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| Medical Device and Imaging | | | | | |
| Engineering Elective  ​​(Minimum two of these,  You can choose up to 4 engineering electives and two will count as Advanced electives.)  If your GPA is higher than 3.0 apply to https://www.njit.edu/dual-degree-programs) | | | Advanced Science Elective  (Maximum two of these, you can choose your Advanced Elective from the list to the left) | | |
| Course | Credits | Description | Course | Credits | Description |
| BME 650 | 3 | Clinical Physiology and NeuroPhys | CHEM 244 and 244A | 3 | Organic Chemistry II and Lab  Prerequisite: [CHEM 243](https://catalog.njit.edu/search/?P=CHEM%20243) |
| BME 652 | 3 | Cell and Molecular Tissue Engineering | CHEM 473 | 3 | Biochemistry |
| BME 420 | 3 | Adv. Biomat. Science  Prerequisites:BME302,BME 304, MATH222, & MTSE 301 or BME 321 | MATH 3xx/4xx | 3 | Upper Level Mathematics Courses – |
| BME 422 | 3 | Biomaterials Characterization  Prerequisites: [MATH 112](https://catalog.njit.edu/search/?P=MATH%20112), [PHYS 121](https://catalog.njit.edu/search/?P=PHYS%20121), [BME 304](https://catalog.njit.edu/search/?P=BME%20304) and [MTSE 301](https://catalog.njit.edu/search/?P=MTSE%20301) | MTSE 301 | 3 | Material Science & Engineering  Prerequisites: [PHYS 111](https://catalog.njit.edu/search/?P=PHYS%20111) and [PHYS 121](https://catalog.njit.edu/search/?P=PHYS%20121), [CHEM 125](https://catalog.njit.edu/search/?P=CHEM%20125) and [CHEM 126](https://catalog.njit.edu/search/?P=CHEM%20126), [MATH 111](https://catalog.njit.edu/search/?P=MATH%20111) and [MATH 112](https://catalog.njit.edu/search/?P=MATH%20112) or equivalent |
| BME 427 | 3 | Biotransport   Prerequisites: [MATH 222](https://catalog.njit.edu/search/?P=MATH%20222) and ([BME 303](https://catalog.njit.edu/search/?P=BME%20303) or [R120 102](https://catalog.njit.edu/search/?P=R120%20102) or [BIOL 201](https://catalog.njit.edu/search/?P=BIOL%20201)) | PHYS 350 | 3 | Biophysics I  Prerequisite: [PHYS 121](https://catalog.njit.edu/search/?P=PHYS%20121) |
| BME430 | 3 | Tissue Engineering  Prerequisites: BME302, (BME303 or R120:102), BME 304, MATH 222, MTSE 301 | PHYS 451 | 3 | Biophysics of Electricity and Radiation (Previously-Biophysics II)  Prerequisites: [PHYS 103](https://catalog.njit.edu/search/?P=PHYS%20103) or [PHYS 121](https://catalog.njit.edu/search/?P=PHYS%20121) |
| BME 452 | 3 | Biomedical Thermodynamics | IE 355 | 3 | Human Factors  Restriction: junior standing |
| BME 321 |  | Adv Mech for BME | IE 449 | 3 | Industrial Robotics  Prerequisites: [CS 101](https://catalog.njit.edu/search/?P=CS%20101), [PHYS 121](https://catalog.njit.edu/search/?P=PHYS%20121), junior or senior standing |
| MECH 236 |  | Dynamics | IE 335 | 3 | Engineering Cost Analysis and Control |
| BME351 S |  | Intro to BioFluid Mech S | IE 439 |  | Deterministic Models in Operations Research (Honors) |
| BME451 F |  | BME451 Biomechanics I | IE 455 |  | Robotics and Prog Logic Control |
| BME452 S |  | Mech. B&P of Biomat | Math 661 |  | Applied Statistics |
| ENGR  3xx/4xx | 3 | Grand Challenges Program  Drone Science Fundamentals  Engineering applications of Data Science (Honors) | CS 350 | 3 | Introduction to Computer Systems    (prerequisites: CS280) |
| BME 491 | 3 | BME Research & Independent Study I  Restrictions: Approved requirements for credits, Research thesis required, Professor permission | IE 334 | 3 | Engineering Economy and Capital Investment  Restriction: junior standing |
| BME 492 | 3 | BME Research & Independent Study II  Prerequisites: BME 491  Restrictions: Approved requirements for credits, Research thesis required, Professor permission | IE 335 | 3 | Engineering Cost Analysis and Control  Restriction: junior standing |
| BME 311 | 3 | Co-op Work Experience  Restrictions: Sophomore or above, Department approval, CDS approval | IE 447 | 3 | Legal Aspects of Engineering  Restriction: junior or senior standing |
| BME 651 | 3 | Principles of Tissue Engineering | IE 455 | 3 | Robotics and Programmable Logic Controllers    (prerequisites: Junior and Senior standing) |
| BME 676 | 3 | Computational Biomechanics | IE 460 | 3 | Measuring Techniques and Quality Control    (prerequisites: understanding of basic probability) |
| BME 678 | 3 | Design of Ortho Implants | IE 463 | 3 | Invention and Entrepreneurship  Restriction: Junior or Senior standing or permission of instructor |
| BME 673 | 3 | Biorobotics |  |  |  |
| BME 674 | 3 | Principles of Neuromuscular Engineering |  |  |  |
| BME 671 | 3 | Biomechanics of Human Str and Motion |  |  |  |
| BME 688 | 3 | Virtual Biomedical Instrumentation ( Labview |  |  |  |
| BME 698ST | 3 | Adv Virtual Biomedical Instrumentation II  Note: at the end of this course they can take Labview certificate |  |  |  |
| OPSE 3xx |  |  |  |  |  |
| OPSE 4xx |  |  |  |  |  |
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| Further Options of Advance Science Electives | | |
| Course | Credits | Description |
| BIOL 320 | 3 | Discovering Biological Research  (prerequisites: HUM 102, R120:201, and BIOL 205/206) |
| BIOL 347 | 4 | Lab Approaches in Neuroscience  (prerequisites: Basic knowledge of Neurophysiology) |
| BIOL 436 | 3 | Advanced Neuroscience Modeling  (prerequisites: BIOL 432 or MATH 430) |
| BIOL 462 | 3 | Comparative Biomechanics  (prerequisites: R120 201, R120 202, BIOL 205 and BIOL 206) |
| CS 350 | 3 | Introduction to Computer Systems  (prerequisites: CS280) |
| IE 334 | 3 | Engineering Economy and Capital Investment  Restriction: junior standing |
| IE 335 | 3 | Engineering Cost Analysis and Control  Restriction: junior standing |
| IE 447 | 3 | Legal Aspects of Engineering  Restriction: junior or senior standing |
| IE 455 | 3 | Robotics and Programmable Logic Controllers  (prerequisites: Junior and Senior standing) |
| IE 460 | 3 | Measuring Techniques and Quality Control  (prerequisites: understanding of basic probability) |
| IE 463 | 3 | Invention and Entrepreneurship  Restriction: Junior or Senior standing or permission of instructor |

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| Further Options of Advance Science Electives | | |
| Course | Credits | Description |
| BIOL 320 | 3 | Discovering Biological Research  (prerequisites: HUM 102, R120:201, and BIOL 205/206) |
| BIOL 347 | 4 | Lab Approaches in Neuroscience  (prerequisites: Basic knowledge of Neurophysiology) |
| BIOL 436 | 3 | Advanced Neuroscience Modeling  (prerequisites: BIOL 432 or MATH 430) |
| BIOL 462 | 3 | Comparative Biomechanics  (prerequisites: R120 201, R120 202, BIOL 205 and BIOL 206) |
| CS 350 | 3 | Introduction to Computer Systems  (prerequisites: CS280) |
| IE 334 | 3 | Engineering Economy and Capital Investment  Restriction: junior standing |
| IE 335 | 3 | Engineering Cost Analysis and Control  Restriction: junior standing |
| IE 447 | 3 | Legal Aspects of Engineering  Restriction: junior or senior standing |
| IE 455 | 3 | Robotics and Programmable Logic Controllers  (prerequisites: Junior and Senior standing) |
| IE 460 | 3 | Measuring Techniques and Quality Control  (prerequisites: understanding of basic probability) |
| IE 463 | 3 | Invention and Entrepreneurship  Restriction: Junior or Senior standing or permission of instructor |