

# Biomedical Engineering

FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR	
FALL	SPRING	FALL	SPRING	FALL	SPRING	FALL	SPRING
BME 101 or GE A/B/B/C/C 4	BME 101 or GE A/B/B/C/C 4	BME 202 MATH 126 or 129 4	BISC 220L (GE D) 4	EE 202L PHYS 152L, (MATH 245) 4	TECHNICAL ELECTIVE 4	BME 302 EE 202L 4	BME 415 2
WRIT 150 4	GESM 4	GE A/B/B/C/C (gw or gp as needed) 4	BME 210 (MATH 245) 4	BME 423 MATH 245 4	GE A/B/B/C/C (gw or gp as needed) 4	BISC 320L, BISC 312 or HBIO 301L *See Special Note* 4	GE A/B/B/C/C (gw or gp as needed) 4
MATH 125 (GE F)* 4	MATH 126 OR MATH 129* MATH 125 4	PHYS 151L (GE E) MATH 125 or 126 or 226 4	MATH 245 MATH 226 or 229 4	CHEM 322aL CHEM 105bL 4	WRIT 340 4	BME 445aL Senior Project Prereq: BME 210 Co-req: EE 202 2	BME 445bL Senior Project BME 445aL 2
CHEM 105aL (GE E)* 4	CHEM 105bL CHEM 105aL 4	MATH 226/229 4	PHYS 152L PHYS 151L, (MATH 226) 4	BME ANCHOR COURSE 4	CHEM 322bL or 400-level BME Course 4	BME 413 PHYS 152L 4	BME 403L Prereq: BISC 220 & MATH 245 Co-req: EE 202 4
ENGR 102 Recommended 2	TAC 165 or OPTIONAL ELECTIVE 2	OPTIONAL ELECTIVE 2	OPTIONAL ELECTIVE 2	OPTIONAL ELECTIVE 2	OPTIONAL ELECTIVE 2	TECHNICAL ELECTIVE 2	TECHNICAL ELECTIVE 4

BIOMEDICAL

## MATHEMATICS (16 UNITS)

**MATH 125:** Calculus I\*

**MATH 126 or 129:** Calculus II\*

**MATH 226 or 229:** Calculus III

**MATH 245:** Mathematics of Phys. and Engr.

## PHYSICS (8 UNITS)

**PHYS 151L:** Mechanics and Thermodynamics

**PHYS 152L:** Electricity and Magnetism

## CHEMISTRY (16 UNITS)

**CHEM 105aL:** General Chemistry\*

**CHEM 105bL:** General Chemistry

**CHEM 322aL:** Organic Chemistry

**CHEM 322bL:** Organic Chemistry or  
400-level BME course

## BIOLOGY (8 UNITS)

**BISC 220L:** Cell Biology & Physiology

**Choice between:** BISC 320L  
BISC 312, or HBIO 301L

## GENERAL EDUCATION (32 UNITS)

**GE A** The Arts (1 Course)\*

**GE B** Humanistic Inquiry (2 Courses)

**GE C** Social Analysis (2 Courses)

**GE D** Life Sciences (1 Course)\*

**GE E** Physical Sciences (1 Course)\*

**GE F** Quantitative Reasoning (1 Course)\*

**GE G,H** Global Perspectives (2 Courses)\*

**GESM** General Education Seminar (1 Course)

## WRITING (8 UNITS)

**WRIT 150:** Writing and Critical Reasoning

**WRIT 340:** Advanced Writing

## ENGINEERING (55 UNITS)

**BME 101:** Intro. to Biomedical Engineering

**BME 202:** Control/Comm. in Nervous System

**BME 210:** Biomed. Comp. Simulation Methods

**BME 302L:** Medical Electronics

**BME 403L:** Physiological Systems

**BME 413:** Bioengineering Signals & Systems

**BME 415:** Regulation of Medical Products

**BME 423:** Statistical Methods in BME

**BME 445aL:** Senior Projects

**BME 445bL:** Senior Projects

**EE 202L:** Linear Circuits

**ENGR 102:** Engineering Freshman Academy

**BME ANCHOR COURSE:**

BME 404, BME 410L, BME 430, BME 450,  
or BME 451

**TECHNICAL ELECTIVES (10 UNITS)**

## SPECIAL NOTES

\*BISC 320L has a prerequisite of CHEM 105bL.  
BISC 312 and HBIO have no prerequisites.

Courses with the \* symbol may be satisfied  
with AP, IB or A-Level exams. See page 18 for  
more information.

**GESM#:** GESM can be taken from GE categories: A,  
B, or C. Courses listed in the guide are options for a  
four-year course plan.

**GE:** Engineering students are encouraged to satisfy  
GE-G and GE-H with a course that also satisfies a  
Core Literacy. GE-H may be satisfied by AP/IB.  
Additionally, your GESM course should be taken in  
categories A, B, or C only. See page 17 for more  
information and consult your advisor for detailed  
assistance.

**TECHNICAL ELECTIVES (10 units):** Taken from  
ONE of the following three areas of specialization:  
Bioelectronics/Computers: (BME 201, BME 204,  
BME 426, BME 427, BME 430, BME 451, BME 453,  
CSCI 445, EE 109L, EE 209, EE 338, EE 348L, EE  
352L, EE 354L, EE 454L, EE 483, ENGR 345 or ITP  
308) or Biomechanics: (AME 201, AME 204, AME  
301, AME 302, AME 308 or ITP 308, AME 309, BME  
201, BME 204, BME 404, BME 408, BME 412, BME  
414, BME 426, BME 427, BME 453 or MASC 310)  
Molecular-Cellular Engineering: (BME 201, BME  
204, BME 406, BME 412, BME 414, BME 430, BME  
453, BME 459, CHE 330, CHE 350, CHE 460L, CHE  
489, ENGR 305, TAC 308, or MASC 310)

The Organic Chemistry option allows students in  
BME, BMEL, and BMEN to replace one semester  
of Organic Chemistry with an additional 4-unit  
400-level BME course.

## Emphasis Course Tracks for Biomedical Engineering

The Biomedical Engineering (BME) curriculum covers foundational concepts during the first few semesters. Students following the standard program will have the opportunity to take more technical electives, while students pursuing one of the optional specializations will take courses related to that content area.

### Electrical (BMEN)

SECOND YEAR		THIRD YEAR		FOURTH YEAR	
FALL	SPRING	FALL	SPRING	FALL	SPRING
BME 202 MATH 126 or 129 4	EE 109L ITP 165 4	EE 202L PHYS 152L, (MATH 245) 4	FIRST TRACK COURSE: EE 338 or EE 250 4	BISC 320L, BISC 312 or HBIO 301L *See Special Note #1 on Pg 25* 4	CHEM 322aL CHEM 105bL or 400-LEVEL BME COURSE 4
GE A/B/B/C/C 4	BME 210 (MATH 245) 4	BME 423 MATH 245 4	GE A/B/B/C/C 4	SECOND TRACK COURSE: EE 348 or EE 354 4	THIRD TRACK COURSE: BME 302/EE 447 or EE 454/EE 459/ EE 477 4
MATH 226 or MATH 229 MATH 126 or 129 4	MATH 245 MATH 226 or 229 4	WRIT 340 WRIT 150 4	BISC 220L 4	BME 413 PHYS 152L 4	BME 403L BISC 220L, MATH 245, EE 202L 4
PHYS 151L (GE E) MATH 125 or 126 or 226 4	PHYS 152L PHYS 151L, (MATH 226) 4	TECHNICAL ELECTIVE 2	TECHNICAL ELECTIVE 3	BME 445aL Senior Project 2	BME 445bL Senior Project 2
OPTIONAL ELECTIVE 2	OPTIONAL ELECTIVE 2	TECHNICAL ELECTIVE 4	OPTIONAL ELECTIVE 2	GE A/B/B/C/C 4	BME 415 2

#### ELECTRICAL TRACKS

##### ANALOG TRACK

FIRST TRACK COURSE:  
**EE 338**

SECOND TRACK COURSE:  
**EE 348**

THIRD TRACK COURSE:  
**BME 202 OR EE 447**

##### DIGITAL TRACK

FIRST TRACK COURSE:  
**EE 250**

SECOND TRACK COURSE:  
**EE 354**

THIRD TRACK COURSE:  
**EE 454, EE 459 OR EE 477**

**TECHNICAL ELECTIVES  
(9 UNITS)**

### Mechanical (BMEL)

SECOND YEAR		THIRD YEAR	
SPRING		FALL	SPRING
AME 201 4	BME 210 (MATH 245) 4	MATH 245 MATH 226 or 229 4	PHYS 152L PHYS 151L, (MATH 226) 4
THIRD YEAR		FOURTH YEAR	
FALL	SPRING	FALL	SPRING
BME 404* 4	GE A/B/B/C/C (gw or gp as needed) 4	BISC 320L**, BISC 312 or HBIO 301L *See Special Note #1 on Pg 25* 4	AME 309/ AME 416/ CHEM 322aL/ MASC 310 4
AME 204 3	AME 301 4	BME 413 PHYS 152L 4	GE A/B/B/C/C (gw or gp as needed) 4
BME 423 4	BISC 220 4	BME 445aL Senior Projects 2	BME 445bL Senior Projects 2
EE 202 4	TAC 308 4	BME 403L 4	BME 415 4
OPTIONAL ELECTIVE 2	TECHNICAL ELECTIVE 2	WRIT 340 4	TECHNICAL ELECTIVE 3

\*(offered "even" falls - or replacement (HBIO 408/BME 504))

\*\* (fall only) or replacement HBIO 301L (fa/sp) or BISC 312 (sp)

**TECHNICAL ELECTIVES (5 UNITS)**

### Molecular-Cellular (BMCE)

THIRD YEAR		FOURTH YEAR	
FALL	SPRING	FALL	SPRING
BISC 320L CHEM 105bL 4	GE A/B/B/C/C 4	THIRD PANEL COURSE 4	BME 403L 4
FIRST PANEL COURSE 4	SECOND PANEL COURSE 4	EE 202L PHYS 152L, (MATH 245) 4	FOURTH PANEL COURSE 4
CHEM 322aL CHEM 105bL 4	CHEM 322bL CHEM 322aL 4	GE A/B/B/C/C 4	WRIT 340 WRIT 150 4
BME 423 MATH 245 4	BISC 330L CHEM 322aL 4	BME 413 PHYS 152L 4	BME 415 2
OPTIONAL ELECTIVE 2-4	OPTIONAL ELECTIVE 2-4	BME 445aL Senior Projects 2	BME 445bL Senior Projects 2

#### BMCE Panel Course Options:

BME 406, BME 410L, BME 430, BME 459L, or CHE 489

**Technical Electives (2 UNITS)**