### University Core and Graduation Requirements

#### University Core Requirements:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>#Classes</th>
<th>Hours</th>
<th>Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion Cornerstones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachings and Doctrine of The Book of Mormon</td>
<td>1</td>
<td>2.0</td>
<td>REL A 275</td>
</tr>
<tr>
<td>Jesus Christ and the Everlasting Gospel</td>
<td>1</td>
<td>2.0</td>
<td>REL A 250</td>
</tr>
<tr>
<td>Foundations of the Restoration</td>
<td>1</td>
<td>2.0</td>
<td>REL C 225</td>
</tr>
<tr>
<td>The Eternal Family</td>
<td>1</td>
<td>2.0</td>
<td>REL C 200</td>
</tr>
<tr>
<td>The Individual and Society</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Heritage</td>
<td>1-2</td>
<td>3-6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Global and Cultural Awareness</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Year Writing</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Advanced Written and Oral Communications</td>
<td>1</td>
<td>3.0</td>
<td>WRTG 316*</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>1</td>
<td>4.0</td>
<td>MATH 112* or 113*</td>
</tr>
<tr>
<td>Languages of Learning (Math or Language)</td>
<td>1</td>
<td>4.0</td>
<td>MATH 112* or 113*</td>
</tr>
<tr>
<td>Arts, Letters, and Sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civilization 1</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Civilization 2</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Arts</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Letters</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Biological Science</td>
<td>1</td>
<td>4.0</td>
<td>BIO 130*</td>
</tr>
<tr>
<td>Physical Science</td>
<td>2</td>
<td>7.0</td>
<td>CHEM 105* &amp; PHSCS 121*</td>
</tr>
<tr>
<td>Social Science</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Core Enrichment: Electives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion Electives</td>
<td>3-4</td>
<td>6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Open Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
</tr>
</tbody>
</table>

**Note:** These classes fill both University Core and Program requirements (18–22 hours overlap)

#### Graduation Requirements:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Hours</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum residence hours required</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td>Minimum hours needed to graduate</td>
<td>120.0</td>
<td></td>
</tr>
</tbody>
</table>

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### Suggested Sequence of Courses

#### Freshman Year

<table>
<thead>
<tr>
<th>Year</th>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Semester</td>
<td>CS 142</td>
<td>First-year Writing or American Heritage</td>
</tr>
<tr>
<td>2nd Semester</td>
<td>Religion Cornerstone course</td>
<td>Total Hours 16.0</td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Year</th>
<th>3rd Semester</th>
<th>4th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd Semester</td>
<td>First-year Writing or American Heritage</td>
<td>Civilization 1</td>
</tr>
<tr>
<td>4th Semester</td>
<td>Religion Cornerstone course</td>
<td>Total Hours 15.0</td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Year</th>
<th>5th Semester</th>
<th>6th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th Semester</td>
<td>CS 236</td>
<td>Civilian 1</td>
</tr>
<tr>
<td>6th Semester</td>
<td>Religion Cornerstone course</td>
<td>Total Hours 15.0</td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Year</th>
<th>7th Semester</th>
<th>8th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th Semester</td>
<td>CS 246</td>
<td>Arts</td>
</tr>
<tr>
<td>8th Semester</td>
<td>Religion Cornerstone course</td>
<td>Total Hours 15.0</td>
</tr>
</tbody>
</table>

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.

FOR UNIVERSITY CORE OR PROGRAM QUESTIONS, CONTACT THE ADVISEMENT CENTER.
BS in Computer Science: Bioinformatics (693222)  
2020-2021 Program Requirements (88 Credit Hours)

Personnel in the College of Physical and Mathematical Sciences Advisement Center will advise regarding core courses and suggested general education. Questions regarding curriculum and career decisions should be directed to the undergraduate advisor in the Computer Science Department.

REQUIREMENT 1 Complete 11 courses

CORE COURSES:
- C S 142 - Introduction to Computer Programming 3.0
- C S 224 - Introduction to Computer Systems 3.0
- C S 235 - Data Structures and Algorithms 3.0
- C S 236 - Discrete Structures 3.0
- C S 240 - Advanced Programming Concepts 4.0
- C S 252 - Introduction to Computational Theory 3.0
- C S 312 - Algorithm Design and Analysis 3.0
- C S 324 - Systems Programming 3.0
- C S 340 - Software Design 3.0
- C S 404 - Ethics and Computers in Society 2.0
- C S 472 - Introduction to Machine Learning 3.0

REQUIREMENT 2 Complete 3 options

SUPPORTING COURSES:

OPTION 2.1 Complete 10 courses
- *BIO 130 - Biology 4.0
- BIO 365 - Quantitative Biology 3.0
- BIO 465 - Capstone in Bioinformatics 3.0
- CHEM 105 - General College Chemistry 1 with Lab (Integrated) 4.0
- MATH 112 - Calculus 1 4.0
- MATH 113 - Calculus 2 4.0
- MBBIO 240 - Molecular Biology 3.0
- PHYS 121 - Introduction to Newtonian Mechanics 3.0
- *WRTG 316 - Technical Communication 3.0

OPTION 2.2 Complete 1 group

GROUP 2.2.1 Complete 1 course
- MATH 313 - (Not currently offered)

GROUP 2.2.2 Complete 2 courses
- MATH 213 - Elementary Linear Algebra 2.0
- MATH 215 - Computational Linear Algebra 1.0

OPTION 2.3 Complete 1 course
- STAT 121 - Principles of Statistics 3.0
- STAT 201 - Statistics for Engineers and Scientists 3.0

REQUIREMENT 3 Complete 15.0 hours from the following option(s)

COMPLETE A TOTAL OF 5 ELECTIVE COURSES (15.0 CREDIT HOURS) FROM THE FOLLOWING OPTIONS. NOTE: IF C S 401R, 497R, OR 498R IS CHOSEN, IT MUST BE TAKEN FOR 3 HOURS.

OPTION 3.1 Complete up to 15.0 hours from the following course(s)

COMPLETE 4-5 ELECTIVE COURSES (12-15 CREDIT HOURS) FROM THE FOLLOWING LIST:
- BIO 463 - Genetics of Human Disease 3.0
- C S 250 - Web Programming 3.0
- C S 329 - Testing, Analysis, and Verification 3.0
- C S 330 - Concepts of Programming Languages 3.0
- C S 345 - Operating Systems Design 3.0
- C S 355 - Interactive Graphics and Image Processing 3.0
- C S 401R - Topics in Computer Science 3.0

You may take up to 3 credit hours.

OPTION 3.2 Complete up to 6.0 hours from the following course(s)

COMPLETE 0-2 ELECTIVE COURSES (0-6.0 CREDIT HOURS) FROM THE FOLLOWING LIST:
- C S 428 - Software Engineering 3.0
- C S 431 - Algorithmic Languages and Compilers 3.0
- C S 450 - Computer Vision 3.0
- C S 452 - Database Modeling Concepts 3.0
- C S 453 - Fundamentals of Information Retrieval 3.0
- C S 455 - Computer Graphics 3.0
- C S 456 - Introduction to User Interface Software 3.0
- C S 460 - Computer Communications and Networking 3.0
- C S 462 - Large-Scale Distributed System Design 3.0
- C S 465 - Computer Security 3.0
- C S 474 - Introduction to Artificial Intelligence 3.0
- C S 479 - (Not currently offered) 3.0
- C S 486 - Verification and Validation 3.0

You may take up to 6 credit hours.

OPTION 3.3 Complete 1 course
- C S 480 - Software Engineering Capstone 1 3.0
- C S 481 - Software Engineering Capstone 2 3.0
- C S 482 - Data Science Capstone 1 3.0
- C S 483 - Data Science Capstone 2 3.0
- C S 493R - Computing Competitions 3.0

You may take up to 3 credit hours.

You may take up to 6 credit hours.

REQUIREMENT 4 Complete Senior Exit Interview with the CS department during your last semester or term.

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.

MAP DISCLAIMER
While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

DEPARTMENT INFORMATION
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Brigham Young University
3361 Talmage Building
Provo, UT 84602
Telephone: (801) 422-3027

ADVISEMENT CENTER INFORMATION
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Brigham Young University
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