### 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><strong>Religion Cornerstones</strong></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 C 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><strong>The Individual and Society</strong></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><strong>Skills</strong></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><strong>Arts, Letters, and Sciences</strong></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>3-4.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Physical Science</td>
<td>1</td>
<td>3.0</td>
<td>CS 312*</td>
</tr>
<tr>
<td>Social Science</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
</tbody>
</table>

**Core Enrichment: Electives**

| Religion Electives                  | 3-4      | 6.0   | from approved list |
| Open Electives                      | Variable | Variable | personal choice |

* THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (13 hours overlap)

#### Graduation Requirements:

- Minimum residence hours required: 30.0
- Minimum hours needed to graduate: 120.0

#### Suggested Sequence of Courses

<table>
<thead>
<tr>
<th>FRESHMAN YEAR 1st Semester</th>
<th>JUNIOR YEAR 5th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 142</td>
<td>C S 312</td>
</tr>
<tr>
<td>First-year Writing or American Heritage</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 112</td>
<td>C S 324</td>
</tr>
<tr>
<td>General Education courses, university requirements, and/or general electives</td>
<td>4.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td>Total Hours</td>
<td>15.0</td>
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<td></td>
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</tbody>
</table>

**2nd Semester**

| PHSCS 121                  | Computer Science elective |
|                           | 3.0 |
| C S 236                    | Computer Science elective |
|                           | 3.0 |
| American Heritage or First-year Writing | 3.0 | C S 404 |
| MATH 113                   | 2.0 | Letters |
| Religion Cornerstone course | 2.0 | 3.0 |
| Total Hours                | 15.0 | Religion Elective |
|                            | 2.0 |

**SOPHOMORE YEAR 3rd Semester**

| C S 236                    | Computer Science elective |
|                           | 3.0 |
| C S 224                    | Computer Science elective |
| STAT 121 or STAT 201 or MATH 431 | 3.0 | Computer Science elective |
| Civilization 1             | 3.0 | Arts |
| Religion Cornerstone course | 2.0 | 3.0 |
| Total Hours                | 14.0 | Religion Elective |
|                            | 2.0 |

**4th Semester**

| CS 240                     | Computer Science elective |
|                           | 4.0 |
| C S 252                    | Computer Science elective |
| Biological Science         | 3.0 |
| MATH 213                   | 2.0 |
| MATH 215                   | 1.0 |
| Religion Cornerstone course | 2.0 | Global and Cultural Awareness |
| Total Hours                | 15.0 | Social Science |

**5th Semester**

| CS/MATH/Science elective   | 3.0 |
|                           | 3.0 |
| Civilization 2             | 3.0 |
| Global and Cultural Awareness | 3.0 |
| Social Science             | 3.0 |
| Total Hours                | 15.0 |

Note: 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 majors, especially those planning graduate work, are advised to acquire a strong background in mathematics, possibly a minor. 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.

Note: All hours of credit toward a major in computer science must be of C- or better and must be taken within eight years of declaring the computer science major. Any exceptions must be approved by the department. Students may choose to graduate under later requirements by updating their date of entry into the major at the college advisement center.

Note: No double counting is allowed within the major.

### REQUIREMENT 1
Complete 10 courses

### CORE COURSES:
- C S 143: 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

### REQUIREMENT 2
Complete 3 options

### SUPPORTING COURSES:

#### OPTION 2.1
Complete 4 courses
- MATH 112: Calculus 1 4.0
- MATH 113: Calculus 2 4.0
- PHYS 111: 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
- MATH 431: Probability Theory 3.0
- STAT 211: Principles of Statistics 3.0
- STAT 201: Statistics for Engineers and Scientists 3.0

### REQUIREMENT 3
Complete 24.0 hours from the following option(s)

**COMPLETE A TOTAL OF 8 COURSES (24 HOURS) FROM THE FOLLOWING THREE GROUPS:**

#### OPTION 3.1
Complete up to 24.0 hours from the following course(s)

**COMPLETE UP TO 9.0 CREDIT HOURS FROM THE FOLLOWING COURSES. A MINIMUM OF 4 OF THE EIGHT ELECTIVE COURSES MUST BE FROM THIS GROUP:**
- C S 260: 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 356: Designing the User Experience 3.0
- C S 393: Advanced Algorithms and Problem Solving 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 9.0 hours from the following option(s)

**COMPLETE UP TO 9.0 CREDIT HOURS FROM THE FOLLOWING COURSES. A MINIMUM OF 4 OF THE EIGHT ELECTIVE COURSES MUST BE FROM THIS GROUP:**
- C S 513: Ethics and Computers in Society 3.0
- C S 501R: Advanced Topics in Computer Science 3.0
- C S 486: Concepts of Programming Languages 3.0
- C S 474: Introduction to Computational Theory 3.0
- C S 472: Advanced Programming Concepts 3.0
- C S 471: Discrete Structures 3.0
- C S 470: Data Structures and Algorithms 3.0
- C S 465: Introduction to Computer Systems 3.0
- C S 462: Introduction to Computer Programming 3.0

Note: If C S 401R or C S 501R is chosen, it must be taken for three hours.

#### OPTION 3.3
Complete up to 9.0 hours from the following option(s)

**COMPLETE UP TO 9.0 CREDIT HOURS FROM THE FOLLOWING COURSES. A MINIMUM OF 4 OF THE EIGHT ELECTIVE COURSES MUST BE FROM THIS GROUP:**
- 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.

### OPTION 2.4
Complete up to 6 credit hours.

#### GROUP 2.4.1
Complete 1 course
- MATH 411: Numerical Methods 3.0

#### GROUP 2.4.2
Complete 1 course
- MATH 481: Mathematical Cryptography 3.0

#### GROUP 2.4.3
Complete 1 course
- MATH 485: Mathematical Cryptography 3.0

#### GROUP 2.4.4
Complete up to 9.0 hours from the following course(s)

- C S 180
- C S 498R: Undergraduate Special Projects 3.0
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Note: If C S 498R is chosen, it must be taken for three hours.

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

### BS in Computer Science (693220)
#### 2021-2022 Program Requirements (74 Credit Hours)

#### OPTION 2.3
Complete 1 course
- MATH 431: Probability Theory 3.0
- STAT 211: Principles of Statistics 3.0
- STAT 201: Statistics for Engineers and Scientists 3.0

#### REQUIREMENT 3
Complete 24.0 hours from the following option(s)

**COMPLETE A TOTAL OF 8 COURSES (24 HOURS) FROM THE FOLLOWING THREE GROUPS:**

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- 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 356: Designing the User Experience 3.0
- C S 393: Advanced Algorithms and Problem Solving 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 9.0 hours from the following option(s)

**COMPLETE UP TO 9.0 CREDIT HOURS FROM THE FOLLOWING COURSES. A MINIMUM OF 4 OF THE EIGHT ELECTIVE COURSES MUST BE FROM THIS GROUP:**
- C S 513: Ethics and Computers in Society 3.0
- C S 501R: Advanced Topics in Computer Science 3.0
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- C S 472: Advanced Programming Concepts 3.0
- C S 471: Discrete Structures 3.0
- C S 470: Data Structures and Algorithms 3.0
- C S 465: Introduction to Computer Systems 3.0
- C S 462: Introduction to Computer Programming 3.0

Note: If C S 401R or C S 501R is chosen, it must be taken for three hours.

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Complete up to 9.0 hours from the following option(s)

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You may take up to 3 credit hours.

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Note: If C S 498R is chosen, it must be taken for three 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

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

### ADVISEMENT CENTER INFORMATION

Physical and Mathematical Sciences College Advisement Center  
Brigham Young University  
N-181 ESC  
Provo, UT 84602  
Telephone: (801) 422-2674