

BIOINFORMATICS (B.S.)

Code	Title	Hours
BIOL 1010	Opportunities in Biological Sciences	1
BIOL 1150	Cells and the Evolution of Life	3
BIOL 1150L	Cells and the Evolution of Life Laboratory	1
BIOL 3100	Genetics	3
BIOL 3120	Molecular and Cellular Biology	3
BIOL 3800	Biochemistry I	4
BIOL 4000	Seminar	1
BIOL 4440	Genomics	3
BIOL 4210	Advanced Evolution	3
Select one of the following:		3
BIOL 4820	Protein Structure and Function	
BIOL 4870	Cellular and Molecular Basis of Disease	
BIOL 4460	Phylogenetics	
CHEM 1111	General Chemistry I	3
CHEM 1111L	General Chemistry I Laboratory	1
CHEM 1120	General Chemistry II	4
CHEM 1120L	General Chemistry II Laboratory	1
CHEM 2770	Organic Chemistry I	3
MATH 1170	Calculus I	4
MATH 1750	Calculus II	4
MATH 1760	Discrete Mathematics	3
STAT 3010	Probability and Statistics	3
CS 1120	Computer Science I	4
CS 1121	Computer Science II	3
CS 2120	Practical Python	3
CS 4615	Computational Biology: Sequence Analysis	3
Select one of the following:		3
CS 3195	Analysis of Algorithms	
CS 3600	Database Systems	
Capstone Experience		
Select one of the following:		2
BIOL 4070 & BIOL 4080	Practicum in Biology Laboratory Teaching and Human Anatomy and Physiology Laboratory Pedagogy	
BIOL 4010	Undergraduate Research	
BIOL 4110	Senior Capstone	
Written Communication		
Select one of the following:		3
ENGL 2020	Technical Writing I	
ENGL 2070	Persuasive Writing	
ENGL 2080	Personal and Exploratory Writing	
ENGL 3170	Technical Writing II	
ENGL 3180	Science Writing	
ENGL 3200	Grant Proposal Writing	
Select at least 12 credits from the following, taken from either category:		12
Biology Electives		
BIOL 4190	Microbial Physiology	
BIOL 4320	Immunology	

BIOL 4330	Pathogenic Microbiology
BIOL 4460	Phylogenetics
BIOL 4470	Virology
BIOL 4500	Microbiomes
BIOL 4540	Biochemistry II
BIOL 4610	Neurobiology
BIOL 4740	Developmental Biology
BIOL 4820	Protein Structure and Function
BIOL 4830	Mammalogy
BIOL 4850	Prokaryotic Molecular Biology
BIOL 4870	Cellular and Molecular Basis of Disease
BIOL 4890	Herpetology
MATH 4370	Mathematical Biology
PHIL 4500	Ethics in Science

Computational Electives

BIOL 4040	Special Topics
CS 4731	Evolutionary Computation
CS 4712	Machine Learning
CS 4771	Python for Machine Learning
CS 4621	Data Science
MATH 3100	Ordinary Differential Equations
MATH 3300	Linear Algebra
STAT 4180	Multivariate Analysis
STAT 4310	Statistical Analysis

Total Hours **84**

Courses to total 120 credits for this degree

4-Year Plan for students beginning in ENGL 1102 and MATH 1170

Fall Term 1		Hours
BIOL 1010	Opportunities in Biological Sciences	1
CHEM 1111	General Chemistry I	3
CHEM 1111L	General Chemistry I Laboratory	1
MATH 1170	Calculus I	4
ENGL 1102	Writing and Rhetoric II	3
COMM 1101	Fundamentals of Oral Communication	3
Hours		15
Spring Term 1		
BIOL 1150	Cells and the Evolution of Life	3
BIOL 1150L	Cells and the Evolution of Life Laboratory	1
CHEM 1120	General Chemistry II	4
CHEM 1120L	General Chemistry II Laboratory	1
MATH 1750	Calculus II	4
CS 1120	Computer Science I	4
Hours		17
Fall Term 2		
CHEM 2770	Organic Chemistry I	3
CS 1121	Computer Science II	3
BIOL 3100	Genetics	3
MATH 1760	Discrete Mathematics	3
Humanistic & Artistic Ways of Knowing Course		3
Hours		15
Spring Term 2		
CS 2120	Practical Python	3
BIOL 3120	Molecular and Cellular Biology	3

BIOL 4440	Genomics	3
Social & Behavioral Ways of Knowing Course		3
American Experience Course		3
Hours		15
Fall Term 3		
BIOL 3800	Biochemistry I	4
STAT 3010	Probability and Statistics	3
CS 3195 or CS 3600	Analysis of Algorithms or Database Systems	3
Written Communication Course		3
Social & Behavioral Ways of Knowing Course		3
Hours		16
Spring Term 3		
BIOL 4460 or BIOL 4820 or BIOL 4870	Phylogenetics or Protein Structure and Function or Cellular and Molecular Basis of Disease	3
CS 4615	Computational Biology: Sequence Analysis	3
BIOL 4210	Advanced Evolution	3
Humanistic & Artistic Ways of Knowing Course		3
International Course		3
Hours		15
Fall Term 4		
Biology or Computational Course		3
Biology or Computational Course		3
Elective		3
Elective		3
Elective		3
Hours		15
Spring Term 4		
BIOL 4000	Seminar	1
BIOL 4010 or BIOL 4070 or BIOL 4080 or BIOL 4110	Undergraduate Research or Practicum in Biology Laboratory Teaching or Human Anatomy and Physiology Laboratory Pedagogy or Senior Capstone	2
Biology or Computational Course		3
Biology or Computational Course		3
Elective		3
Hours		12
Total Hours		120

The degree map is a guide for the timely completion of your curricular requirements. Your academic advisor or department may be contacted for assistance in interpreting this map. This map is not reflective of your academic history or transcript and it is not official notification of completion of degree or certificate requirements. Please contact the Registrar's Office regarding your official degree/certificate completion status.

4-Year Plan for students beginning in ENGL 1101 and MATH 1143

Fall Term 1		Hours
COMM 1101	Fundamentals of Oral Communication	3
ENGL 1101	Writing and Rhetoric I	3
MATH 1143	Precalculus I: Algebra	3
MATH 1144	Precalculus II: Trigonometry	1
BIOL 1010	Opportunities in Biological Sciences	1
Humanistic & Artistic Ways of Knowing Course		3
Hours		14
Spring Term 1		
ENGL 1102	Writing and Rhetoric II	3
CHEM 1111	General Chemistry I	3

CHEM 1111L	General Chemistry I Laboratory	1
MATH 1170	Calculus I	4
CS 1120	Computer Science I	4
Hours		15
Fall Term 2		
BIOL 1150	Cells and the Evolution of Life	3
BIOL 1150L	Cells and the Evolution of Life Laboratory	1
CHEM 1120	General Chemistry II	4
CHEM 1120L	General Chemistry II Laboratory	1
MATH 1750	Calculus II	4
Social & Behavioral Ways of Knowing Course		3
Hours		16
Spring Term 2		
CS 1121	Computer Science II	3
CHEM 2770	Organic Chemistry I	3
MATH 1760	Discrete Mathematics	3
Social & Behavioral Ways of Knowing Course		3
Humanistic & Artistic Ways of Knowing Course		3
Hours		15
Fall Term 3		
BIOL 3100	Genetics	3
STAT 3010	Probability and Statistics	3
BIOL 3800	Biochemistry I	4
American Experience Course		3
Written Communications Course		3
Hours		16
Spring Term 3		
CS 2120	Practical Python	3
BIOL 3120	Molecular and Cellular Biology	3
BIOL 4440	Genomics	3
Biology or Computational Elective		3
Elective		2
Hours		14
Fall Term 4		
CS 3195 or CS 3600	Analysis of Algorithms or Database Systems	3
Biology or Computational Elective		3
Biology or Computational Elective		3
International Course		3
Elective		3
Hours		15
Spring Term 4		
BIOL 4460 or BIOL 4820 or BIOL 4870	Phylogenetics or Protein Structure and Function or Cellular and Molecular Basis of Disease	3
CS 4615	Computational Biology: Sequence Analysis	3
BIOL 4210	Advanced Evolution	3
BIOL 400	Seminar	1
BIOL 4010 or BIOL 4070 or BIOL 4080 or BIOL 4110	Undergraduate Research or Practicum in Biology Laboratory Teaching or Human Anatomy and Physiology Laboratory Pedagogy or Senior Capstone	2
Biology or Computational Elective		3
Hours		15
Total Hours		120

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Learn and integrate: Through independent learning and collaborative study, students will attain, use, and develop knowledge in biology, computer science, and related disciplines with specialization in bioinformatics, integrating information across these disciplines. Students will be able to analyze biological datasets to understand living systems.

Think and create: Students will be able to use multiple thinking strategies to examine issues in bioinformatics, including, in particular, the design and computational analysis of biological datasets. Students will be able to apply bioinformatics knowledge to real world challenges, such as those that may be encountered in applied areas, solving problems using creative avenues of expression.

Communicate: Students will be able to acquire and analyze bioinformatics information from the scientific literature. Students will be able to convey bioinformatics information via verbal, written, and other non-verbal methods such as appropriate statistical analyses and graphics.

Clarify purpose and perspective: The program will allow students to explore bioinformatics in the context of their career and life's purpose as well as to apply perspectives to novel issues or problems within bioinformatics or other disciplines to foster an understanding of diverse global perspectives.

Practice citizenship: Students will understand and accept their roles as educated bioinformaticians and scientists in society. Students will be able to communicate with others, including non-scientists, from the special perspective of an educated bioinformatician. Students will be able to apply their understanding of bioinformatics to collaboratively engage with a diverse world.