



Biomedical Engineering Major Curriculum

Premed Offerings

Pre-medical Courses are highlighted in Green

Freshman Year

<i>Fall Semester</i>		<i>Credit Hours</i>
ENGL 132	English Composition I	3
ENGR 102	First Year Engineering Seminar	1
ENGR 103	Introduction to Engineering	4
MATH 133	Calculus I	4
PEHR 151	Personal Health and Wellness	1
PHYS 133	Mechanics	<u>4</u>
Semester Total		17

Spring Semester

ENGL 133	English Composition II	3
ENGR 110	Engineering Problem Solving	2
ENGR 105	Computer Program Design	3
MATH 134	Calculus II	4
PEHR XXX	Lifetime Activities Series	1
PHYS 134	Electricity and Magnetism	<u>4</u>
Semester Total		17

Sophomore Year

<i>Fall Semester</i>		<i>Credit Hours</i>
BIO 107	General Biology [†]	3
BIO 117	General Biology Lab	1
BME 201	Foundations of Biomedical Engineering	3
CHEM 105	General Chemistry I	4
ENGR 208	Fundamentals of Electrical Engineering	4
MATH 236	Differential Equations	<u>3</u>
Semester Total		18 [†]

Spring Semester

BME 202	Biomedical Systems	3
BIO 108	General Biology II	3
BIO 118	General Biology Lab II	1
CHEM 106	General Chemistry II	4
ENGR 206	Engineering Mechanics	3
MATH 235	Calculus III	3
LBC 2XX	Learning Beyond the Classroom I	<u>0</u>
Semester Total		17

[†] *Premedical students and those students interested in upper-level biology courses need to take BIO 117 concurrently with BME 107 and overload to 18 credit hours for this semester – see premedical section below for additional requirements.*

Western New England College Biomedical Engineering Major

Junior Year

<i>Fall Semester</i>		<i>Credit Hours</i>
BME 301	Engineering Physiology I	3
BME 305	BME Laboratory I	1
BME 331	Bioinstrumentation	3
ENGR 212	Probability and Statistics	3
MATH 350	Engineering Analysis I	3
CHEM 209	Organic Chemistry I	3
CHEM 219	Organic Chemistry Lab I	<u>1</u>
Semester Total		17

<i>Spring Semester</i>		
BME 302	Engineering Physiology II	3
BME 306	BME Laboratory II	1
BME 340	Biomaterials	3
BME 350	Biomedical Thermal Systems	3
CHEM 210	Organic Chemistry II	3
CHEM 220	Organic Chemistry Lab II	1
GenEd XXX	GenEd: Soc/ Behavioral Science	<u>3</u>
Semester Total		17

Senior Year

<i>Fall Semester</i>		<i>Credit Hours</i>
BME 405	BME Senior Laboratory	1
BME 437	BME Senior Design Project I	3
BME 451	Biomechanics	3
BME XXX	BME Technical Elective	3
HIST XXX	GenEd: Historical	3
PH XXX	GenEd: Ethical	<u>3</u>
Semester Total		16

<i>Spring Semester</i>		
BME 440	BME Senior Design Project II	4
CHEM 314	Biochemistry (suggested Sequence Elective)	3
CHEM 324	Biochemistry Laboratory	1
TechElec XXX	Technical Elective	3
ILP XXX	GenEd: Integrated Liberal and Professional	3
CUL XXX	GenEd: Cultural	3
LBC 4XX	Learning Beyond the Classroom II	<u>0</u>
Semester Total		17

†† Students who have taken the premedical recommended courses may consider taking CHEM 211, Analytical Methods and CHEM 221, Analytical Methods Laboratory and be eligible for a Chemistry Minor.

Biomedical Engineering Technical Elective

Any course labeled BME xxx that is not part of the required curriculum may be used to fulfill the BME technical elective.

Technical Elective

Any 200 level or above math or science course or any 300 level or above engineering course may be used to fulfill the technical elective.

Sequence Electives

In the Junior and Senior years, there are a series of four “sequence elective” courses for which the students may choose one of the following sequences of courses. Additional sequences are possible but must be made in consultation with the student’s academic advisor.

Bioinstrumentation Sequence

BME 332 Biomedical Imaging
CPE 271 Digital Design
BME 433 Biomedical Signal Processing
BME 431 Advanced Bioinstrumentation

Computer Sequence

CPE 305 Object Oriented Design
CPE 271 Digital Design
CPE 310 Machine & Assembly Language
CPE 562 VHDL: Simulations and Synthesis

Mechanics Sequence

IE 312 Engineering Economic Analysis
ME 208 Mechanics of Materials
ME 425 Design of Machine Elements
ME 449 Computer Aided Engineering

Manufacturing Sequence (choose 4)

IE 326 Production Planning and Control
IE 312 Engineering Economic Analysis
IE 314 Manufacturing Processes
IE 315 Quality Control and Engineering Statistics
IE 422 Industrial Safety and Ergonomics

Cell and Tissue Engineering Sequence

CHEM 209 Organic Chemistry I with Lab
CHEM 210 Organic Chemistry II with Lab
CHEM 314 Biochemistry with Lab
BME 460 Cell and Tissue Engineering

Premedical Sequence

BIO 117 General Biology Lab (First semester sophomore year)
BIO 108/ 118 General Biology II with Lab (Second semester sophomore year)
CHEM 209 Organic Chemistry I with Lab
CHEM 210 Organic Chemistry II with Lab
CHEM 314 Biochemistry with Lab

Additional courses in Genetics, Cellular Physiology, and Human Anatomy are available through the Cooperating Colleges of Greater Springfield (CCGS).

College-Wide Requirements: A total of five College-wide requirement courses are listed in the biomedical engineering curriculum. These courses will be used to satisfy the requirement that all Western New England College students attain a perspective on: Ethics, History, Aesthetics, Integrated Liberal & Professional Learning, Cultural Studies, and Social and Behavioral issues. In addition to these courses a student is required to have two “**learning beyond the classroom**” (LBC) experiences that have been summarized with two 1000 word essays connecting the student’s experience to the student’s profession.

Premedical Students: Biomedical Engineering students intending to apply to medical school are advised to select the premedical elective sequence and seek the advice of their BME advisor and the campus premedical advisor as soon as practical, and take the following courses:

BIO 107/ 117 & 108/ 118 General Biology I & II with Lab
CHEM 209 Organic Chemistry I with Lab
CHEM 210 Organic Chemistry II with Lab
CHEM 314 Biochemistry with Lab