

University of Rochester Biomedical Engineering (BME) Program

Revised
10/19/14

FIRST TWO YEARS – ALL STUDENTS

Fresh Fall	BME 101 Introduction to Biomedical Engineering	† MTH 161 Calculus I	CHM 131 Chemistry I	Primary Writing or Humanities/Social Science
Fresh Spring	Primary Writing or Humanities/Social Science	<u>MTH161≥C-</u> MTH 162 Calculus II	<u>CHM131≥C-</u> CHM 132 Chemistry II	<u>PHY101</u> PHY 121 Physics I Mechanics
Soph Fall	<u>PHY121</u> BME 201 & 201L Biomechanics & MATLAB	<u>MTH162</u> ‡‡ MTH 165 Differential Equations	BIO 110 Biology	<u>PHY121≥C-</u> PHY 122 Physics II Electricity & Magnetism

† An alternative to the MTH 161 and 162 sequence is the MTH 141, 142, and 143 sequence. Careful attention must be paid to the effects of this longer sequence, including the possible need to take a course in the summer following the first year. MTH 171-4 series also fulfills the Math requirements.

‡‡ MTH 164 may be taken before MTH 165 – both courses are taught Fall & Spring.

All students must complete at least three additional BASIC SCIENCE ELECTIVES (at least 12 credit hours) beyond BIO 110, CHM 131 & 132, and PHY 121/141 & 122/142. Any biology, microbiology, neuroscience, chemistry, or physics course with number greater than 109 may be used to fulfill this requirement (excluding BIO 111, 112, 113). At least two courses must be life science courses (i.e., biology, microbiology, neuroscience). BME/BIO 258 fulfills a life science with a lab. Independent study courses cannot be used to satisfy this requirement. *At least one Basic Science elective must have a lab component.*

For list of Upper-Level BME's for each concentration, see Curriculum Guide.

Three of the four required Humanities/Social Science courses must form a CLUSTER.

**WRT 273 is required for Classes ≥ 2018.

Pre-requisites for each course are noted at the top of each box below (underlined courses are co-requisites).

Color Code:	BME CORE	Basic Science & Math	Humanities/Social Science/Writing	Basic Science Electives	Concentration	Electives
-------------	----------	----------------------	-----------------------------------	-------------------------	---------------	-----------

CONCENTRATIONS:

ALL STUDENTS

BIOMECHANICS

BIO SIGNALS & BIOSYSTEMS

CELL & TISSUE ENGR

MEDICAL OPTICS

Arrows indicate pre-requisites

Soph Spring	<u>PHY122 & MTH165</u> BME 210 Biosystems & Circuits	<u>MTH162</u> ‡‡ MTH 164 Multidimensional Calculus	Humanities/Social Science ----- & WRT 273* Prof Writing	<u>BME201</u> ME 226 Solid Mechanics	Humanities/Social Science & WRT 273* Prof Writing	Basic Science Elective	Humanities/Social Science & WRT 273* Prof Writing	<u>PHY121 & MTH 165</u> CHE 243 Fluid Dynamics	Humanities/Social Science & WRT 273* Prof Writing	<u>PHY122&MTH162</u> BME 270 Biomedical Microscopy
JR Fall	<u>BME210 & MTH165</u> BME 230 Intro to Signals & Imaging	Basic Science Elective (Free Elective for Cell & Tissue – see Fall Sr year)	Humanities/Social Science	Basic Science Elective	<u>BME210</u> ECE 221 Elec Devs & Ckts <u>MTH165</u> or & <u>BME230</u> BME 228 Physiological Control Sys	<u>BME210, MTH164 & MTH165</u> ECE 230 Electromagnetic Waves	<u>CHM132≥C-</u> Basic Science Elective (ORGO I)	<u>CHE243/PHY121/ MTH165</u> CHE 244 Heat & Mass Transfer	<u>MTH162 & PHY121</u> OPT 241 Geometrical Optics	Basic Science Elective
JR Spring	<u>BME201/201P</u> BME 221/ 099 Lab Biomedical Computation & Statistics	<u>CHM132, PHY122, MTH162, BIO110, & BME201</u> BME 245/ 099 Lab Biomaterials	<u>MTH162 & PHY 121</u> ME123 Thermodynamics	Basic Science Elective	Elective	Basic Science Elective	Humanities/Social Science	<u>BIO110, CHM203 [BIO198]</u> Basic Science Elective (BIO 250)	Humanities/Social Science	<u>MTH164&PHY122</u> OPT 261 Interference & Diffraction
SR Fall	<u>BME Senior</u> BME295 Design Seminar	<u>BME210 & BME230</u> BME 260 Quantitative Physiology	<u>MTH164, MTH165, BME201, ME123</u> ME 225 Fluid Dynamics	Upper-level BME	Humanities/Social Science	<u>BME230</u> ECE 246 Digital Signal Processing	Elective (Basic Science Elective BIO 210 for Cell&Tissue)	<u>Junior Standing</u> CHE 225 Thermodynamics	Basic Science Elective	Upper-level BME
SR Spring	<u>BME Senior</u> BME296 Senior Design Project	Humanities/Social Science	Elective	Elective	Elective	Upper-level BME	Elective	Upper Level BME	Elective	Elective