

Sample Schedule
Area of Concentration: Nanotechnology
Chemistry/Bioengineering Emphasis

First Term			Second Term		
		Units			Units
CHEM 0960	Gen. Chem. For Engr.1	3	CHEM 0970	Gen. Chem. For Engr.2	3
MATH 0220	Anal. Geometry & Calc. 1	4	MATH 0230	Anal. Geometry & Calc. 2	4
PHYS 0174	Phys. For Sci. & Engr. 1	4	PHYS 0175	Phys. For Sci. & Engr. 2	4
ENGR 0011	Intr. Engr. Analysis	3	ENGR 0012	Engr. Computing	3
	H/SS Elective 1	3		H/SS Elective 2	3
ENGR 0081	Freshman Seminar	0	ENGR 0082	Freshman Seminar	0
		17			17
Third Term			Fourth Term		
MATH 0240	Anal. Geom. & Calc. 3	4	MATH 0290	Differential Equations	3
MATH 0280	Matrices and Lin. Algebra	3	CHEM 2	Core chemistry course	3
CHEM 1	Core chemistry course	3	MEMS 0051	Intro. to Thermo.	3
ENG 0135	Statics & Mechanics 1	3	LIFESCI 1	Basic Life Science	3
ENGR 0022	Mat. Structure & Prop.	3	ECE 0031	Lin Cir & Systems 1	4
MEMS 1085	Departmental Seminar	0	MEMS 1085	Departmental Seminar	0
		16			16
Fifth Term			Sixth Term		
ENGR 0240	Int. Nanotech. & Nanoeng.	3	ECE 1201	EI Meas & Circuits Lab	3
LIFESCI 2	Basic Life Science	3		H/SS Elective 3	3
MEMS 1010	Exp. Methods in MSE	3	CHEM 3	Core chemistry course	3
MEMS 1053	Struct. of Crystals & Diff.	3	BIOENG 2	Core BIOENG Course	3
ECE 0257	An & Design El. Circuits	3		Nanotech Elective 1	3
BIOENG 1	Core BIOENG Course	3	MEMS 1085	Departmental Seminar	0
MEMS 1085	Departmental Seminar	0			
		18			15
Seventh Term			Eighth Term		
ENGR 0020	Probability & Statistics	4		Senior Design 2*	3
MEMS 1059	Ph. Eq. Multi-Comp. Syst.	3		Nano Elective 2	3
	Senior Design 1*	3		Nano Elective 3	3
MEMS 1057	Micro/Nano Manufacturing	3		H/SS Elective 5	3
	H/SS Elective 4	3		H/SS Elective 6	3
MEMS 1085	Departmental Seminar	0	MEMS 1085	Departmental Seminar	0
		16			15

* at least one senior design course offered by one of the other SSOE engineering programs is required; the second course may be a senior project arranged with a faculty mentor and taken as ENGSCI 1801. Students wishing to complete a two-term project with a faculty mentor may request approval for the second term to count as a program elective (ENGSCI 1802).

classes in red constitute a minor in Bioengineering if the student also takes BIOENG 1085 Seminar
classes in green constitute a minor in Chemistry if students add two 1-cr Chemistry Lab courses

130 total credits; 49 credits minimum of Engineering, 50 credits minimum of Math/Science

Approved Nanotechnology Electives include:

CHEM 0310	Organic Chemistry 1
CHEM 0320	Organic Chemistry 2
CHEM 1130	Inorganic Chemistry
CHEM 1410	Physical Chemistry 1
CHEM 1420	Physical Chemistry 2
CHEM 1450	Molecular Modeling and Graphics
CHEM 1480	Intermediate Physical Chemistry
CHEM 1620	Atoms, Molecules & Materials
PHYS 0577	Modern Physical Measurements
PHYS 1370	Introduction to Quantum Physics
PHYS 1371	Introduction to Quantum Physics
PHYS 1375/CHEM 1630	Foundations of Nanoscience
BIOENG 1005	RF Medical Devices and Applications ...
BIOENG 1532	Bioseparation
BIOENG 1601	Principles and Properties of Complex Engineered Materials
BIOENG 1810	Biomaterials and Biocompatibility
ECE 1232	Introduction to Lasers and Optical Electronics (3 units)
ECE 1238	Digital Electronics (3 units)
ECE 1247	Semiconductor Device Theory
ECE 2295	Nanosensors
ENGR 1065	Nanomanufacturing and Nanomaterials for Photovoltaics
ENGR 1066	Introduction to Solar Cells and Nanotechnology
IE 1012	Manufacture of Structural Nano-Materials
MEMS 1447	Nanocharacterization
MEMS 1469	Materials Science of Nanostructures
MEMS 1477	Thin Film Processes and Characterization
MEMS 1480	Introduction to Microelectromechanical Systems
MEMS 1101	Ferrous Physical Metallurgy

Other appropriate courses may be approved as Nanotechnology Electives by the Program Director

CHEM 1, 2, and 3 must be selected from the following:

CHEM 0250	Analytic Chemistry
CHEM 0310	Organic Chemistry 1
CHEM 0320	Organic Chemistry 2
CHEM 1130	Inorganic Chemistry
CHEM 1250	Instrument Analysis
CHEM 1410	Physical Chemistry 1
CHEM 1420	Physical Chemistry 2
CHEM 1590	Molecular Biophysics

BIOSCI 1000	Principles of Biochemistry
BIOSCI 1810	Macromolecular Structure

Other appropriate courses may be approved as CHEM 1, 2, and 3 by the Program Director

LIFESCI 1 and 2 must be selected from the following:

BIOENG 1070	Cell Biology I
BIOENG 1071	Cell Biology II
BIOSCI 0150	Foundations of Biology I
BIOSCI 0160	Foundations of Biology II
BIOSCI 1070	Human Physiology - UHC
BIOSCI 1250	Introduction to Human Physiology
HRS 1020	Introduction to Anatomy and Physiology
HRS 1022	Human Anatomy
HRS 1023	Human Physiology
HRS 1024	Introduction to Neurosciences
NROSCI 1000	Intro to Neuroscience
NROSCI 1003	UHC Introduction to Neuroscience

Other appropriate courses may be approved as LIFESCI 1 and 2 by the Program Director

BIOENG 1 and 2 must be selected from the following (prerequisites must be met):

BIOENG 1005	Radiofrequency Medical Devices
BIOENG 1061	Human Factors Engineering
BIOENG 1075	Introductory Cell and Molecular Biology Laboratory Techniques
BIOENG 1095	Special Projects
BIOENG 1150	Bioengineering Methods and Applications
BIOENG 1210	Bioengineering Thermodynamics
BIOENG 1220	Biotransport Phenomena
BIOENG 1241	Societal, Political, Ethical Issues in Biotechnology
BIOENG 1310	Linear Systems and Electronics I
BIOENG 1311	Hemodynamics and Biotransport
BIOENG 1320	Linear Systems and Electronics II
BIOENG 1330	Biomedical Imaging
BIOENG 1383	Biomedical Optical Microscopy
BIOENG 1384	Application of NMR Spectroscopy in Medicine
BIOENG 1531	Fundamentals of Biochemical Engineering
BIOENG 1601	Principles and Properties of Complex Engineered Materials
BIOENG 1620	Introduction to Tissue Engineering
BIOENG 1630	Biomechanics 1

Other appropriate courses may be approved as BIOENG 1 and 2 by the Program Director