

Table C5-2 Biomaterials and Tissue Engineering Track Curriculum

| Course (Department, Number, Title) List all courses in the program by term starting with first term of first year and ending with the last term of the final year. * can be taken in Fall or Spring to balance enrollment | Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE. ¹ | Subject Area (Credit Hours) | | | | Last Two Terms the Course was Offered: Year and, Semester, or Quarter | Maximum Section Enrollment for the Last Two Terms the Course was Offered ² |
|---|---|-----------------------------|---|-------------------|-------|---|---|
| | | Math & Basic Sciences | Engineering Topics Check if Contains Significant Design (√) | General Education | Other | | |
| <i>1st Year - Fall Semester (16 Credits)</i> | | | | | | | |
| HUM 101 English Composition I | R | | | 3 | | F12 & S13 | 24 |
| PHYS 111 Physics I | R | 3 | | | | F12 & S13 | 30 |
| PHYS 111A Physics I Laboratory | R | 1 | | | | F12 & S13 | 24 |
| CHEM 125 General Chemistry I | R | 3 | | | | F12 & S13 | 25 |
| MATH 111 Calculus I | R | 4 | | | | F12 & S13 | 30 |
| BME 111 Introduction to Human Physiology I | R | 3 | | | | F12 & S13 | 84/40 |
| BME 101 Introduction to Biomedical Engineering | R | | | | 0 | F11 & F12 | 80/84 |
| <i>1st Year - Spring Semester (18 Credits)</i> | | | | | | | |
| HUM 102 English Composition II | R | | | 3 | | F12 & S13 | 24 |
| PHYS 121 Physics II | R | 3 | | | | F12 & S13 | 30 |
| PHYS 121A Physics II Laboratory | R | 1 | | | | F12 & S13 | 24 |
| CHEM 126 General Chemistry II | R | 3 | | | | F12 & S13 | 25 |
| CHEM 124 General Chemistry Laboratory | R | 1 | | | | F12 & S13 | 200 |
| MATH 112 Calculus II | R | 4 | | | | F12 & S13 | 32/25 |
| FED 101* BME Fundamentals of Engineering Design | R | | 2√ | | | F12 & S13 | 18 |
| <i>2nd Year - Fall Semester (17 Credits)</i> | | | | | | | |
| HIST 2xx Cultural History Elective | SE | | | 3 | | F12 & S13 | 28 |
| CS 101 Computer Programming | R | | | 3 | | F12 & S13 | 30 |
| BME 301* Electrical Fundamentals of Biomedical Engineering | R | | 3 | | | F12 & S13 | 25 |
| BME 303/R120:102* Biological & Chemical Foundations of BME or Rutgers' Biology II | SE | 3 | | | | F11 & F12 | 20 |
| MATH 211 Calculus III A | R | 3 | | | | F12 & S13 | 30 |
| MATH 279 Statistics & Probability for Engineers | R | 2 | | | | F12 & S13 | 30/32 |
| <i>2nd Year - Spring Semester (17 Credits)</i> | | | | | | | |
| SS LL 1xx/2xx Basic Social Science Elective in ECON/EPS/SS/STS | SE | | | 3 | | NA | NA |

| Course (Department, Number, Title) List all courses in the program by term starting with first term of first year and ending with the last term of the final year. * can be taken in Fall or Spring to balance enrollment | Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE. ¹ | Subject Area (Credit Hours) | | | | Last Two Terms the Course was Offered: Year and, Semester, or Quarter | Maximum Section Enrollment for the Last Two Terms the Course was Offered ² |
|---|---|-----------------------------|---|-------------------|-------|---|---|
| | | Math & Basic Sciences | Engineering Topics Check if Contains Significant Design (✓) | General Education | Other | | |
| BME 302* | Mechanical Fundamentals of Biomedical Engineering | R | | 3 | | | F12 & S13 25 |
| BME 304* | Material Fundamentals of Biomedical Engineering | R | | 3 | | | F12 & S13 40 |
| CHEM 243 | Organic Chemistry I | R | 3 | | | | F12 & S13 59/40 |
| MATH 222 | Differential Equations | R | 4 | | | | F12 & S13 30 |
| PE 1xx/2xx | Physical Education Elective | SE | | | | 1 | F12 & S13 15-30 |
| <i>3rd Year - Fall Semester (17 Credits)</i> | | | | | | | |
| SS LL 1xx/2xx | Basic Social Science Elective in ECON/EPS/SS/STS | SE | | | 3 | | NA NA |
| CHE 210 | Chemical Process Calculations I | R | | 2 | | | F12 & S13 30-40 |
| CHE 210W | Chemical Process Calculations I Workshop | R | | 0 | | | F12 & S13 35 |
| MTSE 301 | Material Science & Engineering | R | | 3 | | | F12 & S13 30 |
| CHEM 244 | Organic Chemistry II | R | 3 | | | | F12 & S13 40/60 |
| MATH 337 | Linear Algebra | R | 3 | | | | F12 & S13 30/32 |
| BME 310 | Biomedical Computing | R | | 3 | | | F12 & S13 30/25 |
| <i>3rd Year - Spring Semester (16 Credits)</i> | | | | | | | |
| HUM 3xx | Upper Humanities Elective in LIT/HIST/PHIL/STS | SE | | | 3 | | NA NA |
| BME 382* | Engineering Models in Physiology | R | | 3 | | | F12 & S13 20-30 |
| BME 420 | Advanced Biomaterials Science | R | | 3 | | | S12 & S13 30 |
| CHE 230 | Chemical Engineering Thermodynamics I | R | | 3 | | | F12 & S13 35/40 |
| CHE 230W | Chemical Engineering Thermodynamics I Workshop | R | | 0 | | | F12 & S13 35 |
| BME 385 | Cell & Biomaterials Engineering Laboratory | R | | 3 | | | F12 & S13 20/15 |
| PE 1xx/2xx | Physical Education Elective | SE | | | | 1 | F12 & S13 15-30 |
| <i>4th Year - Fall Semester (18 Credits)</i> | | | | | | | |
| MGMT 390 | Principles of Management | R | | | 3 | | F12 & S13 70/60 |
| BME 430 | Fundamentals of Tissue Engineering | R | | 3 | | | F11 & F12 30 |
| BME 383* | Engineering Physiology Lab | R | | 3 | | | F12 & S13 20-30 |
| BME 495 | BME Capstone Design I | R | | 3✓ | | | F11 & F12 60 |

| Course (Department, Number, Title) List all courses in the program by term starting with first term of first year and ending with the last term of the final year. * can be taken in Fall or Spring to balance enrollment | Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE. ¹ | Subject Area (Credit Hours) | | | | Last Two Terms the Course was Offered: Year and, Semester, or Quarter | Maximum Section Enrollment for the Last Two Terms the Course was Offered ² |
|---|---|-----------------------------|---|-------------------|-------|---|---|
| | | Math & Basic Sciences | Engineering Topics Check if Contains Significant Design (✓) | General Education | Other | | |
| Track Elective | Approved Track Elective | SE | 3 | | | NA | NA |
| Engineering Track Elective | Approved Track Engineering Elective | SE | | 3 | | NA | NA |
| <i>4th Year - Spring Semester (18 Credits)</i> | | | | | | | |
| HSS 4xx | Humanities Capstone Seminar | SE | | | 3 | F12 & S13 | 28/24 |
| HUM 3xx/4xx | Upper Humanities Elective in ENG/HIST/LIT/PHIL/STS/SS/THR | SE | | | 3 | NA | NA |
| ENG/HIST/LIT/PHIL/STS/SS/THR | Upper Humanities Elective | SE | | | 3 | NA | NA |
| BME 422 | Biomaterials Characterization | R | | 3 | | S12 & S13 | 30 |
| BME 427 | Biotransport | R | | 3 | | S12 & S13 | 30 |
| BME 496 | BME Capstone Design II | R | | 3✓ | | F11 & F12 | 60 |
| <i>Biomaterials Track - List of Approved Engineering & Non-Engineering Electives (3xx/4xx)</i> | | | | | | | |
| OPSE 410 | Biophotonics | SE | | | | | |
| MECH 320 | Statics & Strength of Materials | SE | | | | | |
| BME 384 | Biomechanics Laboratory | SE | | | | | |
| BME 351 | Introduction to Biofluid Mechanics | SE | | | | | |
| BME 451 | Biomechanics I | SE | | | | | |
| BME 478 | Introduction to CAD for Biomechanics | SE | | | | | |
| IE 355 | Human Factors | SE | | | | | |
| IE 449 | Industrial Robotics | SE | | | | | |
| BME 491 | BME Research & Independent Study I | SE | | | | | |
| BME 492 | BME Research & Independent Study II | SE | | | | | |
| OPSE 301 | Optical Science Engineering | SE | | | | | |
| BME 479 | Biomems | SE | | | | | |
| BME 6xx | Master's Level Engineering - Excluding BME 651 and BME 672) | SE | | | | | |
| MATH 3xx/4xx | Upper Level Mathematics Course - Excluding MATH 346 | SE | | | | | |
| CHEM 473 | Biochemistry | SE | | | | | |

| Course (Department, Number, Title) List all courses in the program by term starting with first term of first year and ending with the last term of the final year. * can be taken in Fall or Spring to balance enrollment | Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE. ¹ | Subject Area (Credit Hours) | | | | Last Two Terms the Course was Offered: Year and, Semester, or Quarter | Maximum Section Enrollment for the Last Two Terms the Course was Offered ² |
|---|---|-----------------------------|---|-------------------|-------|---|---|
| | | Math & Basic Sciences | Engineering Topics Check if Contains Significant Design (✓) | General Education | Other | | |
| R120 3xx/4xx Upper Level Biology | SE | | | | | | |
| BME 311 Co-op Work Experience | SE | | | | | | |
| TOTALS-ABET BASIC-LEVEL REQUIREMENTS | | 50 | 52 | 30 | 2 | | |
| OVERALL TOTAL CREDIT HOURS FOR COMPLETION OF THE PROGRAM | | | | | | | |
| PERCENT OF TOTAL | | 37.3% | 38.8% | 22.4% | 1.5% | | |
| Total must satisfy either credit hours or percentage | Minimum Semester Credit Hours | 32 Hours | 48 Hours | | | | |
| | Minimum Percentage | 25% | 37.5% | | | | |