

Begin to earn credits toward a Master's Degree while taking undergraduate courses!




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Updated April 2024

## Bachelor of BIOMEDICAL ENGINEERING (BME)




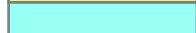
4-Year Recommended *General BME Course Sequence*


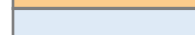


Click on the Course Name to access the course in the Undergraduate Catalog 23-24

Fall Semester 1	Spring Semester 2	Fall Semester 3	Spring Semester 4	Fall Semester 5	Spring Semester 6	Fall Semester 7	Spring Semester 8
ESC 120 [2] <a href="#">Intro to Engineering Design</a>	CHM 261 [3] <a href="#">Gen. Chem. I</a> CHM 266 [1] <a href="#">Gen. Chem. Lab</a>	ESC 152 [3] <a href="#">Programming with MATLAB</a>	BME 300 [3] Introduction to Biomedical Engineering	BME 302 [3] Biofluids / Biotransport	BME 306 [3] Systems Physiology (Writing) (WAC)	BME 440 [3] BME Senior Design I (WAC)	BME 441 [3] BME Senior Design II (Writing) (WAC)
★ ESC 100 [1] <a href="#">New Student Orientation</a>	MCE 181 [2] <a href="#">Computer Aided Design II</a> (MCE 180)	PHY 242 [5] <a href="#">Physics II</a> (PHY 241)	CHM 331 [3] <a href="#">Organic Chemistry</a> (CHM 262) CHM 336 [1] <a href="#">Organic Chem. Lab</a> (*CHM 331)	BME 304 [3] Cell & Tissue Biology	ESC 315 [4] <a href="#">Electrical Engineering Concepts</a> (MTH 182, ESC 250 or MTH 286)	PHL 215 [3] <i>A&amp;H</i> <a href="#">Engineering Ethics</a> (ENG 102 or ESC 102) (WAC)	BME 480 [3] Biomedical Signals & Instrumentation
MTH 181 [4] <a href="#">Calculus I</a>	MTH 182 [4] <a href="#">Calculus II</a> (MTH 181 – C or better)	MTH 286 [3] <a href="#">Intro. to Diff EQ</a> (MTH 182 – C or better) OR ESC 250 [3] <a href="#">Diff EQ for Eng.</a> (MTH 182 – C or better)	STA 323 [3] <a href="#">Statistical Methods</a> (MTH 182) OR ESC 310 [3] <a href="#">Statistics and Probability</a> (MTH 182)	ESC 270 [3] <a href="#">Materials Science &amp; Engineering</a> (CHM 261)	BME 390 [1] Clinical Experience (Writing) (WAC)	BME 455 [3] Biomechanics	BME Senior Elective [3] 300-400 Level 
ENG 100 [3] <a href="#">Intensive Writing</a> or ENG 101 [3] <a href="#">College Writing</a>	ESC 102 [3] <a href="#">Technical Writing</a> (Preferred) (ENG 100 or ENG 101)	CHM 262 [3] <a href="#">Gen. Chem. II</a> CHM 267 [1] <a href="#">Gen. Chem. Lab II</a> (CHM 261 & CHM 266)	ESC 201 [3] <a href="#">Statics</a> (MTH 181, PHY 241 or PHY 243)	ESC 211 [3] <a href="#">Strength of Materials</a> (ESC 201)	BME 455 [3] Biomaterials	BME Senior Elective 300-400 Level [3]  OR BME 553 [3] Cell and Tissue Biology	General Ed. Elective [3] (A&H, non-US)
BIO 200 [3] <a href="#">Introductory Biology I</a> BIO 201 [1] <a href="#">Introductory Biology I Lab</a>	PHY 241 [5] <a href="#">Physics I</a> (MTH 181)	**ESC 130 [1] <a href="#">Engineering Co-op Orientation</a>	BIO 266 [3] <a href="#">Human Anatomy &amp; Physiology I</a> BIO 267 [1] <a href="#">Human Anatomy &amp; Physiology I Lab</a> (BIO 200)	General Ed. Elective [3] (SS)	General Ed. Elective [3] (SS)	 BME Senior Elective [3] 300-400 Level	General Ed. Elective [3] (Diversity)
MCE 180 [2] <a href="#">Computer-Aided Design I</a>					General Ed. Elective [3] (Diversity)		
16 Total Credit Hours	18 Total Credit Hours	16 Total Credit Hours	17 Total Credit Hours	15 Total Credit Hours	16 Total Credit Hours	15 Total Credit Hours	15 Total Credit Hours

Total Credits for BME Degree: **128** including ESC 130 Engineering Co-op Orientation

(Prerequisites) • (\*Pre/co-requisite) • [# of Course Credits] • BME XXX = Only Offered That Fall/Spring Semester

-  Required BME Courses \*\*Highly recommended, yet optional.
-  Required Science Courses
-  Required English Courses (ESC 102 is preferred. However, can be substituted with ENG 102.)
-  Required Writing Across the Curriculum (WAC) Courses

-  Required BME 300-400 Level Electives
-  Required Math Courses **Substitute** courses to achieve the Math Minor
-  [General Ed. Electives \(2 A&Hs, 2 SSs, 1 ALAAME, & 2 DIVs\)](#)
-  [500-level courses that satisfy Undergraduate and Master's degree credits](#)

★ Must take ESC 100 (Exception of ASC 101 upon WCE Advisor Approval or special ASC 101 section)

↓ [Scroll Down to View the Precalculus Entry 4-Year Plan Degree Chart](#) ↓

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## Bachelor of BIOMEDICAL ENGINEERING (BME)

**4-Year** Recommended Course Sequence with *Pre-Medicine Track*

[CLICK HERE](#) to access Course Catalog Descriptions

Fall Semester 1	Spring Semester 2	Fall Semester 3	Spring Semester 4	Fall Semester 5	Spring Semester 6	Fall Semester 7	Spring Semester 8
ESC 120 [2] Intro to Engineering Design	CHM 261 [3] Gen. Chem. I CHM 266 [1] Gen. Chem. Lab	CHM 262 [3] Gen. Chem. II CHM 267 [1] Gen. Chem. Lab II (CHM 261 & CHM 266)	BME 300 [3] Introduction to Biomedical Engineering	BME 302 [3] Biofluids / Biotransport	BME 306 [3] Systems Physiology (Writing) (WAC)	BME 440 [3] BME Senior Design I (WAC)	BME 441 [3] BME Senior Design II (Writing) (WAC)
★ ESC 100 [1] New Student Orientation	MCE 181 [2] Computer Aided Design II (MCE 180)	PHY 242 [5] Physics II (PHY 241)	CHM 331 [3] Organic Chemistry (CHM 262) CHM 336 [1] Organic Chem. Lab (*CHM 331)	BME 304 [3] Cell & Tissue Biology	ESC 315 [4] Electrical Engineering Concepts (MTH 182, ESC 250 or MTH 286)	PHL 215 [3] A&H Engineering Ethics (ENG 102 or ESC 102) (WAC)	BME 480 [3] Biomedical Signals & Instrumentation
MTH 181 [4] Calculus I	MTH 182 [4] Calculus II (MTH 181 – C or better)	MTH 286 [3] Intro. to Diff EQ (MTH 182 – C or better) OR ESC 250 [3] Diff EQ for Eng. (MTH 182 – C or better)	STA 323 [3] Statistical Methods (MTH 182) OR ESC 310 [3] Statistics and Probability (MTH 182)	ESC 270 [3] Materials Science & Engineering (CHM 261)	BME 390 [1] Clinical Experience (Writing) (WAC)	BME 495 [3] Biomedical Engineering Research	BME Senior Elective [3] 300-400 Level
ENG 100 [3] Intensive Writing or ENG 101 [3] College Writing	ESC 102 [3] Technical Writing (Preferred) (ENG 100 or ENG 101)	BIO 202 [3] Introductory Biology II BIO 203 [1] Introductory Biology II Lab	BIO 266 [3] Human Anatomy & Physiology I BIO 267 [1] Human Anatomy & Physiology I Lab (BIO 200)	ESC 152 [3] Programming with MATLAB	BIO 310 [3] Genetics BIO 311 [1] Genetics Recitation (BIO 200 and BIO 202)	BME Senior Elective [3] 300-400 Level	General Ed. Elective [3] (A&H, non-US)
BIO 200 [3] Introductory Biology I BIO 201 [1] Introductory Biology I Lab	PHY 241 [5] Physics I (MTH 181)	**ESC 130 [1] Engineering Co-op Orientation	General Ed. Elective [3] (Psychology)	BIO 306 [3] Biochemistry I BIO 307 [1] Biochemistry I Recitation (BIO 200, BIO 202, and CHM 331)	General Ed. Elective [3] (Diversity)	General Ed. Elective [3] (SS)	General Ed. Elective [3] (Diversity)
MCE 180 [2] Computer-Aided Design I							
16 Total Credit Hours	18 Total Credit Hours	17 Total Credit Hours	17 Total Credit Hours	16 Total Credit Hours	14 Total Credit Hours	15 Total Credit Hours	15 Total Credit Hours

Total Credits for BME Degree: **128** including ESC 130 Engineering Co-op Orientation

(Prerequisites) • (\*Pre/co-requisite) • [# of Course Credits] • BME XXX = Only Offered That Fall/Spring Semester

- Required BME Courses \*\*Highly recommended, yet optional.
- Required Science Courses
- Required English Courses (ESC 102 is preferred. However, can be substituted with ENG 102.)
- Required Writing Across the Curriculum (WAC) Courses

- Required BME 300-400 Level Electives
- Required Math Courses Substitute courses to achieve the Math Minor
- General Ed. Electives (2 A&Hs, 2 SSs, 1 ALAAME, & 2 DIVs)

[500-level courses that satisfy Undergraduate and Master's degree credits](#)

★ Must take ESC 100 (Exception of ASC 101 upon WCE Advisor Approval or special ASC 101 section)

↓ [Scroll Down to View the Precalculus Entry 5-Year Plan Degree Chart](#) ↓

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To eliminate one (1) of your General Education Requirements,  
consider taking a course that qualifies as two (2) General Ed. Electives

Recommended Courses that Qualify as Two (2) General Ed. Electives

Course	Social Sciences (SS)	Arts & Humanities (AH)	Non-Western Social Sciences (ALAAME & NW-SS)
<a href="#">ANT 153 – Intro to African Cultures</a>	X		X
<a href="#">ANT 275 – Ancient Mysteries</a>	X		X
<a href="#">COM 201 – Com &amp; Relationships / East Asian</a>	X		X
<a href="#">COM 233 – Bollywood &amp; Beyond</a>	X		X
<a href="#">HIS 103 – Ancient World His to 1300 C.E.</a>	X		X
<a href="#">HIS 104 – Modern World History</a>	X		X
<a href="#">SOC 210 – Dev. Societies in Changing World</a>	X		X
<a href="#">UST 206 – Megacities of Asia</a>	X		X
<a href="#">UST 222 – World Population and Society</a>	X		X
<a href="#">ANT 103 – Rise/Fall of Civilizations</a>		X	X
<a href="#">ANT 171 – Native Civilization of Americas</a>		X	X
<a href="#">ARB 274 – Introduction to Middle East</a>		X	X
<a href="#">ART 281 – Asian Art</a>		X	X
<a href="#">ART 286 – African Art</a>		X	X
<a href="#">ENG 204 – World Literature</a>		X	X
<a href="#">HIS 165 – Intro to Latin American History</a>		X	X
<a href="#">HIS 175 – Intro to African History</a>		X	X
<a href="#">HIS 185 – Survey of Middle Eastern History</a>		X	X
<a href="#">HIS 195 – Intro to East Asian History</a>		X	X
<a href="#">MUS 263 – Black Music of Two Worlds</a>		X	X
<a href="#">PHL 255 – Non-Western Philosophy</a>		X	X
<a href="#">PHL 262 – Medieval Philosophy</a>		X	X
<a href="#">REL 101 – Understanding Religion</a>		X	X
<a href="#">REL 268 – Religion &amp; Culture in Africa</a>		X	X
<a href="#">WLC 265 – Francophone Lit in Translation</a>		X	X

Popular Introductory General Ed.  
Courses for Engineering Students

**SOCIAL SCIENCES (SS)**

[PSY 220 – Child Development](#) (SS)

[UST 200 – Intro to Urban Studies](#) (SS)

[COM 233 – Bollywood & Beyond](#) (SS & ALAAME)

**ARTS & HUMANITIES (AH)**

[MUS 161 – Roots of Rock & Soul](#) (AH)

[UST 201 – Building Cleveland](#) (AH)

[REL 101 – Understanding Religion](#) (AH & ALAAME)

[MUS 263 – Black Music of Two Worlds](#) (AH & ALAAME)

[ANT 171 – Native Civilization of America](#) (AH & ALAAME)

**US DIVERSITY (US DIV)**

[ANT 100 – Human Diversity](#) (US DIV)

[SOC 201 – Race/Class/Gender](#) (US DIV)

**AFRICAN-AMERICAN (AFRICAN-AMER.)**

[SWK 150 – The Black Experience](#) (African- Amer.)

[UST 202 – Cleveland: The Afr-Amer Exp.](#) (African-Amer.)

