

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.

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	
Additional University Requirements			
	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	

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	
YEAR ONE	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						
	TOTAL HOURS		18		TOTAL HOURS		17		
	Summer Term (optional):								
YEAR TWO	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		
	TOTAL HOURS		18		TOTAL HOURS		16		
	Summer Term (optional):								
YEAR THREE	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		
	TOTAL HOURS		12		TOTAL HOURS		15		
	Summer Term (optional):								
	YEAR FOUR	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		
TOTAL HOURS			14		TOTAL HOURS		14		
Summer Term (optional):									

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.

General Education Requirement
College Requirement
Major Requirement
Area of Emphasis

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 – 2023-2024

INVOLVEMENT OPPORTUNITIES

- Student Government Association
- Campus Activity Board
- JMELI
- Commuter Student Advisory Board
- Club Sports
- Religious Organizations
- Political Organizations
- Residence Hall Association
- Cultural Organizations
- National Society of Leadership and Success

RELATED MAJORS

- Mechanical Engineering
- Pre-Med
- Biology
- Mathematics
- Statistics

GRADUATION REQUIREMENTS

- Have a minimum of 120 credit hours (some colleges or majors require more);
- Have an overall and Marshall Grade Point Average of 2.00 or higher;
- Have an overall Grade Point Average of 2.00 or higher in the major area of study;
- Have earned a grade of C or better in English 201 or 201 H;
- Have met all major(s) and college requirements;
- Have met the requirements of the Core Curriculum;
- Have met the residence requirements of Marshall University, including 12 hours of 300/400 level coursework in the student's college (see section entitled "Residence Requirements" in the undergraduate catalogue);
- Be enrolled at Marshall at least one semester of the senior year;
- Have transferred no more than 72 credit hours from an accredited West Virginia two-year institution of higher education.

Colleges and specific programs may have unique requirements that are more stringent than those noted above. Students are responsible for staying informed about and ensuring that they meet the requirements for graduation.

This academic map is to be used as a guide in planning your coursework toward a degree. Due to the complexities of degree programs, it is unfortunate but inevitable that an error may occur in the creation of this document. The official source of degree requirements at Marshall University is DegreeWorks available in your myMU portal. Always consult regularly with your advisor.

YEAR ONE



Have questions? Need to talk? You already have a Friend-At-Marshall ready to help you succeed. Find your FAM Peer Mentor here: www.marshall.edu/fam



Stay on the Herd Path and come to class! Class attendance is more important to your success than your high school GPA, your class standing, or your ACT/SAT scores.



In order to graduate on time, you need to take an average of 15 credits per semester. Are you on track? Take 15 to Finish.



Take a career self-assessment to help determine what majors fit your talents and interests and consider job shadowing opportunities.



Take a pulse check. Know what you need to do every year to keep your grants, scholarships, or federal financial aid.



Declare a major before your 30th hour. Participate in a Career Exploration Experience (job shadow) to help decide on your major and career goals.



Sign up for Handshake! Handshake is the #1 place to launch a career with no connections, experience, or luck required. The platform connects up-and-coming talent with 650,000+ employers.

YEAR THREE



Attend an intercultural festival or event on campus or in town.



Talk to faculty about pursuing optional professional certifications.



Are you on track to graduate? Meet with your advisor for your Junior Eval to make sure you know what requirements you have left.



Run for Student Government and represent your fellow students while making a longterm difference on Marshall's campus.



Networking is key! Attend a Career Expo to seek employment opportunities and network with employers in your field.



Prepare for and pass the FE exam.



Your degree requires an internship. Start planning now! Meet with your advisor to discuss your internship options.

YEAR TWO



Are you completing enough credits to graduate on time? Dropping or failing a class can put you behind. Use summer terms to quickly get back on track.



Run for Student Government and represent your fellow students while making a longterm difference on Marshall's campus.



No need to wait until graduate school. Discuss undergraduate research opportunities with faculty in your major right now.



In order to work in your field, you need to take a certification exam. Develop a study strategy now. Check with your advisor.



Don't enter your field with zero experience! Secure an internship related to your field of study.



Join or create a club or organization on campus about a particular issue you care about. Marshall has more than 200 student organizations.

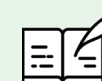


Meet with a career education specialist to conduct a "gap analysis." Figure out the skills you'll need for the career you want while you still have time to build them.

YEAR FOUR



This is it! Are you on track to graduate? Meet with your advisor for your Senior Eval to see what requirements you have left.



Want to continue your education and increase your opportunities? Talk to a faculty member about whether graduate school fits you career goals.



Strengthen your resume and enhance your presentation skills. Present what you've learned at an academic conference of campus.



Prepare for and pass the FE exam.



Your degree requires an internship. Start planning now! Meet with your advisor to discuss your internship options.



Run for Student Government and represent your fellow students while making a longterm difference on Marshall's campus.



Be at the top of your professional game! Prepare a final resume and practice your interview skills with a career coach in Career Education.

TRANSFERABLE SKILLS ASSOCIATED WITH THIS MAJOR

- Analytical Skills
- Design Skills
- Oral and Written Communication Skills
- Critical Thinking Skills
- Leadership Skills
- The Ability to Work as Part of a Team

ASSOCIATED CAREERS

- Medical Doctor
- Bioengineer
- Biomedical Engineer
- Biomechanical Engineer



Marshall University
College of Engineering and
Computer Sciences
One John Marshall Drive
Huntington, WV 25755
1-304-696-5453
cecs@marshall.edu
marshall.edu/cecs