Elective Courses: **Choose 2 M Coded courses and 1 C coded course**

Select 2 M Coded Courses:

Codes:

Course #	Dept.	Course Tite	Term	Credits	M	C
EN.520.315	ECE	Intro. To Bio-Inspired Processing of Audio-Visual Signals	F	3	X	
EN.520.621	ECE	Introduction to Nonlinear Systems	F	3	X	
EN.530.343	MechE	Design & Analysis of Dynamical Systems	S	3	X	
EN.530.616	MechE	Introduction to Linear Systems Theory	S	3	X	
EN.530.676	MechE	Locomotion Dynamics & Control (formerly Locomotion Dynamics)	S	3	X	
EN.540.414	ChemBE	Computational Protein Structure Prediction & Design	S	3	X	X
EN.540.421	ChemBE	Project in Design: Pharmacodynamics	S	3	X	
EN.540.433	ChemBE	Pharmacokinetics and Pharmacodynamics	F	3	X	X
EN.540.438	ChemBE	Advanced Topics of Pharmacokinetics and Pharmacodynamics	S	3	X	X
EN.553.391	AMS	Dynamical Systems	F	4	X	
EN.553.426	AMS	Introduction to Stochastic Processes	S	4	X	
EN.580.430	BME	Systems Pharmacology & Personalized Medicine* [If not core course]	S	4	X	
EN.580.435	BME	Applied Bioelectrical Engineering	S	1.5	X	
EN.580.439	BME	Models of the Neuron	F, S	4	X	
EN.580.447	BME	Computational Stem Cell Biology	S	3	X	
EN.580.448	CS	Computational Genomics: Data Analysis	N/A	3	X	
EN.580.460	BME	Epigenetics at the Crossroads of Genes & the Environment	S	1.5	X	
EN.580.462	BME	Representations of Choice	S	3	X	
EN.580.464	BME	Advanced Data Science for Biomedical Engineering* (formerly Intro. to Data Science for BME)	S	4	X	
EN.580.473		Dynamic Modeling of Infectious Diseases in Patients and Populations	F	4	X	
EN.580.480	BME	Precision Care Medicine I*	F	4	X	X
EN.580.481	BME	Precision Care Medicine II*	S	4	X	X
EN.580.488	BME	Foundations of Computational Biology & Bioinformatics* [If not core course]	S	4	X	X
EN.580.561		Advanced Focus Area Research	S	3	X	
EN.580.689	BME	Modern Optical Microscopy: Theory and Practice	N/A	3	X	X
EN.601.350	CS	Genomic Data Science (formerly Introduction to Genomic Research)*	S	3	X	
EN.601.447	CS	Computational Genomics: Sequences*	F	3	X	
EN.601.449		Undergraduate Computational Genomics: Applied Comparative Genomics		3	X	X
EN.601.649		Computational Genomics: Applied Comparative Genomics	F	3	X	

ME.250.771	ME Health Science Informatics	Introduction to Precision Medicine Data Analytics*	F	1.5	X	
Select 1 C Coded Courses:					**Codes:**	
Course #	**Dept.**	**Course Tite**	**Term**	**Credits**	**M**	**C**
EN.520.315	ECE	Introduction to Bio-Inspired Processing of Audio-Visual Signals (formerly Intro. to Information Processing of Sensory Signals)	F	3	X	X
EN.520.353	ECE	Control Systems	S	3		X
EN.520.432	ECE	Medical Imaging Systems	F	3		X
EN.520.433	ECE	Medical Imaging Analysis	S	3		X
EN.520.439	ECE	Machine Learning for Medical Applications	S	3		X
EN.520.621	ECE	Introduction to Nonlinear Systems	N/A	3		X
EN.530.343	MechE	Design & Analysis of Dynamical Systems	S	3	X	X
EN.530.410	ME	Biomechanics of the Cell	S	3		X
EN.530.616	MechE	Introduction to Linear Systems Theory	S	3		X
EN.540.409	ChemBE	Dynamic Modeling & Control	F	4		X
EN.540.414	ChemBE	Computational Protein Structure Prediction & Design	N/A	3		X
EN.540.421	ChemBE	Project in Design: Pharmacodynamics*	S	3		X
EN.540.433	ChemBE	Pharmacokinetics and Pharmacodynamics			X	X
EN.540.438	ChemBE	Advanced Topics of Pharmacokinetics and Pharmacodynamics			X	X
EN.540.638	ChemBE	Advanced Topics in Pharmacokinetics and Pharmacodynamics I	F	3		X
EN.553.361	AMS	Introduction to Optimization	F/S	4		X
EN.553.391	AMS	Dynamical Systems	F	4		X
EN.553.426	AMS	Introduction to Stochastic Processes	S	4		X
EN.553.430	AMS	Mathematical Statistics	S	4		
EN.553.436	AMS	Introduction to Data Science (formerly Data Mining)	F	4		X
EN.553.492	AMS	Mathematical Biology	S	3		X
EN.580.430	BME	Systems Pharmacology & Personalized Medicine* [If not core course]	S	4		X
EN.580.437	BME	Neuro Data Design I	F	4		X
EN.580.438	BME	Neuro Data Design II	S	4		X
EN.580.439	BME	Models of the Neuron	F, S	4		
EN.580.447	BME	Computational Stem Cell Biology*	S	3		X
EN.580.460	BME	Epigenetics at the Crossroads of Genes & the Environment*	S	1.5		X
EN.580.462	BME	Representations of Choice*	S	3		X
EN.580.464	BME	Advanced Data Science for Biomedical Engineering* (formerly Intro. to Data Science for BME)	S	4		X
EN.580.473		Dynamic Modeling of Infectious Diseases in Patients and Populations	F	4	X	X
EN.580.480	BME	Precision Care Medicine I*	F	4		X
EN.580.481	BME	Precision Care Medicine II*	S	4		X
EN.580.488	BME	Foundations of Computational Biology & Bioinformatics* [If not core course]	S	3		X
EN.580.491	BME	Learning, Estimation, and Control (formerly Learning Theory)	S	3		X

EN.580.689	BME	Computational Personal Genomics	N/A	3		X
EN.601.350	CS	Genomic Data Science (formerly Introduction to Genomic Research)*	S	3		X
EN.601.447	CS	Computational Genomics: Sequences*	F	3		X
EN.601.449	CS	Undergraduate Computational Genomics: Applied Comparative Genomics		3	X	X
EN.601.455	CS	Computer Integrated Surgery 1	F	4		X
EN.601.456	CS	Computer Integrated Surgery 2	S	3		X
EN.601.461	CS	Computer Vision	F	3		X
EN.601.475	CS	Machine Learning	S	3		X
EN.601.476	CS	Machine Learning: Data to Models	N/A	3		X
EN.601.482	CS	Machine Learning: Deep Learning	S	3		X
EN.601.496	CS	Computer Integrated Surgery 2 - Teams	S	3		
EN.601.649	CS	Computational Genomics: Applied Comparative Genomics	F	3	X	X
EN.601.723	CS	Advanced Topics in Data-Intensive Computing	F	3		X
AS.050.375	CS	Probabilistic Models of the Visual Cortex	F	3		X
AS.250.302	Biophysics	Modeling the Living Cell	S	4		X
PH.340.677	Epidemiology (BSPH)	Infectious Disease Dynamics: Theoretical and Computational Approaches	S	1.5		X
		Other Electives (M/C)*				
Course #	**Department**	**Course Title**	**Sem**	**Cr**		
EN.520.315	ECE	Introduction to Bio-Inspired Processing of Audio-Visual Signals (formerly Intro. to Information Processing of Sensory Signals)	F	3		
EN.520.621	ECE	Introduction to Nonlinear Systems	N/A	3		
EN.530.343	MechE	Design & Analysis of Dynamical Systems	S	3		
EN.530.616 (formerly EN.520.601)	MechE	Introduction to Linear Systems Theory	S	3		
EN.553.391	AMS	Dynamical Systems	F	4		
EN.553.420	AMS	Introduction to Probability [if not prereq.]	S	4		
EN.553.426	AMS	Introduction to Stochastic Processes	S	4		
EN.553.430	AMS	Introduction to Statistics [if not prereq.]	F	4		
EN.580.439	BME	Models of the Neuron	F, S	4		
EN.530.410	ME	Biomechanics of the Cell	S	3		

		Core Classes		
Course #	**Dept.**	**Course Tite**	**Term**	**Credits**
Required:				
EN.580.431		Introduction to Computational Medicine: Imaging	1st half of Fall	2
EN.580.433		Introduction to Computational Medicine: The Physiome	2nd half of Fall	2
		Choose ONE of the following courses:		
AS.110.445		Mathematical and Computational Foundations of	Spring	4
EN.553.450		Computational Molecular Medicine	Spring	4
EN.580.430		Systems Pharmacology & Personalized Medicine	Spring	4
EN.580.447		Computational Stem Cell Biology	Spring	3
EN.580.458		Computing the Transcriptome	Spring	3
EN.580.488		Foundations of Computational Biology and Bioinformatics	Spring	4
PH.140.628 1		Data Science for Public Health I & II	Spring	4
PH.140.629 2				

Minor Required Courses		
Required Math Courses:		
1. AS.110.108	Calculus I (Physical Sciences & Engineering)	
2. AS.110.109	Calculus II (For Physical Sciences and Engineering)	
3. One additional course from Math (AS.110) or Applied Math & Statistics (EN.553) department		
4. Probability and Statistics:		
Complete ONE Option 1 course or both Option 2 courses 553.420 and 553.430		
Option 1	EN.540.382	Intermediate Probability and Statistics
Option 1	EN.553.311	Intermediate Probability and Statistics
OR Option 2:		
BOTH EN.553.420	Probability	
AND EN.553.430	and Mathematical Statistics	
One Computer Programming course from the following:		
EN.500.112	Gateway Computing: JAVA	
or EN.500.113	Gateway Computing: Python	
or EN.500.114	Gateway Computing: Matlab	
EN.553.385	Introduction to Computational Mathematics	
EN.601.220	Intermediate Programming	
EN.601.226	Data Structures	
One Biological Science Course from the following:		
AS.020.303	Genetics	
AS.020.305	Biochemistry	
AS.080.305	Neuroscience: Cellular and Systems I	
AS.250.253	Protein Engineering and Biochemistry Lab	
AS.250.315	Biochemistry I	
AS.171.310	Biological Physics	
AS.250.253	Protein Engineering and Biochemistry Lab	
EN.580.221	Biochemistry and Molecular Engineering	