

URochester Sample Biomedical Engineering (BME) 4-Year Curriculum

Revised
8/24/26

First 1 ½ yrs - ALL Students

1 st Fall	BME 101 Introduction to Biomedical Engineering	*MTH 161 Calculus I	CHM 131 Chemistry I	WRT 105 Primary Writing Social Sci or Humanities
1 st Spring	BME 117 MATLAB (2 credit course)	MTH 162 Calculus II	CHM 132 Chemistry II	PHY 121 Physics I Mechanics
Soph Fall	BME 201 Biomechanics	#MTH 165 Differential Equations	BIO 110 Biology	PHY 122 Physics II Electricity & Magnetism

*An alternative to the MTH 161 and 162 sequence is the MTH 141, 142, 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. Students taking the 141-3 series also take PHY 113 instead of PHY 121. MTH 171-4 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 **two** additional BASIC SCIENCE Electives (at least 8 credits) in addition to BIO 110, CHM 131/132 and PHY 121/122. Any natural science with a number of 110 or higher (biology, chemistry, microbiology, environmental science, neuroscience, physics, or selected courses from brain & cognitive sciences) may be used to fulfill this requirement. Independent study courses **cannot** be used to satisfy this requirement. **Students in C&T concentration must take either BME 211, BIO 210 or BIO 202 as one of the BSE courses.** See curriculum guide for further information.

OPT 242/244 are **suggested** electives for the Medical Optics concentration but can be substituted.
⌘ All students need **ONE** Upper Level BME course (listed in Curriculum Guide). These are offered in both fall and spring.

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

****WRT 273 (2 cr.) may be taken either Spring sophomore year or Fall junior year..**

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

Flexibility: Boxes with diagonal splits represent **alternate** choices for that semester. Electives and BSE course may be moved between semesters. Use this flexibility to consider options for study abroad, research, minors, or other interests!

Color Code:	BME CORE	Basic Science & Math	Humanities / Soc Sci / Writing	Basic Science Elective	Concen- tration	Electives
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ALL Students

Concentrations:

Biomechanics

Biosignals & Biosystems

Cell & Tissue Eng

Medical Optics

Soph Spring	PHY 122 & MTH 165 BME 210 Biosystems & Circuits	MTH 162 or 143 #MTH 164 Multidimensional Calculus	Humanities / Social Science & WRT 273 ** Prof Identity	BME 201 ME 226 Solid Mechanics	Humanities / Social Science & WRT 273** Prof Identity	★ Basic Science Elective	Humanities / Social Science & WRT 273** Prof Identity	PHY 121 & MTH 165 CHE 243 Fluid Dynamics	Humanities / Social Science & WRT 273** Prof Identity	PHY 122 & MTH 162 BME 270 Biomedical Microscopy
JR Fall	BME 210 & MTH 165 BME 230 Intro to Signals & Imaging	Elective & WRT 273 ** Prof Identity	Humanities / Social Science	★ Basic Science Elective	BME 210 ECE 221 Elec Devs & Ckts Phys Cont Sys BME 230	BME 210, MTH 164, 165 ECE 230 Electromagnetic Waves	★ Basic Science Elective	CHE 243, PHY 121, MTH 165 CHE 244 Heat & Mass Transfer	PHY 121 & MTH 162 OPT 241 Geometrical Optics	★ Basic Science Elective
JR Spring	BME 201/201P BME 221/099 Lab Biomedical Computation & Statistics	BME 201, PHY 122, CHM 132, BIO 110, MTH 162 BME 245/099 Lab Biomaterials	MTH 162, PHY 121 ME 123 Thermo- dynamics	★ Basic Science Elective	Humanities / Social Science	★ Basic Science Elective	Basic Sci Elec. Elective	MTH 162, PHY 121 ME 123 Thermo- dynamics	Humanities / Social Science	PHY 122 & MTH 164 OPT 261 Interference & Diffraction
SR Fall	BME Senior BME 295 Design Seminar	BME 210 BME 260 Quantitative Physiology	MTH 164, 165, BME 201, PHYS 121 ME 225 Fluid Dynamics	⌘ UL BME BME 283 Elective	BME 230 ECE 246 Digital Signal Processing	⌘ UL BME BME218 or 253 Elective	Humanities / Social Science	⌘ UL BME BME 229 ★ Basic Science Elective	Elective OPT 242 Aberration OPT 261	⌘ UL BME BME 255 ★ Basic Science Elective
SR Spring	BME 295 BME 296 Senior Design Project	Humanities / Social Science	Elective	⌘ UL BME BME 212 or 203 Elective	Elective	⌘ UL BME BME 251 Elective	Elective	⌘ UL BME BME 262 Elective	Elective OPT 244 Lens Des. OPT 242	⌘ UL BME BME 272 ★ Basic Science Elective