in courses required for the bachelor's degree. Students seeking re-admission must have been in good academic standing when last enrolled. Otherwise, re-admission requires a formal review by the undergraduate program committee.

Transfer applicants must have at least 24 credits of transferable college credit, an overall 2.0 GPA on a 4.0 scale in all coursework, which includes repeated coursework, attempted at previous institutions. Transfer applicants without a 2.0 or higher college GPA must submit a petition for admission.

Program Requirements

The Bachelor of Science in Mechanical Engineering prepares students with a breadth and depth in technical knowledge so that they can work immediately in most areas of the profession. **Engineering programs must demonstrate that their students attain the outcomes listed above.**

The Mechanical Engineering curriculum requires a minimum of 130 hours of coursework and satisfies the UMKC General Education requirements.

Notes: Machine Shop Safety class must be completed prior to using any tools in university sponsored activities and facilities.

A grade of C or higher must be earned in all major required coursework.

All UMKC student must take the ETS Proficiency Profile after completing 70 credit hours and before applying for graduation (<http://www.umkc.edu/exitexams/>).

Program Specific Recommendations for UMKC General Education Core (<http://catalog.umkc.edu/undergraduate-academic-regulations-information/general-education-requirements>) Coursework

Code	Title	Credits
Anchor I ¹		3
Anchor II ¹		3
Anchor III (Satisfied in program requirements below)		
DISC 100	Discourse I: Reasoning and Values (Speech and Writing)	3
DISC 200	Discourse II: Culture and Diversity (Writing and Speech)	3
DISC 300	Discourse III: Civic and Community Engagement (Speech and Writing)	3
Focus A ¹		3
Focus B (Satisfied in program requirements below)		
Focus C (May be satisfied by the Constitution course requirement below)		
Focus Elective (Satisfied in program requirements below)		
'Total credits' in this section indicates the number of General Education Core credit hours that are not met by the degree specific requirements outlined below. Choosing to take general education coursework outside of what is recommended in the program requirements below will extend credit hour minimum and program length.		
Total Credits		18

¹ See the UMKC General Education Core (<http://catalog.umkc.edu/undergraduate-academic-regulations-information/general-education-requirements>) section of the catalog for available Anchor and Focus course options.

Constitution Course Requirement

Section 170.011.1 of the Missouri Revised Statutes, 2015, states that all candidates for a degree issued by a college or university in the state of Missouri must have "satisfactorily passed an examination on the provisions and principles of the Constitution of the United States and of the state of Missouri, and in American history and American institutions."

Courses at UMKC that satisfy this state requirement are:

Code	Title	Credits
Choose one of the following:		3
CJC 364	The Supreme Court And The Criminal Process	
HISTORY 101	U.S. History to 1877 (Focus C) ¹	
HISTORY 102	U.S. History Since 1877 (Focus C) ¹	
HISTORY 360R	Constitutional History of the United States	
HONORS 230	Honors American Government (Focus C) ¹	
POL-SCI 210	American Government (Focus C) ¹	
Total Credits		3

¹ Course may satisfy both the UMKC General Education Core (Focus C) and Constitution requirements.

There are a few other ways this requirement can be satisfied for students transferring to UMKC:

- Take an equivalent course from the list above at a regionally accredited institution.
- Earn credit for one of the above courses through AP, IB, or CLEP.
- Take a course that directly satisfies the Missouri Constitution Requirement at another Missouri institution.
- Have a previous bachelors degree (or higher) from a regionally accredited institution.
- Have an Associate of Arts degree from a regionally accredited institution.
- Complete the 42 Hour Core at a Missouri institution and have it listed on the official transcript.

Major Requirements

Code	Title	Credits
Math and Science Requirements		
ALEKS Math Placement		
MATH 110 (Precalculus Algebra; Typically not required due to ACT Admission Requirement)		
MATH 120 (Precalculus; Typically not required due to ACT Admission Requirement)		
CHEM 211 & 211L	General Chemistry I and Experimental General Chemistry I (Focus B)	5
MATH 266	Accelerated Calculus I ¹	4
MATH 268	Accelerated Calculus II	3
MATH 250	Calculus III	4
MEC-ENGR 272	Engineering Analysis	3
PHYSICS 240	Physics For Scientists and Engineers I (Focus B)	5
PHYSICS 250	Physics For Scientists and Engineers II (Focus B)	5
Engineering Fundamental Course Requirements		
E&C-ENGR 216	Engineering Computation	4
CIV-ENGR 275	Engineering Statics	3
CIV-ENGR 276	Strength Of Materials	3
E&C-ENGR 276	Circuit Theory I	3
E&C-ENGR 277	Circuit Theory I Lab	1
CIV-ENGR 319	Engineering Computation and Statistics	3
MEC-ENGR 130	Engineering Graphics	3
MEC-ENGR 285	Engineering Dynamics	3
MEC-ENGR 306	Computer-Aided Engineering	3
MEC-ENGR 352	Mechanical Instruments Lab	2
MEC-ENGR 353	Heat Transfer and Fluid Mechanics Lab	2
Energy Systems Course Requirements		
CIV-ENGR 351	Fluid Mechanics	3
MEC-ENGR 299	Engineering Thermodynamics	3
MEC-ENGR 360	Thermal System Design	3
MEC-ENGR 399	Heat and Mass Transfer	3
Engineering Design Course Requirements		
Choose one of the following:		3
MEC-ENGR 440	Heating and Air Conditioning	
MEC-ENGR 451	Power Plant Design	
MEC-ENGR 457	Mechatronic System Design	
Mechanical System Course Requirements		
ANCH 309	Mechanical Design Synthesis I	3
MEC-ENGR 324	Engineering Materials	3
MEC-ENGR 324L		1
MEC-ENGR 356	Mechanical Component Design	3
MEC-ENGR 380	Manufacturing Methods	3
MEC-ENGR 385	System Dynamics	3
MEC-ENGR 496WI	Mechanical Design Synthesis	3
Mechanical Engineering Electives		
Take 15 hours of mechanical engineering electives at the 300/400 level.		15
Take 1 hour of Machine Shop Safety. ²		1
Total Credits		109

¹ Students not meeting the MATH 266 prerequisite requirements will have 3-8 additional hours (MATH 110 and MATH 125, or MATH 120) with a minimum grade of 'B'.

² Machine Shop Safety is not currently offered at UMKC. Students should consult with advisor for available options.

Minimum GPA: 2.0

Total Credit Hours: 130

Tools for Planning and Fulfilling Academic Requirements

UMKC's Major Maps (<https://cf1.umkc.edu/majormaps>) are detailed, semester by semester plans that lead a student to complete all degree requirements within four years. Plans include benchmarks and critical courses by term that assist a student's evaluation of progress and major "fit". In order to ensure that the appropriate courses are taken, students are encouraged to consult with the undergraduate advisor for this major.

UMKC's Degree Audit System (<https://www.umkc.edu/registrar/majors-degrees/planmydegree.asp>) provides an individual evaluation of all degree requirements (General Education Core, Degree Specific, Major Specific, etc.) for student's officially recorded (Office of Registration and Records) and "what if" plans of study. This evaluation is used to certify all graduation requirements.

UMKC's Transfer Guides (<https://www.umkc.edu/transferguides>) provide detailed guidance on recommended transfer coursework, plans of study, transfer timelines, and transfer contact information. To ensure a seamless transfer experience, students are encouraged to work with both their community college advisor and a UMKC advisor when planning their coursework.