Engineering Distributions
ENGRD 2202: Biomedical Transport Phenomena (Required)
ENGRD 2020: Statics and Mechanics of Solids (Required)

Required Major Course Sequence (Core and Cornerstones)
BME 2010 Physiology of Human Health and Disease
BME 2110* Biomolecular Thermodynamics and Physical Chemistry
BME 2310 Biomedical Signals and Systems
MATH 2940 Linear Algebra
BTRY 3010+ Biological Statistics
BME 2210 Biomaterials: Foundation and Application in Medicine
BME 3010 Cellular Principles of Biomedical Engineering
BME 3020 Molecular Principles of Biomedical Engineering
BME 3030 Biomedical Instrumentation and Technology Fabrication
BME 4010 Biomedical Engineering Analysis of Metabolic and Structural Systems
BME 4020 Electrical and Chemical Physiology
BME 4080/4090 Biomedical Engineering Design Laboratory

* BME 2110 is temporarily satisfied by BEE 2220
+ ENGRD 2700 or CEE 3040 alternatively satisfies this course

Biomedical Engineering Concentrations (Must Choose 1)

Molecular, Cellular, and Systems Engineering (MCSE)
Required Courses:
CHEM 1570a Introduction to Organic and Biological Chemistry
BME 3110 Engineering and Computational Analysis of Cellular Systems
BME 4190 MCTE Practicum Laboratory

Electives:
Choose 6 credits from the following courses:
BTRY 4381 Bioinformatics Programming
BME 5850 Current Practices in Tissue Engineering
BME 5830 Cell-Biomaterials Interactions
CHEME 5430 Bioprocess Engineering
Or 1 3xxx/4xxx course from another BME Concentration

Biomedical Materials and Drug Delivery (BMDD)
Required Courses:
CHEM 1570a Introduction to Organic and Biological Chemistry
BME 3210 BDD Concentration Course
BME 4190 or MCTE Practicum Laboratory
BME 4490 BMMB Practicum Laboratory

Electives:
Choose 6 credits from the following courses:
BEE 3650 Properties of Biological Materials
MSE 4020 or Mechanical Properties of Materials; Processing and Design
MAE 4640 or Orthopedic Tissue Mechanics
MSE 5230 or Physics of Soft Materials
BME 5810 Soft Tissue Biomechanics
### BME Course List (cont...)  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEE 3400</td>
<td>Design and Analysis of Biomaterials</td>
</tr>
<tr>
<td>CBE 5430</td>
<td>Bioprocess Engineering</td>
</tr>
<tr>
<td>MSE 4610</td>
<td>Biomedical Materials and Their Applications</td>
</tr>
<tr>
<td>MSE 5550</td>
<td>Introduction to Composite Materials</td>
</tr>
<tr>
<td>MSE 5620</td>
<td>Biomineralization</td>
</tr>
<tr>
<td>BME 5830</td>
<td>Cell-Biomaterial Interactions</td>
</tr>
<tr>
<td>BME 5850</td>
<td>Current Advances in Tissue Engineering</td>
</tr>
<tr>
<td>BME 6310</td>
<td>Engineering Principles in Drug Delivery</td>
</tr>
</tbody>
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#### Biomedical Imaging and Instrumentation (BMI)  
**Required Courses:**  
- PHYS 2214  Physics III: Oscillations, Waves, and Quantum Physics  
- BME 3310  Medical and Preclinical Imaging  
- BME 4390  Electronics for Biomedical Engineers (Practicum Laboratory)  

**Electives:**  
Choose 6 credits from the following courses:  
- ECE 2100  Introduction to Circuits for Electrical and Computer Engineers  
- ECE 3100  Introduction to Probability and Inference for Random Signals and Systems  
- AEP 3300  Modern Experimental Optics  
- ECE 4300  Lasers and Optoelectronics  
- BEE 4590  Biosensors and Bioanalytical Techniques  
- ECE 4910  Principles of Neurophysiology  
- ECE 4760  Designing with Microcontrollers  
- ECE 5470  Computer Vision  
- ECE 5780  Computer Analysis of Biomedical Images  

#### Biomedical Mechanics and Mechanobiology (BMBM)  
**Required Courses:**  
- PHYS 2214  Physics III: Oscillations, Waves, and Quantum Physics  
  Or CHEM 1570a  Introduction to Organic and Biological Chemistry  
- BME 3410  BMBM Concentration Course  
- BME 4490  BMBM Practicum Laboratory  

**Electives:**  
Choose 6 credits from the following courses:  
- MAE 4640  Orthopaedic Biomechanics  
- MAE 4680  Biofluid Mechanics  
- BME 5810  Soft Tissue Biomechanics  
- MSE 5130  Mechanobiology of Materials and Cells  
- BEE 3310  Bio-Fluid Mechanics  
- BEE 4530  Computer Aided Engineering  

Approved Electives (6 credits)  

**Note:** CHEM 1570 requirement can also be satisfied by the Premed Organic/Biological Chemistry Sequence.