MY ADVISOR'S NAME IS:

study.

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### **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			CORE 2:							
CODE	COURSE NAME		HRS	GRADE		CODE	COURSE NAME		HRS	GRADE
FYS 100	First Year Seminar	•	3			ENG 101	Composition I	•	3	
MTH 229	Calculus I	٠	5			ENG 201	Composition II	•	3	
	Critical Thinking Course	٠	3			CMM 103	Fund Speech-Communication	•	3	
					-	MTH 229	Calculus I (CT)	•	5	
Addition	al University Requirements					BSC 120	Principles of Biology I	•	4	
	Writing Intensive		3				Core II Humanities	•	3	
	Writing Intensive		3				Core II Social Science	• •	3	
	Multicultural or International		3				Core II Fine Arts	•	3	
BME 465	Capstone I		2							
BME 466	Capstone II		2							

#### MAJOR-SPECIFIC

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

	CODE	COURSE NAME	F	IRS	GRADE	CODE C	OURSE NAME	н	RS	GRADE
	MTH 229	Calculus I	• •	5		ENGR 216	Mechanics of Deformable Bodies	•	3	
	MTH 230	Calculus II	•	4		ENGR 219	Engineering Thermodynamics or	•	3	8
	MTH 231	Calculus III	•	4		or CHM 355	Organic Chemistry I			
	MTH 335	Differential Equations	•	3		ENGR 245	Intro to Circuits & Instrumentation	٠	3	
	BSC 120	Principles of Biology I	•	4		ENGR 318	Fluid Mechanics	•	3	
	BSC 121	Principles of Biology II	•	4		BME 101	Intro to Biomedical Engineering	•	1	
	BSC 227	Human Anatomy	٠	4		BME 201	Biomedical Engineering Seminar	•	2	2
	BSC 228	Human Physiology	٠	4		BME 302	Engineering Biomechanics	•	3	
)	CHM 211	Chemistry I	•	3		BME 305	Intro to Biophysical Measurement	•	3	
	CHM 217	Chemistry I Lab	٠	2		BME 306	Mechanics of Biological Tissues	•	3	
1	CHM 212	Chemistry II	٠	3		BME 310	Modeling & Simulat of BME Syst	•	3	
	CHM 218	Chemistry II Lab	٠	2		BME 405	Mech & Performance Biomaterials	•	3	
	PHY 211	Physics I	٠	3		BME 460	Mechanics of Bio-Fluids	•	3	
	PHY 213	Physics II	•	4		BME 465	Capstone I	• •	2	2
	ENGR 102	Introduction to CAD	٠	2		BME 466	Capstone II	• •	2	2
	ENGR 104	Engineering Profession	٠	1			BME Technical Elective	•	3	
	ENGR 111	Engineering Computations	٠	3			<b>BME</b> Technical Elective	٠	3	
	ENGR 202	Circuits II or Principles of Cell	٠	4			BME Technical Elective	٠	3	
	or BSC 322	2 Biology					BME Technical Elective	٠	3	
1	ENGR 213	Statics	٠	3						
1	ENGR 214	Dynamics	•	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: Four 300 or 400 level biomedical engineering or closely related courses must be taken. The courses must be approved by the student's advisor and the division's chair.
- The B.S.B.M.E. degree program requires a minimum of 136 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.

# **BIOMEDICAL ENGINEERING**<sup>2019-2020</sup>

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.

		CODE (	FALL SEMESTER	_	LIDC	GRADE		CODE	SPRING SEMESTER			GRAD
		ENG 101	Beginning Composition	•	3	GRADE		MTH 230	Calculus II	•	4	GNAL
		MTH 229	Calculus I (CT)	• •	5			CHM 212	Chemistry II	•	3	
r-1	C.C.	FYS 100	First Year Sem Crit Thinking	•	3			CHM 212	Chemistry II Lab	•	2	
YEAR ONE		ENGR 104		•				ENGR 111		•		
0			Engineering Profession	•	1			BSC 120	Engineering Computations	•	3	
AF		BME 101 CHM 211	Intro to Biomedical Engineer	•	3			ENGR 102	Principles of Biology I Introduction to CAD	•	2	
ЧE			Chemistry I					ENGR 102	Introduction to CAD	•	2	
		CHM 217	Chemistry I Lab	•	2							
		UNI 100 TOTAL HOL	Freshman First Class JRS		1 19			TOTAL HO	URS		18	
	Sumi	mer Term (opti										
			FALL SEMESTER						SPRING SEMESTER			
		CODE (	COURSE NAME	_	HRS	GRADE		CODE	COURSE NAME		HRS	GRA
		MTH 231	Calculus III	•	4			PHY 213	Physics II	•	4	
		BSC 227	Human Anatomy	•	4			BSC 121	Principles of Biology II	•	4	
0		BME 201	Biomedical Engineering Seminar	٠	2			ENGR 216	Mechanics of Deformable Bodies	٠	3	
M		PHY 211	Physics I	•	4		-	ENGR 214	Dynamics	٠	3	
Ч		ENGR 213	Statics	٠	3			BSC 228	Human Physiology	٠	4	
YEAR TWO												
		TOTAL HOU	IRS		17			TOTAL HO	URS		18	
	Sumi	mer Term (opti										
			FALL SEMESTER						SPRING SEMESTER			
		CODE	COURSE NAME		HRS	GRADE		CODE	COURSE NAME		HRS	GRAI
		MTH 335	Differential Equations	•	3			ENGR 318	Fluid Mechanics	٠	3	
G		BME 305	Intro to Biophysical Measurement	•	3			ENG 201	Advanced Composition	٠	3	
THREE		CMM 103	Fund Speech-Communications	•	3			BME 310	Modeling & Simulation of BME Syst	٠	3	
Ë		BME 302	Engineering Biomechanics	•	3			BME 306	Mechanics of Biological Tissues	•	3	
E C		ENGR 245	Intro to Circuits & Instrumentation	•	3			ENGR 202	Circuits II or Principles of Cell	•	4	
EAR		ENGR 219 o	r Engineering Thermodynamics or	•	3			or BSC 322	Biology			
ХE		CHM 355	Organic Chemistry I						Core II Social Science (MC/I, WI)	• •	3	
		TOTAL HOU	JRS		18			TOTAL HO	URS		19	
	Sumi	mer Term (opti	onal):									
		_		_	_	_		_	SPRING SEMESTER		_	_
		CODE (	FALL SEMESTER	-	LIDC	GRADE		CODE	COURSE NAME		LIDC	GRA
		BME 405	Mech & Performance of Biomaterials	•	3	GRADE		CODE	BME Technical Elective	•	3	GNA
		DIVIL 400	BME Technical Elective	•	3				BME Technical Elective		3	
щ			BME Technical Elective	•	3			BME 466		•		
D		BME 465		•	2			DIVIE 400	Capstone II		2	
$\frown$		BME 463	Capstone I Mechanics of Bio-Fluids	•					Core II Humanities (WI, CT)	•	3	
БO		DIVIE 400	Mechanics of Bio-Fluids		3				Core II Fine Arts	•	3	
AR FO												
YEAR FOUR												
YEAR FO		TOTAL HOU	JRS		14			TOTAL HO	URS		14	

#### 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**

- Business
- Mathematics
- Statistics
- Geography
- Geology

#### **GRADUATION REOUIREMENTS**

- 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 twoyear institution of higher education.

Colleges and specific programs may have unique requirements that are more stringent than those noted above. Students are responsible for staving 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.

Have guestions? 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





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

through the FAM Program, or apply to be

**YEAR TWO** 

**YEAR ONE** 

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.



Explore peer leadership opportunities

a UNI Peer Mentor.

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.

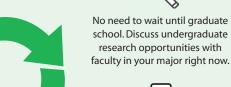


In order to work in your field, you need to take a certification exam. Develop a study strategy now. Check with your advisor.

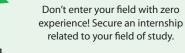


Join or create a club or organization on campus about a particular issue you care about. Marshall has more than 200 student organizations.









**\_\_\_\_** 

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.

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### BIOMEDICAL ENGINEERING – 2019-2020

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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 pulse check. Know what

you need to do every year to keep

your grants, scholarships, or federal

financial aid.

#### **YEAR THREE**









on Marshall's campus.

represent your fellow students while making a longterm difference



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

#### **YEAR FOUR**

and in

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wheth



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



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



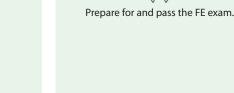
Your degree requires an internship. Start planning now! Meet with your advisor to discuss your internship options.

crease your opportunities?
o a faculty member about
er graduate school fits you
career goals.



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

<u>A</u>







## 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.



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

#### 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

- Structural Engineer
- Urban Planner
- Construction Engineer
- Environmental Engineer
- Transportation Engineer
- Geotechnical Engineer

Want to continue your education ities? bout

Prepare for and pass the FE exam.



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



Marshall University College of Information Technology and Engineering One John Marshall Drive Huntington, WV 25755 1-304-696-5453 cite@marshall.edu marshall.edu/cite