Biomedical Engineering (Instrumentation, Signals and Imaging) 480005BS with Co-Op

The following information has official approval of the **College of Engineering**, but is intended only as a supplemental guide. Official degree requirements are established at the time of admission to the degree-granting college. The transfer process is completed through an appointment with your academic adviser**.**

Italicized courses fulfill General Education requirements. Unless a course is specified, refer to the General Education guide at http://www.uakron.edu/advising/docs/General_Education_Guide.pdf

1st Year	Fall Semester	Credit Hours	Prerequisites
3150:151	*Principles of Chemistry I (Lecture and Recitation) (Natural Science Requirement)*	3	Placement into 3450:149 (Precalculus) or higher
3150:152	*Principles of Chemistry I Lab (Natural Science Requirement)*	1	3150:151, corequisite
3450:221	*Analytic Geometry-Calculus I (Mathematics Requirement)*	4	Placement Test or 3450:149 (Precalculus)
4800:101	Tools for BME	3	3450:149 (Precalculus) or higher, corequisite
	English Composition I Requirement	3	Appropriate placement by advisor
		14	

1st Year	Spring Semester		
3450:222	Analytic Geometry-Calculus II	4	3450:221 with C- or better
3150:153	Principles of Chemistry II (Lecture and Rec)	3	3150:151
3650:291	*Physics I (Natural Science Requirement)*	4	3450:221 with C- or better
4800:111	Intro to Biomedical Engineering Design	3	4800:101
	English Composition II Requirement	3	
		17	

1st Year	Summer Semester		
	Optional Internship		

2nd Year	Fall Semester		
3450:223	Analytic Geometry-Calculus III	4	3450:222 with C- or better
3650:292	Physics II (Lecture and Lab)	4	3650:291
4400:230	Circuits I Laboratory	1	4400:231, corequisite
4400:231	Circuits I	3	4400:230, 3450:223, 3650:292, corequisites
4800:201	BME Sophomore Seminar	1	4800:101 and 32 credit hours
3100:200	Anatomy and Physiology I Lecture	3	
3100:201	Anatomy and Physiology I Lab	1	3100:200, corequisite
		17	

2nd Year	Spring Semester		
3100:202	Anatomy and Physiology II Lecture	3	3100:200
3100:203	Anatomy and Physiology II Lab	1	
3450:335	Introduction to Ordinary Differential Equations	3	3450:223 with C- or better
4400:330	Circuits II Laboratory	1	4400:332, corequisite
4400:332	Circuits II	3	4400:231, prerequisite 4400:330, 3450:335, corequisites
4450:220	Digital Logic Design (Lecture and Lab)	4	4400:101 or 4450:101, corequisite
4800:220	Biomedical Computing	3	4800:101 and 3450:223
		18	

2nd Year	Summer Semester		
	Optional Co-Op		

3rd Year	Fall Semester		
4300:201	Statics	3	3450:222 and 3650:291, corequisite

4400:340	Signals and Systems	4	4400:332, (4450:208 or 3560:209), 3450:335
4400:360	Physical Electronics	3	4450:220, 4400:332
4800:305	Intro to Biophysical Measurement	4	4800:101 and (4400:231 or 4400:307) prerequisites; 3100:202, corequisite
	Speech/Oral Communication Requirement	3	
		17	

3rd Year	**Spring Semester**		
	Co-Op Assignment I		

3rd Year	**Summer Semester**		
4600:305	Thermal Science (Lecture and Problem)	2	3450:223, prerequisite; 3650:292, corequisite
3470:461	Applied Statistics	4	3450:222
3400:210 **or** 3400:221	*Humanities in the Western Tradition* ***-OR-*** *Humanities on the World since 1300*	4	32 credit hours and 3300:112 equivalent 32 credit hours and 3300:112 equivalent
		10	

4th Year	**Fall Semester**		
	Co-Op Assignment II		

4th Year	**Spring Semester**		
4600:203	Dynamics (Lecture and Problem)	3	3450:222, 3650:291, 4300:201, prerequisites 3450:223, corequisite
4800:310	Modeling and Simulation of Biomedical Systems	3	3450:335
	BME Elective	3	
	Area Studies/Cultural Diversity Requirement	2-3	
	Humanities Elective Requirement	3	
		14-15	

4th Year	**Summer Semester**		
	Co-Op Assignment III		

5th Year	**Fall Semester**		
4800:491	BME Design I	2	4800:111, prerequisite; 4800:305, corequisite
4800:420	Biomedical Signals and Image Processing	3	4400:163 and 4400:343
4800:325	Design of Medical Devices	3	Jr or Sr Standing in College of Engineering, Polymer Science or Arts and Science
4800:430/530	Design of Medical Imaging Systems	3	3100:200, 3650:292, 4400:343, 4400:353, 4800:305
3600:120	*Intro to Ethics (Humanities Elective Requirement)*	3	
	Social Science Requirement (not economics)	3	
		17	

5th Year	**Spring Semester**		
	BME Elective	3	
	BME Elective	3	
4800:492	BME Design II	2	4800:491
4800:400	Biomaterials	3	
	Social Science Elective	3	
	Physical Education Requirement	1	
		15	

	Minimum Total Credits for Degree	**140**	

*BME Electives must include a minimum of 3 credits from Biomedical Engineering (4800). All other electives may be chosen from a list of Approved Electives.

ALERT: 1) By the end of your first 48 credit hours attempted, you should have completed your General Education English, Math, and Oral Communication (Speech) requirements; 2) By the end of your first 48 credit hours attempted, you should have declared a major and transferred to (been accepted by) a degree granting college at The University of Akron.

Professor and Department Chair: Dr. Brian L. Davis 330-972-6977 bdavis3@uakron.edu Web Address: www.uakron.edu/engineering/BME/

IN GENERAL: The Bachelor of Science in Biomedical Engineering was designed to provide an in-depth understanding of the fundamentals of engineering. The Biomed program focuses first on core engineering course work followed by advanced applications specific to the field of Biomedical Engineering.

The Instrumentation, Signals and Imaging track is designed for those students who wish to pursue an Electrical Engineering background with specialization in biomedical instrumentation, signal and image processing, imaging devices, detectors, and system simulations.

3300:112 English Composition II is preferred, however 2020:222 Technical Report Writing will be accepted.

JOB OUTLOOK: Biomedical Engineering is a rapidly growing field. New companies are being developed each month. The job outlook is excellent. A graduate will also be prepared to enter graduate study in Engineering, Law, or medical school.

SALARY LEVEL: Starting salary offers for new graduates range from $47,000 to $61,200 per year with an average of $51,500.

CO-OP OPTION: Students can choose between a five-year program, which includes up to four semesters of co-op experience, or a four-year program without co-op experience. The Co-op Program provides an opportunity to gain real-world, relevant experience while working toward a bachelor's degree. Students who participate in the Co-op Program earn money to help fund their education, graduate with 12 or more months of career-related experience, and often receive a higher starting salary after graduation. More information about the Co-op Program can be found at engineering.uakron.edu/coop

PLACEMENT: The Engineering Co-op and Placement Office, ASEC 203, Akron, Ohio 44325 assists all graduates with full-time placement.

TRANSFER TO COLLEGE OF ENGINEERING: To be admitted to the college, the student must:

- Complete at least 30 semester hours of coursework post high school
- Complete Calculus 2 with a C- or higher
- Have a 2.3 grade point average in at least three of the following categories:
    - in all coursework
    - in all engineering coursework
    - in all required mathematics coursework
    - in all required science coursework (chemistry, physics, computer science, biology)

Admission of students who do not meet the above requirements will be considered by the dean or representative only if the request originates by an Engineering department head or representative.

Students can arrange inter-college transfers through an appointment with their academic advisor; advisor contact information is listed in "My Akron."

WOMEN AND MINORITY ENGINEERS: Eligible students are invited to register into the applicable engineering course elective. There are two options; 4100:110, Women in Engineering Seminar & Peer Group (Contact: Heidi Cressman, 330-972-7701, or hec9@uakron.edu). This course provides beginning women students an overview of the career opportunities for women in engineering. The course introduces relevant topics in engineering, an overview of career opportunities, student led discussion groups and an opportunity to meet with professionals in various engineering disciplines. The other option is 4100:120, Minority Engineering Seminar and Peer Groups (Contact: Julie Zhao, 330-972-2823, or zhao1@uakron.edu). This course provides an overview of disciplines and opportunities in engineering. It also reinforces educational/ career choices and provides role models of successful minority engineers.

(Jackson)