Concentration Electives

All BME students must complete 12 credits of Concentration Electives to satisfy the requirements for the BSBME degree. Specific sets of Concentration Electives have been approved for each of the undergraduate concentrations.

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. In addition, at least two of the courses must be chosen under the specific concentration selected. If an Honors Thesis or Directed Study is selected, it must be within the concentration chosen as well. 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 5070 – Engineering Anatomy
BME 4010 – Engineering Physiology Laboratory

Prior to registration for junior 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 (max. 4 credits allowed)

BE 5998 – Honors Thesis (4 cr)
BME 5010 – Quantitative Physiology (4 cr.)
BME 5020 – Computer and Mathematical
   Applications in Biomedical Engineering (4 cr)
BME 5070 – Engineering Anatomy (4 cr)
BME 5990 – Directed Study (max. 1 cr. allowed)
BME 5995 - Engg. For Women's Health (3 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 (at least 2 courses must be taken)

BME 5210 – Musculoskeletal Biomechanics (4 cr)
BME 5220 – Cell & Tissue Biomechanics (3 cr)
BME 5310 – Device and Drug App. and the FDA (3 cr)

BME 5380 – Biocompatibility (4 cr)

CHE 5060 – Low-Cost Microfluidic and Millifluidic Systems: Design, Fabrication and Testing (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 (at least 2 courses must be taken)

BME 5130 – Vehicle Safety Engineering (4 cr) ME 3400 – Dynamics (3 cr)
BME 5140 -Biomedcal Aspcts of Neurtrauma (3 cr.) ME 5040 – Finite Element Analysis I (4 cr)
BME 5210 – Musculoskeletal Biomechanics (4 cr) ME 5400 – Dynamics II (4 cr)
BME 5220 – Cell & Tissue Biomechanics (3 cr) ME 5580 – Computer-Aided Mech Design (4 cr)
BME 5570 –Design of Human Rehab System (3 cr.) ME 5720 – Mech of Composite Materials (4 cr)
BME 6130 – Accident Reconstruction (3 cr)
ECE 5425 – Robotics Systems 1 (4 cr)
KIN 3580 – Biomechanics (3 cr)
KIN 6310 – Physiology of Exercise II (3 cr)

Biomedical Instrumentation (at least 2 courses must be taken)

BME 5140 -Biomedcal Aspcts of Neurtrauma (3 cr.) ECE 4330 – Linear Systems and Signals (4 cr)
BME 6470 – Smart Sensor Tech I: Design (3 cr) ECE 4570 – Fundamentals of Microelectronic
BME 6480 – Biomedical Instrumentation (4 cr) Devices (3 cr)
CSC 3100 – Computer Architecture & Org. (4 cr) ECE 5425 – Robotics Systems 1 (4 cr)
CSC 3110 – Algorithm Design & Analysis (3 cr) ECE 5575 – Introduction to Micro and Nano Electro
CSC 3400 – Human-Computer Interaction (3 cr) Mechanical Systems (3 cr)
CSC 6860 – Digital Image Procssing & Anal. (3 cr) ECE 5620 – Embedded System Design
ECE 3330 – Circuits II (3 cr) ECE 5690 – Introduction to Digital Image Pro. (4 cr)
ECE 3570 – Electronics I (4 cr) ECE 5770 – Digital Signal Processing (4 cr)
ECE 4050 – Algorithms & Data Structures (3 cr) PHY 5340/5341 – Optics Lecture + Lab (5 cr)