Bioinformatics and Systems Biology Graduate Program
2019-20 Projected Course Offerings - Updated October 1, 2019

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.

Projected schedules for some departments and classes are not yet available, and are highlighted in pink.
Wait for the schedule of classes for these, or ask the department or instructor.

	Summer	Fall	Winter	Spring
BIOINFORMATICS AND SYSTEMS BIOLOGY CORE COURSES AND SEMINARS				
Core Classes for BISB Track				
Bioinformatics II: Sequence and Structure Analysis - Methods and Applications (BENG 202/CSE 282)			X	
Bioinformatics III: Functional Genomics (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	
CSE 284: Personal Genomics for Bioinformaticians				X
ECE 208: Algorithms for Biological Data Analysis				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: Sequence and Structure Analysis - Methods and Applications (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	
CSE 284: Personal Genomics for Bioinformaticians				X
ECE 208: Algorithms for Biological Data Analysis				X
BNFO 286/MED 283: Network Biology and Biomedicine				X
Bioinformatics III: Functional Genomics (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)				
BNFO 294: Scientific Ethics (must register on both Tritonlink and ethics.ucsd.edu)	*	X	X	X
Ethics Refresher course every 4 years thereafter - details TBA (register on 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 record ethics/rotations/research/TAs, in lieu of course credit				

SEE NEXT PAGE FOR ELECTIVES

	Summer	Fall	Winter	Spring
BIOLOGY ELECTIVES				
Elective BIO-1: Biochemistry				
BENG 230A: Biochemistry		X		
CHEM 209: Macromolecular Recognition		X		
CHEM 213A: Structure of Biomolecules and Biomolecular Assemblies			X	
CHEM 213B: Biophysical Chemistry of Macromolecules				X
CHEM 216: Chemistry of Enzyme Catalized Reactions			X	
Elective BIO-2: Molecular Genetics				
BICD 100: Genetics	SU1,2	X	X	X
BGGN 206A: Concepts of Reasoning and Experimentation (CORE) I		X		
BGGN 220: Graduate Molecular Biology [possible replacement for BGGN 220DEF in a future year]				
BGGN 223: Graduate Genetics (6 units)				X
Elective BIO-3: Cell Biology				
BICD 110: Cell Biology	SU1,2	X	X	X
BICD 130: Embryos, Genes, and Development [still on the books, possibly discontinued]				
BGGN 222: Graduate Cell Biology (6 units) [still on the books, possibly discontinued]				
BGGN 230/CHEM 221: Signal Transduction [still on the books, possibly discontinued]				
COMPUTER SCIENCE/MATH/STATISTICS ELECTIVES				
Elective CS-1: Algorithms				
CSE 101: Design and Analysis of Algorithms	SU2	X	X	X
CSE 200: Computability and Complexity			X	
CSE 202: Algorithm Design and Analysis		X	X	X
CSE 280A: Algorithms in Computational Biology [Also a core option; may not be used as both core and elective]			X	
Bioinformatics III: Functional Genomics (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: Principles of Artificial Intelligence: Probabilistic Reasoning and Learning		X		
CSE 250B: Principles of Artificial Intelligence: Learning Algorithms			X	X
CSE 253: Neural Networks for Pattern Recognition			X	
CSE 255: Data Mining and Predictive Analytics				X
CSE 258: Recommender Systems and Web Mining		X		
ECE 208: Algorithms for Biological Data Analysis [Also a core option; may not be used as both core and elective]				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	
MATH 284: Survival Analysis				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				
BENG 212: Systems Biology and Bioengineering II: Network Reconstruction			X	
BENG 227: Biomedical Transport Phenomena				X
BNFO 286/MED 283: Network Biology and Biomedicine [Also a core option; may not be used as both core and elective]				X
Elective SB-2: Kinetic Modeling				
BENG 125: Modeling and Computation in Bioengineering				X
BNFO 284: Nonlinear Dynamics in Quantitative Biology [Not offered this year. Instructor is planning to replace it with a new course in the future, date not yet known.]				
PHYS 276: Quantitative Molecular Biology			X	
CHEM 220: Regulatory Circuits in Cells				

	Summer	Fall	Winter	Spring
BIOMEDICAL INFORMATICS ELECTIVES				
Elective BMI-1: Biomedical Informatics				
Note that the patterns of typical quarters and alternating years are subject 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 267: Modeling Clinical Data and Knowledge for Computation (4 units) [Alternate years]			X	
MED 268: Statistics Concepts for Biomedical Research (4 units)		X		
MED 277: Introduction to Biomedical Natural Language Processing (4 units)		X		
Some BMI classes may be merged. Course numbers, titles, units, descriptions, scheduling, frequency, and other info may change. The following is tentative; details are not yet confirmed.				
MED 265 and 269 may be merged and only offered in alternate years				
MED 265: Informatics in Clinical Environments (4 units) [Alternate years]			X	
MED 269: Clinical Decision Support Systems at the Point of Care (4 units) [Alternate years]				X
MED 273 and 276 may be merged				
MED 273: Communicating Biomedical Informatics (4 units) [Alternate years]				X
MED 276: Grant Proposal Writing Practicum (2 units) [Alternate years]				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				X
PHYS 275: Fundamentals of Biological Physics		X		
PHYS 277: Physics of the Cell				X