

BIOINFORMATICS, BS

Program Director: Kaitlyn Dykstra, Ph.D.

The program in Bioinformatics provides students with the interdisciplinary scientific and mathematical background needed for graduate study in this growing field at the interface of biology, mathematics, and computer science. The core requirements furnish background in each of these areas while later flexibility in the program will allow the student to emphasize one or the other of these subject areas. The major is appropriate to students interested in a research career in bioinformatics, as well as students preparing for careers in medicine and pharmacology, since these fields are increasingly informed by bioinformatics.

Code	Title	Credits
Biology		22
BIO-105	BIOLOGICAL SCIENCE I	
BIO-106	BIOLOGICAL SCIENCE II	
BIO-291	GENETICS	
BIO-494	GENOMICS	
Take 1 of the following:		
BIO-292 & BIOL-293	CELL BIOLOGY and GENETICS/CELL BIO LABORATORY	
BIO-466	MOLECULAR BIOLOGY	
Chemistry		12
CHEM-101 & CHML-101	GENERAL CHEMISTRY I and GEN CHEM I LAB	
CHEM-102 & CHML-102	GENERAL CHEMISTRY II and GEN CHEM II LAB	
CHEM-301 & CHML-301	ORGANIC CHEMISTRY I and ORGANIC CHEM I LAB	
Computer Science		11
CS-101	Beauty & Joy of Computer Science	
CS-131 & CSL-131	OBJECT ORIENTED PROGRAMMING and OBJECT ORIENTED PROGRAMMING LAB	
CS-132 & CSL-132	ALGORITHMS & DATA STRUCTURES and ALGORITHMS & DATA STRUCTURES LAB	
Physics		8
PHYS-103 & PHYL-103	GENERAL PHYSICS I and GENERAL PHYSICS I LAB	
PHYS-104 & PHYL-104	GENERAL PHYSICS II and GENERAL PHYSICS LAB II	
Mathematics		20
MATH-151	CALCULUS I	
MATH-152	CALCULUS II	
MATH-207	DISCRETE MATHEMATICS I	
MATH-208	DISCRETE MATHEMATICS II	
MATH-322	MATHEMATICAL PROBABILITY	
MATH-323	MATHEMATICAL STATISTICS	
BIF Electives ¹		9-11
BIF-401	BIOINFORMATICS SEMINAR	1
Foreign Language ²		3

General Education Requirements (<https://catalog.sbu.edu/undergraduate/degree-requirements/>) 37

Total Credits 123-125

¹ Nine to eleven hours selected from: BIO-321, BIO-371, BIO-390, CS-133, CS-243, CS-244, CS-257, CS-258, CHEM-302/CHML-302, CHEM-401/CHML-401, CHEM-470, MATH-241.

² The foreign language must be at the level of 202 or higher. Students not prepared to begin at this level will need to take additional courses in language.

Outlined below are two suggested yearly plans of study: one for students who want a Bioinformatics degree with an emphasis in biology, and one for those seeking a degree with an emphasis in math and computer science.

Suggested Plan of Studies for Bioinformatics Majors with a Biology Emphasis

First Year			
Fall	Credits	Spring	Credits
BIO-105		4 BIO-106	4
ENG-101		3 CHEM-102 & CHML-102	4
CHEM-101 & CHML-101		4 MATH-207	3
CS-101		3 Foreign Language 202	3
BONA-101		3	
			17
			14

Second Year			
Fall	Credits	Spring	Credits
BIO-291		3 MATH-151	4
CHEM-301 & CHML-301		4 BIO-292 & BIOL-293	4
MATH-208		3 PHIL-104	3
ENG-102		3 BIO-494	3
General Education Requirement		3	
			16
			14

Third Year			
Fall	Credits	Spring	Credits
BIO-371		4 MATH-322	3
MATH-152		4 CS-131	4
PHYS-103 & PHYL-103		4 PHYS-104 & PHYL-104	4
General Education Requirement		3 General Education Requirements	6
			15
			17

Fourth Year			
Fall	Credits	Spring	Credits
MATH-323		3 BIF-401	1
CS-132		4 Bioinformatics Elective	3
Bioinformatics Elective		3 General Education Requirement	6
General Elective ¹		3 General Elective ¹	4
			13
			14

Total Credits 120

¹ When a General Education requirement also fulfills a major requirement, General Elective credits are needed to reach the required 120 credits.

Suggested Plan of Studies for Bioinformatics Majors with a Math/ Computer Science Emphasis

First Year			
Fall	Credits	Spring	Credits
MATH-151		4 MATH-207	3
ENG-101		3 CHEM-102 & CHML-102	4
CHEM-101 & CHML-101		4 MATH-152	4
CS-101		3 Foreign Language 202	3
BONA-101		3	
	17		14
Second Year			
Fall	Credits	Spring	Credits
BIO-105		4 BIO-106	4
CHEM-301 & CHML-301		4 MATH-322	3
MATH-208		3 PHIL-104	3
ENG-102		3 CS-131	4
General Education Requirement		3	
	17		14
Third Year			
Fall	Credits	Spring	Credits
MATH-323		3 BIO-494	3
CS-132		4 General Education Requirement	6
BIO-291		3 BIO-292 & BIOL-293	4
General Education Requirements		6	
	16		13
Fourth Year			
Fall	Credits	Spring	Credits
BIO-371		4 BIF-401	1
General Education Requirements		3 Bioinformatics Elective	3
PHYS-103 & PHYL-103		4 General Electives ¹	7
Bioinformatics Elective		3 PHYS-104 & PHYL-104	4
	14		15
Total Credits 120			

¹ When a General Education requirement also fulfills a major requirement, General Elective credits are needed to reach the required 120 credits.