

Biological Engineering
Technical Electives 2007-2008
February 28, 2008

Bioenvironmental Emphasis

BE 4150 Soil and Water Conservation Engineering
BE 4250 Irrigation and Drainage Engineering
BE 4350 Watershed Modeling Using GIS
CvE 3230 Introduction to Water Quality
CvE 3400 Soil Mechanics
CvE 4210 Solid Waste Management
CvE 4220 Hazardous Waste Management
CvE 4230 Water and Wastewater Treatment
CvE 4240 Water Quality Analysis
CvE 4250 Environmental Regulatory Compliance
CvE 4280 Sanitary Engineering Chemistry
CvE 4700 Hydraulics of Open Channels
CvE 4406 Landfills

Bioprocessing Emphasis

BE 3170 Biomaterials
BE 4160 Food Process Engineering I
BE 4480 Physics and Chemistry of Materials
ChE 2225 Mass and Energy Balance
ChE 3234 Principles of Chemical Engineering I
ChE 3235 Principles of Chemical Engineering II
ChE 3262 Chemical Engineering Thermodynamics II
BE/ChE 4314 Biochemical Engineering Operations
BE/ChE 4315 Introduction to Biochemical Engineering
ChE 4319 Introduction Polymer materials
ChE 4321 Introduction to Ceramic Materials
ChE 4363 Chemical Reaction Engineering and Technology

Biomedical Emphasis

BE 3170 Biomaterials
BE 4001s1 Orthopaedic Biomechanics
BE 4001 s2 Modeling and Experiments in Neuroscience
BE 4070 Bioelectricity
BE 4170 Biomaterials Interfaces for Implantable Devices
BE 4470 Biomolecular Engineering & Nanobiotechnology
BE 4570 Biomedical Imaging
BE 4670 Photonics and Nanotech in Biosensors
BE 4770 Biomedical Optics
BE 4870 Molecular and Cell Mechanics
BE 4080 Engineering Computation
BE 4480 Physics and Chemistry of Materials

Biomechanics emphasis (choose up to 5-6 courses)

All biomedical engineering majors should take one of the following physiology courses:

An Sci 3254 Physiology of Domestic Animals

Bio3700 Animal Physiology

Physiol(MPP) 3202 Elements of Physiology

Course Number	Title	Credits
BE 4001	Orthopaedic Biomechanics	3
BE 3170	Biomaterials (WI)	3
BE 4480	Chemistry/Physics of Materials	3
BE 4870	Molecular and Cell Biomechanics	3
BE 4570	Biomedical Imaging	3
BE 4170	Biomaterials Interface	3
BE 4080	Engineering Computation	3
BE 4580	Mechanical Systems Engineering	3
MAE 2600	Dynamics	3
MAE 3100	Advanced CAD	3
MAE 3200	Engineering Materials	4
MAE 4280	Finite Element Analysis	3
MAE 4680	Introduction to MEMS	3

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Biophotonics Emphasis (choose up to 5-6 engineering courses)

All biomedical engineering majors should take one of the following physiology courses:

An Sci 3254 Physiology of Domestic Animals

Bio3700 Animal Physiology

Physiol(MPP) 3202 Elements of Physiology

Course Number	Title	Credits
BE 4570	Biomedical Imaging	3
BE 4770	Biomedical Optics	3
BE 4080	Engineering Computations	3
BE 4070	Bioelectricity	3
BE 4670	Photonics and Nanotech in Biosensors	3
BE 4470	Biomolecular Engr & Nanobiotechnology	3
ECE-4570(NU ENG 4382)	Lasers and Their Applications	3
ECE 4610	Physical Electronics	3
ECE 4850	Introduction to Digital Image Processing	4
ECE-4830	Introduction to Digital Signal Processing	4

This course can be utilized as a science elective:

Physics 4110	Light and Modern Optics	4
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Biomaterials Emphasis (choose up to 5-6 courses)

All biomedical engineering majors should take one of the following physiology courses:

An Sci 3254 Physiology of Domestic Animals

Bio3700 Animal Physiology

Physiol(MPP) 3202 Elements of Physiology

Course Number	Title	Credits
BE 3170	Biomaterials (WI)	3
BE 4170	Biomaterials Interfaces	3
BE 4570	Biomedical Imaging	3
BE 4480	Chemistry/Physics of Materials	3
BE 4870	Molecular and Cell Biomechanics	3
BE 4080	Engineering Computation	3
BE 4470	Biomolecular Engr & Nanobiotechnology	3
ChemE 4319	Intro. to Polymers	3
ChemE 4320	Plasma Polymerization	3
ChemE 4321	Intro. to Ceramics	3
MAE 3200	Engineering Materials	4

This course can be utilized as a science elective:

Physics 4310	Physics in Cell and Developmental Biology	3
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Bioinstrumentation or Bioelectronics Emphasis (choose up to 5-6 courses)

All biomedical engineering majors should take one of the following physiology courses:

An Sci 3254 Physiology of Domestic Animals

Bio3700 Animal Physiology

Physiol(MPP) 3202 Elements of Physiology

Course Number	Title	Credits
BE 4570	Biomedical Imaging	3
BE 4770	Biomedical Optics	3
BE4080	Engineering Computation	3
BE 4070	Bioelectricity	3
BE 3170	Biomaterials (WI)	3
ECE 2100	Circuit Theory I	3
ECE 3810	Circuit Theory II	3
ECE-4570(NU ENG 4382)	Lasers and Their Applications	3
ECE-4830	Introduction to Digital Signal Processing	4
ECE-4850	Introduction to Digital Image Processing	4
MAE 3800	Instrumentation and Measurements Laboratory	3
MAE 4680	Introduction to MEMS	3

These courses can be utilized as the science electives:

DMU 4200	Principles of Diagnostic Medical Ultrasound	3
NUCMED 4327	Nuclear Medicine Instrumentation	3

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