Bioinformatics and Systems Biology Graduate Program

2017-18 Projected Course Offerings

Please note: Departments may change or cancel the quarter(s) in which their courses are offered.
Refer to the schedule of classes for an active listing. The next quarter's schedule is posted Friday of 5th week.

	Summer	Fall	Winter	Spring
BIOINFORMATICS AND SYSTEMS BIOLOGY CORE COURSES AND SEMINARS				
Core Classes for BISB Track				
Bioinformatics II: Introduction for Bioinformatics Algorithms (BENG 202/CSE 282)			X	
Bioinformatics III: Genomic Analysis (BENG 203/CSE 283)				X
Bioinformatics IV: Statistical Methods in Bioinformatics (MATH 283)		X		
For the fourth core class, choose one of				
CSE 280A: Algorithms in Computational Biology			X	
ECE 208. Algorithms for Biological Data Analysis (previously had temporary course number ECE 286)				X
BNFO 286/MED 283. Network Biology and Biomedicine				X
Seminars for BISB Track				
BNFO 281: Bioinformatics and Systems Biology Seminar		X	X	X
BNFO 283: Bioinformatics Student Research Talks		X	X	X

BIOMEDICAL INFORMATICS CORE COURSES AND SEMINARS				
Core Classes for BMI Track				
Bioinformatics II: Introduction for Bioinformatics Algorithms (BENG 202/CSE 282)			X	
MED 264: Principles of Biomedical Informatics (BMI students take this instead of BENG 203/CSE 283)		X		
Bioinformatics IV: Statistical Methods in Bioinformatics (MATH 283)		X		
For the fourth core class, choose one of				
CSE 280A: Algorithms in Computational Biology			X	
ECE 208. Algorithms for Biological Data Analysis (previously had temporary course number ECE 286)				X
BNFO 286/MED 283. Network Biology and Biomedicine				X
Bioinformatics III: Genomic Analysis (BENG 203/CSE 283)				X
Seminars for BMI Track				
MED 262: Current Trends in Biomedical Informatics (BMI students take this instead of BNFO 281)		X	X	X
BNFO 283: Bioinformatics Student Research Talks		X	X	X

OTHER REQUIREMENTS (BOTH TRACKS)				
Choose one: SOMI 226 or BIOM 219. Scientific Ethics (must register on both Tritonlink and ethics.ucsd.edu)		X	X	X
BNFO 298: Research Rotation	*	X	X	X
BNFO 299: Graduate Research	*	X	X	X
BNFO 500: Teaching Assistantship	*	X	X	X
* For summers, contact the Graduate Coordinator to get credit for rotations/research/TAs				

BIOLOGY ELECTIVES				
Elective BIO-1: Biochemistry				
BENG 230A: Biochemistry		X		
CHEM 209: Macromolecular Recognition		X		
CHEM 213A: Structure of Biomolecules and Biomolecular Assemblies (offered odd years in winter)			WI19	
CHEM 213B: Biophysical Chemistry of Macromolecules (offered even years in spring)				X
CHEM 216: Chemistry of Enzyme Catalized Reactions			X	
Elective BIO-2: Molecular Genetics				
BICD 100: Genetics	SU1	X	X	X
BGGN 220DEF are three consecutive 3.3 week classes, usually taken together, but may be taken individually				
BGGN 220D. Chromatin Structure and Transcriptional Regulation (2 units)		X		
BGGN 220E. Post-Transcriptional Gene Regulation (2 units)		X		
BGGN 220F. Shaping Cellular Function through Post-Translational Regulation (2 units)		X		
BGGN 223: Graduate Genetics (6 units)				X
Elective BIO-3: Cell Biology				
BICD 110: Cell Biology	SU2	X	X	X
BICD 130: Embryos, Genes, and Development				
BGGN 222: Graduate Cell Biology (6 units)			X	
BGGN 230/CHEM 221: Signal Transduction (possibly discontinued)				

	Summer	Fall	Winter	Spring
COMPUTER SCIENCE/MATH/STATISTICS ELECTIVES				
Elective CS-1: Algorithms				
CSE 101: Design and Analysis of Algorithms	SU1,2	X	X	X
CSE 200: Computability and Complexity			X	
CSE 202: Algorithm Design and Analysis		X	X	
CSE 280A: Algorithms in Computational Biology [Also a core option; may not be used as both core and elective]			X	
Bioinformatics III: Genomic Analysis (BENG 203/CSE 283) [Core for BISB, Elective CS-1 for BMI]				X
MATH 261A: Probabilistic Combinatorics and Algorithms (offered odd years in fall)		X		
Elective CS-2: Machine Learning and Data Mining				
CSE 250A: Artificial Intelligence: Search and Reasoning		X		
CSE 250B: Artificial Intelligence: Learning			X	
CSE 255: Data Mining and Predictive Analytics				X
Elective CS-3: Mathematics and Statistics				
MATH 274: Numerical Methods for Physical Modeling		X		
MATH 280A: Probability Theory		X		
MATH 281A: Mathematical Statistics		X		
MATH 281B: Mathematical Statistics			X	
PHYS 210A: Equilibrium Statistical Mechanics (5 units)				X
PHYS 210B: Equilibrium Statistical Mechanics		X		

SYSTEMS BIOLOGY ELECTIVES				
Elective SB-1: Biological Systems				
BENG 211: Systems Biology and Bioengineering I: Biological Components		FA18		
BENG 212: Systems Biology and Bioengineering II: Network Reconstruction			X	
BENG 227: Biomedical Transport Phenomena				X
Elective SB-2: Kinetic Modeling				
BENG 125: Modeling and Computation in Bioengineering				X
BNFO 284: Nonlinear Dynamics in Quantitative Biology				
PHYS 276: Quantitative Molecular Biology			X	
CHEM 220: Regulatory Circuits in Cells				

BIOMEDICAL INFORMATICS ELECTIVES				
Elective BMI-1: Biomedical Informatics				
Note that the patterns of typical quarters and alternating years are likely to change. Don't rely on them.				
MED 263: Bioinformatics Applications to Human Disease (4 units)			X	
MED 264: Principles of Biomedical Informatics (4 units) [Core for BMI, elective for BISB]		X		
MED 265: Informatics in Clinical Environments (4 units)			WI19	
MED 267: Modeling Clinical Data and Knowledge for Computation (offered even years in fall) (4 units)				X
MED 268: Statistics Concepts for Biomedical Research (4 units)		X		
MED 269: Clinical Decision Support Systems at the Point of Care (4 units)				X
MED 273: Communicating Biomedical Informatics (offered even years in winter) (4 units)			X	
MED 276: Grant Proposal Writing Practicum (offered odd years in spring) (2 units)				SP19
MED 277: Introduction to Biomedical Natural Language Processing (4 units)		X		?

QUANTITATIVE BIOLOGY ELECTIVES				
Elective QBIO-1: Quantitative Biology				
BENG 226. Foundations of Biomechanics			X	
BENG 235. Molecular Imaging and Quantitation in Living Cells				X
BGGN 214. Introduction to Q-Biology [May be applied to BIO area elective requirement]		X		
MAE 263. Experimental Methods in Cell Mechanics				
PHYS 273. Information Theory and Pattern Formation in Biological Systems		X		
PHYS 274. Stochastic Processes in Population Genetics				
PHYS 275. Fundamentals of Biological Physics		X		
PHYS 277. Physics of the Cell				X