

# BME Concentrations

- Mechanics and Transport related courses
- Biomedical Signals & Instrumentation related courses
- Tissue Engineering related courses

## Core Classes

All courses required for B.S. in BME

- BIOG 140, 240 - Molecular and Cellular Biology
- BIME 200 - Intro to Biomechanics
- ■ BIME 250 - Biosystem Process Analysis
- ■ BIME 320 - Fluid Mechanics
- BIME 360 - Biomedical Signal Analysis
- ■ BIME 370 - Biomaterials
- ■ BIME 391 - Biomechanics/Biomaterials Lab
- ■ ■ BIME 410 - Quantitative Physiology
- ■ ■ BIME 411 - Quantitative Systems Physiology
- ■ ■ BIME 407 - Medical Device Design
- BIME 450 - Numerical Analysis
- BIME 460 - Systems Dynamics & Control
- BIME 491 - Quant Phys Signal Analysis Lab
- BIME 492 - Sys Phys Ctrl Dynamics Lab

## Concentration Electives

3 electives required for selected concentration:  
 - 1 must be a technical 300-level or higher  
 - 1 must be a technical 400-level or higher

### Mechanics and Transport

Technical Electives:

- BIME 340 - 3D-Technologies for Prosthetic Applications
- BIME 430 - Bioprocess Engineering
- BIME 480 - Stress Analysis & Biomechanics
- BIME 520 - Hemodynamics
- BIME 610 - Bioanalytical Microfluidics
- ISEE 330 - Ergonomics and Human Factors
- MECE 555 - Biomechatronics
- MECE 557 - Applied Biomaterials

Open Electives:

- + MATH 241 - Linear Algebra
- MATH 305 - Intro to Mathematical Computing (CSCI 141 req.)
- # MATH 311 - Linear Optimization (MATH 241 req.)
- + MATH 341 - Advanced Linear Algebra (MATH 241 req.)
- # MATH 381 - Complex Variables
- MATH 421 - Mathematical Modeling (MATH 241 req.)
- PACK 546/547 - Pharmaceutical & Medical Packaging w/Lab

# after taking MATH 241 and 341 (+), one of these two help toward math minor after immersion

### Biomedical Signals & Instrumentation

Technical Electives:

- BIME 489 - Fundamentals of Electrical Medical Devices
- BIME 560 - Introduction to Medical Imaging Systems
- BIME 589 - BCI - Theory and Practice
- EEEE 530 - Biomedical Instrumentation
- EEEE 531 - Biomedical Sensors and Transducers I
- MECE 555 - Biomechatronics

Open Electives:

- + MATH 241 - Linear Algebra
- MATH 305 - Intro to Mathematical Computing (CSCI 141 req.)
- # MATH 311 - Linear Optimization (MATH 241 req.)
- + MATH 341 - Advanced Linear Algebra (MATH 241 req.)
- # MATH 381 - Complex Variables
- MATH 421 - Mathematical Modeling (MATH 241 req.)
- IMGS 261 - Linear and Fourier Methods for Imaging
- IMGS 361 - Image Processing and Computer Vision I
- IMGS 371 - Imaging Systems Analysis
- CSCI 510 - Foundations in Computer Graphics

# after taking MATH 241 and 341 (+), one of these two help toward math minor after immersion

### Tissue Engineering

Technical Electives:

- BIME 570 - Tissue Engineering (REQUIRED)

- BIME 430 - Bioprocess Engineering
- BIME 470 - Cell Culture Techniques
- BIME 520 - Hemodynamics
- BIME 610 - Bioanalytical Microfluidics
- BIME 670 - Advanced Topics in Tissue Engineering
- BIME 675 - Practical Methods in Tissue Engineering
- CHME 589/570 - Biochemical Engineering

Open Electives:

- \* CHMO 231 - Organic Chemistry I
- \* CHMO 232 - Organic Chemistry II
- \* CHMB 402 - Biochemistry I
- CHMB 610 - Advanced Protein Biochemistry
- BIOL 450 - Genetic Engineering
- BIOL 494 - Molecular Modeling and Proteomics
- PACK 546/547 - Pharmaceutical & Medical Packaging w/Lab

\*part of Chemistry Immersion