Biomedical Engineering (Biomaterials and Tissues) 480006BS

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 transfer and admission to the degree-granting college. *Completion of this degree within the identified time frame below is contingent upon many factors, including but not limited to: class availability, total number of required credits, work schedule, finances, family, course drops/withdrawals, successfully passing courses, prerequisites, among others.* The transfer process is completed through an appointment with your academic advisor.

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*	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
Total		**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 (Lecture and Lab) (Natural Science Requirement)*	4	3450:221 with C- or better
4800:111	Intro to Biomedical Engineering Design (Lecture and Lab)	3	4800:101
3150:154	Qualitative Analysis	2	
Total		**16**	

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
4300:201	Statics	3	3450:222 and 3650:291, 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
Total		**16**	

2nd Year	**Spring Semester**		
3100:202	Anatomy and Physiology II Lecture	3	3100:200
3100:203	Anatomy and Physiology II Lab	1	
4600:203	Dynamics (Lecture and Problem)	3	3450:222, 3650:291, 4300:201, prerequsites 3450:223, corequisite
3450:335	Introduction to Ordinary Differential Equations	3	3450:223 with C- or better
4300:202	Mechanics of Solids (Lecture and Problem)	3	4300:201
	English Composition II Requirement	3	3300:111 or equivalent
Total		**16**	

3rd Year	**Fall Semester**		
4200:321	Transport Phenomena (Lecture and Recitation)	3	4200:200 and 3450:335
3150:263	Organic Chemistry I	3	3150:153
3150:265	Organic Chemistry I Lab (and Discussion)	2	3150:154, prerequisite 3150:263, prerequisite or corequisite
4800:360	Biofluid Mechanics (Lecture and Problem)	3	3450:335, 3150:153, 3650:292, 4600:203

4800:365	Mechanics of Biological Tissues	3	4300:202 and 3450:335
	Speech/Oral Communication Requirement	3	
Total		**17**	

3rd Year	**Spring Semester**		
4600:300	Thermodynamics I	3	3450:223, prerequisite; 3650:292, corequisite
4400:307	Basic Electrical Engineering	4	3650:292, prerequisite; 3450:335, corequisite
4800:220	Biomedical Computing	3	4800:101 and 3450:223
4800:400	Biomaterials	3	
	Humanities Requirement	3	
Total		**16**	

3rd Year	**Summer Semester**		
3470:461	Applied Statistics	4	3450:222
	Social Science Requirement (not economics)	3-4	
3400:210 or 3400:221	*Humanities in the Western Tradition* ***-OR-*** *Humanities in the World since 1300*	4	32 credit hours and 3300:112 32 credit hours and 3300:112
Total		**11-12**	

4th Year	**Fall Semester**		
4800:440	Advanced Biomaterials	3	4800:400
4800:491	BME Design I	2	4800:111, prerequisite; 4800:305, corequisite
4800:305	Intro to Biophysical Measurements	4	4800:101 and (4400:231 or 4400:307), prerequisites; 3100:202, corequisite
	BME Elective*	3	
3600:120	*Intro to Ethics (Humanities Requirement)*	3	
	Area Studies/Cultural Diversity Requirement	2-3	
Total		**17-18**	

4th Year	**Spring Semester**		
	BME Elective*	3	
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4800:492	BME Design II	2	4800:491
4800:445	Experimental Techniques in Biomaterials and Tissue Engineering (Lecture and Lab)	3	4800:440
3250:244	*Intro to Economic Analysis (Social Science Requirement)*	3	
	Physical Education/Wellness Requirement	1	
Total		**15**	

	Minimum Total Credits for Degree	**139**	

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.

*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.

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 program focuses first on core engineering course work followed by advanced applications specific to the field of Biomedical Engineering.

The Biomechanics track is designed for those students who would pursue a Mechanical Engineering background with specialization in the areas of cardiovascular, orthopedic, rehabilitation engineering and system simulations.

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)