# **B.S.** in Biomedical Engineering

# **BME Tracks:**

# **Medical Device and Imaging Track**

(120 credits)

| First Year                         |   |         |
|------------------------------------|---|---------|
| 1st Semester                       |   | Credits |
| PHYS 111                           | Physics I   | 3       |
| PHYS 111A                          | Physics I Lab   | 1       |
| ENGL 101                           | English Composition: Introduction to Academic Writing   | 3       |
| CHEM 125                           | General Chemistry I   | 3       |
| CHEM 125A                          | General Chemistry Lab I   | 1       |
| MATH 111                           | Calculus I  | 4       |
| FED 101                            | Fundamentals of Engineering Design  | 2       |
| FYS SEM                            | First-Year Student Seminar  | 0       |
|                                    | Term Credits  | 17      |
| 2nd Semester                       |   |         |
| BME 101                            | Introduction to Biomedical Engineering  | 0       |
| MATH 112                           | Calculus II   | 4       |
| CHEM 126                           | General Chemistry II  | 3       |
| PHYS 121                           | Physics II  | 3       |
| PHYS 121A                          | Physics II Lab  | 1       |
| ENGL 102                           | English Composition: Introduction to Writing for Research   | 3       |
|                                    | Term Credits  | 14      |
| Second Year                        |   |         |
| 1st Semester                       |   |         |
| History and Huma                   | anities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-                  | 3       |
| requirements/ger-                  | ·200-level/)  |         |
| BME 111                            | Introduction to Physiology  | 3       |
| BME 301                            | Electrical Fundamentals of Biomedical Engineering   | 3       |
| BME 303                            | Biological and Chemical Foundations of Biomedical Engineering   | 3       |
| MATH 211                           | Calculus III A <sup>1</sup>   | 3       |
| MATH 279                           | Statistics and Probability for Engineers <sup>2</sup>   | 2       |
|                                    | Term Credits  | 17      |
| 2nd Semester                       |   |         |
| History and Huma requirements/ger- | anities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>-300-level/) | 3       |
| BME 210                            | Processing Fund for Biol Signa  | 3       |
| BME 302                            | Mechanical Fundamentals of Biomedical Engineering   | 3       |
| BME 304                            | Material Fundamentals of Biomedical Engineering   | 3       |
| MATH 222                           | Differential Equations  | 4       |
|                                    | Term Credits  | 16      |
| Third Year                         |   |         |
| 1st Semester                       |   |         |
| History and Huma requirements/ger- | anities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>-300-level/) | 3       |
| BME 382                            | Engineering Models of Physiological Systems   | 3       |
| MATH 337                           | Linear Algebra  | 3       |
| BME 386                            | Biosensor and Data Acquisition Lab  | 3       |

|                 | Total Credits  | 120 |
|-----------------|--|-----|
|                 | Term Credits   | 12  |
| Science or Engi | ineering Elective 3,4                                | 3   |
| BME 472         | FDA Regulation of Medical Devices                    | 3   |
| Capstone HSS    | 4xx  | 3   |
| BME 496         | Capstone Design 2                                    | 3   |
| 2nd Semester    |  |     |
|                 | Term Credits   | 14  |
| BME 471         | Principles of Medical Imaging                        | 3   |
| Science or Engi | ineering Elective 3,4                                | 3   |
|                 | ineering Elective 3,4                                | 3   |
| Engineering Ele | ective <sup>3</sup>                                  | 3   |
| BME 495         | Capstone Design I                                    | 2   |
| 1st Semester    |  |     |
| Fourth Year     |  |     |
|                 | Term Credits   | 15  |
| Engineering Ele | ective <sup>3</sup>                                  | 3   |
| IE 492          | Engineering Management                               | 3   |
| BME 372         | Electronics of Medical Devices                       | 3   |
| BME 383         | Measurement Lab for Physiological Systems and Tissue | 3   |
| Engineering Ele | ective <sup>3</sup>                                  | 3   |
| 2nd Semester    |  |     |
|                 | Term Credits   | 15  |
| BME 333         | Biomedical Signals and Systems                       | 3   |

Students can take MATH 213 (http://catalog.njit.edu/search/?P=MATH%20213) (Calculus III B) instead of MATH 211 (http://catalog.njit.edu/search/?P=MATH%20211).

- Students can take MATH 333 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https://catalog.njit.edu/search/?P=MATH%20279).
- Engineering Electives choices: BME 385, BME 420, BME 422, BME 427, BME 430, BME 321, BME 351, BME 352, BME451, BME 452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.
- Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

#### The curriculum for B.S. in Biomedical Engineering – MEDICAL DEVICE & IMAGING CO-OP TRACK – CYCLE A

| 1st Semester |   | Credits |
|--------------|---|---------|
| PHYS 111     | Physics I   | 3       |
| PHYS 111A    | Physics I Lab   | 1       |
| ENGL 101     | English Composition: Introduction to Academic Writing | 3       |
| CHEM 125     | General Chemistry I                                   | 3       |
| CHEM 125A    | General Chemistry Lab I                               | 1       |
| MATH 111     | Calculus I  | 4       |
| FED 101      | Fundamentals of Engineering Design                    | 2       |
| FYS SEM      | First-Year Student Seminar                            | 0       |
|              | Term Credits  | 17      |
| 2nd Semester |   |         |
| BME 101      | Introduction to Biomedical Engineering                | 0       |
| MATH 112     | Calculus II   | 4       |
| CHEM 126     | General Chemistry II                                  | 3       |
| PHYS 121     | Physics II  | 3       |
| PHYS 121A    | Physics II Lab  | 1       |

| ENGL 102                             | English Composition: Introduction to Writing for Research   | 3  |
|--------------------------------------|---|----|
|                                      | Term Credits  | 14 |
| Second Year                          |   |    |
| 1st Semester                         |   |    |
| History and Huma<br>requirements/ger | anities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>-200-level/)  | 3  |
| BME 111                              | Introduction to Physiology  | 3  |
| BME 301                              | Electrical Fundamentals of Biomedical Engineering   | 3  |
| BME 303                              | Biological and Chemical Foundations of Biomedical Engineering   | 3  |
| MATH 211                             | Calculus III A <sup>1</sup>   | 3  |
| MATH 279                             | Statistics and Probability for Engineers <sup>2</sup>   | 2  |
|                                      | Term Credits  | 17 |
| 2nd Semester                         |   |    |
| History and Huma<br>requirements/ger | anities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>-300-level/) | 3  |
| BME 210                              | Processing Fund for Biol Signa  | 3  |
| BME 302                              | Mechanical Fundamentals of Biomedical Engineering   | 3  |
| BME 304                              | Material Fundamentals of Biomedical Engineering   | 3  |
| MATH 222                             | Differential Equations  | 4  |
| ENGR 211                             | Professional Skills for Engineers I   | 1  |
|                                      | Term Credits  | 17 |
| Third Year                           |   |    |
| 1st Semester                         |   |    |
| ENGR 310                             | Co-op Work Experience I   | 12 |
|                                      | Term Credits  | 12 |
| 2nd Semester                         |   |    |
| MATH 337                             | Linear Algebra  | 3  |
| BME 372                              | Electronics of Medical Devices  | 3  |
| BME 382                              | Engineering Models of Physiological Systems   | 3  |
| BME 386                              | Biosensor and Data Acquisition Lab  | 3  |
| History and Huma<br>requirements/ger | anities GER 300 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>-300-level/)  | 3  |
|                                      | Term Credits  | 15 |
| Fourth Year                          |   |    |
| 1st Semester                         |   |    |
| ENGR 410                             | Co-op Work Experience II  | 12 |
|                                      | Term Credits  | 12 |
| 2nd Semester                         |   |    |
| BME 333                              | Biomedical Signals and Systems  | 3  |
| BME 383                              | Measurement Lab for Physiological Systems and Tissue  | 3  |
| Engineering Elec                     |   | 3  |
| Engineering Elec                     |   | 3  |
| IE 492                               | Engineering Management  | 3  |
|                                      | Term Credits  | 15 |
| Fifth Year                           |   |    |
| 1st Semester                         |   |    |
| BME 495                              | Capstone Design I   | 2  |
|                                      | eering Elective <sup>3,4</sup>  | 3  |
|                                      | eering Elective <sup>3,4</sup>  | 3  |
| Engineering Elec                     |   | 3  |
| BME 471                              | Principles of Medical Imaging   | 3  |
|                                      | Term Credits  | 14 |

#### B.S. in Biomedical Engineering

#### 2nd Semester

|                | Total Credits                      | 145 |
|----------------|------------------------------------|-----|
|                | Term Credits                       | 12  |
| Science and Er | ngineering Elective <sup>3,4</sup> | 3   |
| BME 472        | FDA Regulation of Medical Devices  | 3   |
| Capstone HSS   | 5 4xx                              | 3   |
| BME 496        | Capstone Design 2                  | 3   |

- Students can take MATH 213 (http://catalog.njit.edu/search/?P=MATH%20213) (Calculus III B) instead of MATH 211 (http://catalog.njit.edu/search/?P=MATH%20211).
- Students can take MATH 333 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https://catalog.njit.edu/search/?P=MATH%20279).
- Engineering Electives choices: BME 385, BME 420, BME 422, BME 427, BME 430, BME 321, BME 351, BME 352, BME451, BME452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.
- Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

#### The curriculum for B.S. in Biomedical Engineering – MEDICAL DEVICE & IMAGING CO-OP TRACK – CYCLE B

| 1st Semester                       |   | Credits |
|------------------------------------|---|---------|
| PHYS 111                           | Physics I   | 3       |
| PHYS 111A                          | Physics I Lab   | 1       |
| ENGL 101                           | English Composition: Introduction to Academic Writing   | 3       |
| CHEM 125                           | General Chemistry I   | 3       |
| CHEM 125A                          | General Chemistry Lab I   | 1       |
| MATH 111                           | Calculus I  | 4       |
| FED 101                            | Fundamentals of Engineering Design  | 2       |
| FYS SEM                            | First-Year Student Seminar  | 0       |
|                                    | Term Credits  | 17      |
| 2nd Semester                       |   |         |
| BME 101                            | Introduction to Biomedical Engineering  | 0       |
| MATH 112                           | Calculus II   | 4       |
| CHEM 126                           | General Chemistry II  | 3       |
| PHYS 121                           | Physics II  | 3       |
| PHYS 121A                          | Physics II Lab  | 1       |
| ENGL 102                           | English Composition: Introduction to Writing for Research   | 3       |
|                                    | Term Credits  | 14      |
| Second Year                        |   |         |
| 1st Semester                       |   |         |
| History and Huma requirements/ger- | inities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>200-level/) | 3       |
| BME 111                            | Introduction to Physiology  | 3       |
| BME 301                            | Electrical Fundamentals of Biomedical Engineering   | 3       |
| BME 303                            | Biological and Chemical Foundations of Biomedical Engineering   | 3       |
| MATH 211                           | Calculus III A <sup>1</sup>   | 3       |
| MATH 279                           | Statistics and Probability for Engineers <sup>2</sup>   | 2       |
|                                    | Term Credits  | 17      |
| 2nd Semester                       |   |         |
| History and Huma requirements/ger- | inities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-300-level/)    | 3       |
| BME 210                            | Processing Fund for Biol Signa  | 3       |
| BME 302                            | Mechanical Fundamentals of Biomedical Engineering   | 3       |
|                                    |   |         |

| BME 304           | Material Fundamentals of Biomedical Engineering  | ;  |
|-------------------|--|----|
| MATH 222          | Differential Equations   | 4  |
|                   | Term Credits   | 10 |
| Third Year        |  |    |
| 1st Semester      |  |    |
| History and Huma  | nities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education- | ;  |
| requirements/ger- | 300-level/)  |    |
| BME 382           | Engineering Models of Physiological Systems  | ;  |
| MATH 337          | Linear Algebra   | ;  |
| BME 372           | Electronics of Medical Devices   | ;  |
| BME 386           | Biosensor and Data Acquisition Lab   | ;  |
| ENGR 211          | Professional Skills for Engineers I  | •  |
|                   | Term Credits   | 10 |
| 2nd Semester      |  |    |
| ENGR 310          | Co-op Work Experience I  | 12 |
|                   | Term Credits   | 1: |
| Fourth Year       |  |    |
| 1st Semester      |  |    |
| Engineering Elect | ive <sup>3</sup>   | ;  |
| Engineering Elect | ive <sup>3</sup>   | ;  |
| BME 333           | Biomedical Signals and Systems   | ;  |
| BME 383           | Measurement Lab for Physiological Systems and Tissue   | ;  |
| IE 492            | Engineering Management   | ;  |
|                   | Term Credits   | 15 |
| 2nd Semester      |  |    |
| ENGR 410          | Co-op Work Experience II   | 12 |
|                   | Term Credits   | 12 |
| Fifth Year        |  |    |
| 1st Semester      |  |    |
| BME 495           | Capstone Design I  | 2  |
| BME 471           | Principles of Medical Imaging  | ;  |
| Science or Engine | pering Elective <sup>3,4</sup>   | ;  |
| Science or Engine | pering Elective <sup>3,4</sup>   | ;  |
| Engineering Elect |  | ;  |
|                   | Term Credits   | 14 |
| 2nd Semester      |  |    |
| BME 496           | Capstone Design 2  | ;  |
| Science or Engine |  | ;  |
| Capstone HSS 4x   |  | ;  |
| BME 472           | FDA Regulation of Medical Devices  | ;  |
|                   | Term Credits   | 12 |
|                   | Total Credits  | 14 |

Students can take MATH 213 (http://catalog.njit.edu/search/?P=MATH%20213) (Calculus III B) instead of MATH 211 (http://catalog.njit.edu/search/?P=MATH%20211).

Students can take MATH 333 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https://catalog.njit.edu/search/?P=MATH%20279).

<sup>&</sup>lt;sup>3</sup> Engineering Electives choices: BME 385, BME 420, BME 422, BME 427, BME 430, BME 321, BME 351, BME 352, BME451, BME452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.

Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

### **Biomaterials Track**

(120 credits)

MTEN 201

**BME 385** 

**BME 383** 

**BME 422** 

**BME 420** 

**2nd Semester** IE 492

Introductory Principles of Materials Engineering

Measurement Lab for Physiological Systems and Tissue

Cell and Biomaterial Engineering Laborarory

**Term Credits** 

**Engineering Management** 

Biomaterials Characterization

Advanced Biomaterials Science

| (120 credits)                      |   |         |
|------------------------------------|---|---------|
| First Year                         |   |         |
| 1st Semester                       |   | Credits |
| PHYS 111                           | Physics I   | 3       |
| PHYS 111A                          | Physics I Lab   | 1       |
| ENGL 101                           | English Composition: Introduction to Academic Writing   | 3       |
| CHEM 125                           | General Chemistry I   | 3       |
| CHEM 125A                          | General Chemistry Lab I   | 1       |
| MATH 111                           | Calculus I  | 4       |
| FED 101                            | Fundamentals of Engineering Design  | 2       |
| FYS SEM                            | First-Year Student Seminar  | 0       |
|                                    | Term Credits  | 17      |
| 2nd Semester                       |   |         |
| ENGL 102                           | English Composition: Introduction to Writing for Research   | 3       |
| PHYS 121                           | Physics II  | 3       |
| PHYS 121A                          | Physics II Lab  | 1       |
| CHEM 126                           | General Chemistry II  | 3       |
| MATH 112                           | Calculus II   | 4       |
| BME 101                            | Introduction to Biomedical Engineering  | 0       |
|                                    | Term Credits  | 14      |
| Second Year                        |   |         |
| 1st Semester                       |   |         |
| BME 303                            | Biological and Chemical Foundations of Biomedical Engineering   | 3       |
| BME 304                            | Material Fundamentals of Biomedical Engineering   | 3       |
| BME 111                            | Introduction to Physiology  | 3       |
| MATH 211                           | Calculus III A <sup>1</sup>   | 3       |
| MATH 279                           | Statistics and Probability for Engineers <sup>2</sup>   | 2       |
|                                    | Term Credits  | 14      |
| 2nd Semester                       |   |         |
| History and Huma requirements/ger- | inities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>200-level/) | 3       |
| BME 210                            | Processing Fund for Biol Signa  | 3       |
| BME 302                            | Mechanical Fundamentals of Biomedical Engineering   | 3       |
| MATH 222                           | Differential Equations  | 4       |
| BME 301                            | Electrical Fundamentals of Biomedical Engineering   | 3       |
|                                    | Term Credits  | 16      |
| Third Year                         |   |         |
| 1st Semester                       |   |         |
| History and Huma requirements/ger- | inities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-300-level/)    | 3       |
| CHEM 243                           | Organic Chemistry I   | 3       |
| BME 352                            | Thermal Science for Biomedical Engineering  | 3       |
|                                    |   |         |

3

3

15

3

3

3

3

History and Humanities GER 300 (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-

3 requirements/ger-300-level/) **Term Credits** 15 Fourth Year 1st Semester **BME 430** 3 Fundamentals of Tissue Engineering **BME 382** Engineering Models of Physiological Systems 3 Science or Engineering Elective 3,4 3 Science or Engineering Elective 3,4 3 **BME 495** Capstone Design I 2 **Term Credits** 14 2nd Semester **BME 427** 3 Biotransport Engineering Elective <sup>3</sup> 3 Engineering Elective 3 3 **BME 496** 3 Capstone Design 2 Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/ 3 general-education-requirements/hss-capstone/) **Term Credits** 15 **Total Credits** 120

#### The curriculum for B.S. in Biomedical Engineering – BIOMATERIALS CO-OP TRACK – CYCLE A

| 1st Semester |   | Credits |
|--------------|---|---------|
| PHYS 111     | Physics I   | 3       |
| PHYS 111A    | Physics I Lab   | 1       |
| ENGL 101     | English Composition: Introduction to Academic Writing     | 3       |
| CHEM 125     | General Chemistry I                                       | 3       |
| CHEM 125A    | General Chemistry Lab I                                   | 1       |
| MATH 111     | Calculus I  | 4       |
| FED 101      | Fundamentals of Engineering Design                        | 2       |
| FYS SEM      | First-Year Student Seminar                                | 0       |
|              | Term Credits  | 17      |
| 2nd Semester |   |         |
| ENGL 102     | English Composition: Introduction to Writing for Research | 3       |
| PHYS 121     | Physics II  | 3       |
| PHYS 121A    | Physics II Lab  | 1       |
| CHEM 126     | General Chemistry II                                      | 3       |
| MATH 112     | Calculus II   | 4       |
| BME 101      | Introduction to Biomedical Engineering                    | 0       |
|              | Term Credits  | 14      |

Students can take MATH 213 (http://catalog.njit.edu/search/?P=MATH%20213) (Calculus III B) instead of MATH 211 (http://catalog.njit.edu/ search/?P=MATH%20211).

Students can take MATH 333 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https:// catalog.njit.edu/search/?P=MATH%20279).

Engineering Electives choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 321, BME 351, BME 352, BME451, BME 452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, CHE 375, BMET 415, MNET 303, MNET 315.

Science Elective Choices are: CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

#### Second Year 1st Semester **BME 303** Biological and Chemical Foundations of Biomedical Engineering 3 **BME 304** Material Fundamentals of Biomedical Engineering 3 Introduction to Physiology 3 **BME 111 MATH 211** Calculus III A 1 3 Statistics and Probability for Engineers <sup>2</sup> **MATH 279** 2 **Term Credits** 14 2nd Semester History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-3 requirements/ger-200-level/) **BME 210** Processing Fund for Biol Signa 3 **BME 302** Mechanical Fundamentals of Biomedical Engineering 3 4 **MATH 222** Differential Equations **BME 301** Electrical Fundamentals of Biomedical Engineering 3 **ENGR 211** 1 Professional Skills for Engineers I **Term Credits** 17 **Third Year** 1st Semester **ENGR 310** Co-op Work Experience I 12 **Term Credits** 12 2nd Semester History and Humanities GER 300 (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-3 requirements/ger-300-level/) **BME 352** Thermal Science for Biomedical Engineering 3 **MTEN 201** Introductory Principles of Materials Engineering 3 **CHEM 243** Organic Chemistry I 3 Cell and Biomaterial Engineering Laborarory **BME 385** 3 Term Credits 15 Fourth Year 1st Semester **ENGR 410** Co-op Work Experience II 12 **Term Credits** 12 2nd Semester 3 Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/ general-education-requirements/hss-capstone/) Engineering Models of Physiological Systems 3 **BME 382** IE 492 **Engineering Management** 3 **BME 420** Advanced Biomaterials Science 3 **BME 422** Biomaterials Characterization 3 **Term Credits** 15 Fifth Year 1st Semester **BME 495** Capstone Design I 2 **BME 383** Measurement Lab for Physiological Systems and Tissue 3 **BME 430** Fundamentals of Tissue Engineering 3 Science or Engineering Elective 3,4 3 Science or Engineering Elective 3,4 3 **Term Credits** 14 2nd Semester **BME 496** Capstone Design 2 3 **BME 427** Biotransport 3

| Total Credits  | 145 |
|--|-----|
| Term Credits   | 15  |
| Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/) | 3   |
| Engineering Elective <sup>3</sup>  | 3   |
| Engineering Elective <sup>3</sup>  | 3   |

- Students can take MATH 213 (http://catalog.njit.edu/search/?P=MATH%20213) (Calculus III B) instead of MATH 211 (http://catalog.njit.edu/search/?P=MATH%20211).
- Students can take MATH 333 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https://catalog.njit.edu/search/?P=MATH%20279).
- Engineering Electives choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 321, BME 351, BME 352, BME451, BME 452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, CHE 375, BMET 415, MNET 303, MNET 315.
- Science Elective Choices are: CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

#### The curriculum for B.S. in Biomedical Engineering – BIOMATERIALS CO-OP TRACK – CYCLE B

| First Year                           |  |         |
|--------------------------------------|--|---------|
| 1st Semester                         |  | Credits |
| PHYS 111                             | Physics I  | 3       |
| PHYS 111A                            | Physics I Lab  | 1       |
| ENGL 101                             | English Composition: Introduction to Academic Writing  | 3       |
| CHEM 125                             | General Chemistry I  | 3       |
| CHEM 125A                            | General Chemistry Lab I  | 1       |
| MATH 111                             | Calculus I   | 4       |
| FED 101                              | Fundamentals of Engineering Design   | 2       |
| FYS SEM                              | First-Year Student Seminar   | 0       |
|                                      | Term Credits   | 17      |
| 2nd Semester                         |  |         |
| ENGL 102                             | English Composition: Introduction to Writing for Research  | 3       |
| PHYS 121                             | Physics II   | 3       |
| PHYS 121A                            | Physics II Lab   | 1       |
| CHEM 126                             | General Chemistry II   | 3       |
| MATH 112                             | Calculus II  | 4       |
| BME 101                              | Introduction to Biomedical Engineering   | 0       |
|                                      | Term Credits   | 14      |
| Second Year                          |  |         |
| 1st Semester                         |  |         |
| BME 303                              | Biological and Chemical Foundations of Biomedical Engineering  | 3       |
| BME 304                              | Material Fundamentals of Biomedical Engineering  | 3       |
| BME 111                              | Introduction to Physiology   | 3       |
| MATH 211                             | Calculus III A <sup>1</sup>  | 3       |
| MATH 279                             | Statistics and Probability for Engineers <sup>2</sup>  | 2       |
|                                      | Term Credits   | 14      |
| 2nd Semester                         |  |         |
| History and Humar requirements/ger-2 | nities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-lo0-level/) | 3       |
| BME 210                              | Processing Fund for Biol Signa   | 3       |
| BME 302                              | Mechanical Fundamentals of Biomedical Engineering  | 3       |
| MATH 222                             | Differential Equations   | 4       |
| BME 301                              | Electrical Fundamentals of Biomedical Engineering  | 3       |

| ENGR 211                        | Professional Skills for Engineers I   | 1  |
|---------------------------------|---|----|
|                                 | Term Credits  | 17 |
| Third Year                      |   |    |
| 1st Semester                    |   |    |
| History and Hum requirements/ge | anities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>-300-level/) | 3  |
| CHEM 243                        | Organic Chemistry I   | 3  |
| BME 352                         | Thermal Science for Biomedical Engineering  | 3  |
| MTEN 201                        | Introductory Principles of Materials Engineering  | (  |
| BME 385                         | Cell and Biomaterial Engineering Laborarory   | 3  |
|                                 | Term Credits  | 1: |
| 2nd Semester                    |   |    |
| ENGR 310                        | Co-op Work Experience I   | 12 |
|                                 | Term Credits  | 12 |
| Fourth Year                     |   |    |
| 1st Semester                    |   |    |
| BME 382                         | Engineering Models of Physiological Systems   | 3  |
| IE 492                          | Engineering Management  | 3  |
| BME 420                         | Advanced Biomaterials Science   | 3  |
| BME 422                         | Biomaterials Characterization   | (  |
| History and Hum                 | anities GER 300 (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-                        | 3  |
| requirements/ge                 |   |    |
|                                 | Term Credits  | 15 |
| 2nd Semester                    |   |    |
| ENGR 410                        | Co-op Work Experience II  | 12 |
|                                 | Term Credits  | 12 |
| Fifth Year                      |   |    |
| 1st Semester                    |   |    |
| BME 495                         | Capstone Design I   | 2  |
| BME 383                         | Measurement Lab for Physiological Systems and Tissue  | 3  |
| BME 430                         | Fundamentals of Tissue Engineering  | 3  |
| Science or Engir                | eering Elective 3,4   | 3  |
| Science or Engir                | eering Elective <sup>3,4</sup>  | 3  |
|                                 | Term Credits  | 14 |
| 2nd Semester                    |   |    |
| BME 496                         | Capstone Design 2   | 3  |
| BME 427                         | Biotransport  | 3  |
| Engineering Elec                |   | 3  |
| Engineering Elec                |   | ;  |
| -                               | Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/                        | (  |
|                                 | n-requirements/hss-capstone/)   |    |
|                                 | Term Credits  | 15 |
|                                 |   |    |

Students can take MATH 213 (http://catalog.njit.edu/search/?P=MATH%20213) (Calculus III B) instead of MATH 211 (http://catalog.njit.edu/search/?P=MATH%20211).

Students can take MATH 333 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https://catalog.njit.edu/search/?P=MATH%20279).

Engineering Electives choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 321, BME 351, BME 352, BME451, BME 452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, CHE 375, BMET 415, MNET 303, MNET 315.

Science Elective Choices are: CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

# **Biomechanics Track**

(120 credits)

| (120 credits)                        |   |         |
|--------------------------------------|---|---------|
| First Year                           |   |         |
| 1st Semester                         |   | Credits |
| ENGL 101                             | English Composition: Introduction to Academic Writing   | 3       |
| PHYS 111                             | Physics I   | 3       |
| PHYS 111A                            | Physics I Lab   | 1       |
| CHEM 125                             | General Chemistry I   | 3       |
| CHEM 125A                            | General Chemistry Lab I   | 1       |
| MATH 111                             | Calculus I  | 4       |
| FED 101                              | Fundamentals of Engineering Design  | 2       |
| FYS SEM                              | First-Year Student Seminar  | 0       |
|                                      | Term Credits  | 17      |
| 2nd Semester                         |   |         |
| ENGL 102                             | English Composition: Introduction to Writing for Research   | 3       |
| PHYS 121                             | Physics II  | 3       |
| PHYS 121A                            | Physics II Lab  | 1       |
| CHEM 126                             | General Chemistry II  | 3       |
| MATH 112                             | Calculus II   | 4       |
| BME 101                              | Introduction to Biomedical Engineering  | 0       |
|                                      | Term Credits  | 14      |
| Second Year                          |   |         |
| 1st Semester                         |   |         |
| History and Humar                    | nities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-                 | 3       |
| requirements/ger-2                   | (00-level/)   |         |
| BME 111                              | Introduction to Physiology  | 3       |
| MATH 211                             | Calculus III A <sup>1</sup>   | 3       |
| BME 210                              | Processing Fund for Biol Signa  | 3       |
| BME 302                              | Mechanical Fundamentals of Biomedical Engineering   | 3       |
| MATH 279                             | Statistics and Probability for Engineers <sup>2</sup>   | 2       |
|                                      | Term Credits  | 17      |
| 2nd Semester                         |   |         |
| History and Humar requirements/ger-3 | nities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>i00-level/) | 3       |
| BME 304                              | Material Fundamentals of Biomedical Engineering   | 3       |
| BME 301                              | Electrical Fundamentals of Biomedical Engineering   | 3       |
| BME 303                              | Biological and Chemical Foundations of Biomedical Engineering   | 3       |
| MATH 222                             | Differential Equations  | 4       |
|                                      | Term Credits  | 16      |
| Third Year                           |   |         |
| 1st Semester                         |   |         |
| History and Humar requirements/ger-3 | nities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>100-level/) | 3       |
| BME 382                              | Engineering Models of Physiological Systems   | 3       |
| BME 321                              | Adv Mechanics for Biomed Engr   | 3       |
| MATH 337                             | Linear Algebra  | 3       |
| MECH 236                             | Dynamics  | 2       |
|                                      | Term Credits  | 14      |
| 2nd Semester                         |   |         |
| BME 351                              | Introduction to Biofluid Mechanics  | 3       |
| BME 384                              | Biomechanics Laboratory   | 3       |
|                                      |   |         |

| BME 478         | Introduction to CAD for Biomechanics   | 4   |
|-----------------|--|-----|
| IE 492          | Engineering Management   | 3   |
| Science or Engi | neering Elective <sup>3,4</sup>  | 3   |
|                 | Term Credits   | 16  |
| Fourth Year     |  |     |
| 1st Semester    |  |     |
| Science or Engi | neering Elective <sup>3,4</sup>  | 3   |
| BME 451         | Biomechanics I   | 3   |
| BME 495         | Capstone Design I  | 2   |
| BME 383         | Measurement Lab for Physiological Systems and Tissue   | 3   |
| Engineering Ele | octive <sup>3</sup>  | 3   |
|                 | Term Credits   | 14  |
| 2nd Semester    |  |     |
| BME 452         | Mechanical Behavior and Performance of Biomaterials  | 3   |
| BME 496         | Capstone Design 2  | 3   |
| Engineering Ele | octive <sup>3</sup>  | 3   |
|                 | Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/on-requirements/hss-capstone/) | 3   |
|                 | Term Credits   | 12  |
|                 | Total Credits  | 120 |

- Students can take MATH 213 (http://catalog.njit.edu/search/?P=MATH%20213) (Calculus III B) instead of MATH 211 (http://catalog.njit.edu/search/?P=MATH%20211).
- Students can take MATH 333 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https://catalog.njit.edu/search/?P=MATH%20279).
- Engineering Electives Choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 385, BME 420, BME 422, BME 427, BME 430, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.
- Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

#### The curriculum for B.S. in Biomedical Engineering – BIOMECHANICS CO-OP TRACK– CYCLE A

| 1st Semester |   | Credits |
|--------------|---|---------|
| ENGL 101     | English Composition: Introduction to Academic Writing     | 3       |
| PHYS 111     | Physics I   | 3       |
| PHYS 111A    | Physics I Lab   | 1       |
| CHEM 125     | General Chemistry I                                       | 3       |
| CHEM 125A    | General Chemistry Lab I                                   | 1       |
| MATH 111     | Calculus I  | 4       |
| FED 101      | Fundamentals of Engineering Design                        | 2       |
| FYS SEM      | First-Year Student Seminar                                | 0       |
|              | Term Credits  | 17      |
| 2nd Semester |   |         |
| ENGL 102     | English Composition: Introduction to Writing for Research | 3       |
| PHYS 121     | Physics II  | 3       |
| PHYS 121A    | Physics II Lab  | 1       |
| CHEM 126     | General Chemistry II                                      | 3       |
| MATH 112     | Calculus II   | 4       |
| BME 101      | Introduction to Biomedical Engineering                    | 0       |
|              | Term Credits  | 14      |

3

| Second Year                        |   |    |
|------------------------------------|---|----|
| 1st Semester                       |   |    |
| History and Huma requirements/ger- | anities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>200-level/) | 3  |
| BME 111                            | Introduction to Physiology  | 3  |
| BME 301                            | Electrical Fundamentals of Biomedical Engineering   | 3  |
| BME 303                            | Biological and Chemical Foundations of Biomedical Engineering   | 3  |
| MATH 211                           | Calculus III A <sup>1</sup>   | 3  |
| MATH 279                           | Statistics and Probability for Engineers <sup>2</sup>   | 2  |
|                                    | Term Credits  | 17 |
| 2nd Semester                       |   |    |
| History and Huma requirements/ger- | anities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-300-level/)    | 3  |
| BME 210                            | Processing Fund for Biol Signa  | 3  |
| BME 302                            | Mechanical Fundamentals of Biomedical Engineering   | 3  |
| BME 304                            | Material Fundamentals of Biomedical Engineering   | 3  |
| MATH 222                           | Differential Equations  | 4  |
| ENGR 211                           | Professional Skills for Engineers I   | 1  |
|                                    | Term Credits  | 17 |
| Third Year                         |   |    |
| 1st Semester                       |   |    |
| ENGR 310                           | Co-op Work Experience I   | 12 |
|                                    | Term Credits  | 12 |
| 2nd Semester                       |   |    |
| MATH 337                           | Linear Algebra  | 3  |
| MECH 236                           | Dynamics  | 2  |
| BME 321                            | Adv Mechanics for Biomed Engr   | 3  |
| Science or Engine                  | eering Electives <sup>3,4</sup>   | 3  |
| History and Huma requirements/ger- | anities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-300-level/)    | 3  |
|                                    | Term Credits  | 14 |
| Fourth Year                        |   |    |
| 1st Semester                       |   |    |
| ENGR 410                           | Co-op Work Experience II  | 12 |
|                                    | Term Credits  | 12 |
| 2nd Semester                       |   |    |
| BME 351                            | Introduction to Biofluid Mechanics  | 3  |
| BME 382                            | Engineering Models of Physiological Systems   | 3  |
| BME 384                            | Biomechanics Laboratory   | 3  |
| BME 478                            | Introduction to CAD for Biomechanics  | 4  |
| IE 492                             | Engineering Management  | 3  |
|                                    | Term Credits  | 16 |
| Fifth Year                         |   |    |
| 1st Semester                       |   |    |
| BME 383                            | Measurement Lab for Physiological Systems and Tissue  | 3  |
| BME 451                            | Biomechanics I  | 3  |
| BME 495                            | Capstone Design I   | 2  |
|                                    | eering Elective <sup>3,4</sup>  | 3  |
| Engineering Elect                  | ive <sup>3</sup>  | 3  |
|                                    | Term Credits  | 14 |
| 0                                  |   |    |

**2nd Semester** BME 496

Capstone Design 2

|                | Total Credits  | 145 |
|----------------|--|-----|
|                | Term Credits   | 12  |
|                | d Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/<br>tion-requirements/hss-capstone/) | 3   |
| Engineering El | lective <sup>3</sup>   | 3   |
| BME 452        | Mechanical Behavior and Performance of Biomaterials  | 3   |

- Students can take MATH 213 (http://catalog.njit.edu/search/?P=MATH%20213) (Calculus III B) instead of MATH 211 (http://catalog.njit.edu/search/?P=MATH%20211).
- Students can take MATH 333 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https://catalog.njit.edu/search/?P=MATH%20279).
- Engineering Electives Choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 385, BME 420, BME 422, BME 427, BME 430, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.
- Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

#### The curriculum for B.S. in Biomedical Engineering – BIOMECHANICS CO-OP TRACK – CYCLE B

| First Year                           |  |         |
|--------------------------------------|--|---------|
| 1st Semester                         |  | Credits |
| ENGL 101                             | English Composition: Introduction to Academic Writing  | 3       |
| PHYS 111                             | Physics I  | 3       |
| PHYS 111A                            | Physics I Lab  | 1       |
| CHEM 125                             | General Chemistry I  | 3       |
| CHEM 125A                            | General Chemistry Lab I  | 1       |
| MATH 111                             | Calculus I   | 4       |
| FED 101                              | Fundamentals of Engineering Design   | 2       |
| FYS SEM                              | First-Year Student Seminar   | 0       |
|                                      | Term Credits   | 17      |
| 2nd Semester                         |  |         |
| ENGL 102                             | English Composition: Introduction to Writing for Research  | 3       |
| PHYS 121                             | Physics II   | 3       |
| PHYS 121A                            | Physics II Lab   | 1       |
| CHEM 126                             | General Chemistry II   | 3       |
| MATH 112                             | Calculus II  | 4       |
| BME 101                              | Introduction to Biomedical Engineering   | 0       |
|                                      | Term Credits   | 14      |
| Second Year                          |  |         |
| 1st Semester                         |  |         |
| History and Humar requirements/ger-2 | nities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>00-level/)  | 3       |
| BME 111                              | Introduction to Physiology   | 3       |
| BME 301                              | Electrical Fundamentals of Biomedical Engineering  | 3       |
| BME 303                              | Biological and Chemical Foundations of Biomedical Engineering  | 3       |
| MATH 211                             | Calculus III A <sup>1</sup>  | 3       |
| MATH 279                             | Statistics and Probability for Engineers <sup>2</sup>  | 2       |
|                                      | Term Credits   | 17      |
| 2nd Semester                         |  |         |
| History and Human requirements/ger-3 | nities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-<br>00-level/) | 3       |
| BME 210                              | Processing Fund for Biol Signa   | 3       |
| BME 302                              | Mechanical Fundamentals of Biomedical Engineering  | 3       |
| BME 304                              | Material Fundamentals of Biomedical Engineering  | 3       |

|                    | Total Credits  | 146 |
|--------------------|--|-----|
|                    | Term Credits   | 12  |
|                    | requirements/hss-capstone/)  |     |
|                    | ocial Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/        | 3   |
| Engineering Electi |  | 3   |
| BME 452            | Mechanical Behavior and Performance of Biomaterials  | 3   |
| BME 496            | Capstone Design 2  | 3   |
| 2nd Semester       | Term Credits   | 14  |
| Engineering Electi |  |     |
| Engineering Electi |  | 3   |
| Science or Engine  |  | 3   |
| BME 495            | Capstone Design I  | 2   |
| BME 451            | Biomechanics I   | 3   |
| BME 383            | Measurement Lab for Physiological Systems and Tissue   | 3   |
| 1st Semester       |  |     |
| Fifth Year         | Total Ground   | 12  |
| 2.101( -10         | Term Credits   | 12  |
| ENGR 410           | Co-op Work Experience II   | 12  |
| 2nd Semester       | Total Ground   | 10  |
| 12 702             | Term Credits   | 16  |
| IE 492             | Engineering Management   | 3   |
| BME 478            | Introduction to CAD for Biomechanics   | 2   |
| BME 384            | Biomechanics Laboratory  | 3   |
| BME 382            | Engineering Models of Physiological Systems  | 3   |
| BME 351            | Introduction to Biofluid Mechanics   | 3   |
| 1st Semester       |  |     |
| Fourth Year        |  | ••  |
|                    | Term Credits   | 1:  |
| ENGR 310           | Co-op Work Experience I  | 12  |
| 2nd Semester       |  |     |
| 1                  | Term Credits   | 15  |
| requirements/ger-  | nities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education- | (   |
| Science or Engine  |  | 3   |
| BME 321            | Adv Mechanics for Biomed Engr  | ;   |
| MECH 236           | Dynamics   | 2   |
| MATH 337           | Linear Algebra   | ;   |
| ENGR 210           | Career Planning Seminar for En   |     |
| 1st Semester       |  |     |
| Third Year         |  |     |
|                    | Term Credits   | 1   |
| ENGR 211           | Professional Skills for Engineers I  |     |
| MATH 222           | Differential Equations   | 4   |
|                    |  |     |

Students can take MATH 213 (http://catalog.njit.edu/search/?P=MATH%20213) (Calculus III B) instead of MATH 211 (http://catalog.njit.edu/search/?P=MATH%20211).

Students can take MATH 333 (https://catalog.njit.edu/search/?P=MATH%20333) (Probability and Statistics) instead of MATH 279 (https://catalog.njit.edu/search/?P=MATH%20279).

<sup>&</sup>lt;sup>3</sup> Engineering Electives Choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 385, BME 420, BME 422, BME 427, BME 430, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.

Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

# **Pre-Health Option**

Students planning to apply to Medical and Dental schools will follow one of the above tracks with specific selections and substitutions to fulfill Medical School admissions guidelines.

The following should be taken as Advanced Science Electives:

| Code      | Title                          | Credits |
|-----------|--------------------------------|---------|
| CHEM 473  | Biochemistry                   | 3       |
| CHEM 244  | Organic Chemistry II           | 3       |
| CHEM 244A | Organic Chemistry I Laboratory | 2       |

The following should be taken as History and Humanities GER courses:

| Code    | Title                          | Credits |
|---------|--------------------------------|---------|
| STS 221 | Introduction to Sociology      | 3       |
| PSY 359 | Foundations of Cyberpsychology | 3       |

The following will substitute for BME 303:

| Code        | Title                                    | Credits |
|-------------|--|---------|
| BIOL 201    | Found of Biol: Cell & Molecula (Lecture) | 3       |
| or R120 201 | Foundations Of Biology                   |         |
| BIOL 202    | Found of Biol: Cell & Molecula (Lab)     | 1       |
| or R120 202 | Foundations Of Biology Lab               |         |

General Education Requirements "Refer to the General Education Requirements for specific information for GER courses"