

**State University of New York at Binghamton**  
**Thomas J. Watson School of Engineering and Applied Science**  
**BS in Biomedical Engineering Four-Year-Program**

Application Code: 274  
(If undecided use: 0229)

**FALL 2019**

**Engineering Design Division**

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

**Fall**

MATH 224/225 Diff Calc/Int Calc(M)  
CHEM 111 Chemical Principles (L)  
EDD 111 Introduction to Engineering Design  
EDD 103 Engineering Communications I  
General Education Elective (A, G, N, P)  
Body/Wellness

**Spring**

MATH 226/227 Int Tech&App/Inf S. (MATH 225)  
PHYS 131 General Physics I Calculus-based (MATH 225)  
EDD 112 Introduction to Engineering Analysis (J) (EDD 111)  
EDD 104 Engineering Communications II (EDD 103)  
BIOL 113 Cell & Molecular Biology  
Body/Wellness

**Year 2**

**Fall**

BME 201 Introduction to Biomedical Engineering  
(MATH 225, PHYS 131, EDD 112) (Co-req: BIOL 113)  
MATH 324 Ordinary Differential Equations  
(MATH 227)  
CHEM 231 Organic Chemistry I (CHEM 111)

**Spring**

BME 203 Biomedical Modeling & Numerical Methods  
(MATH 324 or 371, BME 201)  
BME 213 Biomolecular Engineering  
(BIOL 113, BME 201, CHEM 111, MATH 324)  
MATH 323 Calculus III (MATH 227)  
PHYS 132 General Physics II Calculus-based (PHYS 131)

General Education Elective (A,G,N,P)

General Education Elective (A,G,N,P)

**Year 3**

**Fall**

BME 313 Biomaterials (CHEM 231, BME 213, BIOL 113)  
BME 318 Biomechanics (PHYS 131, MATH 227)  
BME 324 Biomedical Instruments (L)  
(BME 201, BME 203, BME 213, PHYS 132)  
BME 330 Thermodynamics  
(MATH 323, MATH 324, PHYS 131)  
BME Depth or Science Elective\*

**Spring**

BME 303 Bio-Fluid Mechanics (BME 318, PHYS 131, MATH 226)  
BME 340 Bioinformatics and Biostatistics (BIOL 113, BME 203)  
BME 351 Biomedical Engineering Lab  
(BME 213, BME 324, BME 318) (Co-req: BME 303)  
BIOL 311 Cell Biology (BIOL 113, CHEM 111)  
or  
BIOL 401 Molecular Genetics (BIOL 113, CHEM 111, CHEM 231)  
(Co-req: CHEM 332)

General Education Elective (A, G, N, P)

**Year 4**

**Fall**

BME 413 Biomedical Transport Phenomena (BME 330,  
BME 318, BME 303)  
BME 432 Ethics in Engineering (H) (Co-req: BME 450)  
BME 433 Human Physiology  
(CHEM

**Spring**

BME 451 Biomedical Engineering Design II (J) (BME 450)

**Biomedical Engineering with MCAT Preparation**  
**FALL 2019**

**Year 1**

**Engineering Design Division**

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

**Fall**

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

**Spring**

MATH 226/227    Calculus II (MATH 225)  
PHYS 131        General Physics I Calculus-based (MATH 225)  
EDD 112        Introduction to Engineering Analysis (J) (EDD 111)  
EDD 104        Engineering Communications II (EDD 103)  
BIOL 113        Cell &

## **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 (Fall) (BME 313, BME 201, BIOL 113) (Co-req: BME 433)

BME 473 Advanced biomaterials and biocompatibility (Spring) (BME 313)

BME 463 Bioprocess engineering (Spring) (BME 213, CHEM 231)

BME 442 Nanotechnology and drug delivery (Fall) (BME 313)

### **Biomedical Devices and Instrumentations Concentration** (Choose