

BIOMEDICAL ENGINEERING

AET 1.102 – (210) 458-7084

A Bachelor of Science (B.S.) degree in Biomedical Engineering (BME) at UTSA is an interdisciplinary program that combines engineering principles, approaches, and methodologies with biological, chemical and physical sciences in order to define and solve problems in medicine. Students will be trained in the fundamentals of science and engineering and are expected to be able to apply this knowledge to investigate fundamental biomedical engineering questions associated with complex living systems as well as with the diagnosis and treatment of human diseases. A broad understanding of sciences and engineering principles is provided in the first two years of the program, with students having the option to choose one concentration as an in-depth focus area of study in the last two years of the program. Critical thinking and innovative design skills are integrated throughout the program to aid students in developing solutions and in solving biomedical engineering-related problems. Design projects throughout the program and Senior BME Design courses provide students the opportunity to integrate their design, critical thinking and communication skills with the scientific and engineering knowledge they acquired throughout the Biomedical Engineering program. The regulations for this degree comply with the general University regulations (refer to Bachelor's Degree Regulations).

Students enrolled in the BME degree program are given opportunities to develop a strong background in the engineering, technology and physical and biological sciences to learn the analysis, design, and synthesis tools necessary to function successfully as active participants in new and emerging areas of biosciences, medical devices and healthcare technologies. The Biomedical Engineering and Chemical Engineering department continues to be recognized locally and nationally for the quality of its undergraduate program. BME graduates continue to find positions in industry and are accepted into graduate schools and professional training programs (medicine and dentistry) nationwide.

FOCUS AREAS

- Biomechanics
- Biomaterials, Cellular and Tissue Engineering
- Imaging and Nanotechnology

EDUCATIONAL OBJECTIVES

The objectives of this program are founded on the belief that engineering principles and understanding of biological and physical sciences are critical to the investigation of fundamental bioengineering questions associated with complex living systems as well as with the diagnosis and treatment of human diseases. As such, the program educational objectives of the UTSA Biomedical Engineering program are to prepare graduates who will be able to:

- contribute positively to the biomedical industries and/or other sectors such as hospitals, government agencies, and academia;
- enhance competence in biomedical engineering by pursuing an advanced or a professional degree; and
- work successfully as a member in a team environment to facilitate biomedical engineering practice.

The minimum number of semester credit hours required for this degree is 125, at least 39 of which must be at the upper-division level. All candidates for this degree must fulfill the Core Curriculum requirements.

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RECOMMENDED PROGRAM OF STUDY

2022 – 2024 UNDERGRADUATE CATALOG

SEMESTER I (Fall)				SEMESTER II (Spring)			
AIS	1203	Academic Inquiry and Scholarship (core)	3	BME	1002	Introduction to Biomedical Engineering	2
BIO	1404	Biosciences I (core)	4	CHE	1113	General Chemistry II	3
CHE	1103	General Chemistry I	3	MAT	1224	Calculus II	4
MAT	1214	Calculus I (core and major)	4	PHY	1943	Physics for Scientists and Engineers I (core and major)	3
WRC	1013	Freshman Composition I (Q) (core)	3	PHY	1951	Physics for Scientists and Engineers I Laboratory	1
				WRC	1023	Freshman Composition II (Q) (core)	3
Semester Total Credits			17	Semester Total Credits			16
SEMESTER III (Fall)				SEMESTER IV (Spring)			
BME	2103	Physiology for Biomedical Engineering	3	BME	2203	Biomechanics I	3
EGR	2323	Applied Engineering Analysis I	3	BME	3003	Biomaterials I	3
STA	1403 or 2303	Probability and Statistics for the Biosciences or Applied Probability and Statistics for Engineers	3	BME	3113	Cellular Biology for Biomedical Engineering	3
				BME	3121	Cellular Biology for Biomedical Engineering Laboratory	1
PHY	1963	Physics for Scientists and Engineers II	3	BME	3211	Biomedical Engineering Laboratory I	1
PHY	1971	Physics for Scientists and Engineers II Laboratory	1	Technical elective			3
Technical elective			3				
Semester Total Credits			16	Semester Total Credits			14
Summer II							
BME	3013	Clinical Internship in Biomedical Engineering	3				
Summer Total Credits			3				
SEMESTER V (Fall)				SEMESTER VI (Spring)			
BME	3303	Bioinstrumentation	3	BME	3023	Biomedical Engineering Technology and Product Development	3
BME	3311	Biomedical Engineering Laboratory II	1	BME	3703	Biotransport Phenomena	3
BME	3373	Modeling and Simulation using MATLAB	3	BME	3711	Biomedical Engineering Laboratory III	1
Technical elective			3	Government-Political Science core			3
Government-Political Science core			3	Upper-division BME elective			3
Semester Total Credits			13	Semester Total Credits			13
Summer III							
BME	3033	Biomedical Engineering Internship (BME Elective)	3				
Summer Total Credits			3				
SEMESTER VII (Fall)				SEMESTER VIII (Spring)			
BME	4903	Senior BME Design I	3	BME	4913	Senior BME Design II	3
Upper-division BME elective			3	American History core			3
Upper-division BME elective			3	Component Area Option core			3
American History core			3	Language, Philosophy and Culture core			3
Creative Arts core			3	Social and Behavioral Sciences core			3
Semester Total Credits			15	Semester Total Credits			15
TOTAL CREDIT HOURS							125

Bachelor of Science Degree in Biomedical Engineering

A first-time, full-time freshman admitted as a biomedical engineering major must meet the minimum admission criteria of the College of Engineering.

All students applying for admission to the Biomedical Engineering program must submit the following supplemental documents to the Department of Biomedical Engineering:

- A cover page containing two references and declaration of intent form (https://engineering.utsa.edu/biomedical/wp-content/uploads/sites/2/2021/01/Declaration-of-Intent_Update21.pdf)
- A copy of the transcript
- A statement of their interests, professional career goals and how the Biomedical Engineering program will help them achieve those goals.

All transfer students must meet the aforementioned minimum admission requirements for the College of Engineering and the Biomedical Engineering program. Transfer students must also meet the minimum Good Academic Standing Requirements for a Biomedical Engineering Major (see below) in order to be considered for admission to the Biomedical Engineering program. Additionally, transfer students should also have an overall grade point average of 3.0 or better.

** Admission to the Biomedical Engineering program is competitive; meeting the aforementioned requirements does not guarantee admission to the program. Admission will be restricted only to the most qualified applicants. No conditional admission will be granted.