COMPUTATIONAL BIOLOGY B.S.

FIRST YEAR

Fall			Spring		
Number	Course	CR	Number	Course	CR
MATH 1010	Calculus I	4	MATH 1020	Calculus II	4
CHEM 1110	Chemistry I with Advanced Lab[1]	4	CHEM 1200	Chemistry II	4
BIOL 1010	Introduction to Biology	4	BIOL 2120	Introduction to Cell & Molecular Biology	4
BIOL 1015	Introduction to Biology Laboratory	4	CSCI 1100	Computer Science I[3]	4
	HASS Core Elective[2]	4			

SECOND YEAR

Fall			Spring		
Number	Course	CR	Number	Course	CR
CHEM 2250	Organic Chemistry I	3	CHEM 2260	Organic Chemistry II	3
CHEM 2230	Organic Chemistry Lab I	1	CHEM 2240	Organic Chemistry Lab II	1
PHYS 1100	Physics I	4	PHYS 1200	Physics II	4
BIOL 2500	Genetics and Evolution	4	BIOL 4620	Molecular Biology	4
	HASS Core Elective[2]	4		HASS Core Elective[2]	4

THIRD YEAR (WITH 3RD YEAR FALL SEMESTER AWAY)

The Arch Summer Semester			Spring		
Number	Course	CR	Number	Course	CR
BCBP 4760	Molecular Biochemistry I	4		Concentration Elective[5]	4
BIOL 4200	Biostatistics	4		Concentration Elective[5]	4
	Elective	4		Elective	4
	HASS Core Elective[2]	4		Elective	4

FOURTH YEAR (WITH 3RD YEAR FALL SEMESTER AWAY)

Fall			Spring		
Number	Course	CR	Number	Course	CR
	Advanced Laboratory[4]	6		Senior Research Thesis [6]	4
	Concentration Elective[5]	4		Concentration Elective[5]	4
	HASS Core Elective[2]	4		Concentration Elective[5]	4
	Elective	2		Elective	4

THIRD YEAR (WITH 3RD YEAR SPRING SEMESTER AWAY)

The Arch Summer Semester			Fall		
Number	Course	CR	Number	Course	CR
BCBP 4760	Molecular Biochemistry I	4		Advanced Laboratory[4]	6
BIOL 4200	Biostatistics	4		Concentration Elective[5]	4
	Elective	4		Concentration Elective[5]	4
	HASS Core Elective[2]	4		Elective	2

FOURTH YEAR (WITH 3RD YEAR SPRING SEMESTER AWAY)

Fall			Spring		
Number	Course	CR	Number	Course	CR
	Concentration Elective[5]	4		Senior Research Thesis [6]	4
	Concentration Elective[5]	4		Concentration Elective[5]	4
	HASS Core Elective[2]	4		Elective	2
	Elective	4		Elective	2

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This curriculum requires a minimum of 128 credit hours.

FOOTNOTES

1. *Students may substitute CHEM 1100 for CHEM 1110.*
2. *Humanities, Arts & Social Science (HASS) courses should add up to 24 credits.*
3. *May be taken in another semester depending on individual student schedule*
4. *Advanced Lab option: BIOL 4720 Molecular Biology Laboratory or BIOL 4320: Microbiology Laboratory. The Advanced Lab Option fulfills the Communication Intensive and Culminating Experience requirements.*
5. *Concentration courses. Students must choose a concentration, among 1. Biomolecular Systems 2. Ecological Systems and must complete 20 credits of course work within the concentration, including required and elective courses (see below).*
6. *Senior Research Thesis (BCBP 4990 or BIOL 4990) is recommended; however, students may substitute any additional 4000-level elective course from either concentration (see below).*

CONCENTRATION 1: BIOMOLECULAR SYSTEMS (20 CREDITS TOTAL)

REQUIRED COURSES

BCBP 4550	Molecular Modeling	BIOL 4630	Molecular Biology II

BIOMOLECULAR ELECTIVES (CHOOSE AT LEAST ONE)

BCBP 4660	The Biology of Systems	CHEM 6250	Glycochemistry, Glycobiology, and Glychotechnology
BIOL/BCBP 4770	Molecular Biochemistry II	CHEM 6510	Computational Chemistry
BCBP 4800	Methods in Biophysics	BMED 2100	Biomaterials Science and Engineering
BCBP 4870	Protein Structure Determination	BMED 4200	Modeling of Biomedical Systems
CHEM 4300	Medicinal Chemistry	BMED 4450	Drug and Gene Delivery
CHEM 4310	Bioorganic Mechanisms	BMED 4500	Advanced Systems Physiology

COMPUTATIONAL ELECTIVES (CHOOSE AT LEAST ONE)

BIOL 4220	Machine Learning for Env. Biology	CSCI 4350	Data Science
BIOL 4550	Sequence Analysis	CSCI 4370	Data and Society
CSCI 1200	Data Structures	CSCI 4390	Data Mining
CSCI 2300	Introduction to Algorithms	CSCI 4800	Numerical Computing
CSCI 4100	Machine Learning from Data	MATH 4720	Mathematics in Medicine and Biology
CSCI 4150	Introduction to Artificial Intelligence		

CONCENTRATION 2: ECOLOGICAL SYSTEMS (20 CREDITS TOTAL)

REQUIRED COURSES

BCBP 4220	Machine Learning for Env. Biology	BIOL 4850	Principles of Ecology
BIOL 4880	The Global Environment		

ECOLOGICAL ELECTIVES (CHOOSE AT LEAST ONE)

BIOL 4870	Lake George Liminology and Underwater Ecology (BLUE)	ENVE 4710	Groundwater Hydrology
BIOL 4961	Human Population	ERTH 4190	Environmental Measurements
CHEM 4810	Chemistry of the Environment	ERTH 4500	Earth's Climate: Past, Present, Future
ECON 4260	Env. and Resource Economics	IENV 4700	One Mile of the Hudson River

COMPUTATIONAL ELECTIVES (CHOOSE AT LEAST ONE)

BIOL 4550	Sequence Analysis	CSCI 4370	Data and Society
CSCI 1200	Data Structures	CSCI 4390	Data Mining
CSCI 2300	Introduction to Algorithms	CSCI 4800	Numerical Computing
CSCI 4100	Machine Learning from Data	MATH 4720	Mathematics in Medicine and Biology
CSCI 4150	Intro to Artificial Intelligence	ERTH 4750	Geographic Info. Sys. in Sciences
CSCI 4350	Data Science	MATP 4600	Probability Theory and Applications