

# BIOMEDICAL ENGINEERING

## REQUIREMENTS

### CORE CURRICULUM

The Core Curriculum is designed to foster critical thinking skills and introduce students to basic domains of thinking that transcend disciplines. The Core applies to all majors. Information on specific classes in the Core can be found at [marshall.edu/gened](http://marshall.edu/gened).

#### CORE 1: CRITICAL THINKING

CODE	COURSE NAME	HRS	GRADE
FYS 100	First Year Seminar	● 3	_____
MTH 229	Critical Thinking Course	● 5	_____
_____	Critical Thinking Course	● 3	_____
<b>Additional University Requirements</b>			
_____	Writing Intensive	3	_____
_____	Writing Intensive	3	_____
_____	Multicultural or International	3	_____
BME 465	Capstone I	2	_____
BME 466	Capstone II	2	_____

#### CORE 2:

CODE	COURSE NAME	HRS	GRADE
ENG 101	Beginning Composition	● 3	_____
ENG 201	Advanced Composition	● 3	_____
CMM 103	Fund Speech-Communication	● 3	_____
MTH 229	Calculus I (CT)	● ♦ 5	_____
BSC 120/120L	Principles of Biology I/ BSC120L	● ♦ 4	_____
_____	Core II Humanities	● 3	_____
_____	Core II Social Science	● 3	_____
_____	Core II Fine Arts	● 3	_____

### MAJOR-SPECIFIC

All Biomedical Engineering majors are required to take the following courses:

CODE	COURSE NAME	HRS	GRADE	CODE	COURSE NAME	HRS	GRADE
MTH 229	Calculus I	● ♦ 5	_____	ENGR 102	Introduction to CAD	♦ 2	_____
MTH 230	Calculus II	♦ 4	_____	ENGR 104	Engineering Profession	♦ 1	_____
MTH 231	Calculus III	♦ 4	_____	ENGR 111	Engineering Computations	♦ 3	_____
MTH 335	Differential Equations	♦ 3	_____	ENGR 213	Statics	♦ 3	_____
BSC 120	Principles of Biology I	● ♦ 3	_____	ENGR 214	Dynamics	♦ 3	_____
BSC 120L	Principles of Biology I Lab	● ♦ 1	_____	ENGR 318	Fluid Mechanics	♦ 3	_____
BSC 121	Principles of Biology II	♦ 3	_____	ME 245	Circuits and Instrumentation	♦ 3	_____
BSC 121L	Principles of Biology II Lab	♦ 1	_____	BME 101	Intro to Biomedical Engineering	♦ 1	_____
BSC 227	Human Anatomy	♦ 3	_____	BME 201	Biomedical Engineering Seminar	♦ 2	_____
BSC 227L	Human Anatomy Lab	♦ 1	_____	BME 302	Engineering Biomechanics	♦ 3	_____
BSC 228	Human Physiology	♦ 3	_____	BME 305	Intro to Biophysical Measurement	♦ 3	_____
BSC 228L	Human Physiology Lab	♦ 1	_____	BME 306	Mechanics of Biological Tissues	♦ 3	_____
CHM 211	Chemistry I	♦ 3	_____	BME 310	Modeling & Simulat of BME Syst	♦ 3	_____
CHM 217	Chemistry I Lab	♦ 2	_____	BME 405	Mech & Performance Biomaterials	♦ 3	_____
CHM 212	Chemistry II	♦ 3	_____	BME 460	Mechanics of Bio-Fluids	♦ 3	_____
CHM 218	Chemistry II Lab	♦ 2	_____	BME 465	Capstone I	● ♦ 2	_____
PHY 211	University Physics I	♦ 4	_____	BME 466	Capstone II	● ♦ 2	_____
PHY 213	University Physics II	♦ 4	_____	_____	BME Technical Elective	♦ 3	_____
				_____	BME Technical Elective	♦ 3	_____
				_____	ENGR Elective	♦ 3	_____

● Area of Emphasis

♦ Major Requirement

■ College Requirement

● General Education Requirement

### MAJOR INFORMATION

- Students are required to know and track their degree requirements for graduation or for entrance to a professional school.
- BME Technical Elective: At least two BME technical electives must be taken from the following list of courses: any BSC 300- or 400-level course, any CHM 300- or 400-level course, ENGR 222, ENGR 451, ME 330, or any BME 300- or 400-level course not already taken to satisfy degree requirements.
- ENGR Elective: Any BME, CE, EE, ENGR, IE, or ME (300- or 400- level) course not already taken to satisfy degree requirements.
- The B.S.B.M.E. degree program requires a minimum of 123 credit hours of coursework.
- Course offerings and course attributes are subject to change each semester. Please consult each semester's schedule of courses for availability and attributes.

Milestone Course: This is a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.

# BIOMEDICAL ENGINEERING

The Biomedical Engineering discipline is the application of engineering principles and design concepts to medicine and biology for health care purposes. This discipline aims to narrow the gap between engineering and medicine, combining the design and problem-solving skills of engineering with medical and biosciences to advance health care treatment, including diagnosis, monitoring, and therapy. Biomedical engineering has only recently emerged as its own study, compared to many other engineering fields. Biomedical engineering is a rapidly growing field, and Marshall University has a unique program that will highlight the technical strengths of the university and garner interest in the development of the biomedical industry in the state.

FALL SEMESTER					SPRING SEMESTER					
CODE	COURSE NAME	HRS	GRADE		CODE	COURSE NAME	HRS	GRADE		
BME 101	Intro to Biomedical Engineer	1			BSC 120	Principles of Biology I	3			
BSC 227	Human Anatomy	3			BSC 120L	Principles of Biology I Lab	1			
BSC 227L	Human Anatomy Lab	1			BSC 228	Human Physiology	3			
ENG 101	Beginning Composition	3			BSC 228L	Human Physiology Lab	1			
ENGR 104	Engineering Profession	1			ENGR 102	Introduction to CAD	2			
FYS 100	First Year Seminar	3			ENGR 111	Engineering Computations	3			
MTH 229	Calculus I (CT)	5			MTH 230	Calculus II	4			
UNI 100	Freshman First Class	1								
<b>TOTAL HOURS</b>				<b>18</b>	<b>TOTAL HOURS</b>				<b>17</b>	
Summer Term (optional):										
FALL SEMESTER					SPRING SEMESTER					
CODE	COURSE NAME	HRS	GRADE		CODE	COURSE NAME	HRS	GRADE		
BME 201	Biomedical Engineering Seminar	2			BSC 121	Principles of Biology II	3			
CHM 211	Chemistry I	3			BSC 121L	Principles of Biology II Lab	1			
CHM 217	Chemistry I Lab	2			CHM 212	Chemistry II	3			
ENGR 213	Statics	3			CHM 218	Chemistry II Lab	2			
MTH 231	Calculus III	4			ENGR 214	Dynamics	3			
PHY 211	University Physics I	4			PHY 213	Physics II	4			
<b>TOTAL HOURS</b>				<b>18</b>	<b>TOTAL HOURS</b>				<b>16</b>	
Summer Term (optional):										
FALL SEMESTER					SPRING SEMESTER					
CODE	COURSE NAME	HRS	GRADE		CODE	COURSE NAME	HRS	GRADE		
BME 302	Engineering Biomechanics	3			BME 306	Mechanics of Biological Tissues	3			
BME 305	Intro to Biophysical Measurement	3			BME 310	Modeling & Simulation of BME Syst	3			
ME 245	Circuits and Instrumentation	3				ENGR Elective	3			
ENGR 318	Fluid Mechanics	3			ENG 201	Advanced Composition	3			
					MTH 335	Differential Equations	3			
<b>TOTAL HOURS</b>				<b>12</b>	<b>TOTAL HOURS</b>				<b>15</b>	
Summer Term (optional):										
FALL SEMESTER					SPRING SEMESTER					
CODE	COURSE NAME	HRS	GRADE		CODE	COURSE NAME	HRS	GRADE		
BME 405	Mech & Performance of Biomaterials	3			BME 466	Capstone II	2			
BME 460	Mechanics of Bio-Fluids	3				BME Technical Elective	3			
BME 465	Capstone I	2				Core II Humanities (WI, CT)	3			
	BME Technical Elective	3				Core II Social Science (MC/I, WI)	3			
CMM 103	Fund Speech-Communication	3				Core II Fine Arts	3			
<b>TOTAL HOURS</b>				<b>14</b>	<b>TOTAL HOURS</b>				<b>14</b>	
Summer Term (optional):										

◆ Area of Emphasis

◆ Major Requirement

■ College Requirement

● General Education Requirement

Milestone Course: This is a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.