### BS in Biomedical Engineering Four-Year-Program

#### Application Code: 274  
(If undecided use: 0229)

**FALL 2016**

**Engineering Design Division**

*(The freshman year is common to all engineering majors)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st</strong></td>
<td>MATH 224/225 Calculus I (M)</td>
<td>MATH 226/227 Calculus II (MATH 225)</td>
</tr>
<tr>
<td></td>
<td>CHEM 111 Chemical Principles (L)</td>
<td>PHYS 131 General Physics I Calculus-based (MATH 225)</td>
</tr>
<tr>
<td></td>
<td>WTSN 111 Introduction to Engineering Design</td>
<td>WTSN 112 Introduction to Engineering Analysis (J) (WTSN 111)</td>
</tr>
<tr>
<td></td>
<td>WTSN 103 Engineering Communications I</td>
<td>WTSN 104 Engineering Communications II (WTSN 103)</td>
</tr>
<tr>
<td></td>
<td>Body/Wellness</td>
<td>Body/Wellness</td>
</tr>
</tbody>
</table>

* Depth Electives are chosen from your concentration. Science electives include: PSYC 111, BCHM 403, any CHEM 300 level and above, any BIOL 300 level and above.

6/6/16
Biomedical Engineering with MCAT Preparation

FALL 2016

Engineering Design Division
(The freshman year is common to all engineering majors)

**Fall**
- MATH 224/225  Calculus I (M)
- CHEM 111  Chemical Principles (L)
- WTSN 111  Introduction to Engineering Design
- WTSN 103  Engineering Communications I
- General Education Elective (A, G, N, P)
- Body/Wellness

**Spring**
- MATH 226/227  Calculus II (MATH 225)
- PHYS 131  General Physics I Calculus-based (MATH 225)
- WTSN 112  Introduction to Engineering Analysis (J) (WTSN 111)
- WTSN 104  Engineering Communications II (WTSN 103)
- General Education Elective (A, G, N, P)
- Body/Wellness

**Year 1**

**Fall**
- MATH 224/225  Calculus I (M)
- CHEM 111  Chemical Principles (L)
- WTSN 111  Introduction to Engineering Design
- WTSN 103  Engineering Communications I
- General Education Elective (A, G, N, P)
- Body/Wellness

**Spring**
- MATH 226/227  Calculus II (MATH 225)
- PHYS 131  General Physics I Calculus-based (MATH 225)
- WTSN 112  Introduction to Engineering Analysis (J) (WTSN 111)
- WTSN 104  Engineering Communications II (WTSN 103)
- General Education Elective (A, G, N, P)
- Body/Wellness

**Year 2**

**Fall**
- BME 201  Introduction to Biomedical Engineering (MATH 225, PHYS 131, WTSN 112) (Co-req: BIOL 118)
- MATH 324  Ordinary Differential Equations (MATH 227)
- CHEM 231  Organic Chemistry I (CHEM 111)
- BIOL 118  Cell & Molecular Biology

**Spring**
- BME 203  Biomedical Modeling & Numerical Methods (MATH 227, BME 201)
- BME 213  Biomolecule Engineering (BIOL 118, BME 201, CHEM 111, MATH 324)
- MATH 323  Calculus III (MATH 227)
- PHYS 132  General Physics II Calculus-based (PHYS 131)
- Pre-Med Elective*

**Year 3**

**Fall**
- BME 318  Biomechanics (PHYS 131, MATH 227)
- BME 324  Biomedical Instrumentations (L) (BME 201, BME 203, BME 213)
- ME 331  Thermodynamics (MATH 323, MATH 324, PHYS 131)
- CHEM 341  Intermediate Inorganic Chemistry (CHEM 111)
- Pre-Med Elective*

**Spring**
- BME 303  Bio-Fluid Mechanics (BME 318, PHYS 131, MATH 227)
- BME 340  Bioinformatics and Biostatistics (BIOL 118, BME 203)
- BME 351  Biomedical Engineering Lab (BME 213, BME 324, BME 318) (Co-req: BME 303)
- Pre-Med Elective*
- Pre-Med Elective*

MCAT typically taken after Junior Year
Before MCAT, you should take: BIOL 117, BIOL 118, CHEM 111, CHEM 341, CHEM 231, CHEM 332 and 335, PHYS 131, PHYS 132, PSYC 111, BCHM 403, BME 340 Biostatistics, & ANTH 240.

**Year 4**

**Fall**
- BME 313  Biomaterials (CHEM 231, BME 213, BIOL 118)
- BME 413  Biomedical Transport Phenomena (ME 331, BME 318, BME 303)
- BME 432  Ethics in Engineering (H) (Co-req: BME 450)
- BME 433  Human Physiology (CHEM 231, BIOL 118)
- BME 450  Biomedical Engineering Design I (BME318, BME 351) (Co-req: BME 413)
- BME Depth elective**

**Spring**
- BME 451  Biomedical Engineering Design II (J) (BME 450)
- BIOL 311  Cell Biology (BIOL 118, CHEM 111)
- or
- BIOL 401  Molecular Genetics (BIOL 118, CHEM 111, CHEM 231) (Co-req: CHEM 332)
- BME Depth Elective**
- General Education Elective (A, G, N, P)
- General Education Elective (A, G, N, P)

* Pre-Med Electives: BIOL 117, CHEM 332, CHEM 335 (L), PSYC 111, BCHM 403, ANTH 240
** Students who are planning on taking the MCAT, must choose two additional depth electives from any of the other BME concentrations, except pre-health to meet the ABET 48 engineering credit hour requirement.

6/6/16
BME Major Concentrations:
Students are required to select an area of emphasis to gain more in-depth knowledge and specialty training in biomedical engineering. Students must take any two courses from the list of courses prescribed in each concentration to declare their concentration. Courses chosen from a concentration fulfill the BME Depth Electives.

**Biomaterials and Bio-pharmaceutical Technology Concentration** (Choose two courses to declare this concentration)
- BME 483 Tissue Engineering (BME 313, BME 201, BIOL 118) (Co-req: BME 433)
- BME 473 Advanced biomaterials and biocompatibility (BME 313)
- BME 463 Bioprocess engineering (BME 213, CHEM 231)
- BME 442 Nanotechnology and drug delivery (BME 213)

**Computational Biosystems Concentration** (Choose two courses to declare this concentration)
- BME 302 Adaptive Systems
- BME 472 Multivariate Statistics (MATH 323, BME 203)
- BME 410 Complexity in Biological Systems (MATH 324)
- BME 453 Modeling Complex Biological Systems
- BME 423 Dynamics of Complex Networks

**Biomedical Devices and Instrumentations Concentration** (Choose two courses to declare this concentration)
- BME 424 Bioimaging (BME 324)
- EECE 260 Circuits (PHYS 132)
- BME 420 Biomedical Devices and Diagnostics
- BME 443 Bio-MEMS (BME 303)
- EECE 301 Signals and Systems (EECE 260, MATH 324)

**Pre-Health Concentration** (Students who wish to complete the pre-health concentration, but are not planning on taking the MCAT, must complete two courses from the pre-health concentration below, in addition to any two engineering depth electives from the other three BME concentrations. The two additional engineering depth electives are required to meet the ABET 48 engineering credit hour requirement.)
- BIOL 117 Organismal & Population Biology
- CHEM 332 Organic Chemistry II (CHEM 231)
- CHEM 335 Organic Chemistry Lab (CHEM 231)
- CHEM 341 Intermediate Inorganic Chemistry (CHEM 111)
- PSYC 111 Psychology
- BCHM 403 Biochemistry (BIOL 118, CHEM 111, CHEM 231, CHEM 332)
- ANTH 240 – this course is recommended prior to taking the MCAT however, it will not count for a pre-health concentration

*Students who plan on taking the MCAT should follow the BME MCAT Preparation Guidesheet to complete the suggested courses prior to taking the MCAT Exam.*

6/6/16