Master of Science in Biomedical Engineering

Wichita State University’s Department of Biomedical Engineering offers a course of study leading to the Master of Science in Biomedical Engineering. Biomedical Engineering (BME) utilizes engineering expertise to analyze and solve problems in biology and medicine, with an eye towards improvement in health care. New and innovative solutions to today’s health challenges is increasingly requiring advanced and more in-depth study that graduate education can provide.

Admission Requirements
Students wishing to be considered for the MS in BME program will submit the Graduate School application and fee, and transcripts from all schools previously attended. The minimum requirements for admission to the MS in BME are:

- Bachelor’s degree in a discipline relevant to BME
- Minimum undergraduate GPA of 3.00
- Statement of purpose including a section on research interests
- Official GRE Scores
- Three letters of recommendation

Application materials will be evaluated by the Graduate School and the BME Graduate Admissions Committee, after which the student will be notified of their decision.

Applicants may request a waiver of some of the above requirements for admission if sufficient evidence is provided to the BME Graduate Admissions Committee for review.

Students entering the MS in BME program are expected to have already completed the following courses or their equivalents: Biology I, Anatomy and Physiology, General Chemistry (Chemistry I and II), Physics I, Math (Calculus I and II, Differential Equations), Circuits, Thermodynamics, Statics, Statistics, and programming. If prior coursework deficiencies exist, a student may be admitted on a conditional basis. It is recommended that as much of the deficient coursework as possible be completed prior to beginning graduate study.

Degree Requirements
The students in the MS in BME program will advance their technical knowledge in the discipline of BME through four required core courses. The MS in BME program allows students to take elective courses in their areas of interest from defined concentrations or coursework across different concentrations. Students will also develop their ability and skills for performing independent research and development of communication skills through the completion of a thesis.

The MS in BME requires a minimum of 30 credit hours, consisting of 12 credit hours of required core BME courses, 12 credit hours of elective courses, 6 credit hours of a required Master’s thesis, and a 0 credit hour seminar each semester.

Required Courses:
- BME 738 Bioimaging (3 hrs)
- BME 752 Applied Human Biomechanics (3 hrs)
- BME 748 Molecular & Cellular Engineering (3 hrs)
- BME 777 Biodegradable Materials (3 hrs)
- BME 876 Master’s Thesis (6 hrs)

Elective Courses:
Students need 12 credit hours of elective courses, which can be selected from within a chosen concentration or across concentrations. Elective courses must be selected in consultation with the student’s academic advisor. If a student desires to have expertise in a specific concentration, a minimum of two courses for the selected concentration must be completed.
Concentration Areas:
Biomaterials & Tissue Engineering; Molecular & Cell Bioengineering; Biomechanics & Rehabilitation Engineering; Bio-Computational Modeling & Devices; Innovation & Translational Biomedical Engineering.

Research Facilities
Biomedical Engineering faculty and their students engage in basic, applied and translational research in the following labs: Biomaterials and Bioengineering Lab, Human Biomechanics and Design Lab, Biomedical Sensors, Imaging and Modeling Engineering Lab, Biomedical Undergraduate Innovation and Design Lab, and the Human Performance and Design Lab. Biomedical Engineering laboratory and research activities can be viewed here: www.wichita.edu/bmelabs

Financial Aid
Several financial aid opportunities are available on a competitive basis to the best qualified students in the form of teaching and research assistantships. Furthermore, the university at large provides several campus employment opportunities for students.

Faculty
Michael J. Jorgensen, Associate Professor and Chair. Research Areas: Occupational biomechanics, industrial ergonomics, musculoskeletal injury risk assessment and interventions, segmental and whole body vibration
Anil Mahapatro, Associate Professor. Research Areas: Biomaterials, surface modification of bio-metallic alloys, biodegradable metallic implants, nanotechnology, drug delivery, design and optimization of bio-devices
Nils Hakansson, Assistant Professor. Research Areas: Musculoskeletal biomechanics, human movement computer simulation, rehabilitation engineering and technology, functional electrical stimulation, neuromuscular control, human movement coordination
Kim Cluff, Assistant Professor. Research Areas: Muscle damage quantification, Raman spectral analysis, peripheral artery disease muscle imaging, hyperspectral imaging, biomedical instrumentation design
David Long, Assistant Professor. Research Areas: Cardiovascular mechanobiology, cell-tissue biophysics, instrumentation/devices to understand cell and tissue mechanobiology, identifying novel surrogate markers of diseases, gene regulation, epigenetics, cell and tissue engineering, regenerative medicine
Jaydip Desai, Assistant Professor. Research Areas: Brain-machine interface, rehabilitation robotics, neuroprosthesis, cognitive neuroscience, robotic exoskeletons, biomedical instrumentation and control
Gary Brooking, Engineering Educator. Research Areas: Medical instrumentation, telemedicine, robotics and neuromuscular control, entrepreneurship and business development

BME Affiliated Faculty
Jeremy Patterson, Professor and Director, Institute of Interdisciplinary Creativity
Moriah Beck, Assistant Professor, Chemistry
Ramazan Asmatulu, Professor, Mechanical Engineering
Li Yao, Associate Professor, Biology
Mark Schneegurt, Professor, Biology
Ryan Amick, Assistant Professor, Human Performance Studies
Heidi Bell, Assistant Professor, Human Performance Studies

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