

Semester by Semester Plans leading to a BS in Biomedical Engineering with minimum Premed requirements (6 additional credits)

Select one of the four options

Medical Imaging and Devices		Biomaterials		Biomechanics		Biochemical	
Credits		Credits		Credits		Credits	
Semester 1	19	Semester 1	19	Semester 1	19	Semester 1	19
FYS	1	FYS	1	FYS	1	FYS	1
MATH 140	4	MATH 140	4	MATH 140	4	MATH 140	4
CHEM 110	3	CHEM 110	3	CHEM 110	3	CHEM 110	3
CHEM 111	1	CHEM 111	1	CHEM 111	1	CHEM 111	1
ENGL 15 or 30	3	ENGL 15 or 30	3	ENGL 15 or 30	3	ENGL 15 or 30	3
BIOL 110 (premed course)	4	BIOL 110 (premed course)	4	BIOL 110 (premed course)	4	BIOL 110 (premed course)	4
PYSCH 100 (GS)	3	PYSCH 100 (GS)	3	PYSCH 100 (GS)	3	PYSCH 100 (GS)	3
Semester 2	19	Semester 2	19	Semester 2	19	Semester 2	19
MATH 141	4	MATH 141	4	MATH 141	4	MATH 141	4
CHEM 112	3	CHEM 112	3	CHEM 112	3	CHEM 112	3
CHEM 113	1	CHEM 113	1	CHEM 113	1	CHEM 113	1
PHYS 211	4	PHYS 211	4	PHYS 211	4	PHYS 211	4
EDSGN 100	3	EDSGN 100	3	EDSGN 100	3	EDSGN 100	3
BIOL 240W	4	BIOL 240W	4	BIOL 240W	4	BIOL 240W	4
Semester 3	19	Semester 3	19	Semester 3	19	Semester 3	19
MATH 251	4	MATH 251	4	MATH 251	4	MATH 251	4
PHYS 212	4	PHYS 212	4	PHYS 212	4	PHYS 212	4
SOC 001 (GS)	3	SOC 001 (GS)	3	SOC 001 (GS)	3	SOC 001 (GS)	3
EMCH 210	5	EMCH 210	5	EMCH 210	5	EMCH 210	5
CHEM 210 (Related Elect)	3	CHEM 210	3	CHEM 210 (Related Elect)	3	CHEM 210	3
Semester 4	18	Semester 4	18	Semester 4	18	Semester 4	18
MATH 230	4	MATH 230	4	MATH 230	4	MATH 230	4
BME 201	3	BME 201	3	BME 201	3	BME 201	3
CMPSC 200	3	CMPSC 200	3	CMPSC 200	3	CMPSC 200	3
CHEM 212 (Related Elect)	3	CHEM 212 (Related Elect)	3	CHEM 212 (Related Elect)	3	CHEM 212 (Related Elect)	3
CHEM 213 (Premed)	2	CHEM 213 (Premed)	2	CHEM 213 (Premed)	2	CHEM 213 (Premed)	2
PHIL 132 (GH)	3	PHIL 132 (GH)	3	PHIL 132 (GH)	3	PHIL 132 (GH)	3
Semester 5	17	Semester 5	16	Semester 5	16	Semester 5	16
BME 301	4	BME 301	4	BME 301	4	BME 301	4
BME 303	3	BME 303	3	BME 303	3	BME 303	3
BME 313	3	BME 313	3	BME 313	3	BME 313	3
EE 210	4	MATSE 201	3	EMCH 212	3	BMB 401 (Sci&Engr Elect)	3
BME 406	3	BME 443	3	EMCH 315+316	3	GA	3
Semester 6	14	Semester 6	13	Semester 6	13	Semester 6	13
BME 401	3	BME 401	3	BME 401	3	BME 401	3
BME 402	3	BME 402	3	BME 402	3	BME 402	3
BME 403	1	BME 403	1	BME 403	1	BME 403	1
EE 310or 330orCMPSC 270	4	GA	3	GA	3	BME 413	3
BMB 401 (Sci&Engr Elect)	3	BMB 401 (Sci&Engr Elect)	3	BMB 401 (Sci&Engr Elect)	3	GA/ GH	3
MCAT STUDY		MCAT STUDY		MCAT STUDY		MCAT STUDY	
Semester 7	16.5	Semester 7	16.5	Semester 7	16.5	Semester 7	16.5
BME 440	1	BME 440	1	BME 440	1	BME 440	1
ECON 102 or 104	3	ECON 102 or 104	3	ECON 102 or 104	3	ECON 102 or 104	3
CAS 100 A/B	3	GHA	1.5	CAS 100 A/B	3	CAS 100 A/B	3
GHA	1.5	BME 429	2	GHA	1.5	GHA	1.5
BME 429	2	BME 446	3	BME 429	2	BME 429	2
GA	3	Biomaterial Elective	3	Biomechanics elective	3	Biochemical Elective	3
ENGL 202C	3	ENGL 202C	3	ENGL 202C	3	ENGL 202C	3
Semester 8	13.5	Semester 8	16.5	Semester 8	16.5	Semester 8	16.5
BME 450W	3	BME 450W	3	BME 450W	3	BME 450W	3
GA/ GH	3	GA/ GH	3	BME 409	3	Biochemical Elective	3
GHA	1.5	GHA	1.5	GHA	1.5	GHA	1.5
Device Elective	3	BME 409	3	Biomechanics elective	3	BME 409	3
Device Elective	3	Biomaterial Elective	3	Biomechanics elective	3	BME 423	3
		CAS 100 A/B	3	GA/ GH	3	Biochemical Elective	3
TOTAL CREDITS	136	TOTAL CREDITS	137	TOTAL CREDITS	137	TOTAL CREDITS	137

Biochemical Option Electives:

B E 468, BME 410, BME 419, BME 433, BME 435, BME 443, BME 444, BME 445, BME 446, BME 496 or 494H (3 credits max), CH E 340, CH E 438, E SC 483, E SC 484, EDSGN 452, EDSGN 453

Medical Imaging and Device Option Electives:

BME 409, BME 410, BME 419, BME 435, BME 443, BME 444, BME 496 or 494H (3 credits max), E SC 314, EDSGN 452, EDSGN 453, E E 3xx, E E 4xx

Biomechanics Option Electives:

BME 410, BME 413, BME 419, BME 443, BME 444, BME 446, BME 496 or 494H (3 credits max), E MCH 400, E MCH 402, E MCH 403, E MCH 409, E MCH 416H, E MCH 446, E MCH 461/M E 461, M E 360, M E 370, EDSGN 452, EDSGN 453

Biomaterials Option Electives:

BME 410, BME 413, BME 423, BME 419, BME 433, BME 435, BME 444, BME 445, BME 496 or 494H (3 credits max), EDSGN 452, EDSGN 453, MATSE 430

Related Technical Electives:

Any of the Option Electives, any additional BME 400 level or BIOE 500 level course, CHEM 210, CHEM 212, ENGR 295, ENGR 395, ENGR 495 (3 credits max for ENGR x95), and courses for an approved minor (E L D, ESHIP, ENTI, NANO, E MCH, MATH, STAT, CHEM, PHYS)

Science and Engineering Electives:

Any of the above Option or Related Technical Electives, any CHEM, PHYS, MATH, BIOL, STAT, BMB or College of Engineering course at 300 level or higher, 3 credits of a completed ROTC program.

Concurrent Majors in Biomedical (BME) and Mechanical Engineering (M E)

Only for students admitted first to BME with the Biomechanics Option

9 Semesters: Total Credits = 148

PROGRAM REQUIREMENTS					
First Semester			Second Semester		
		CR			CR
(a,b,d)	MATH 140	<i>Calculus with Analytic Geometry I -or- Calculus with Engineering Applications I</i>	(a,b,d)	MATH 141	<i>Calculus with Analytic Geometry II - or- Calculus with Engineering Applications II</i>
	MATH 140E			MATH 141E	
(a,d)	CHEM 110	<i>Chemical Principles I</i>	(a,d)	PHYS 211	<i>General Physics: Mechanics</i>
	CHEM 111	Experimental Chemistry I		CHEM 112	Chemical Principles II
	EDSGN 100	Introduction to Engineering Design		CHEM 113	Experimental Chemistry III
	ENGL 015	Rhetoric and Composition - or -	(d)	BIOL 141	<i>Physiology (or BIOL 240W)</i>
	ENGL 030	Honors Freshman Composition	(d)	BIOL 142	<i>Physiology Lab (240W has a lab)</i>
	FYS	First Year Seminar		GHA	Health & Physical Activity
	ECON 102	Microeconomic Analysis and Policy (GS), - or-			
	ECON 104	Microeconomic Analysis and Policy (GS),			
		Total			Total
		18			17.5
Third Semester			Fourth Semester		
		CR			CR
(a, d)	MATH 251	<i>Ordinary and Partial Differential Equations</i>	(e)	MATH 230	Calculus and Vector Analysis
(c, d)	E MCH 210	<i>Statics and Strength of Materials</i>		MATH 220	Matrices
	CMPS 200	Programming for Engineers with MATLAB	(d)	E MCH 212	<i>Dynamics</i>
(a,d)	PHYS 212	<i>General Physics: Electricity and Magnetism</i>	(d,*)	BME 201	<i>Fundamentals of Cells and Molecules</i>
		Total		E MCH 315	Mechanical Response of Engineering Materials
		16		E MCH 316	Experimental Determination of Mechanical Response of Materials
					Total
					15
Fifth Semester			Sixth Semester		
		CR			CR
(d)	M E 300	<i>Engineering Thermodynamics I</i>		MATSE 259	Properties and Processing of Eng. Materials
	PHYS 214	Wave Motion and Quantum Physics	(d,*)	BME 409	<i>Biofluid Mechanics</i>
(d)	M E 360	<i>Mechanical Design</i>	(d,*)	BME 401	<i>Numerical Simulations in BME</i>
(d,*)	BME 303	<i>Bio-Continuum Mechanics</i>	(d,*)	BME 402	<i>Biomedical Instrumentation and Measurements</i>
(d,*)	BME 301	<i>Analysis of Physiological Systems</i>		BME 403	<i>Biomedical Instrumentation Laboratory</i>
	GHA	Health & Physical Activity	(i)	GA, GH, or GS Course	
		Total			Total
		16.5			16
Seventh Semester			Eighth Semester		
		CR			CR
	IE 312	Product Design and Manufacturing Processes		BME Related & ME ET Elective (Must complete BME&ME req)	3
(d)	M E 370	<i>Vibration of Mechanical Systems</i>	(*)	BME 450W	Senior Design (CAPSTONE)
(*)	BME 440	BME Professional Seminar	(d)	M E 410	<i>Heat Transfer</i>
(d)	M E 340	<i>Mechanical Engineering Design Methodology</i>	(f)	M E Lab	
	ENGL 202C	Technical Writing	(i)	GA, GH, or GS Course	3
(*)	BME 429	Biomechanics and Techniques Lab	(i)	GA, GH, or GS Course	3
		Total			Total
		15			16
Ninth Semester					
		CR			
(h)	Related Elective (See BME guidelines)	3			
(d)	M E 450	<i>Modeling of Dynamic Systems</i>			
(g)	METE	M E Technical Elective			
	CAS 100A/B	Effective Speech			
(i)	GA, GH, or GS Course	3			
(i)	GA, GH, or GS Course	3			
		Total			
		18			

- (a) Courses listed in **boldface italic type** require a grade of C or better for entrance to this major.
- (b) MATH 140E and MATH 141E are only available at University Park in the semester shown.
- (c) E MCH 211 and E MCH 213 = E MCH 210
- (d) Courses listed in **bold face type** require a grade of C or better for graduation in this concurrent majors program.
- (e) MATH 231 and MATH 232 = MATH 230
- (f) To graduate, a student must take at least one of the following M E lab courses: M E 315, M E 325, M E 355, or M E 375. E MCH 316 is a required course and will satisfy the second M E Lab requirement. Note: If M E 445 is taken as a technical elective, one credit can be used as an M E Lab Course.

- (g) A Mechanical Engineering Technical Elective (METE) is any three-credit, 400-level mechanical engineering course, not required for the major. M E 494 or M E 496 may not be used.
- (h) A BME Related Elective is any Option (Biochemical, Device and Imaging, Biomechanical, Biomaterial) Elective, any BME 400 level or BIOE 500 level course not otherwise required (may not double count), CHEM 210, CHEM 212, ENGR 295, ENGR 395, ENGR 495 (3 credits max for ENGR x95), and courses for an approved minor (E L D, ESHIP, ENTI, NANO)
- (i) An elective course to satisfy General Education AHS requirements: GA - General Arts, GH - Humanities, GS - Social & Behavioral Sciences, selected from the lists published in the University General Education Handbook.

Choose one from the courses enclosed within the brackets.

(*) BME courses are offered only in the semester shown: Fall = odd-numbered semesters, Spring = even-numbered semesters.