School of Biomedical ENGINEERING

Undergraduate Biomedical Engineering Minor
Curriculum Requirements & Course Information
Engineering Students

Curriculum Requirements:

- The undergraduate program requires completion of 21 credits with at least 12 credits greater than or equal to 300-level courses.
- All undergraduates are required to complete 8 credits of core courses.
- The 13 credits of electives are chosen according to the student's major.

Core Courses: 8 Credits

Course Number	Title	Credits	Prerequisite(s)	Semesters Taught	Catalog Description
BIOM 470	Biomedical Engineering	3	MATH 155 or MATH 160; PH 141	F	Engineering application in human/animal physiology, diagnosis of disease, treatment, rehabilitation, human genome manipulation.
BMS 300	Principles of Human Physiology	4	BZ 101 or BZ 110 or LIFE 102; CHEM 103 or CHEM 107 or CHEM 111	F, S, SS	Physiology of humans.
OT 215	Medical Terminology	1		F, S, SS	Definition and use of medical terms.

Elective Courses: 13 Credits

Course Number	Title	Credits	Prerequisite(s)	Semesters Taught	Catalog Description
BC 351	Principles of Biochemistry	4	BZ 110 or BZ 120 or LIFE 102; CHEM 245 or CHEM 346 or concurrent reg. in CHEM 346	F, S, SS	Structure and function of biological molecules; biocatalysis; metabolism, and energy transduction; gene expression.

BZ	310	Cell Biology	4	BZ 110 or BZ 120 or LIFE 103; CHEM 245 with a C or better or CHEM 345 with a C or better	F, S	Structure and function of cells emphasizing molecular mechanism. Communication, metabolism, motility, genetics, growth, reproduction (Special course fee).
BIOM	476A-B	Biomedical Clinical Practicum	2-4	BMS 300; BIOM 470	F, S, SS	Biomedical lab work or exposure to the hospital/clinical environment.
BMS	301	Human Gross Anatomy	5	BZ 110 or LIFE 102	F	Structure and function of the human body. Study of prosected human cadavers; clinical applications; living anatomy (Special course fee).
BMS	325	Cellular Neurobiology	3	BMS 300 or BMS 360	F	Cellular and molecular bases of nervous system function and behavior.
BMS	345	Functional Neuroanatomy	4	BMS 300 or BMS 360	S	Functional systems and circuits of the human brain and spinal cord (Special course fee).
BMS	405	Nerve and Muscle-Toxins, Trauma, and Disease	3	BIO 310 or BMS 300 or BMS 360	S	Understanding cellular and molecular basis of nerve and muscle activities in health and disease.
BMS	420	Cardiopulmonary Physiology (BMS 300 or BMS 360)	3	BMS 300 or BMS 360	F	Normal and pathophysiology of cardiovascular and pulmonary systems.
BMS	430	Endocrinology	3	BMS 300 or BMS 360	F	Physiology of the glands of internal secretion.
BUS	205	Legal and Ethical Issues in Business[1]	3		F, S, SS	Ethical, legal and regulatory issues in the US business environment.
CHEM	245	Fundamentals of Organic Chemistry	4	CHEM 107 or CHEM 113	F, S, SS	Nomenclature, structure, bonding, reactions, mechanisms, synthesis, stereochemistry of organic compounds.
CHEM	246	Fundamentals of Organic Chemistry Laboratory	1	CHEM 108 or CHEM 112 or CHEM 114; CHEM 245 or concurrent reg.	F, S	Laboratory applications of principles presented in CHEM 245 (Special course fee).
CHEM	345	Organic Chemistry I	4	CHEM 113; CHEM 114	F, S	Structure, nomenclature, dynamics, spectroscopy, reactions of organic molecules. Laboratory applications of principles presenting lecture (Special course fee).
HES	207	Anatomical Kinesiology	3		F, S, SS	Anatomical, physiological, and mechanical fundamental of human movement.
HES	307	Biomechanical Principles of Human Movement	3	BMS 301 or HES 207; PH 121 or PH 141	F, S, SS	Identify with and utilize biomechanical principles pertinent to human movement.
HES	403	Physiology of Exercise	4	BMS 300; LIFE 102	F, S, SS	Effects of exercise on tissues, organs, and systems of the body (Special course fee).
HES	405	Exercise Testing Instrumentation	2	HES 403	F, S	Theory and operation of devices commonly employed in quantifying factors related to exercise (Special course fee).

HES 420	Electrocardiography and Exercise Management	3	BMS 300	F, S	Interpretation of 12-lead ECG tracings, administering exercise tests, and prescribing exercise program for healthy individuals and special populations (Special course fee).
HES 476	Rehabilitation Exercise	3	HES 403	F, S	Interaction of physical activity with pathophysiology and treatment of chronic diseases and conditions.
HONR 499*	Senior Honors Thesis	3	HONR 399		* Must be biomedical and science focused. Must be approved by SBME Advisor or Director. Call 491-7157.
LIFE 103	Biology of Organisms-Animals and Plants	4	LIFE 102	F, S, SS	Diversity of animals and plants; their structural and functional characteristics (Special course fee).
MGT 420	New Venture Creation[1]	3	MGT 340	F	Entrepreneurs and the entrepreneurial process. Growth of an independent business.
MGT 440	New Venture Management[1]	3	MGT 420	S	Theories and skills necessary for managing startup and existing small firms.
MIP 300	General Microbiology	3	BZ 110 or BZ 120 or LIFE 102; CHEM 245 or concurrent reg. or CHEM 341 or concurrent reg. or CHEM 345 or concurrent reg.	F, S, SS	Structure, function, development, physiology, and molecular biology of microorganism emphasizing bacteria.
PHIL 205	Introduction to Ethics[1]	3	Sophomore standing or higher	F, S	Problems and theories concerning values and standards, right action, and the good life.
PHIL 305E	Philosophical Issues in the Professions-Animal Science[1]	3		F	Philosophical problems, theories relevant to specific professions-Animal science.
PSY 456	Sensation and Perception	3	PSY 250	F, S, SS	Review of research on physiological substrates of sensation; methods of scaling sensory experience; role of perception in behavioral adaption.
PSY 457	Sensation and Perception Laboratory	2	PSY 250; PSY 456 or concurrent reg.	F, S, SS	Review of research on physiological substrates of sensation; methods of scaling sensory experience. Role of perception in behavioral adaption.
STAT 315	Statistics for Engineers and Scientists	3	MATH 161 or MATH 255	F, S, SS	Calculus-based probability and statistics: distribution theory, estimation, hypothesis testing, applications to engineering and the sciences.

[1] Only three credits of non-technical courses may count toward minimum requirements.

F=Fall **S**=Spring **SS**=Summer **E**=Even Years **O**=Odd Years