Concentration Electives

All BME students must complete 12 credits of Concentration Electives in order to satisfy the requirements for the BSBME degree. Specific sets of Concentration Electives have been approved for each of the undergraduate concentrations.
In order to guarantee that ABET requirements regarding minimum numbers of engineering credits are met, at least 6 of 12 credits of Concentration Electives must be in an engineering course. Note that not all 5995 courses may count for Engineering Credit. Please discuss with the Undergraduate Chair if you are electing one of these courses.

Notable exceptions are these current and former BME courses that count as life science credits and not engineering credits:

BME 2050 – Introduction to Anatomy and Physiology
BME 4010 – Engineering Physiology Laboratory
BME 5070 – Engineering Anatomy

Prior to registration for senior year courses, each student should file a Concentration Plan (available on the BME website) with the Undergraduate Program Chair. The University Bulletin lists all course descriptions and term availability. (https://bulletins.wayne.edu/undergraduate/)
NOTE: Students should pay attention to listed course prerequisites in developing their Concentration Plans.

All Concentrations

BE 5998 – Honors Thesis (4 cr)
BME 5020 – Computer and Mathematical Applications in Biomedical Engineering (4 cr)
BME 5010 – Quantitative Physiology (4 cr.)
BME 5070 – Engineering Anatomy (4 cr)
BME 5990 – Directed Study (1 cr.)
IE 4260 – Principles of Quality Control (3 cr)
IE 6240 – Quality Management Systems (3 cr)
IE 6405 – Integrated Product Develop (3 cr)
IE 6840 – Project Management (3 cr)

Biomaterials

BME 5210 – Musculoskeletal Biomechanics (4 cr)
BME 5220 – Cell & Tissue Biomechanics (3 cr)
BME 5310 – Device and Drug Approval and the FDA (3 cr)
BME 5320 – Fundamentals in Implant Tech (3 cr)
BME 5350 – Regenerative Biology and Medicine for Biomedical Engineers (4 cr)
BME 5380 – Biocompatibility (4 cr)
CHE 5060 – Low-Cost Microfluidic and Millifluidic Systems: Design, Fabrication and Testing (3 cr)
CHE 5450 – Nanocarrier-based Drug Delivery Systems (3 cr)
CHM 5600 – Biochemistry (3 cr)
MSE 5350 – Polymer Science (3 cr)
MSE 5360 – Polymer Processing (3 cr)
MSE 5650 – Surface Science (3 cr)

Biomechanics

BME 5130 – Vehicle Safety Engineering (4 cr)
BME 5210 – Musculoskeletal Biomechics (4 cr)
BME 5220 – Cell & Tissue Biomechanics (3 cr)
BME 6130 – Accident Reconstruction (3 cr)
KIN 3580 – Biomechanics (3 cr)
KIN 6310 – Physiology of Exercise II (3 cr)
ME 3400 – Dynamics (3 cr)
ME 5040 – Finite Element Analysis I (4 cr)
ME 5400 – Dynamics II (4 cr)
ME 5580 – Computer-Aided Mech Design (4 cr)
ME 5720 – Mech of Composite Materials (4 cr)

Biomedical Instrumentation

BME 6470 – Smart Sensor Tech I: Design (3 cr)
BME 6480 – Biomedical Instrumentation (4 cr)
CSC 3100 – Computer Architecture & Organization (4 cr)
CSC 3110 – Algorithm Design & Analysis (3 cr)
CSC 3400 – Human-Computer Interaction (3 cr)
CSC 6860 – Digital Image Processing & Analysis (3 cr)
ECE 3330 – Circuits II (3 cr)
ECE 3570 – Electronics I (4 cr)
ECE 4050 – Algorithms & Data Structures (3 cr)
ECE 4330 – Linear Systems and Signals (4 cr)
ECE 4570 – Fundamentals of Microelectronic Devices (3 cr)
ECE 5425 – Robotics Systems 1 (4 cr)
ECE 5575 – Introduction to Micro and Nano Electro Mechanical Systems (3 cr)
ECE 5690 – Introduction to Digital Image Processing (4 cr)
ECE 5770 – Digital Signal Processing (4 cr)
PHY 5340/5341 – Optics Lecture + Lab (5 cr)