

Biomedical Engineering

College of
Engineering

Biomedical engineering (BME) is a multidisciplinary field that applies engineering principles and design methods to improve the interaction and integration of engineering with medicine and biological sciences for improving human health and solving healthcare challenges.

The 4-year Bachelor of Science (BS) in BME undergraduate program is designed for students who aspire to engineer novel treatments, devices, materials, technologies, or processes to improve human healthcare. Students seeking careers in industry, the healthcare professions, government agencies, or graduate studies in BME are candidates for this program.

The curriculum provides students with a unique set of qualitative and quantitative healthcare problem definition, analysis, and solution skills. This program uses the shared freshman-engineering curriculum, and offers students the flexibility to select among a variety of foundational engineering courses beginning in the third semester and a variety of upper-level BME courses in the senior year. A novel 2-semester interdisciplinary Capstone Senior Design project focused on creative engineering solution of an actual healthcare issue posed by collaborating industrial and/or healthcare partners completes the curriculum. BME and Product Design courses jointly created by BME and College of Design faculty, are integral to semesters 4 to 8 of the proposed program and are intended to instill “design-thinking” in students.

The curriculum is distinct from other BS BME programs due to these integral design-thinking courses and experiences within the proposed curriculum. These design-thinking experiences balance left-brain oriented technical materials with right-brain creative approaches to cultivate crucial abilities needed to: 1) communicate empathetically with all stakeholders in a design cycle; 2) frame healthcare challenges into engineering problems; and 3) design, prototype, build, test, refine. and implement solutions that solve contemporary healthcare challenges problems and meet all user needs.

Degree Requirements

In addition to fulfilling UK Core and College of Engineering requirements, students must complete the biosystems engineering curriculum. The following curriculum meets the requirements for the B.S. degree.

Freshman Year

First Semester	Hours
MA 113 Calculus I.....	4
PHY 231 General University Physics.....	4
PHY 241 General University Physics Laboratory.....	1
CIS/WRD 110 Composition and Communication I.....	3
EGR 101 Engineering Exploration I §▽.....	1
EGR 102 Fundamentals of Engineering Computing.....	2
Second Semester	
MA 114 Calculus II.....	4
CHE 105 General College Chemistry I.....	4
CIS/WRD 111 Composition and Communication II.....	3
EGR 103 Engineering Exploration II §▽.....	2
BIO 148 Introductory Biology I.....	3

Sophomore Year

First Semester	Hours
MA 213 Calculus III.....	4
PHY 232 General University Physics.....	4
PHY 242 General University Physics Laboratory.....	1
BIO 152 Principles of Biology II.....	3
BME 201 Introduction to Biomedical Engineering.....	3
Guided Engineering Elective I.....	3

Second Semester

MA 214 Calculus IV.....	3
CHE 107 General College Chemistry II.....	3
PRD/BME 170 Human Anatomy for Design.....	3
PRD 272 Introduction to UX for Product Design.....	2
Guided Engineering Elective II.....	3
UK Core – Humanities.....	3

Junior Year

First Semester	Hours
BME 322 Design Strategies for Biomedical Engineering.....	3
BME 435 Computer Modeling of Complex Systems.....	4
PRD/EGR 250 Computer-Aided Design: Solidworks.....	2
PRD/BME 371 Ergonomics.....	1
Guided Engineering Elective III.....	3
UK Core – Social Sciences.....	3
Second Semester	
STA 381 Engineering Statistics – A Conceptual Approach.....	3
BME 330 Experimental Methods in Biomedical Engineering.....	3
PRD/BME 350 Materials and Processes.....	3
PRD/BME 372 UX + UI for Product Design.....	1
BME Basic Elective I.....	3
UK Core – Citizenship - USA.....	3

Senior Year

First Semester	Hours
BME 420 Senior Design Project in Biomedical Engineering I.....	3
PRD/BME 451 Integrated Entrepreneurship in Product Design.....	2
PGY 412G Principles of Human Physiology.....	4
BME Basic Elective II.....	3
BME Advanced Elective I.....	3
Second Semester	
*BME 421 Senior Design Project in Biomedical Engineering II.....	3
BME Basic Elective III.....	3
BME Basic Elective IV.....	3
BME Advanced Elective II.....	3
UK Core – Global Dynamics.....	3

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

▽ Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

*Graduation Composition and Communication Requirement (GCCR) course.

University of Kentucky is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award associate, baccalaureate, masters, and doctorate degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call 404-679-4500, or online at www.sacscoc.org for questions about the accreditation of University of Kentucky.