

**Biological Engineering (9 credits)**

- \_\_\_\_\_ (3) ABE 58000\* Process Engineering of Renewable Resources (*CHE 34800*)
- \_\_\_\_\_ (3) BCHM 56100 General Biochemistry I (*CHM 26200*)
- \_\_\_\_\_ (3) BME 52100 Biosensors: Fundamentals and Applications (*BIO23000 & MA 26600/30300/30400/36600*)
- \_\_\_\_\_ (3) BME 49500 Biomolecular Engineering
- \_\_\_\_\_ (3) BME 49500 Introductory Computational Biology
- \_\_\_\_\_ (3) BME 55100 Tissue Engineering
- \_\_\_\_\_ (3) CHE 41100 or 49800 Biological Engineering Related Research
- \_\_\_\_\_ (3) CHE 52500\* Biochemical Engineering (*CHE 34800*)
- \_\_\_\_\_ (3) CHE 59700 Engineering Applications of Biological Molecules
- \_\_\_\_\_ (3) CHE 59700 Principles of Tissue Engineering
- \_\_\_\_\_ (3) CHM 33300 Principles of Biochemistry (*CHM 26200*)
- \_\_\_\_\_ (3) CHM 53300 Introductory Biochemistry (*CHM 26200 & CHM 32100*)
- \_\_\_\_\_ (3) ME 59700 Bio-energy and Biofuels

\*Students cannot earn credit in both CHE 52500 and ABE 58000

**Energy and Environment (9 credits)**

- \_\_\_\_\_ (3) CE 35000 or EEE 35000 Environmental Engineering (*MA 16200, PHYS 17200, CHM 11600*)
- \_\_\_\_\_ (3) CE 35500 or EEE 35500 Engineering Environmental Sustainability
- \_\_\_\_\_ (3) CE 45700 Air Pollution Control and Design (*CE 34000*)
- \_\_\_\_\_ (3) CE 55400 Aquatic Chemistry in Environmental Engineering (*CE 34000*)
- \_\_\_\_\_ (3) CHE 41100 or 49800 Energy and Environment Related Research
- \_\_\_\_\_ (3) CHE 55800 Rate Controlled Separation Processes (*CHE 30600 & CHE 37800*)
- \_\_\_\_\_ (3) CHE 59700 Advanced Solar Energy Conversion
- \_\_\_\_\_ (3) CHE 59700 System Analysis of Energy Production
- \_\_\_\_\_ (3) CHE 59700 Battery Storage Systems Lab
- \_\_\_\_\_ (3) CHE 59700 Energy Storage Systems
- \_\_\_\_\_ (3) CHE 59700 Organic Electronic Materials & Devices
- \_\_\_\_\_ (3) ME 41800 Engineering of Environmental Systems and Equipment (*ME 30000/30100 & ME 31500*)
- \_\_\_\_\_ (3) ME 59700 Bio-Energy and Biofuels
- \_\_\_\_\_ (3) NUCL 40200 Engineering of Nuclear Power Systems (*ME 35100 or NUCL 35100*)
- \_\_\_\_\_ (3) NUCL 47000 Fuel Cell Engineering
- \_\_\_\_\_ (3) NUCL 50300 Radioactive Waste Management (*CHM 10200 & NUCL 20000/21100*)
- \_\_\_\_\_ (3) NUCL 56300 Direct Energy Conversion

**Material and Polymers (9 credits)**

- \_\_\_\_\_ (3) CHE 41100 or 49800 Material and Polymer Related Research
- \_\_\_\_\_ (3) CHE 44200 Chemistry and Engineering of High Polymers (*CHM 26200 & CHM 37000*)
- \_\_\_\_\_ (3) CHE 51700 Micro/Nanoscale Physical Processes (*CHE 37700 & CHE 37800*)
- \_\_\_\_\_ (3) CHE 53600 Particulate Systems (*CHE 37700*)
- \_\_\_\_\_ (3) CHE 54300 Polymerization Reaction Engineering and Reactor Analysis (*CHE 34800*)
- \_\_\_\_\_ (3) CHE 54400 Structure and Physical Behavior (*CHM 26200 & CHM 37000*)
- \_\_\_\_\_ (3) CHE 55600 Fundamental of Microelectronics Processing (*ECE 30500*)
- \_\_\_\_\_ (3) CHE 59700 Organic Electronic Materials & Devices
- \_\_\_\_\_ (3) MSE 37000 Electrical, Optical and Magnetic Properties of Materials (*PHYS 24100*)
- \_\_\_\_\_ (3) MSE 51000 Microstructural Characterization Techniques (*Senior Classification*)
- \_\_\_\_\_ (3) MSE 51200 Powder Processing (*Senior Classification*)
- \_\_\_\_\_ (3) MSE 52500 Struct-Property Relations of Engineering Polymers (*Junior 75+credits & Senior Classification*)
- \_\_\_\_\_ (3) MSE 55600 Fracture of Materials (*Senior Classification*)
- \_\_\_\_\_ (3) MSE 56000 Production of Inorganic Materials (*Junior 75+credits & Senior Classification*)
- \_\_\_\_\_ (3) MSE 59700 Manufacturing Advanced Composites
- \_\_\_\_\_ (3) MSE 59700 Biomaterials
- \_\_\_\_\_ (3) MSE 59700 Characterization of Advanced Composite Materials

**Pharmaceutical Engineering (9 credits)**

- \_\_\_\_\_ (3) CHE 41100 or 49800 Pharmaceutical Engineering Related Research
- \_\_\_\_\_ (3) CHE 53600 Particulate Systems (*CHE 37700*)
- \_\_\_\_\_ (3) CHE 55500 Computer Integrated Process Operations (*Senior Classification*)
- \_\_\_\_\_ (3) CHE 55700 Intelligent Systems in Process Engineering (*Senior Classification*)
- \_\_\_\_\_ (3) CHE 59700 Pharmaceutical Process Development and Design
- \_\_\_\_\_ (3) CHE 59700 Principles of Pharmaceutical Engineering (*CHE 34800 & 37800 concurrently*)
- \_\_\_\_\_ (3) IPPH 36200 Basic Pharmaceuticals I
- \_\_\_\_\_ (3) IPPH 56200 Introduction to Pharmaceutical Manufacturing Process (*CHM 37000*)
- \_\_\_\_\_ (3) PHAD 50100 Food and Drug Law Administration

Prerequisites are listed in *italics*.