



BS in COMPUTER SCIENCE: Bioinformatics Emphasis (693222) MAP Sheet

Department of Computer Science

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

UNIVERSITY CORE AND GRADUATION REQUIREMENTS				PROGRAM REQUIREMENTS (84 total hours)																																																																																																																																																																																																																																												
UNIVERSITY CORE REQUIREMENTS (48.5 hours minimum)				No D credit is allowed in major courses																																																																																																																																																																																																																																												
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340</td><td>Software Design and Testing</td><td>3.0</td></tr> <tr><td>C S 345</td><td>Operating Systems Design</td><td>3.0</td></tr> <tr><td>C S 360</td><td>Internet Programming</td><td>3.0</td></tr> <tr><td>C S 404</td><td>Ethics and Computers in Society</td><td>2.0</td></tr> <tr><td>C S 418</td><td>Bioinformatics</td><td>3.0</td></tr> </tbody> </table> <p>Complete the following supporting courses:</p> <table border="1"> <tbody> <tr><td>Bio 265</td><td>Genomics</td><td>3.0</td></tr> <tr><td>Bio 365</td><td>Computational Biology</td><td>3.0</td></tr> <tr><td>Chem 105*</td><td>General College Chemistry</td><td>4.0</td></tr> <tr><td>Chem 351</td><td>Organic Chemistry</td><td>3.0</td></tr> <tr><td>Engl 316*</td><td>Technical Writing</td><td>3.0</td></tr> <tr><td>Math 112*</td><td>Calculus 1</td><td>4.0</td></tr> <tr><td>Math 113*</td><td>Calculus 2</td><td>4.0</td></tr> <tr><td>Math 343</td><td>Elementary Linear Algebra</td><td>3.0</td></tr> <tr><td>MMBio 240*</td><td>Molecular Biology</td><td>3.0</td></tr> <tr><td>PDBio 120</td><td>Science of Biology</td><td>2.0</td></tr> <tr><td>Phscs 121*</td><td>Principles of Physics 1</td><td>3.0</td></tr> <tr><td>PWS 340*</td><td>Genetics</td><td>2.0</td></tr> <tr><td>Stat 221</td><td>Principles of Statistics</td><td>3.0</td></tr> </tbody> </table> <p>Note: Students who are wishing for a more advanced experience and are prepared, complete Stat 321, 331, 332, or 441; for details see an advisor.</p>			C S 124	Introduction to Computer Systems	3.0	C S 142	Introduction to Computer Programming	3.0	C S 235	Data Structures and Algorithms	3.0	C S 236	Discrete Structures	3.0	C S 240	Advanced Programming Concepts	3.0	C S 252	Introduction to Computational Theory	3.0	C S 312	Algorithm Analysis	3.0	C S 340	Software Design and Testing	3.0	C S 345	Operating Systems Design	3.0	C S 360	Internet Programming	3.0	C S 404	Ethics and Computers in Society	2.0	C S 418	Bioinformatics	3.0	Bio 265	Genomics	3.0	Bio 365	Computational Biology	3.0	Chem 105*	General College Chemistry	4.0	Chem 351	Organic Chemistry	3.0	Engl 316*	Technical Writing	3.0	Math 112*	Calculus 1	4.0	Math 113*	Calculus 2	4.0	Math 343	Elementary Linear Algebra	3.0	MMBio 240*	Molecular Biology	3.0	PDBio 120	Science of Biology	2.0	Phscs 121*	Principles of Physics 1	3.0	PWS 340*	Genetics	2.0	Stat 221	Principles of Statistics	3.0	<p>Complete three elective courses from the following:</p> <table border="1"> <tbody> <tr><td>C S 401R</td><td>Topics in Computer Science</td><td>3.0V</td></tr> <tr><td>C S 405</td><td>Creating and Managing a Software Business</td><td>3.0</td></tr> <tr><td>C S 412</td><td>Modeling and Optimization</td><td>3.0</td></tr> <tr><td>C S 428</td><td>Software Engineering</td><td>3.0</td></tr> <tr><td>C S 431</td><td>Algorithmic Languages and Compilers</td><td>3.0</td></tr> <tr><td>C S 450</td><td>Intro to Digital Signal & Image Processing</td><td>3.0</td></tr> <tr><td>C S 452</td><td>Database Modeling Concepts</td><td>3.0</td></tr> <tr><td>C S 455</td><td>Computer Graphics</td><td>3.0</td></tr> <tr><td>C S 456</td><td>Introduction to User Interface Software</td><td>3.0</td></tr> <tr><td>C S 460</td><td>Computer Communications & Networking</td><td>3.0</td></tr> <tr><td>C S 462</td><td>Large-Scale Distributed System Design</td><td>3.0</td></tr> <tr><td>C S 465</td><td>Computer Security</td><td>3.0</td></tr> <tr><td>C S 470</td><td>Introduction to Artificial Intelligence</td><td>3.0</td></tr> <tr><td>C S 476</td><td>Introduction to Data Mining</td><td>3.0</td></tr> <tr><td>C S 478</td><td>Intro Neural Networks & Machine Learning</td><td>3.0</td></tr> <tr><td>C S 486</td><td>Verification and Validation</td><td>3.0</td></tr> </tbody> </table> <p>Note: If C S 401R is chosen, it must be taken for three hours.</p>			C S 401R	Topics in Computer Science	3.0V	C S 405	Creating and Managing a Software Business	3.0	C S 412	Modeling and Optimization	3.0	C S 428	Software Engineering	3.0	C S 431	Algorithmic Languages and 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***THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (19 hours overlap)**

FOR UNIVERSITY CORE OR PROGRAM QUESTIONS CONTACT THE ADVISEMENT CENTER

Physical and Mathematical Sciences College Advisement Center
N-179 ESC

Brigham Young University, Provo, UT 84602
Telephone: (801) 422-6270

FACULTY ADVISOR:

Paul Roper
3370 TMCB

Brigham Young University, Provo, UT 84602
Telephone: (801) 422-8149

BS in COMPUTER SCIENCE: Bioinformatics Emphasis (693222)
2008–2009

Suggested Sequence of Courses:

FRESHMAN YEAR

1st Semester

C S 142 (FWSpSu)	3.0
1 st Year Writing or A Htg 100	3.0 (3.0)
PDBio 120 (FWSp)	2.0
Math 112 (FWSpSu)	4.0
Rel A 121 (FWSpSu)	2.0
Total Hours	14.0

2nd Semester

C S 124 (FWSpSu)	3.0
C S 235 (FWSpSu)	3.0
A Htg 100 or 1 st Year Writing	3.0 (3.0)
Math 113 (FWSpSu)	4.0
Rel A 122 (FWSpSu)	2.0
Total Hours	15.0

SOPHOMORE YEAR

3rd Semester

C S 236 (FWSpSu)	3.0
Civilization 1	3.0
Stat 221 (FWSpSu)	3.0
Bio 265 (FW)	3.0
Rel A 211 or 212 (FWSpSu)	2.0
Total Hours	14.0

4th Semester

C S 240 (FWSu)	3.0
C S 252 (FWSp)	3.0
Chem 105 (FWSpSu)	4.0
Math 343 (FWSpSu)	3.0
Rel C 324 or 325	2.0
Total Hours	15.0

JUNIOR YEAR

5th Semester

C S 312 (FWSp)	3.0
MMBio 240 (FWSp)	3.0
Bio 365 (F)	3.0
Engl 316 (FWSpSu)	3.0
HEPE 129 (Wellness)	2.0
Religion Elective	2.0
Total Hours	16.0

6th Semester

C S 340 (FW)	3.0
C S 404 (FW)	2.0
PWS 340 (FWSu)	2.0
C S 418 (W)	3.0
C S 345 (FWSu)	3.0
Religion Elective	2.0
Total Hours	15.0

SENIOR YEAR

7th Semester

C S 360 (W)	3.0
Computer Science Elective(400 level)	3.0
Arts	3.0
Phscs 121 (FWSpSu)	3.0
Religion Elective	2.0
Chem 351 (FWSp)	3.0
Total Hours	17.0

8th Semester

Computer Science Elective (400 level)	3.0
Computer Science Elective(400-500 level)	3.0
Civilization 2 (and Letters)	3.0
Global and Cultural Awareness	3.0
Social Science	3.0
Total Hours	15.0

THE DISCIPLINE:

Computer science touches virtually every area of human endeavor. Software is responsible for everything from the control of kitchen appliances to sophisticated climate models used in predicting future environmental change. Students in computer science learn to approach complex problems in business, science, and entertainment using their strong background in mathematics, algorithms, and data structures.

The degree programs in the Computer Science Department prepare students to be confident software developers and technical problem solvers. The curriculum also trains students for research into new avenues where computers will have a significant impact.

The BS curriculum is accredited by the Computing Accreditation Commission of ABET.

CAREER OPPORTUNITIES:

Graduates pursue exciting opportunities in graphics, artificial intelligence, software engineering, database design, scientific programming, systems administration, and research at universities and national laboratories.

Students completing the animation emphasis will be prepared for technical positions at animation and game programming studios. Students will learn both the technical and artistic side of creating and implementing digital animations and games.

The bioinformatics emphasis is designed for students who are interested in building software to assist in analyzing biological systems. Students will graduate with a significant background in biology coupled with the software development and analysis skills necessary to implement large bioinformatics applications.

For more information on careers in your major, please refer to *From Major to Career*, a publication which is located in all college advisement centers.

Note 1: The sequence of courses suggested may not fit the circumstances of every student. Students should contact their college advisement center for help in outlining an efficient schedule.

Note 2: 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.

Computer Science Department
3361 Talmage Building
Brigham Young University Provo, UT 84602
Telephone: (801) 422-3027