UMKC School of Science and Engineering

BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING, 2024-25

For more information about policies and requirements, please see the UMKC 2024-25 Catalog.

FIRST YEAR

FALL SEMESTER	HOURS	SPRING SEMESTER	HOURS
MATH 266 Accelerated Calculus I	4	MATH 268 Accelerated Calculus II	3
CHEM 211 General Chemistry I	4	PHYSICS 240 Physics for Scientists & Engineers I	5
CHEM 211L General Chemistry I Lab	1	CHEM 212R General Chemistry II	4
GEFSE 101 First Semester Experience	3	CHEM 212LR General Chemistry II Lab	1
ENGLISH 110 English I: Intro to Academic Prose	3	Communication Requirement (COMM-ST 110, 140, 212 or 277)	3
BMD-ENGR 115 Intro to Biomedical Engineering	1		
TOTAL	**16**	**TOTAL**	**16**

SECOND YEAR

FALL SEMESTER	HOURS	SPRING SEMESTER	HOURS
MATH 250 Calculus III	4	MATH 345 Ordinary Differential Equations	3
PHYSICS 250 Physics for Scientists & Engineers II	5	BMD-ENGR 215 3D Modeling & Printing	1
CIV-ENGR 275 Engineering Statics (Meets GECRT-SC req)	3	BIOLOGY 202 Cell Biology	3
BIOLOGY 108 General Biology I	3	E&C-ENGR 216 Engineering Computation	4
BIOLOGY 108L General Biology I Lab	1	MEC-ENGR 285 Engineering Dynamics	3
		GECRT-AH Critical Thinking in Arts & Humanities	3
TOTAL	**16**	**TOTAL**	**17**

THIRD YEAR

FALL SEMESTER	HOURS	SPRING SEMESTER	HOURS
BIOLOGY 304 Biostatistics I	3	BMD-ENGR 315 Biomedical Instrumentation	3
BIOLOGY 316 Principles of Physiology	3	BMD-ENGR 325 Biomedical Systems Physiology	3
E&C ENGR 380 Signals and Systems	3	E&C-ENGR 276 Circuit Theory I	3
E&C ENGR 381 Signals and Systems Lab	1	E&C-ENGR 277 Circuit Theory I Lab	1
MEC-ENGR 411 Introduction to Biomechanics	3	MEC-ENGR 299 Engineering Thermodynamics	3
ENGLISH 225 English II: Intermed Academic Prose	3	GECRT-SS Critical Thinking in Social & Behavioral Sciences	3
TOTAL	**16**	**TOTAL**	**16**

FOURTH YEAR

FALL SEMESTER	HOURS	SPRING SEMESTER	HOURS
BMD-ENGR 335 Biomedical Transport Phenomena	3	BMD-ENGR 495WI Biomedical Capstone Design	3
BMD-ENGR 415 Bioelectromagnetics & Bioelectricity	3	Biomedical Elective (see reverse)	3
MEC-ENGR 406 Intro to Biomaterials	3	Biomedical Elective (see reverse)	3
MEC-ENGR 492 Mechanical Design Synthesis I (Meets GECUE req)	3	Constitution Requirement (HIST 101 OR 102; POL-SCI 210, CJC 364, or HON 230)	3
Biomedical Elective (see reverse)	3	GECDV Culture & Diversity	3
TOTAL	**15**	**TOTAL**	**15**

Additional Graduation Requirements: Civics Exam, HElghten Exit Exam.

Total Credits to Graduate: 127

UMKC School of Science & Engineering · SS&C Student Services Center
336 Flarsheim Hall · 5110 Rockhill Road
816-235-2399 · sse@umkc.edu · sse.umkc.edu

<u>Biomedical Elective Options</u> – CHOOSE 3 courses from this list

(or 300-400 level program-approved course in BMD-ENGR, MEC-ENGR, EC-ENGR, CIV-ENGR, BIOL, or CHEM)

NOTE: at least 1 course must be an engineering elective & ** only 1 elective course can be below the 300 level

Engineering Electives

ME 306 Numerical Methods (Spring)

ME 351 Fluid Mechanics (Fall)

ME 385 System Dynamics (Spring)

ME 401 Imaging to Modeling (Fall) ^

ME 401 Intro to Polymers & Soft Materials (Even Spring) ^

ME 401 Adv Thermodynamics (Odd Spring) ^

ME 401 Material Selection (Spring)

ME 407 Adv Dynamics & Modeling (Spring) ^

ME 412 Biodynamics (Spring) ^

ME 413 Exp Biomechanics of Human Motion (Odd Spring) ^

ME 416 Biomedical Device Design (Spring) ^

ME 457 Mechatronic System Design (Fall)

– –

ECE 334 Semiconductors and Devices (Fall) ^

ECE 330/331 Electronic Circuits (4 cr hrs) (pre-req: ECE 334) (Spring)

ECE 401 Nano-electromagnetics and Plasmonics (Fall)

ECE 416 Neural & Adaptive Systems (Fall) ^

ECE 479 Intro to Computer Vision (Spring)

ECE 480 Digital Signal Processing (Spring)

ECE 484 Digital Image Processing (Fall)

ECE 486 Pattern Recognition (Fall) ^

– –

CE 276 Strength of Materials (Fall/Spring) **

CE 351 Fluid Mechanics (Spring)

CE 447 Contracts and Law (Fall)

Science Electives

BIOL 206 Genetics (Fall/Spring) **

BIOL 218 Introductory Anatomy (Fall) **

BIOL 306 From Bench to Bedside: Translational Research (Fall)

BIOL 441 Biochemistry (pre-req: CHEM 321/321L) (Fall/Spring)

BIOL 452 Bioinformatics (pre-req: BIOL 441) (Fall)

BIOL 404 Biostatistics II (Spring)

– –

CHEM 321/321L Organic Chemistry I (4 cr hrs) (Fall/Spring)

CHEM 341WI Analytical Chemistry I: Quantitative Analysis (4 cr hrs) (Fall/Spring)

| UNIVERSITY OF MISSOURI-KANSAS CITY |

School of Science and Engineering

Why Major in Biomedical Engineering

Beyond The Classroom

Students build experience by participating in any of our **student-led teams or organizations**:

- Biomedical Engineers Society
- National Society of Black Engineers (NSBE)
- Pre-Med Society
- Society for Biomaterials
- Society of Hispanic Professional Engineers (SHPE)
- Society of Women Engineers (SWE)
- UMKC Robotics
- Women in Science

Students have access to our **state-of-the-art facilities** complete with various life science and engineering research labs, 3D printing lab, clean room and more to best equip students for a variety of career paths.

The **adjacency of professional schools** (Medicine, Dentistry, Pharmacy) allows students the unique opportunity to explore higher level topics and coursework applicable to their areas of interest.

Personalize Your Degree

BSBME degrees expose students to the **principles of biology, chemistry and engineering** with the opportunity to take specialized courses relevant to those academic areas.

Easily **earn a master's degree through our BS to MS** program which allows students to complete a graduate degree at undergraduate tuition rates.

Students apply class concepts and strengthen their skills by participating in **innovative undergraduate research** alongside faculty mentors.

- Join projects focused on 3D printing approaches to tissue engineering, musculoskeletal modeling, drug delivery, and more!

After Graduation

SSE connects students with industry professionals in the area through **information sessions** and two **STEM Career Fairs** every year.

Kansas City is renowned for its **strengths in bioscience and medical research**, including:

- comparative medicine, cardiology, neuroscience, pharmaceutical development, outcomes research, and oncology

Employment for biomedical engineers is expected to **grow faster** than the average for all occupations.

There are nearly **300 life science companies in the region** and almost 4,000 established tech firms where students may participate in internships or find future employment.

SSE 22096469

UMKC