



BS in BIOINFORMATICS (282021) Map Sheet

Department of Biology

For students entering the degree program during the 2008–2009 curricular year.

UNIVERSITY CORE AND GRADUATION REQUIREMENTS				PROGRAM REQUIREMENTS (63.0 total hours)		
UNIVERSITY CORE REQUIREMENTS (48.5 hours minimum)				Complete the following:		
<u>Requirements</u>	<u>#Classes</u>	<u>Hours</u>	<u>Classes</u>	Bio 265	Genomics	3.0
Doctrinal Foundation				Bio 365	Computational Biology	3.0
Book of Mormon	2	4.0	RelA 121 and 122	Bio 370	Bioethics	2.0
New Testament	1	2.0	RelA 211 or 212	Bio 420	Evolutionary Biology	2.0
Doctrine and Covenants	1	2.0	RelC 324 or 325	Bio 421	Evolutionary Biology Lab	1.0
The Individual and Society				Bio 465	Bioinformatics	3.0
Wellness	1 or 3	1.5–2.0	from approved list	MMBio240*	Molecular Biology	3.0
Citizenship				PDBio 120	Science of Biology	2.0
American Heritage	1–2	3–6.0	from approved list	PWS 340	Genetics	2.0
Global & Cultural Awareness	1	3.0	from approved list	Complete the following:		
Skills				C S 142	Intro to Computer Programming	3.0
Effective Communication				C S 235	Data Structures & Algorithms	3.0
First-Year Writing	1	3.0	from approved list	C S 236	Discrete Structures	3.0
Adv Written & Oral Communication	1	3.0	Engl 316	C S 240	Adv. Programming Concepts	3.0
Quantitative Reasoning	0–1	0–3.0	from approved list	Chem 105*	General College Chemistry	4.0
Languages of Learning (Math or Language)	1	4.0	Math 112* or 113*	Chem 106	General College Chemistry	3.0
Arts, Letters, and Sciences				Chem 351	Organic Chemistry	3.0
Civilization 1 and 2	2	6.0	from approved list	Math 112*	Calculus 1	4.0
Arts	1	3.0	from approved list	Math 113*	Calculus 2	4.0
Letters	1	3.0	from approved list	Complete one introductory statistics course:		
Scientific Principles & Reasoning				Stat 221	Principles of Statistics	3.0
Biological Science	2	5.0	MMBio 240*, PWS 340*	Stat 321	Elements of Mathematical Stats	3.0
Physical Science	2	7.0	Chem 105* plus one course from approved list	Stat 331	Intro to Bayesian Statistics	3.0
Social Science	1	3.0	from approved list	Stat 332	Quality Improvement for Industry	3.0
Core Enrichment: Electives				Complete one advanced statistics course not previously taken:		
Religion Electives	3–4	6.0	from approved list	Stat 331	Intro to Bayesian Statistics	3.0
Open Electives	Variable	Variable	personal choice	Stat 332	Quality Improvement for Industry	3.0
GRADUATION REQUIREMENTS:				Stat 336	Statistical Methods 1	6.0
Minimum residence hours required		30.0		Stat 421	Intro to Probability and Statistical Theory	3.0
Minimum hours needed to graduate		120.0				

FOR UNIVERSITY CORE QUESTIONS CONTACT THE ADVISEMENT CENTER ♦ FOR PROGRAM QUESTIONS SEE YOUR FACULTY ADVISOR

*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (13.0 hours overlap)

BS in BIOINFORMATICS (282021)
2008–2009

Suggested Sequence of Courses:

FRESHMAN YEAR

<u>1st Semester</u>	
Chem 105 (FWSpSu)	4.0
C S 142 (FWSpSu)	3.0
First-Year Writing	3.0
or A Htg 100 (FWSpSu)	(3.0)
Math 112 (FWSpSu)	4.0
PdBio 120(FWSp)	2.0
Total Hours	16.0

2nd Semester

A Htg 100 (FWSpSu)	3.0
or First-Year Writing	(3.0)
Chem 106 (FWSpSu)	3.0
C S 235 (FWSpSu)	3.0
Math 113 (FWSpSu)	4.0
Rel A 121 (FWSpSu)	2.0
Total Hours	15.0

SOPHOMORE YEAR

<u>3rd Semester</u>	
MMBio 240 (FWSp)	3.0
Chem 351 (FWSp)	3.0
C S 236 (FWSpSu)	3.0
Bio Science elective	3.0
General elective	2.0
Rel A 122 (FWSpSu)	2.0
Total Hours	16.0

4th Semester

Bio 265 (FW)	3.0
C S 240 (FW,Alt terms)	3.0
PWS 340 (FWSp)	2.0
Global & Cultural Awareness	3.0
Stat 331 (W)	3.0
Rel A 211 or 212 (FWSpSu)	2.0
Total Hours	16.0

JUNIOR YEAR

<u>5th Semester</u>	
Stat 336 (FW)	6.0
Bio 365 (F)	3.0
Bio 370 (FW)	2.0
Rel C 324 or 325 (FWSpSu)	2.0
Arts elective	3.0
Total Hours	16.0

6th Semester

Bio 465 (W)	3.0
Engl 316 (FWSpSu)	3.0
Religion elective (FWSpSu)	2.0
Civilization 1	3.0
Letters elective	3.0
**Wellness	1.5–2.0
Total Hours	15.5–16.0

SENIOR YEAR

<u>7th Semester</u>	
Civilization 2	3.0
Social Science	3.0
Religion elective (FWSpSu)	2.0
Open Electives (if needed)	2.0
Physical Science elective	3.0
Total Hours	13.0

8th Semester

Bio 420 (FWSp)	2.0
Bio 421 (FWSp)	1.0
Major electives	6.0
Open electives	3.0
Total Hours	12.0

THE DISCIPLINE:

Bioinformatics is an interdisciplinary program offering substantial training in both the biological sciences and the physical and mathematical sciences with an emphasis on computer programming coupled with genetics and molecular biology. Students are expected to acquire programming, databasing, and operating system skills coupled with a foundation in mathematics and statistics. In addition, students will be well trained in molecular biology and genetics and can pursue individual interests in a variety of areas (chemistry, physics, bioengineering, computer science, molecular biology, genetics, etc.).

RESEARCH OPPORTUNITIES:

Undergraduates majoring in bioinformatics are expected to participate in research training both on and off campus. The bioinformatics faculty has substantial research programs in phylogenetics, biophysics, ecological modeling, and proteomics with developing programs in biodiversity informatics and biotechnology/agricultural genomics. Students are encouraged to participate in one of these bioinformatic research programs. For a further description of research opportunities and research groups on campus see our website at www.bioinformatics.byu.edu

INTERNSHIPS, CO-OP ED, PRACTICAL EXPERIENCE:

The bioinformatics major offers an abundance of internship opportunities off campus in addition to working with faculty on campus as described above. Students have worked at federal research labs (NIH, NCBI, NCI), at other universities, and at private biotech and pharmaceutical companies seeking summer interns in bioinformatics. The bioinformatics major offers placement assistance for such programs and encourages students to gain a variety of external research experiences.

CAREERS:

The bioinformatics major is designed to develop the skills of those students with interests in both computer science and the biological sciences and to merge these interests in the area of bioinformatics or computational biology. The breadth of skills acquired will provide students with exciting options from graduate school, professional school (medical, dental, law), to employment opportunities directly out of this undergraduate program, especially with biotechnology companies.

FINANCING:

Students in this major may apply for university, college, and department scholarships. A limited number of research or teaching assistant positions for undergraduate students also exist.

****Wellness** – one course: HEPE 129; **or** a three-course combination: ExSc 105 + 2 activity classes (1.5–2.0 hours).

Note: This degree program requires a minimum of 120.0 hours for graduation. Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.

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